

© 2021 International Bank for Reconstruction and Development / The World Bank 1818 H Street NW Washington, DC 20433

Telephone: 202-473-1000 Internet: www.worldbank.org

#### **ATTRIBUTION**

Please cite the report as: World Bank. 2021. World Bank Support to Reducing Child Undernutrition. Independent Evaluation Group. Washington, DC: World Bank.

#### **COVER PHOTO**

Shutterstock/ Riccardo Mayer

#### **EDITING AND PRODUCTION**

Amanda O'Brien

#### **GRAPHIC DESIGN**

Luísa Ulhoa

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

#### **RIGHTS AND PERMISSIONS**

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: pubrights@worldbank.org.

# World Bank Support to Reducing Child Undernutrition

An Independent Evaluation

October 26, 2021

## Contents

Abbreviations	V
Acknowledgments	vi
Overview	viii
Management Response	xvi
Chairperson's Summary: Committee on Development Effectivenes	ss <b>xxi</b>
1. Introduction  Challenge	
Evolution of the Global Nutrition Agenda  Evaluation Objectives and Scope	4
Methodology	9
2. Approach to Multidimensionality: Evidence-Based Interventions,	, Engagement of
Global Practices, and Alignment with Country Needs————	14
Portfolio of Nutrition-Related Interventions	16
Evidence-Based Interventions: Is the World Bank Doing the Right Thing	? 21
Multisectorality of the Nutrition Portfolio: Engagement across Global Pra	actices 29
Multidimensionality in Country Programs	33
Are Interventions Supported by the World Bank Based on Country Nee	ds? <b>39</b>
3. World Bank Contribution to Nutrition Results	44
Nutrition Results: Project Performance and World Bank Contributions	45
Measuring Nutrition Results	54
Explaining Nutrition Results: Successes and Failures behind Project Per	formance 58
4. Conclusions and Way Forward———————————————————————————————————	63
Lessons	64
Recommendations	68
Glossary —	69
Dibliography	71

DOXES ————————————————————————————————————	
Box 1.1. Explaining the Logic of the Conceptual Framework	
of Child Undernutrition	11
Box 2.1. Examples of Interventions by Behavior Change Area	20
Box 2.2. Factors That Facilitate Multisectoral Coordination Efforts	37
Box 3.1. Contributions to Institutional Strengthening in 12 Countries	48
Figures ————————————————————————————————————	
Figure 1.1. Nutrition in the Life Cycle of Mother and Child	4
Figure 1.2. Evolution of the Global Nutrition Agenda	5
Figure 1.3. Conceptual Framework of Child Undernutrition	10
Figure 2.1. Nutrition Interventions in the Portfolio	18
Figure 2.2. Behavior Change Interventions in the Portfolio	21
Figure 2.3. Effective Interventions to Improve Stunted and Linear Growth	24
Figure 2.4. Alignment of Nutrition Interventions with Evidence on What Works	, by
Intervention Area	25
Figure 2.5. Projects by Approval Period and Global Practice	30
Figure 2.6. Interventions in Projects by Global Practice	31
Figure 2.7. Projects by Global Practice and Degree of Multidimensionality	32
Figure 2.8. Ethiopia Project Time for World Bank Nutrition Support	35
Figure 2.9. Undernutrition Determinants and Nutrition Outcomes	41
Figure 2.10. Alignment of Portfolio Interventions with Country Needs	42
Figure 3.1. Portfolio Performance	46
Figure 3.2. Distribution of Interventions, Intended Outcomes,	
and Project Indicators	55
Figure 3.3. Measurement of Nutrition Results at the Project Level	56
Figure 3.4. Tracing Evidence of Behavior Change Levels in Actors	58
Table ————————————————————————————————————	
Table 21 Systematic Deview Man Interventions with a Broad Positive Impact	28

Appendixes — — — — — — — — — — — — — — — — — — —	
Appendix A. Overall Methodology	78
Appendix B. Systematic Review Map and Relevance of the	, -
World Bank Nutrition Portfolio	90
Appendix C. Behavior Change Process Map	167
Appendix D. Nutrition Portfolio	189
Appendix E. Behavior Change Portfolio Analysis	224
Appendix F. Heat Map of Country Needs	231
Appendix G. Case Studies	244
Appendix H. Stocktaking of Multidimensional Approaches	298
Appendix I. Multivariate Regression Analysis	316

# World Bank Group Independent Evaluation Group

## **Abbreviations**

ASA advisory services and analytics

CBN community-based nutrition

CHW community health worker

ECD early childhood development

FY fiscal year

GP Global Practice

HNP Health, Nutrition, and Population

IEG Independent Evaluation Group

LBW low birthweight

M&E monitoring and evaluation

RETF recipient-executed trust fund

SBCC social and behavior change communication

SDG Sustainable Development Goal

SPJ Social Protection and Jobs

SR systematic review

SRM systematic review map

UNICEF United Nations Children's Fund

WASH water, sanitation, and hygiene

All dollar amounts are US dollars unless otherwise indicated.

# Acknowledgments

This evaluation was prepared by an Independent Evaluation Group team led by Jenny Gold, senior evaluation officer, and Mercedes Vellez, evaluation officer, under the overall direction of Alison Evans, Director-General, Evaluation, and with the guidance and supervision of Galina Sotirova, manager, Corporate and Human Development, and Oscar Calvo-Gonzalez, director, Human Development and Economic Management.

Santiago Ramirez Rodriguez, a core evaluation team member, was responsible for the portfolio review and the econometric analysis (appendixes D and I). Michael Premson supported the use of machine learning to identify the portfolio, and the Endeavour Programme team conducted artificial intelligence topic modeling. Rocio Garabito supported coding of the portfolio.

Case studies were conducted by Richard Anson, April Connelly, Judith Gaubatz, Jenny Gold, Aliza Inbal, Victor Malca, Denise Vaillancourt, and Mercedes Vellez, with support from Jean-Jacques Ahouansou, Chefou Balla, Mulusew Gerbaba, Umi Hanik, Hamani Harouna, Zione Kalumikiza, Ventura Mufume, Felix Muramutsa, Evelyne Ndipondjou, Huguette Noromiadana, Epimaque Nsanzabaganwa, Denise Van Wissen, and Helder Zavale.

Andrea Spray prepared the systematic review map (appendix B); the team is grateful to Ann Flanagan for her comments on an early draft. Dawn Roberts prepared the behavior change analysis (appendixes C and E) and the stocktaking on multidimensional approaches (appendix H); Brian Allen, Salim Habayeb, and Bjorn Ljungqvist supported the analysis. Ryoko Sato supported the heat map analysis (appendix F).

Estelle Raimondo provided overall methods support, and Qihui Chen provided advice on the heat map and econometric analysis. Jean-Jacques Ahouansou provided administrative support to the team. William Hurlbut edited the report, and Sharon Fisher provided design and editorial support.

External reviewers for this evaluation were Shawn Baker, chief nutritionist at the United States Agency for International Development, and former director of nutrition at the Bill & Melinda Gates Foundation and vice president for

Africa at Helen Keller International; Professor James Levinson, former professor at Boston University, Friedman School of Nutrition at Tufts University, Harvard University, and University of Massachusetts Amherst, and former director of nutrition at Tufts University International Food and Nutrition Center, Massachusetts Institute of Technology, and United States Agency for International Development; Dr. Bruno Marchal, evaluation methods expert at the Institute of Tropical Medicine, Antwerp; and Dr. Olivia Yambi, currently cochair of the International Panel of Experts on Sustainable Food Systems, and former United Nations Children's Fund regional nutrition adviser for Eastern and Southern Africa and representative in India, Kenya, and Lao People's Democratic Republic.

The team is grateful to all the staff who generously shared documents, insights, and experiences and engaged with us throughout the evaluation. Thanks are due to the country offices of Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nicaragua, Niger, and Rwanda for their support during the case studies.

## Overview

Insufficient intake or absorption of nutrients results in undernutrition in children and negatively affects their health, physical growth, and cognitive development. These and other nutrition outcomes are affected by immediate determinants that include caregiving practices, dietary intake or diversity, and the health status of the mother and child. These immediate determinants are all difficult to realize when communities lack adequate underlying determinants of nutrition, such as access to nutrient-rich food, caregiving resources, health care, and water, sanitation, and hygiene (WASH) services. Successfully addressing both the immediate and underlying determinants of nutrition requires changing behaviors related to feeding, caregiving, health, and WASH practices throughout the life cycle of the mother and child and social norms related to early marriage, early pregnancy, birth spacing, and women's empowerment.

This evaluation assesses the contributions of the World Bank to improving nutrition determinants and outcomes for children through its interventions during fiscal years (FY) 2008–19. The evaluation uses a variety of evidence at the global, country, and portfolio levels. Its findings are intended to inform the design of future nutrition support.

## **Main Findings**

In line with the conceptual framework of child undernutrition, the World Bank's approach to nutrition has evolved from a narrow focus on food security to a portfolio of multidimensional and multisectoral support. The multidimensional support combines nutrition-specific, nutrition-sensitive, social norms, behavior change, and institutional strengthening support. Institutional strengthening accounted for the largest share of the rapidly growing portfolio over FY08–19. Nutrition-sensitive interventions that aim to improve access to nutritious food, maternal resources, health care, and WASH services increased during the evaluation period. Meanwhile, nutrition-specific interventions that aim to address the immediate determinants of nutrition have not seen the same increase. Behavior change interventions are cross-cutting in the portfolio,

especially in support to communities. Social norms interventions, which can support an understanding of gender roles in decision-making that may influence nutrition status among children and pregnant and lactating women, remain relatively limited in the nutrition portfolio.

The portfolio supports interventions known to be effective in improving nutrition determinants and thus contributing to the reduction of child undernutrition. The increasing focus on nutrition-sensitive interventions in recent years is consistent with growing global evidence of the need to support both nutrition-specific and nutrition-sensitive interventions in countries where there is a need. Nonetheless, there is an opportunity for World Bank projects to better emphasize nutrition-sensitive and nutrition-specific interventions that work. Nutrition-specific interventions that work to address immediate nutrition determinants in countries can be balanced with support to interventions that work across sectors to address underlying nutrition determinants; support to institutional strengthening of stakeholder, policy, and services; and knowledge work to facilitate evidence, learning, and leadership.

The evaluation confirms that the World Bank's approach to nutrition—addressing dimensions of underlying and immediate nutrition determinants, social norms, behaviors, and institutional strengthening—provides a plausible pathway to improve nutrition outcomes. A combination of results across these dimensions is critical to support needs in countries. The associations among access to health services and social norms and a country's nutrition outcomes are the strongest, followed by access to WASH and food and care.

Although World Bank interventions generally address country needs at the national level, significant gaps remain in addressing social norms and WASH. Gaps in country needs relate to areas where there are low levels of nutrition determinants and a lack of support for improvement. The alignment of the nutrition portfolio with country needs is particularly high in access to health care that has the strongest association with country nutrition outcomes, but synergistic support in social norms and WASH is often lacking in countries where these determinants are disadvantaged.

Case studies revealed that at the subnational level within-country alignment and targeting is challenging. Support to nutrition is led by various Global Practices (GPs), and in most countries, interventions are fragmented across

projects and time, and coordination to ensure support to all relevant nutrition determinants is limited.

Country experiences also suggest a need for strengthening multisectoral arrangements for nutrition. The key for multisectoral response is having consistent support to develop leadership, services, systems, policies, and evidence to help countries sustain support to nutrition that involves multiple actors and sectors. Most institutional strengthening efforts in the case study countries are in one sector, with increasing examples of projects that contribute to strengthening multisectoral approaches for nutrition.

Moreover, case studies revealed that core nutrition projects are important because of their intentional design to address nutrition determinants. Noncore projects that integrate nutrition interventions do not have explicit nutrition objectives, are often not designed to improve nutrition determinants, and do not have a heavy nutrition focus. Health, Nutrition, and Population projects, for example, focus on health and family planning interventions, Water projects on WASH interventions, and Agriculture projects on agriculture and food approaches, and these interventions may integrate support to nutrition. Core projects, in contrast, are intentionally designed to support nutrition interventions that target immediate and underlying nutrition determinants.

The World Bank is also increasingly successful in achieving results related to underlying nutrition determinants and institutional strengthening, although the achievement of immediate nutrition determinants is more challenging given that they are higher on the results chain. The performance of World Bank projects in achieving underlying determinants improved over the evaluation period, with the most successful area being agriculture and food, although evidence also shows that the targeting of projects to address underlying nutrition determinants could be improved. In addition, successful institutional strengthening of national and subnational systems is helping in some countries to institutionalize policies, effective services, and stakeholder engagement to enhance the achievement of nutrition determinants and outcomes and to ensure sustained programs for continued outcomes improvement. Project achievements in immediate determinants of nutrition resulting from nutrition-specific interventions have declined in recent years and require greater emphasis and more consistent longer-term support.

Although the overall measurement of results has improved, persistent measurement gaps highlight areas to strengthen the portfolio results. Measurement of expected results, especially those related to immediate nutrition determinants and to behavior change and social norms, must increase to foster learning and improve the results monitoring when these interventions are implemented in projects.

The evaluation highlights encouraging bright spots, including an increasing nutrition portfolio in countries burdened by undernutrition and improved nutrition outcomes in some countries. In countries burdened by undernutrition, the World Bank invested an estimated \$22 billion in nutrition across multiple sectors from FY08 to FY19 (including about \$5.8 billion in recipientexecuted trust funds), with the number of projects tripling in recent years. This financing has supported interventions with broad positive evidence of effectiveness that can influence multiple nutrition outcomes and determinants. Some countries, Madagascar and Senegal among them, now have more than a decade of experience using a combination of financing and knowledge work to improve nutrition outcomes through multidimensional nutrition programs, from which other countries can learn. At the same time, the nutrition portfolio is young, with many countries recently developing their support, and there are opportunities to further improve the evidence base of interventions, knowledge work, the addressing of nutrition in the country programs, and results achievement and measurement.

#### Lessons

Five lessons follow from the findings:

- More intentional planning of nutrition support (financing and advisory services and analytics) is needed in the country portfolio to improve nutrition determinants, social norms, behavior change, and institutional strengthening. The multidimensionality of the country portfolio matters for results.
- » Interventions can be supported by multidimensional projects that implement a range of interventions to address nutrition determinants or by trust funds and partnership, and better GP coordination. Interventions can also

be integrated in noncore projects in GPs if they are accompanied by learning to design and target nutrition interventions and internal efforts to coordinate implementation. Trust funds and partnerships have been especially catalytic to designing new support in countries, which can be expanded with government ownership to develop comprehensive nutrition services.

- » Institutional strengthening can be done through support to stakeholder engagement, the development of nutrition services, and the coordination of plans, financing, and policies. At the national level, institutional strengthening can help develop multisectoral nutrition approaches and arrangements to coordinate, finance, plan, and communicate nutrition. At the local level, institutional strengthening has been important to engage stakeholders for the planning, monitoring, and delivery of nutrition programs. Links among these levels are also important for accountability and capacity building.
- » Addressing social norms is important to improve nutritional outcomes in countries. Only 6 percent of World Bank nutrition interventions address social norms. In particular, supporting the empowerment of key change agents can influence other behaviors and facilitate changes toward nutrition determinants.
- 2. The targeting and continuity of support in countries matter to successfully influence nutrition determinants. The evaluation finds that the targeting, continuity, and sustainability of nutrition interventions are important for achieving expected results from multisectoral nutrition approaches.
- The quality and extent of subnational targeting of multisectoral interventions matter for the ability to address (disaggregated) needs within countries. Interventions must come together in the same community to synergistically address identified needs. Multidimensional projects are one option to coordinate interventions to meet needs in the same community, but they have not performed better or worse overall. An alternative is improved coordination across GPs and with other development partners in the implementation of multisectoral interventions.
- » Continuity of support, particularly at the community level, is important for successfully influencing nutrition determinants for results. Community interventions involve building the capacity of a wide range of actors and pro-

moting behavior change, which need to be sustained. Strong community-based implementation is shown to be a success factor for improving project performance.

- 3. Improving the measurement of results for interventions addressing nutrition determinants and behavior change will support improvements in nutrition outcomes in countries.
- » Although the World Bank has improved its results measurement in the past 10 years, some areas still are not well measured. Projects measure only about 60 percent of the achievements of supported interventions toward nutrition determinants. The evaluation consistently identifies monitoring and evaluation of nutrition indicators as a pathway to improve project performance.
- » The World Bank's nutrition-sensitive interventions increasingly have achieved results in underlying determinants of nutrition in countries. Yet, nutrition-specific interventions, mainly implemented by Health, Nutrition, and Population, have not seen the same improvements in immediate determinants of nutrition, and these results are more challenging to achieve and require consistent support in countries. Areas where projects had limited success include diet diversity, child feeding, and micronutrient outcomes in women and children.
- » Most projects do not track behavior change results along the results chain (engage-learn-apply-sustain). The World Bank's contributions to behavior change focus mostly on lower-level indicators related to the engagement of actors. There is a need for learning in countries to better track behavior change, including on routine and periodic data sources to support results. Appendix C offers an example of a qualitative tool assessment used to track behavior change.
- 4. Refocusing the portfolio to have greater emphasis on a mix of nutrition-specific interventions balanced with nutrition-sensitive interventions across GPs can improve nutrition programs in countries. Although nutrition-sensitive interventions have increased in the portfolio, a similar proportional increase in nutrition-specific investments supported by health and other sectors is seen in only some countries (such as Rwanda), despite the critical importance of supporting these interventions in coun-

tries. The evaluation's systematic review map shows that effective interventions can be delivered by health, social protection, agriculture, and WASH sectors. Investing in improvements to nutrition-specific interventions and nutrition-sensitive support in countries is needed.

- 5. Learning—the systematic generation and use of knowledge work—is important to help countries design and expand effective nutrition policy and programming. Some case study countries have used a combination of knowledge work to help develop nutrition interventions and policies. Key examples are Ethiopia, Indonesia, Madagascar, Rwanda, and Senegal.
- » Country-level learning requires a stream of analytical work (evaluations, diagnostics, and so on) to improve interventions and expand their targeted delivery in national programs. For example, Madagascar had over a decade of advisory services and analytics to develop its community-based program, which is being expanded.
- » Because nutrition is often not the objective of GP projects (such as those in Agriculture and Water), interventions do not target improving nutrition determinants and in some cases might even negatively affect child undernutrition (as in the example of cash cropping). Attention to this issue and learning has already started at the global level, for example, through research on nutrition-sensitive agriculture.
- » Combining analytical work (such as evaluations and diagnostics) with knowledge sharing (within and across countries) and leadership-building activities in countries helps generate political commitment and the use of evidence to inform policies and programs and leverage resources.

#### Recommendations

The preceding lessons support two recommendations for the World Bank:

Adjust nutrition programming in country portfolios to (i) give more priority to institutional strengthening of stakeholder engagement, coordination, and services for nutrition and (ii) increase focus on subnational targeting of interventions to reflect areas of greatest disadvantage and persistency of need.

2. Strengthen nutrition support in GPs to (i) rebalance investments to have greater emphasis on nutrition-specific interventions and (ii) increase focus on social norms interventions and behavior changes, with more attention to tracking expected achievements to improve nutrition determinants.

# Management Response

Management of the World Bank thanks the Independent Evaluation Group (IEG) for the opportunity to respond to the report, *World Bank Support to Reducing Child Undernutrition*. The World Bank appreciates the close consultations IEG maintained with the operations teams during the evaluation.

#### Overall

Management welcomes this timely evaluation, given that the coronavirus pandemic (COVID-19) is undermining global progress toward Sustainable Development Goal 2.2. One projection is that over and above the current 149 million stunted children, an additional 9.3–13.6 million children will suffer from acute malnutrition, and 2.6–3.6 million more children will be stunted by 2022, rolling back years of progress. There is also a grave risk that these malnourished children will learn less in school and grow up to be less economically productive as adults.¹ The Human Capital Index Update for 2020 warns that a decade of human capital gains could be reversed by COVID-19.² The decision to elevate human capital as an special theme for the 20th Replenishment of the International Development Association reaffirms the World Bank's commitment to enhancing the focus on the nutritional status of children as part of the World Bank's COVID-19 response.

Management is pleased with the report's conclusion that the World Bank's approach to nutrition is sound and has evolved in a positive direction. The report states that "the World Bank's approach to nutrition has evolved from a narrow focus on food security to a portfolio of multidimensional and multisectoral support" (viii) and it "provides a plausible pathway to improve nutrition outcomes" (ix). Further, management welcomes the finding that nutrition is being mainstreamed into sectors beyond Health, Nutrition, and Population and that non–Health, Nutrition, and Population projects accounted for 63 percent in FY14–19, with Agriculture being the largest at 29 percent. Management is also pleased to note the report's finding that the World Bank is selective in its country engagements and has targeted its nutrition operations especially in those countries that had significant child undernutrition levels. The report

notes that "in countries burdened by undernutrition, the World Bank invested an estimated \$22 billion in nutrition across multiple sectors from FY08 to FY19 (including about \$5.8 billion in [recipient executed trust funds] RETF), with the number of projects tripling in recent years" (63).

### **Outcome Orientation**

Management agrees with the report's findings regarding the World Bank's effective support to indirect pathways to high-level outcomes. The report highlights the strategic role that the World Bank has played in convening and influencing the global nutrition agenda, so the World Bank's impact goes well beyond the projects that it finances. Scaling-Up Nutrition has been cited "as an example of the Bank Group's effective convening" (6). The growth in the nutrition portfolio over the review period is also reflective of the World Bank's efforts at the regional and country levels in advocating with governments to invest in nutrition. At the regional level, child nutrition interventions have been progressively integrated within the human capital regional plans and embedded in the human capital upstream support for policy and institutional reforms—including through development policy financing instruments, particularly in the South Asia and East Asia and Pacific regions. At the country level, many country programs have supported institutional reforms to support the nutrition agenda. The report also notes that "the World Bank is also increasingly successful in achieving results related to underlying nutrition determinants and institutional strengthening ... Successful institutional strengthening of national and subnational systems is helping in some countries to institutionalize policies, effective services, and stakeholder engagement to enhance the achievement of nutrition determinants and outcomes, and to ensure sustained programs for continued outcomes improvement" (x). Management believes that the long-term support that convening, knowledge and operational engagement in institutional strengthening brings to countries—beyond the typical project implementation time frame—is fundamental to improving child nutritional outcomes.

Management supports the report's quest for better measurement of child nutrition results in projects, yet it notes that high-level outcomes materialize long after project closing. First, the report notes that "most projects do not

measure sustained behavior change results... The World Bank's contributions to behavior change focus mostly on lower-level indicators related to the engagement of actors." (xiii). Although management supports the increased focus on monitoring and evaluation, including interventions to change social norms and behaviors, it also cautions that sustained behavior change is a long-term development impact that is not easily measured or captured within a typical Bank project cycle. Project development objectives are grounded in the realism of what can be measured during the project lifetime, and projects are to be evaluated based on the impactful change that they can reasonably expect within the project and its lifetime. Also, the persistent gaps that exist when tracking achievements from nutrition-specific and social norms interventions requiring behavioral changes may be explained by the limited availability of information to differentiate adherence to social norms from the usual patterns of behavior reflecting food availability, affordability, convenience, and familiarity. It is important to note that very few studies in the global literature measure outcomes related to social norms; this reflects measurement challenges and the lack of globally validated indicators of social norms globally. As noted in the report, several projects are now pioneering more rigorous evaluation of nutrition programs, for example in Madagascar, Rwanda, and India, among other countries. In this context, it is worth noting that the Bank Group has recently issued guidance to strengthen measurement of high-level outcomes, such as improved child nutrition, at the country level and over multiple Country Partnership Frameworks, as part of a road map to strengthen its outcome orientation.

#### Recommendations

Management agrees to adjust nutrition programming in country portfolios (i) to give more priority to institutional strengthening of stakeholder engagement, coordination, and services for nutrition; and (ii) to increase the focus on subnational targeting of interventions to reflect areas of greatest disadvantage and persistence of need (recommendation 1). As mentioned above, the emphasis on institutional strengthening at the country level is a key aspect of World Bank engagement with clients, and the World Bank will continue to support institutional strengthening yet more decisively. As highlighted in the evaluation, the World Bank has been effective at target-

ing investments in countries with child undernutrition and will continue to emphasize subnational targeting to reduce child nutrition disparities within countries whenever needed.

Although management agrees with the spirit of recommendation 2 ([i] to rebalance investments to have greater emphasis on nutrition-specific interventions and [ii] to increase the focus on social norms interventions and behavior changes, with more attention to tracking expected achievements to improve nutrition determinants), management will continue to be guided by global evidence. Global evidence, compiled in *The Lancet Series* (2008, 2013, 2021), suggests that nutrition-specific interventions may be more effective when complemented with nutrition-sensitive interventions, and vice versa, and this is the approach that the World Bank plans to continue pursuing, depending on specific country contexts. Management therefore finds the word rebalancing somewhat ambiguous, as it suggests that greater emphasis on nutrition-specific interventions is required. Management also believes that in the case of social norms and behavioral change interventions, the World Bank should also follow global best practices. Management agrees with the report's finding that greater focus on changing social norms is needed but also notes that inducing impactful behavioral change requires a long-term multifaceted engagement informed by evidence. Although there is consensus on the need to do more in relation to social norms, the evidence base to support country-level changes is still evolving. Best practice evidence suggests that increasing investments in evidence-based nutrition-specific interventions complemented with nutrition-sensitive sectors is paramount to improving nutrition outcomes, in addition to scaling-up interventions to address social norms. In addition, in many country contexts, other local or international partners that have a larger presence in the field may have a greater comparative advantage than the World Bank in changing social norms, and these changes may in fact be catalyzed by their complementary projects. Further, as stated above, it is important to note that social norms take a very long time to change and cannot realistically be measured within the time frame of World Bank projects, particularly considering the lack of globally validated indicators for measuring social norms. Several World Bank projects are now pioneering measurement of nutrition outcomes, and management will continue to support such efforts, in the quest for increased outcome orientation.

 $^1\ https://blogs.worldbank.org/voices/financing-sdg2-hunger-and-malnutrition-what-will-it-take.$ 

<sup>2</sup> Through simulations, the 2020 Human Capital Index report shows that without any remediation, a decade of human capital gain could be reversed by the pandemic with a 0.44 percent drop in the index globally, and up to 0.73 percent loss in low income countries. (See World Bank. 2020. *The Human Capital Index 2020 Update: Human Capital in the Time of Covid-19*.)

<sup>3</sup> "Almost 40 percent of World Bank support is institutional strengthening, especially aimed at improved nutrition service delivery, such as quality assurance approaches, capacity building, and performance-based systems" (14).

<sup>4</sup> https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(21)00568-7.pdf

# Chairperson's Summary: Committee on Development Effectiveness

The Committee on Development Effectiveness met to consider the Independent Evaluation Group (IEG) evaluation entitled *World Bank Support to Reducing Child Undernutrition* and the draft World Bank management response.

The committee noted the timeliness of the evaluation at a time when the coronavirus pandemic (COVID-19) has undermined global progress toward Sustainable Development Goal 2.2 and deepened many nutrition challenges. Members welcomed management's broad agreement with IEG's recommendations and its acknowledgment that, despite the progress made, there is room for improvement. They asked management to be more specific about the actions it will take to implement the recommendations and the evidence it will be tracking and collecting to monitor progress.

Members were pleased to learn that the World Bank's approach to nutrition is sound and that it has evolved in a positive direction, moving from a narrow focus on food security to a portfolio of multidimensional and multisectoral support; that nutrition is being mainstreamed to non-Health Nutrition Population sectors; and that the World Bank is selective in its engagement, and has steered its nutrition operations specifically toward countries that have significant child undernutrition issues. Members welcomed the World Bank's enhanced focus on the nutritional status of children as part of the World Bank's COVID-19 response and commitment to elevate human capital as a special theme in the 20th Replenishment of the International Development Association. They encouraged management to increase investments in nutrition-specific interventions; further strengthen monitoring and evaluation frameworks; enhance learning and knowledge sharing across the World Bank; translate lessons into operational guidance for Global Practices and country teams; and strengthen coordination across Global Practices and with other partners.

Many attendees highlighted the broader aspect of malnutrition—including obesity—stressing the importance of tackling this challenge, which also affects some low-income countries, compromises human capital, and increases susceptibility to noncommunicable diseases. They appreciated management's explanation that it conducted a major analytic study on obesity through trust-fund support from the government of Japan, which they plan to use to inform its work. Nonetheless, alluding to the Food System Summit, the committee underscored the importance for the World Bank to adopt a holistic approach and play a convening role in supporting the implementation of voluntary guidelines on food systems and nutrition, and in scaling up national food systems that prioritize access for all to healthy diets, ensure food security, and promote a nutrition-sensitive agenda. They called on the World Bank to demonstrate its comparative advantage as a knowledge and solutions bank that strives to help client countries meet their Sustainable Development Goals and prevent and mitigate adverse economic impacts and health consequences for its citizens. Management explained that President Malpass had made a commitment on behalf of the World Bank Group at the United Nations Food Security Summit to focus on the food security and nutrition-sensitive agenda, noting that nutrition-specific issues will be the focus of the upcoming Nutrition for Growth Summit to be hosted by the government of Japan on December 7 and 8, 2021, in Tokyo.

Members acknowledged that although nutrition-sensitive projects have generally achieved results, achieving results for nutrition-specific interventions has been more challenging. They asked management to clarify its plan for enhancing nutrition-specific interventions. They also asked IEG and management to comment on World Bank's value added on social norms and behavior change interventions, particularly as the World Bank seeks to ramp up efforts to empower women and strengthen cross-sectoral work across Global Practices to address coordination bottlenecks. Members encouraged the World Bank to continue seeking strategic opportunities to engage more frequently and in a more effective manner on these types of interventions. The committee recognized the World Bank's convening role in mobilizing partnerships in support of the nutrition agenda and look forward to improved metrics that better reflect the measurement of outcomes.

# 1 Introduction

## Highlights

Undernutrition negatively affects the health, physical growth, and cognitive development of children, with consequences that last through adulthood and reduce their potential to learn and contribute to society, ultimately affecting human capital accumulation in countries.

Stunted growth of children under five, anemia, and low birth-weight—all indicators of child undernutrition—still severely affect the Africa and South Asia regions. Globally, an estimated 150 million children (22 percent) had stunted growth in 2018, compared with 198 million (33 percent) in 2000.

Coordinated effort throughout the life cycle of the mother and child is required to improve nutrition determinants, including diet diversity, child feeding, the health of mother and child, and access to food, caregiving, health services, water, sanitation, and hygiene.

The evaluation assesses the contribution of the World Bank's nutrition support in improving outcomes for reducing child undernutrition and in improving nutrition determinants through multidimensional and collaborative multisectoral interventions. The findings support lessons and recommendations to inform the design of future nutrition support.

H

## Challenge

Undernutrition negatively affects the health, physical growth, and cognitive development of children. It arises from the insufficient intake or absorption of nutrients, which starts with the nutrition and health of the future mother, affecting the growth and development of the child in utero and birth outcomes. Child undernutrition has irreversible effects in early childhood and beyond. The causes of child undernutrition are influenced by the mother and child's access to and practice of behaviors related to nutrition determinants: caregiving practices, diet diversity, maternal and child health, and access to food, maternal resources, health services, and water, sanitation, and hygiene (WASH).

Reducing child undernutrition is essential for enhancing human capital accumulation, boosting economic growth, and reducing poverty. The consequences of undernutrition for young children last through adulthood and reduce their potential to learn and contribute to society. These consequences are also often intergenerational, extending to future children. Galasso and Wagstaff (2018) estimate the average per person income penalty from stunted growth is about 7 percent.

Global reports on indicators of undernutrition show mixed progress across regions in reducing the stunted growth of children under five, anemia, and low birthweight (LBW), with Africa and South Asia most severely affected. Moreover, although much of Latin America and the Caribbean and of East Asia and Pacific have low national prevalence of stunted growth of children, some countries and subnational areas have levels of stunted growth similar to Africa and South Asia. Stunted growth, wasting, and underweight are the most-used anthropometric measures of child undernutrition. Globally, more than 150 million children (22 percent) were estimated to have stunted growth as of 2018, compared with 198 million (33 percent) in 2000. In Africa, stunted growth rates have improved since 2000, yet total undernutrition is worsening as the population is growing; therefore, the total number of children with stunted growth is increasing. Reducing anemia and LBW have seen similarly mixed progress. The latest figures show that the prevalence of anemia in girls and women of reproductive age has stagnated at about 33 percent. Approximately 20 million babies are LBW globally, compared

with 22.9 million in 2000 (Development Initiatives 2020; UNICEF, WHO, and World Bank 2019).

Improving child nutrition requires efforts at each stage of the life cycle of the mother and child. Malnourished pregnant women may deliver LBW newborns, and mothers with low body weight or micronutrient deficiencies may struggle to sustain exclusive breastfeeding or to feed and care for their babies (figure 1.1). Children with low or inadequate nutritional status are more prone to childhood infections, which further aggravate the child's capacity to absorb nutrients, and have slower growth and impaired cognitive capacity (Maternal and Child Nutrition Study Group 2013).

Evaluation of child undernutrition requires the assessment of outcomes at different points in the life cycle of mother and child, with a focus on the early years of life. Within the life cycle, mother and child are most sensitive to the consequences of undernutrition from preconception through pregnancy, until the child is about two years old. For this reason, nutrition interventions often target mothers, children, and future mothers during this period, including girls, adolescents, and women before conception and during pregnancy, and households with mothers and young children. Given the many nutrition determinants that affect the life cycle of mother and child, the challenge of improving nutrition outcomes (anthropometric measurements, micronutrient status, and cognitive development) becomes multidimensional, requiring interventions in health, agriculture, WASH, social protection, education, and governance. Thus, improving outcomes in countries requires coordination to improve diet diversity, child feeding, the health of mother and child, and access to food, caregiving, health services, and WASH. It also involves engaging a range of actors, including government, communities, and households, to influence nutrition determinants.

Reduced capacity to care for baby Household LBW baby caregiver Inadequate breastfeeding, weaning malnourished Frequent infections Inadequate Inadequate catch-up in Inadequate food, care, fetal nutrition growth, delayed health, WASH milestones Child stunted Mother malnourished, low energy Reduced cognitive Pregnancy capacity low weight gain Inadequate food, learning, health, WASH Higher neonatal Adolescent mortality, anemia stunted Inadequate food, care, Reduced capacity to contribute health, WASH socially and economically

Figure 1.1. Nutrition in the Life Cycle of Mother and Child

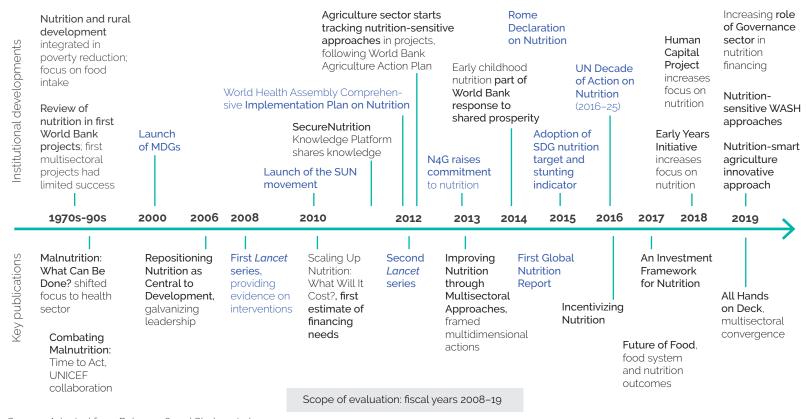
Sources: Adapted from ACC/SCN 2000 and UNCNC21 2000.

Note: LBW = low birthweight; WASH = water, sanitation, and hygiene.

## **Evolution of the Global Nutrition Agenda**

Historically, the World Bank's nutrition agenda has focused on access to food. In the 1970s, the World Bank approached nutrition by integrating it into poverty reduction through multisectoral rural development projects. Government commitments to implement these projects were often weak (MacNally 1983; World Bank 2014). Later projects shifted to focus mainly on the health sector (Berg 1987), where the challenge became how to meaningfully integrate nutrition interventions into one component of the project or to expand interventions in health services or interventions that had been confined to small geographical areas (figure 1.2).

Figure 1.2. Evolution of the Global Nutrition Agenda



Sources: Adapted from Rokx 2006 and Shekar et al. 2017.

Note: Black type indicates World Bank actions; blue type indicates multipartner actions. MDG = Millennium Development Goal; N4G = Nutrition for Growth; SDG = Sustainable Development Goal; SUN = Scaling Up Nutrition; UN = United Nations; UNICEF = United Nations Children's Fund; WASH = water, sanitation, and hygiene.

Over the years, World Bank support to nutrition has evolved into a more multidimensional and collaborative multisectoral agenda. Countries and development partners have adopted the United Nations Children's Fund (UNICEF) framework of child undernutrition (UNICEF 1990, 2015), which highlights the need to address multidimensional determinants, including access to food, caregiving, health services, and WASH throughout the life cycle of mother and child (figure 1.3). Among the milestones in the World Bank's adoption of a multidimensional or collaborative multisectoral approach is a series of reports on combating nutrition (Gillespie, McLachlan, and Shrimpton 2003), strengthening country commitment (Heaver 2005), repositioning nutrition in the development agenda (World Bank 2006), scaling up nutrition (Horton et al. 2010), and improving nutrition through multisectoral approaches (World Bank 2013a).

The Scaling Up Nutrition Movement (2010) brought together countries, sectors, and development partners to act on nutrition and began to organize learning and operational efforts regarding the UNICEF framework of child undernutrition and addressing of nutrition determinants. In some countries, the movement initiated policy and institutional reforms to coordinate, plan, measure, and implement nutrition interventions and find solutions to overcome previous challenges relating to the countries' ownership and delivery of the agenda; that is, nutrition does not fall within the mandate of any one sector (SUN Movement 2019). Within the World Bank, the commitment to the movement renewed the engagement of sectors (agriculture, social protection, health, water, and so on) to address nutrition in country programs (Alderman 2016; Hawkes and Ruel 2008; World Bank 2013a, 2014). The 2020 Independent Evaluation Group (IEG) Evaluation of the World Bank Group's Global Convening cited the movement as an example of the Bank Group's effective convening that transformed the execution of nutrition efforts by creating a multisectoral, multistakeholder platform and galvanized momentum in reducing malnutrition.

In 2008, the first of several *Lancet* series on nutrition began consolidating the knowledge and evidence on interventions that were effective in improving nutrition outcomes (Maternal and Child Undernutrition Study Group 2008). In 2010, the World Bank published the first estimates for financing nutrition interventions in countries; these estimates have led to more

detailed country-level investment cases (Horton et al. 2010), work on the Optima Nutrition budget allocation decision tool (Pearson et al. 2018), and from 2013 became the basis for mobilizing financing for nutrition and political commitment through Nutrition for Growth, together with partners such as the Bill & Melinda Gates Foundation. Multisectoral knowledge sharing has also been supported through the SecureNutrition Knowledge Platform (World Bank 2017).

Since 2016, the Sustainable Development Goals (SDGs) have been adopted to improve nutrition outcomes, and the United Nations has declared the Decade of Action on Nutrition (2016–25). The Millennium Development Goals had focused on halving the prevalence of underweight children under five by 2015, which did not fully address the importance of nutrition to healthy growth and child development. The need for better nutrition is further recognized in SDG 2, which aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. SDG 2 emphasizes the transformational role nutrition can play in driving human capital development and the need to address multidimensional nutrition determinants and inequalities in the life cycle of mother and child. The SDG 2 focus on stunted growth was influenced by the World Bank's strategy of reducing extreme poverty and promoting shared prosperity and by its emphasis on inequalities in early childhood development (ECD) and nutrition (Denboba et al. 2014; World Bank 2013b). Since the creation of the SDGs, the World Bank has supported nutrition investments in countries and analyses on the economic costs of child undernutrition (Galasso and Wagstaff 2018; Laviolette et al. 2016; Shekar et al. 2017; WHO 2014). Global nutrition targets set by the World Health Assembly for 2025 include a 40 percent reduction in stunted growth, a 50 percent reduction in anemia in women, a 30 percent reduction in LBW newborns, and an achievement of at least 50 percent for exclusive breastfeeding (WHO 2014).

The launch of the World Bank's Human Capital Project in 2018 further reinforced the importance of reducing child undernutrition and of implementing a package of multidimensional interventions to achieve results. The percentage of children under five who do not have stunted growth is now used as a proxy for healthy child growth based on its emphasis in the Human Capital Index (World Bank 2018). The human capital agenda has led to (i) efforts to

improve data on nutrition indicators and (ii) analysis to understand aspects of multidimensionality relating to how interventions from different sectors can be prioritized and integrated in a package to address disadvantaged nutrition determinants in a country context, that is, inadequate access to nutrient-rich food, caregiving resources, health services, and WASH (UNICEF, WHO, and World Bank 2019; Skoufias, Vinha, and Sato 2019).

## **Evaluation Objectives and Scope**

The objectives of this evaluation are (i) to assess the contribution of the World Bank in improving outcomes related to reducing child undernutrition and improving nutrition determinants and (ii) to inform the design of future nutrition support. The evaluation provides evidence on results across sectors and lessons from operational experience to feed into country strategies, multidimensional and collaborative multisectoral approaches, and project design, particularly in those countries where child undernutrition is an important factor inhibiting the healthy growth of children and the accumulation of human capital.

The overarching evaluation question is, "What has been the contribution of World Bank support to improve outcomes and intermediate outcomes in reducing child undernutrition and improving nutrition determinants in countries burdened by undernutrition?" Underlying this question are three main lines of inquiry:

- » To what extent is the World Bank supporting relevant interventions to improve outcomes and intermediate outcomes of child undernutrition and its determinants within the country context?
- » How is the World Bank implementing multidimensional approaches to support outcomes and intermediate outcomes that reduce child undernutrition, improve its determinants, and strengthen countries' institutional capacities?
- » To what extent have World Bank interventions contributed to achieve outcomes and intermediate outcomes of reducing child undernutrition and improving its determinants, and what were the factors of success and failure?

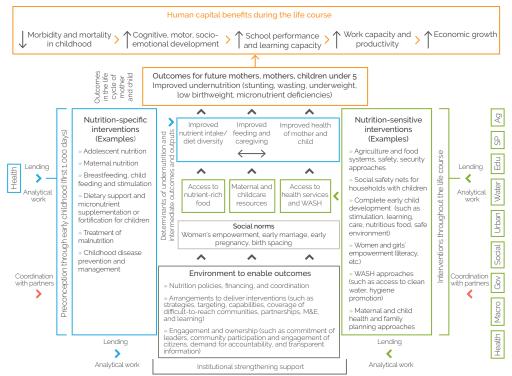
To answer these questions, the evaluation focuses on World Bank engagements in nutrition (investment operations, development policy lending, and recipient-executed trust funds [RETFs]) that were active during fiscal year (FY) 2008–19 in countries that have reported high levels of stunted growth.

## Methodology

The evaluation design adopts a multilevel analysis at the global, portfolio, country, and intervention levels using quantitative and qualitative evaluative evidence and applying participatory, theory-based, and case-based principles.

The conceptual framework underpinning this evaluation is adapted from the UNICEF framework of determinants of child undernutrition (figure 1.3; Maternal and Child Nutrition Study Group 2013; UNCNC21 2000; UNICEF 1990, 2015). The framework models interlinked dimensions to sustainably address child undernutrition in a country context. In doing this, the evaluation takes a systems approach to look at the World Bank's support and results across these dimensions. These dimensions are nutrition-specific and nutrition-sensitive interventions addressing the immediate and underlying determinants of nutrition, respectively, social norms interventions, and institutional strengthening support, considering factors within the country that are used to prioritize and target interventions (box 1.1). The evaluation methods look at each of these dimensions and confirm the interlinkages among the dimensions. This emphasizes the need for a mix support tailored to needs in countries to achieve results across these dimensions to contribute to nutrition outcomes (anthropometric measures and micronutrients deficiencies).

Figure 1.3. Conceptual Framework of Child Undernutrition



Country context: inequalities in the distribution of outcomes; poverty; health status; demographics; status of women; fragility and conflict; politics; environment

Sources: Adapted from Maternal and Child Nutrition Study Group 2013 and UNICEF 1990.

Note: The assessment of the contribution of the World Bank's nutrition support to human capital benefits is outside the scope of the evaluation. Ag = Agriculture; Edu = Education; Gov = Governance; Macro = Macroeconomics, Trade, and Investment; M&E = monitoring and evaluation; Social = Social Sustainability and Inclusion; SP = Social Protection and Jobs; Urban = Urban, Disaster Risk Management, Resilience, and Land; WASH = water, sanitation, and hygiene.

# **Box 1.1.** Explaining the Logic of the Conceptual Framework of Child Undernutrition

The conceptual framework premises that nutrition outcomes for pregnant women and children (for example, anthropometric measures and micronutrient status) are better among women and children with adequate nutrition determinants. Immediate determinants of child nutrition relate to caregiving practices, dietary intake or diversity, and the health status of the mother and child. It is not possible to realize these factors when communities lack adequate access to underlying determinants of nutrition, including nutrient-rich food, caregiving resources, health services, and water, sanitation, and hygiene (WASH). Improvements in underlying determinants are interdependent; that is, access to food is not enough without adequate feeding, proper care, adequate and accessible health services, and clean water.

Successfully addressing both the immediate and the underlying determinants of nutrition requires transforming social norms relating to early marriage, early pregnancy, birth spacing, and women's empowerment (decision-making regarding childcare, food production, health care seeking) and changing behaviors relating to feeding, caregiving, health, and WASH practices, including those related to gender relations and practices. Behavioral interventions are thus central to the framework and can target women, caregivers, children, and other agents of change (such as household members and community leaders) who can influence the prevailing social norms, and more broadly, behavior practices at the community and household levels.

The conceptual framework suggests that nutrition interventions within a country need to be multidimensional to address both the immediate and underlying nutrition determinants in their context; this may require synergizing interventions related to multiple sectors. Nutrition-specific interventions, such as adolescent nutrition, maternal nutrition, breastfeeding support, micronutrient supplementation, child disease prevention, and management and treatment of undernutrition, are expected to influence the immediate determinants of nutrition. Nutrition-sensitive interventions, such as cash transfers, WASH approaches, girls' education, and food system improvements, are expected to address the underlying determinants. Whereas nutrition-specific interventions are often delivered by the health system and target women and children, nutrition-sensitive interventions may be delivered by various sectors and target households and communities or geographies with inadequate nutrition determinants (access to nutritious food, caregiving resources, health services, and WASH).

# **Box 1.1.** Explaining the Logic of the Conceptual Framework of Child Undernutrition (cont.)

The country-specific situation, including the distribution of outcomes, frames the context in which to prioritize and target interventions, and the enabling environment frames interventions to strengthen institutional capacities at national and subnational levels over time in a country to support outcomes. Factors of fragility and distributional factors related to inequalities in nutritional outcomes, health and education status, and poverty can create different country scenarios in which to prioritize and target interventions to improve undernutrition. Moreover, the distribution of nutrition determinants in a population—that is, access to nutritious foods, caregiving resources, health services, and WASH—can provide information on investment needs. Institutional capacities in the enabling environment at the national and subnational levels can frame priorities for interventions to improve the delivery of services and programs, the engagement of communities, and the implementation of policies to address nutrition in countries.

Source: Independent Evaluation Group.

The evaluative findings and conclusions are a result of the triangulation of different evaluation components at the global, portfolio, and country levels. The evaluation adopted several innovative practices and broadened the methodological applications to ensure construct validity, internal validity, external validity, and reliability of findings through a transparent methodological design, with clear justification of choices made (see appendix A for the evaluation methodology).

At the global level, the evaluation methods included a systematic review map (SRM) that synthesizes the existing evidence from systematic reviews (SRs) of the literature on the effectiveness of nutrition interventions across sectors to support nutrition outcomes, immediate nutrition determinants, or underlying nutrition determinants (appendix B). The SRM provides a tool to visualize the existing evidence and benchmark it against the nutrition portfolio to review the alignment of World Bank support in Global Practices (GPs) to the evidence base. Additionally, a structured literature review identified and categorized behavior change concepts and evidence to develop a set of process maps describing a basic results chain for benchmarking behavior change in projects (appendix C). The process maps provide a qualitative

tool to review behavior change support to nutrition determinants, which is often not tracked in projects.

At the portfolio level, the evaluation conducted a systematic identification, coding, extraction, and analysis of the World Bank's nutrition lending portfolio based on its relevance, multidimensional approaches, and contributions to nutrition results in countries. The portfolio review and analysis combined a mapping of project indicators to measure nutrition achievements with artificial intelligence theory-based content analysis and unsupervised machine learning techniques to develop a taxonomy of common success and failure factors that influenced the results of nutrition projects (appendix D). In addition, portfolio data were contrasted against a heat map on nutrition outcomes and determinants in countries to assess the alignment of projects' interventions to the country needs and to understand the empirical links of the conceptual framework (appendix F). Moreover, a qualitative stocktaking exercise of 12 countries was conducted to understand multisectoral approaches to nutrition in different country contexts and how the World Bank helped enhance multisectoral coordination through institutional capacity building (appendix H). Finally, a multivariate regression analysis was done to deepen learning on the portfolio data (appendix I).

At the country level, central to the evaluation are eight country case studies (Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nicaragua, Niger, and Rwanda) that include a review of nutrition in the country program (including analytical work), semistructured interviews, and analysis of the World Bank's contribution to results in each country (appendix G).

The report is structured as follows: chapter 2 focuses on the World Bank's approaches to multidimensionality; chapter 3 looks at the World Bank's contribution to results; and chapter 4 presents conclusions, lessons, and recommendations to inform the design of future multidimensional nutrition support by the World Bank.

Approach to
Multidimensionality:
Evidence-Based
Interventions, Engagement
of Global Practices, and
Alignment with Country
Needs

## **Highlights**

The World Bank's nutrition portfolio is growing quickly, with many new projects since 2014, and it increasingly uses multidimensional and multisectoral interventions.

The portfolio engages with issues spanning the conceptual framework, with a mix of interventions, including nutrition-specific and nutrition-sensitive approaches. Institutional strengthening accounts for the largest share of support, with less attention to social norms and behavior change and limited attention to adolescent health—all of which have been shown to be effective in improving nutrition outcomes.

The World Bank aligns its nutrition support with current evidence and helps generate knowledge and learning to promote evidence-based policies. However, a range of interventions can be delivered by health, social protection, agriculture, and water, sanitation, and hygiene sectors with consistent evidence, which could be better addressed in the portfolio. This approach can be balanced with knowledge and learning in countries to improve the use of evidence in nutrition programming.

Global Practices often collaborate in implementing nutrition interventions, but case studies suggest that they need support in learning how to design effective nutrition interventions in projects where nutrition is not the main priority.

The World Bank's institutional strengthening support can facilitate multisectoral arrangements in two ways. First, it can support the enhancement of national leadership and subnational governments to coordinate multisectoral actions. Second, it can support the organization of sectoral extension services or community actors to deliver an integrated package of interventions tailored to local needs.

Better results also could be achieved through alignment of relevant interventions to address the disaggregated needs or priorities of countries. Recent efforts to improve the alignment of interventions with community needs are promising.

### Portfolio of Nutrition-Related Interventions

During FY08–19, the World Bank committed \$22.7 billion in financing, including about \$14.4 billion of International Development Association support, \$2.5 billion of International Bank for Reconstruction and Development financing, and \$5.8 billion in RETFs, to support reducing child undernutrition. The nutrition lending portfolio is young, comprising 282 projects, more than half of which were approved since 2014. The portfolio, mostly channeled through International Development Association financing, supports investments in 64 countries with high rates of stunted growth, mainly in the Africa Region (53 percent of projects). Most of the lending support is through investment project financing operations (90 percent), led mainly by the Health, Nutrition, and Population (HNP), Agriculture, and Social Protection and Jobs (SPJ) GPs, among others.<sup>2</sup>

The portfolio includes a mix of interventions—nutrition-specific, nutrition-sensitive, social norms, and behavior change—and institutional strengthening support, which accounts for the largest share of investments. This mix of support is consistent with the premise that improving child nutrition requires support across the conceptual framework. Investments in institutional strengthening include support to develop institutional capacities at the national and subnational level to improve delivery of services and programs, engagement of communities, and implementation of policies to address nutrition in countries. Almost 40 percent of World Bank support is institutional strengthening, especially aimed at improved nutrition service delivery, such as quality assurance approaches, capacity building, and performance-based systems (figure 2.1).

The World Bank is increasingly orienting its support toward nutrition-sensitive interventions, namely those that address the underlying determinants to improve access to nutritious food, maternal resources, health, and WASH services. The share of nutrition-sensitive interventions increased from 27 percent at the beginning of the FY08–19 evaluation period to 39 percent toward the end. Health and family planning interventions continue to be a major support area, and agricultural approaches (for example, home gardens, livestock production, and food fortification), and to a lesser

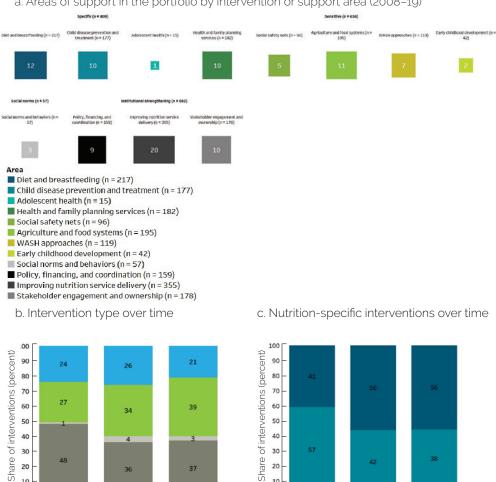
extent social safety nets, receive increased attention. Still, the portfolio continues to have important gaps.

The World Bank's nutrition portfolio also supports nutrition-specific interventions, namely those that aim to address the immediate determinants of nutrition. Nutrition-specific interventions account for 23 percent of the portfolio, with more recent investments in dietary diversity and breastfeeding than in child disease prevention and treatment. Although there was some increase toward the end of FY08–19, particularly in the Europe and Central Asia and East Asia and Pacific Regions, nutrition-specific interventions targeting adolescents do not receive much attention.

Behavior change interventions to address determinants of nutrition are cross-cutting in the World Bank portfolio. Successfully addressing determinants of child nutrition requires transforming behaviors relating to feeding, caregiving and stimulation, health care-seeking behaviors and treatment compliance, food production diversification, WASH practices, social norms, and service delivery practices (box 2.1). About 85 percent of projects had at least one behavior change intervention. Behavior change is most common in institutional strengthening support targeting service providers' practices (29 percent), followed by food and care interventions targeting caregivers and households (14 percent; figure 2.2). Behavior change interventions in health, agriculture, and WASH sectors are less apparent (about 9 percent).

Figure 2.1. Nutrition Interventions in the Portfolio

a. Areas of support in the portfolio by intervention or support area (2008–19)





Sensitive

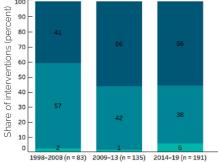
20

10

Social norms

■ Institutional strengthening

1998-2008 (n = 339) 2009-13 (n = 528)



2014-19 (n = 925)

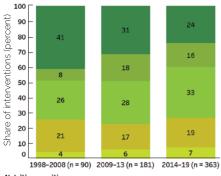
Nutrition-specific

Diet and breastfeeding

Child disease prevention and treatment

Adolescent health

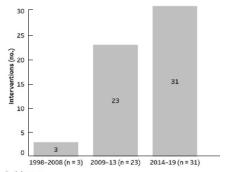
### d. Nutrition-sensitive interventions over time



#### Nutrition-sensitive

- Health and family planning services
- Social safety nets
- Agriculture and food systems
- WASH approaches
- Early childhood development

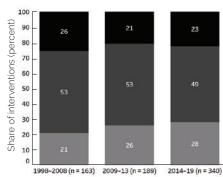
### e. Social norms interventions over time



### Social norms

Social norms

### f. Institutional strengthening over time



### Institutional strengthening

- Policy, financing, and coordination
   Improving nutrition service delivery
- Stakeholder engagement and ownership

Sources: Independent Evaluation Group; portfolio review and analysis.

Note: In panel a, boxes report the percentages of total interventions represented by each area. In panel e, because social norms has no subcategories, the bar chart reports numbers of interventions. WASH = water, sanitation, and hygiene.

### Box 2.1. Examples of Interventions by Behavior Change Area

#### Food and Care

- » Community or backyard garden promotion, agricultural skills training, promotion of fruits and vegetables or diversification of food production, promotion of local processing and conservation
- Parent counseling and education, promotion of toys, promotion of early childhood development, awareness campaigns, positive deviation modeling, breastfeeding, child feeding promotion and counseling, accompanying measures of conditional cash transfers

### Health Services

» Health and nutrition promotion and counseling, information, education, and communication campaigns, accompanying measures of conditional cash transfers, sexually transmitted disease prevention education

### Water, Sanitation, and Hygiene

» Communication campaigns, outreach activities, open defecation-free campaigns, hand washing and hygiene promotion

### Social Norms

» Women's empowerment activities, awareness campaigns, life skills education, accompanying measures of conditional cash transfer

### Institutional Strengthening

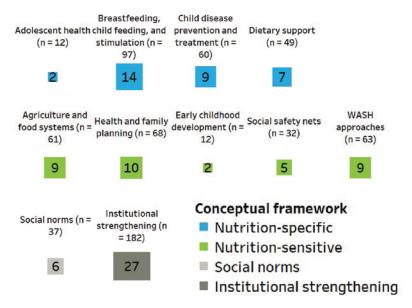
» Awareness campaigns, performance-based financing, coordination activities, continuing education programs for service providers, community mobilization and training on nutrition and health, sensitization of local community leaders

Sources: Independent Evaluation Group; behavior change analysis.

A notable gap in portfolio coverage is the limited attention to social norms. Despite the consensus that social norms can provide an understanding of gender roles, such as those related to decision-making regarding the care of children, and social and cultural practices that may influence the nutrition status

of children and pregnant and lactating women, the focus on women's empowerment, early marriage, and childbearing remains relatively narrow in the nutrition portfolio (only 3 percent of interventions and 6 percent of projects).

Figure 2.2. Behavior Change Interventions in the Portfolio



Sources: Independent Evaluation Group; behavior change analysis.

*Note:* A project was coded as having an intervention in the behavior change category if it had at least one relevant intervention. Boxes report the percentage of total interventions within each area. WASH = water, sanitation, and hygiene.

# Evidence-Based Interventions: Is the World Bank Doing the Right Thing?

The evidence on what works to reduce child undernutrition and improve nutrition determinants encompasses many options for interventions in projects. The SRM for this evaluation visually synthesizes the available evidence on the effectiveness of nutrition-specific and nutrition-sensitive interventions across multiple nutrition outcomes and determinants from SRs (appendix B). This synthesis is to benchmark knowledge on interventions that work against GP support in the portfolio. The SRM's search strategy includes 227 SRs identifying 84 types of interventions and 24 nutrition-relevant outcomes (relating to nutrition outcomes, and more intermediate outcomes of immediate and underlying determinants) for children, women, and households.

Approximately 36 percent are nutrition-specific interventions (30 out of 84 interventions with available evidence). Nutrition-sensitive interventions account for 64 percent, spanning across health (20 percent), agriculture (19 percent), and, to a lesser extent, WASH (14 percent) and social protection (11 percent) sectors. Although nutrition-sensitive interventions are more in number than nutrition-specific interventions, the evidence supporting these interventions is often weaker. Synthesizing the available evidence on nutrition-sensitive interventions is especially importance, since the list of interventions that work for World Bank support in this area has been less clear.

A large body of evidence suggests that some interventions have the potential to reduce the long-term effects of undernutrition, although the SRM could not identify a single intervention with a consistent and large amount of evidence of effectiveness to reduce stunted growth, emphasizing the need to mix a range of interventions in countries. Among nutrition-specific interventions, one SR found that social and behavior change communication (SBCC) on nutrition and health practices via community and support groups was an effective intervention to improve stunted and linear growth (figure 2.3). SBCC interventions through other channels (such as education or promotion, growth monitoring and promotion, and home visits and peer support) offer less conclusive evidence. Within interventions targeting children, most of the evidence studied the effects of providing supplementary energy-dense foods, followed by zinc supplementation, supplementary feeding with micronutrient-rich food, and multiple micronutrients, and showed mixed results, yet with mostly positive findings. Among nutrition-sensitive interventions in the health sector, few SRs found that family planning and contraception services, through its effects on birth spacing, and institutional strengthening policies and health insurance can contribute to reducing stunted growth. Deworming campaigns targeting children and child stimulation interventions were found to have mixed results. Few nutrition-sensitive interventions in the agriculture sector seem to be effective in improving child growth, although the evidence remains limited. A meta-analysis found that consumption of biofortified quality protein maize led to an increase in the rate of growth in weight and height in infants and young children with mild to moderate undernutrition. Also, a significant and positive effect of land reforms conferring or providing land rights and autonomy to women in agricultural production was observed on the long-term nutritional status of women and child nutrition. The study revealed

that a mother owning land halved the probability of her child being severely underweight. Home gardening, small-scale livestock production, and provision of agricultural inputs and training interventions are shown to have mixed results on improving stunted and physical growth. In the social protection sector, the provision of daycare services and the facilitation of access to microfinance, credit, and banking were found to have mixed results. Evidence on the effect of nutrition-sensitive interventions in WASH is rather limited. One SR found evidence suggestive of a small benefit of improving quality of water supply, identifying a borderline statistically significant effect on height-for-age z score in children under five years old. Provision of latrines and potties for safe disposal of feces (4 SRs) and SBCC delivered through WASH (1 SR) show mixed results.

The global knowledge also highlights other interventions with consistent evidence of effectiveness to improve particular nutrition outcomes and determinants. Many of the most effective interventions target the mother, underscoring the importance of engaging women early (preconception) and across all stages of early child development. For instance, the provision of iodine supplementation to women has consistently worked for improving child micronutrients status, the provision of energy-dense food increases child birthweight, supplementation with iron folate improves maternal nutrition status and micronutrient deficiencies, and SBCC is effective for improving breastfeeding practices and maternal mental health. Also, there is consistent evidence that deployment of community health workers (CHWs) is effective for improving child use of health services, family planning and contraception services are effective to reduce birth spacing, and health system strengthening support shows positive effects in improving complementary feeding practices and household welfare. In agriculture, food fortification with vitamin A improves children's complementary feeding, small-scale aquaculture is an effective intervention for increasing household income resources, and the provision of agriculture inputs and training improves knowledge and attitudes. In the social protection sector, conditional cash transfers are the only intervention with consistent and positive evidence to improve household access to nutrient-rich food, schooling, and knowledge and attitudes. In the WASH sector, provision of safe water storage is the only intervention showing strong evidence of effectiveness in reducing child enteric infection and diarrhea.

Figure 2.3. Effective Interventions to Improve Stunted and Linear Growth

Nutrition and dietary support interventions	Target	Stunted and linear growth
Micronutrient supplement: iodine	Children	•
Micronutrient supplement: MMNs (including omega-3)	Children	
Micronutrient supplement: vitamin A	Children	•
Micronutrient supplement: zinc	Children	
Supplementary feeding with energy-dense food (lipid, protein)	Children	
Supplementary feeding with micronutrient-rich food	Children	
Micronutrient supplement: MMNs	Women	•
SBCC via community or support groups	Household	•
SBCC via education or promotion	Household	
SBCC via home visits or peer support	Household	
SBCC via growth monitoring and promotion	Household	
Health interventions	Target	Stunted and linear growth
Deworming (single or periodic)	Children	
Family planning and contraception	Women	•
Provision of early child stimulation	Household	•
WASH interventions	Target	Stunted and linear growth
Sanitation (latrines, potties, safe disposal, and so on)	Household	
Water supply (such as community standpipe or hand pump)	Household	•
SBCC via promotion, home visits or peer support, or mass communication	Household	•
Agriculture interventions	Target	Stunted and linear growth
Home gardens (with or without livestock)	Household	
Small-scale livestock production	Household	
Fortification/biofortification: quality protein maize	Household	•
Policy on land property rights	Household	•
Provision of inputs and training	Household	•
Social protection interventions	Target	Stunted and linear growth
Daycare services	Household	•
Access to microfinance, credit, or banking	Household	•
Health care interventions	Target	Stunted and linear growth
Health care demand: health insurance	Institutions	•
Health care supply: system strengthening (training, BFHI, mHealth)	Institutions	•



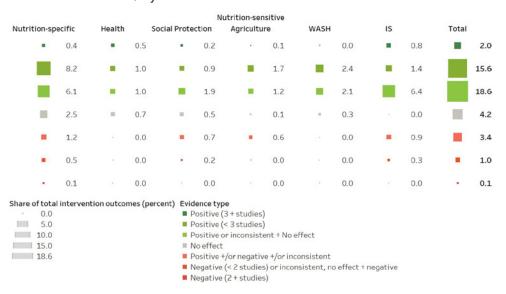
Sources: Independent Evaluation Group; systematic review map.

Note: The legend combines the size of the evidence (number of systematic reviews) and the direction of the evidence (positive, no effect, or inconsistent). Positive indicates that the pooled effect (for meta-analyses) or all underlying studies (for narrative syntheses) of the intervention are found to have a positive effect on the outcome of interest. No effect indicates that the intervention is neither significantly positive nor significantly negative on the outcome of interest. Inconsistent indicates that for a narrative synthesis, the evidence of a particular intervention on a specific outcome shows a mix of positive (P) and no effects (NE) across the underlying studies. Given the direction of the evidence, the dark- and medium-green legends indicate that the evidence of an intervention on a particular outcome is found to be positive more than three systematic reviews or in up to three systematic reviews, respectively. The

light-green legend indicates that the pool of evidence of a particular intervention on a specific outcome shows a mix of positive effects no effect, or a combination of both (inconsistent) in narrative synthesis. The full list of interventions reviewed in the systematic review map for stunted and linear growth is shown in appendix B. BFHI = Baby-Friendly Hospital Initiative; MMN = multiple micronutrients; SBCC = social and behavior change communication.

The World Bank largely supports nutrition interventions that are known to work. An assessment of the alignment between the portfolio interventions and the literature on what works covering 47 percent of the portfolio shows that the World Bank has focused on interventions that have positive evidence of effectiveness to improve the nutrition outcomes of interest (figure 2.4).<sup>4</sup>

Figure 2.4. Alignment of Nutrition Interventions with Evidence on What Works, by Intervention Area



Sources: Independent Evaluation Group; systematic review map, and portfolio review and analysis.

Note: The legend follows the systematic review map. Positive indicates that the pooled effect (for meta-analyses) or all underlying studies (for narrative syntheses) of the intervention are found to have a positive effect on the outcome of interest. No effect indicates that the intervention is neither significantly positive nor significantly negative on the outcome of interest. Inconsistent indicates that for a narrative synthesis the evidence of a particular intervention on a specific outcome shows a mix of positive and no effects across the underlying studies. Negative indicates that the intervention is found to have a negative effect on the outcome of interest. Given the direction of the evidence, the dark- and medium-green legends indicate that the evidence of an intervention on a particular outcome is found to be positive in more than three systematic reviews or in up to three systematic reviews, respectively. Similarly, the dark-red legend indicates that the evidence of an intervention on a particular outcome is found to be negative in more than two systematic reviews. The light-green legend indicates that the pool of evidence of a particular intervention on a specific outcome shows a mix of positive effects, no effect, or a combination of both (inconsistent) in narrative synthesis. IS = institutional strengthening; WASH = water, sanitation, and hygiene.

In health, the World Bank concentrates on supporting SBCC on nutrition and health practices known to work across different nutrition-relevant outcome areas, including breastfeeding and complementary feeding, and child use of health care services. Other health interventions where the World Bank highly aligns with the literature are supporting health care approaches that implement health

facilities outreach activities, the deployment of CHWs, and family planning and contraception services. Consistent with the findings of the portfolio review, the World Bank largely focuses on institutional strengthening support to improve the health system, expand health insurance, and implement performance-based financing and service integration approaches that the global evidence base shows to be effective for improving particular nutrition-relevant outcomes (such as use of health care services, knowledge and attitudes, complementary feeding, child health, stunted growth, and child cognitive development).

The most frequent agriculture intervention supported by the World Bank's nutrition portfolio is the provision of inputs and training. Biofortification of foods and the support for small-scale livestock production are also prominent in the portfolio within the group of interventions with consistent positive evidence of effectiveness.

Within social protection interventions, the World Bank aligns with evidence on what works by mainly focusing on countries' cash transfer programs. Cash transfer programs have positive effects in improving households' food security and welfare, schooling attendance, health care seeking, and child health and nutrition dietary practices. Support for access to center- or homebased care services, also supported by the World Bank, has been shown to be effective to improve complementary feeding and child health outcomes.

The portfolio includes effective WASH interventions, such as SBCC and community water supply. According to the literature on what works, effective interventions in the portfolio are SBCC to promote hand washing and safe drinking water, community water supply through standpipes or hand pumps, safe water storage, and provision of soap. These interventions have consistent evidence of effectiveness in improving access to safe water, improving household knowledge and attitudes, or reducing the incidence of childhood illness and diarrhea.

Although World Bank interventions align well with global knowledge in many areas, more attention might be directed at particular interventions where evidence is consistently positive across a broad set of nutrition-relevant outcomes areas, such as energy-dense food supplements for women and micronutrient-rich food supplements for children. The SRM identifies interventions with broad positive evidence of effectiveness across multiple nutrition-relevant outcomes areas (table 2.1). Although the World Bank emphasizes many of these interven-

tions, some of them may not be receiving sufficient attention given their potential benefits. Among nutrition-specific interventions, few projects in the HNP portfolio include women's supplementary feeding with energy-dense food and children supplementary feeding with micronutrient-rich food. Within nutrition-sensitive interventions, vitamin A biofortification of foods in the agriculture portfolio and provision of soap to stimulate hygiene and sanitation practices in the WASH portfolio have received little attention. Furthermore, two interventions with broad positive impacts remain unexplored in the nutrition portfolio. The first refers to maternal emotional support interventions for which the global evidence suggests that they are effective in improving breastfeeding and parenting practices, women's mental health, and use of health care services. The second intervention is land property right reforms that could be implemented through governance, macroeconomics, or the agriculture sector. Such reforms can be effective in improving household welfare (consumption and income), empowering women (increased control of resources), reducing micronutrient deficiencies of women, and even stunted growth.

Impact evaluations of World Bank projects contribute to increasing knowledge of what works by supporting evidence-based learning to design and improve nutrition interventions in operations. A review of the advisory services and analytics (ASA) portfolio in case study countries shows that even when the World Bank works in a small geographical area, impact evaluations facilitate the mainstreaming of interventions or experiences leveraged from the project support. In this way impact evaluations can support the institutionalization of interventions in the country's own program. Some countries, like Madagascar, have given more consistent attention to evidence learning over a decade and have been using evidence to improve and strengthen the rollout of nutrition interventions of the community-based nutrition (CBN) program. Impact evaluations on CBN programs have been important in Ethiopia, Malawi, Nicaragua, and Rwanda. In social sectors, some countries (Indonesia, Madagascar, Malawi, Nicaragua, Niger, and Rwanda) are using impact evaluations to improve the design of interventions, specifically the links among community block grants or cash transfers and behavior nudges to improve the demand for maternal and child health services, parenting behaviors programs, or child feeding practices. Impact evaluations also support learning

on ECD programs in some countries (Ethiopia, Indonesia, Madagascar, Niger, and Rwanda) to integrate nutrition interventions across social sectors.

**Table 2.1.** Systematic Review Map Interventions with a Broad Positive Impact

Intervention Types	Interventions (%)	Projects (no.)
Nutrition-specific		
Child supplementary feeding with micronutrient-rich foods	0.5	8
Maternal supplementary feeding with energy-dense foods	0.3	4
Women micronutrient supplementation: iron folate (iron–folic acid)	0.9	15
SBCC of nutrition and health promotion (via community and groups, education, growth monitoring and promotion, home visits, mass communication, and IPC at health facility)	21.5	107
Nutrition-sensitive		
Health		
Health system strengthening	8.8	101
Maternal emotional support	0.0	0
Family planning and contraception	2.1	32
Health care approach: CHWs	0.8	11
Health facility community outreach	0.7	11
E-health communication	0.0	0
Health insurance	0.7	11
Agriculture		
Provision of agriculture inputs and training	2.3	34
Small-scale livestock	2.1	30
Vitamin A fortification	0.5	7
Land property rights	0.0	0
Social protection		
CCTs	2.2	32
WASH		
Provision of soap	0.2	4
Total interventions with a broad positive impact	43.6	

Sources: Independent Evaluation Group; systematic review map and portfolio review and analysis.

Trust funds and partnerships catalyze innovation and the adoption of novel approaches where learning is important to support expansion. For example, in Madagascar, the Knowledge for Change program and the Health Results Innovation Trust Fund provided critical support for impact evaluation and other operational learning activities to adaptively improve the CBN program, including for human-centered design learning to improve the effectiveness of interventions. In Rwanda, the Bill & Melinda Gates Foundation supports evidence-based learning on the national behavior change strategy (led by the Mind, Behavior, and Development Unit), which could help rethink behavior change interventions for nutrition.

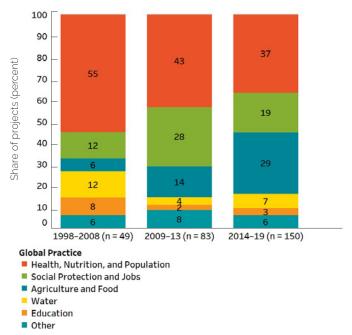
# Multisectorality of the Nutrition Portfolio: Engagement across Global Practices

The World Bank's nutrition portfolio is multisectoral in that it engages different GPs to implement interventions toward nutrition determinants. The portfolio is also multidimensional in that it includes a range of different interventions across the nutrition-specific and nutrition-sensitive dimensions of the conceptual framework. HNP leads most projects in the nutrition portfolio (42 percent), Agriculture leads about 21 percent, and SPJ leads 20 percent. Over time, the roles of Agriculture and SPJ have grown to account for about half of the active nutrition portfolio, but projects led by Water, Education, and other GPs remain small (figure 2.5). Nutrition interventions are implemented by a combination of core projects that have a heavy focus on nutrition and noncore projects, which integrate nutrition interventions in their components.

Increasingly, the portfolio has included more multidimensional projects that support a range of nutrition interventions. In these projects, GPs have integrated interventions that inherently belong to other sectors to work across silos to tackle nutrition determinants more comprehensively. These projects may be core nutrition projects that have a heavy focus on nutrition, with nutrition explicit in the objectives or in the title. Interventions related to diet and breastfeeding, WASH, safety nets, health, agriculture, and institutional strengthening have been integrated across projects in all GPs (figure 2.6). Interventions related to social norms have been emerging across GPs, and

ECD is increasingly being integrated in SPJ, Agriculture, and HNP operations. The emphasis on multidimensional projects is strongest in SPJ, Education, and other GPs, such as Macroeconomics, Trade, and Investment (figure 2.7). SPJ has integrated interventions across all dimensions of the conceptual framework as part of its support to lower-income households. Education has integrated interventions on diet and breastfeeding, child disease prevention (such as deworming), and WASH (such as SBCC).

Figure 2.5. Projects by Approval Period and Global Practice



Sources: Independent Evaluation Group; portfolio review and analysis.

Note: Data are presented by fiscal years. Other Global Practices include Macroeconomics, Trade, and Investment; Social Sustainability and Inclusion; Urban, Disaster Risk Management, Resilience, and Land; and Governance.

Figure 2.6. Interventions in Projects by Global Practice

	Specific (n = 409)				Sensitive (n = 634)			Social norms (n = 57) Institu		utional strengthening (n = 692)		
Global Practice	Diet and breastfeeding (n = 217)	Child disease prevention and treatment (n = 177)	Adolescent health (n = 15)	Health and family planning services (n = 182)	Social safety nets (n = 96)	Agriculture and food systems (n = 195)		Early childhood development (n = 42)	Social norms and behaviors (n = 57)		Improving nutrition service delivery (n = 355)	Stakeholder engagement and ownership (n = 178)
Health, Nutrition, and Population (n = 118)									-			
Social Protection and Jobs (n = 57)										•		
Agriculture and Food (n = 58)										•		
Water (n = 19)										•		
Education (n = 11)												
Other (n = 19)												

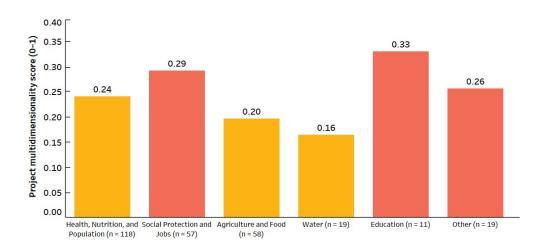
#### Intervention area

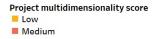
- Diet and breastfeeding
- Child disease prevention and treatment
- Adolescent health
- Health and family planning services
- Social safety nets
- Agriculture and food systems
- WASH approaches
- Early childhood development
- Social norms and behaviors
- Policy, financing, and coordination ■ Improving nutrition service delivery
- Improving nutrition service delivery
   Stakeholder engagement and ownership

Sources: Independent Evaluation Group; portfolio review and analysis.

Note: WASH = water, sanitation, and hygiene.

Figure 2.7. Projects by Global Practice and Degree of Multidimensionality





Source: Independent Evaluation Group.

*Note:* The multidimensionality score is the sum of the number of nutrition-specific and nutrition-sensitive intervention areas in a project divided by the total possible number of interventions.

Noncore nutrition projects integrate sector-related nutrition interventions in their components. These projects often focus on a few interventions, but do not have an explicit focus on nutrition. For example, HNP projects focus on health and family planning interventions, Water projects on WASH interventions (such as SBCC and latrines), Agriculture projects on agriculture and food approaches (such as fortified crops, home gardens, livestock and poultry, and seasonal food access), and SPJ projects on safety nets. In case study countries, interventions that have been integrated in Agriculture and Water projects lacked an intentional design to target improvements in nutrition determinants, such as access to nutritious foods or hygiene and sanitation practices of households with children. Some countries (Ethiopia, Madagascar, Malawi, Nicaragua, Niger, and Rwanda) are using evaluation evidence to improve the design of integrated nutrition interventions in social protection and ECD.

# **Multidimensionality in Country Programs**

A World Bank country portfolio with a mix of nutrition-specific and nutrition-sensitive interventions and institutional strengthening provides a pathway to improve nutrition determinants and contribute to outcomes. Key for the country portfolio is that it successfully supports a mix of interventions toward nutrition determinants and institutional strengthening to contribute to outcomes, in collaboration with other partners. About half of the countries have both multidimensional portfolios, with a mix of interventions, and medium-to-high support for institutional strengthening. (Figure D.7 in appendix D shows countries by the multidimensionality of their portfolio and the share of institutional strengthening support.) Countries where the World Bank portfolio has had few interventions and low support for institutional strengthening, such as Burkina Faso and Sierra Leone, stand out as candidates to improve nutrition support. Among countries where the World Bank's portfolio has had high multidimensionality and medium-to-high institutional strengthening are the Comoros, Côte d'Ivoire, Haiti, India, Indonesia, Malawi, Madagascar, Nicaragua, Pakistan, Rwanda, and Senegal. Some of these countries, however, have newer investments, such as Côte d'Ivoire, Pakistan, and Rwanda. The success of the institutional strengthening in these countries will be important to support results toward nutrition. The country portfolios of fragile and conflict-affected situation countries on average have a slightly lower multidimensionality than other countries. This is likely due to the implementation challenges in fragile and conflict-affected situations.

In the case studies, country portfolios show a continuum of support to nutrition led by different GPs and instrument types (investment project financing, development policy loan, Program-for-Results, RETF) over the 10-year evaluation period. However, in most countries these interventions are fragmented across projects and time, and coordination to ensure support to all relevant nutrition determinants is limited. Figure 2.8 presents the timeline of the Ethiopia portfolio, which since 2008 has had a series of HNP projects to support the national nutrition program, expanding health services, and a package of community-based interventions. Other projects have supported safety nets, nutritious food, and WASH. Ethiopia stands out for its increasing

emphasis on multisector and partner coordination of nutrition efforts. In Malawi, the Nutrition and HIV/AIDS Project (P125237; FY12-19) has supported development of a package of CBN interventions with other donors. Other GPs with relevant support have included Agriculture, SPJ, Water, and Urban, Disaster Risk Management, Resilience, and Land, but health services support was lacking. In Mozambique, the main support has been through HNP projects to health services and a CBN intervention package—with limited coordination with projects in other sectors. In Nicaragua, HNP and SPJ projects have coordinated support to community and family health care services, including ECD and adolescent health support linked to a social welfare model, focused on children. Projects in Water and Agriculture separately supported interventions. In Niger, the main support is through HNP and SPJ projects to health services, women and girls' empowerment, and safety nets, with some recent support to WASH and ECD. In Rwanda, projects in Water, SPJ, Agriculture, and Macroeconomics, Trade, and Investment helped improve decentralized access to health, water, safety nets, and food. Since FY17, the country portfolio has emphasized coordinated GP projects (HNP, SPJ, Agriculture, Education, and Macroeconomics, Trade, and Investment). See appendix G for all country examples.

Many nutrition interventions in country portfolios are emerging and need further support and collaboration with partners to be institutionalized in country systems. In Indonesia, the community-driven development approach is well established, but support to converge services across sectors is newer. In Ethiopia, support to ECD, maternal diet intake, women's empowerment, and adolescent nutrition is emerging. In Madagascar, although the community package supporting nutrition has been developed over many years, support to access nutritious food and WASH is less developed. In Malawi, the duration of World Bank support to develop community interventions has been limited, and other partners have also provided support. In Mozambique, support to nutritious food, social norms, and WASH has received limited attention. In Nicaragua, support to develop child feeding and caregiving is ongoing. In Niger, there has been limited support to develop community-based interventions to reach the large rural populations and ensure access to nutritious food. In Rwanda, support to develop a package of nutrition-related intervention to reach communities, including ECD, maternal health, home gardens, safety nets, and other support, is ongoing.

50 Childhood stunting (percent under 5) AFR average 33% (2018) WASH SII Food security Safety Nets 30 SIL World Bank Young Women's Health P4R Livelihood JSDF lending projects Lowlands Livelihoods IPF WASH IPF Nutrition SIL 20 One WASH IPF Pastoral Community Development IPF Nutrition JSDF Livestock and Agriculture IPF Series Fisheries IPF 0 2005 2015 2010 2020 SCD identifies Small area Combating nutrition Investing in the Maintaining estimation constraints malnutrition in Ethiopia early years World Bank Momentum analytics (WASH) Health P4R project Nutrition project Maternal and child Stunting ΑII operations research operations research health inequalities reduction hands in SSA on deck Government National nutrition strategy, first national program, and establishment of Second national nutrition program, initiatives National food and Segota Declaration, second growth and coordination body, health extension nutrition policy transformation plan. CINUS program, community-based nutrition

Figure 2.8. Ethiopia Project Time for World Bank Nutrition Support

Sources: Independent Evaluation Group; UNICEF, WHO, and World Bank 2019.

Note: The box colors in the chart indicate the World Bank Global Practice responsible for the lending: brown = Social Protection and Jobs; gray = Water; green = Agriculture; dark blue = Health, Nutrition, and Population; light blue = Education. AFR = Africa; APL = adaptable program loan; CINUS = Comprehensive Integrated Nutrition Services; IPF = investment project financing; JSDF = Japan Social Development Fund; P4R = Program-for-Results; SCD = Systematic Country Diagnostic; SIL = sector investment loan; SSA = Sub-Saharan Africa; WASH = water, sanitation, and hydiene.

Strengthening institutional capacities (stakeholder engagement, policy, and service delivery) is important to improve nutrition support in countries. In case studies, *stakeholder engagement and ownership* has included strengthening leadership, knowledge, and participatory roles of networks of community volunteers, local leaders, farmers, nongovernmental organizations, and other local actors in SBCC, the implementation of interventions, results monitoring, and other approaches. In Indonesia, Rwanda, and Senegal, leadership building has been at all levels and across sectors, from the president to ministries, districts, and communities, and this has helped improve the accountability of nutrition support. *Strengthening of policy, financing, and coordination* has included support to policy dialogue and strategies. *Strengthening of service delivery* has included support to design basic services and to build knowledge of service providers, monitoring and evaluation (M&E), and supervision.

Experience points to a need for institutional strengthening of multisectoral arrangements for nutrition in countries to improve stakeholder engagement, policy, and services. Most institutional strengthening in case study countries has been in one sector (for example, to develop agriculture or health services), with emerging examples of how projects can strengthen multisectoral arrangements for nutrition. The stocktaking analysis of countries identified factors that have facilitated multisectoral coordination efforts and results for nutrition in countries (appendix H; box 2.2). In Ethiopia, Indonesia, Malawi, Nepal, Rwanda, and Senegal, support to multisectoral nutrition coordination, strategies, planning, and financing at the national and decentralized levels has been key. However, the continuity of this support across projects is a challenge. In some countries, the World Bank has supported *multisectoral* arrangements for M&E. In Senegal, the World Bank has facilitated the M&E of the nutrition program in communities. Activities in Peru have helped build capacity for the social monitoring of nutrition results. Indonesia and Rwanda are improving the accountability and convergence of service delivery by initiating village scorecards and child scorecards and developing the interoperability of sectoral M&E systems. In some countries (Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Rwanda, and Senegal), the World Bank has ongoing support to develop integrated nutrition intervention packages (integrating interventions from health, social protection, education, agriculture). In Indonesia, Malawi, Rwanda, and Senegal, the World Bank has

supported *multisectoral communication strategies* to align nutrition messages across different sectors and actors involved in nutrition.

Overall, more intentional planning of nutrition support (financing and ASA) is needed in the country portfolio and for multisector implementation within country portfolios to support nutrition determinants and institutional strengthening. This is already initiated in Ethiopia, Indonesia, and Rwanda to coordinate the implementation of World Bank support across GPs and projects and to synergize efforts with other partners. Although the strategies of all countries addressed nutrition in some way, most did not identify how different instruments collectively addressed nutrition needs in the country context. Moreover, country experiences point to the importance of better aligning World Bank support to strengthen multisectoral nutrition coordination and local government and communities to deliver a multidimensional package of nutrition interventions.

### Box 2.2. Factors That Facilitate Multisectoral Coordination Efforts

- » Consistency of national leadership regarding a mandated program or framework to coordinate actors and roles of relevant sectoral ministries
- » Developed role of subnational government to coordinate multisectoral actions
- » Organization of sectoral extension services and community actors to deliver an integrated package of interventions tailored to local needs, with consistent messaging
- » Strengthened financing and planning, monitoring and evaluation, and knowledge sharing approaches that support multisectoral interoperability of decisions, actions, and learning (rather than single-sector systems) on nutrition interventions at different levels of implementation, horizontally and vertically

Source: Independent Evaluation Group.

The challenge is to coordinate the delivery of nutrition interventions by sectors—social, agriculture, and WASH—considering their different priorities and target groups in communities. Health interventions often target women and children in communities with low nutrition indicators, but coverage of

remote areas is a challenge. Safety net and ECD interventions increasingly have coordinated with health interventions by focusing on lower-income households in the same communities, as in Nicaragua and Rwanda. However, agriculture interventions tend to target farmers and geographies important to the food supply, and WASH interventions are often in towns. In particular, food and agriculture approaches and social services (health, social protection, education) support have often not coordinated support in the same communities (for example, Ethiopia, Madagascar, and Mozambique). This situation has likely limited the possibility of the country program to support results unless another partner is providing the relevant interventions in other geographies. Accordingly, recent approaches in Indonesia and Rwanda to improve the coordinated implementation of interventions are learning how to converge interventions at the community level. These countries also have technical assistance to help coordinate nutrition support across projects and partners nationally and in districts and communities.

Having multidimensional projects, which support a range of nutrition interventions in communities, and coordinating nutrition interventions led by different GPs are options to improve nutrition support in countries. The community level provides a platform where a project can support the delivery of a multidimensional package of interventions (as in Madagascar and Malawi). Another option is the use of multisectoral nutrition action plans as internal coordination tools to improve synergy across portfolios with projects led by different GPs under the leadership of the World Bank country manager or director, such as in Indonesia, Rwanda, Vietnam, Papua New Guinea, and Ethiopia. (The countries listed are examples, and the list may not be exhaustive.) The evaluation did not examine the relative cost-effectiveness of coordinating sectoral support compared with having multidimensional projects with a mix of intervention. Also important is the consistency, quality, coverage, and expansion strategies to support interventions in communities—for example, Ethiopia and Madagascar have had multiple World Bank projects to help design nutrition intervention packages and institutionalize them in national programs over years. This consistent timeline to develop a quality package of interventions has been lacking in most other countries.

# Are Interventions Supported by the World Bank Based on Country Needs?

The evaluation confirms the logic of the conceptual framework, which guides the World Bank's nutrition agenda. The heat map analysis assesses the countries' access to the nutrition determinants and their empirical links with nutrition outcomes based on the conceptual framework and existing work on the drivers of undernutrition (Skoufias, Vinha, and Sato 2019). The heat map is based on cross-country data from the Joint Child Malnutrition estimates (UNICEF, WHO, and World Bank 2019) during the evaluation period for the 64 countries of the portfolio for which indicators related to food and care, access to health and WASH services, social norms determinants, and nutrition outcomes data were available. Principal components analysis has been used to construct composite measures for each of the determinants and overall nutrition outcomes based on selected indicators.

The countries' conditions in nutrition determinants matter for achieving better nutrition outcomes, reinforcing the importance of having synergized support across determinants to improve outcomes. Correlation analysis shows that countries that are better off in terms of food and care, access to WASH and health services, and social norms determinants tend to have better nutrition outcomes (no stunted growth, no wasting, no underweight, no anemia, and no LBW) at the beginning and at the end of the evaluation period (figure 2.9, panel a). The link between health determinants and outcomes is the strongest across all nutrition outcomes, followed by social norms, WASH, and food and care, which reinforces the importance of having interventions in health synergized with multidimensional interventions across determinants to improve outcomes. This synergized support has not consistently happened in any of the case study countries. For example, although Malawi had a strong emphasis on community interventions that addressed a range of determinants, support to health services was largely absent in the portfolio. In Mozambique and Niger, by contrast, support in health has not been consistently synergized with support to other determinants.

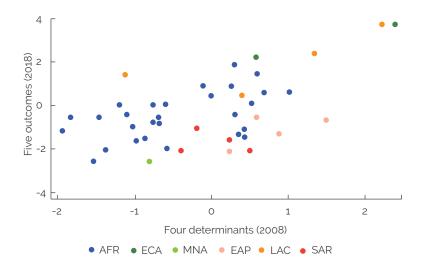
Intentional planning of World Bank support in countries to address needs related to disadvantaged determinants (low levels of food and care, WASH, and

health services) can help countries to catch up to improve outcomes. Correlation analysis suggests that countries at the bottom of the distribution in nutrition determinants at the beginning of the period are slowly converging in nutrition outcomes, with improvements in these determinants, and thus have potential to catch up over time (figure 2.9, panel b). These results are encouraging and suggest that the inequality in nutrition outcomes among countries could decrease with more intentional support to improve determinants. Conversely, improvements in nutrition outcomes to benefit vulnerable populations may be slower, with countries taking longer to achieve adequate levels of determinants. The nutrition portfolio indeed has focused on low-income countries with high rates of stunted growth.

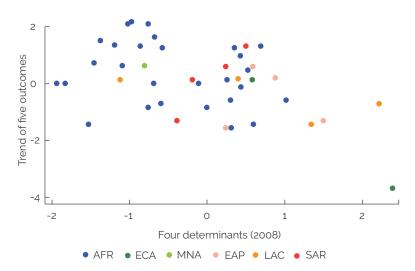
The interventions of the nutrition portfolio align well with country needs at the national level, but there is room to strengthen support to nutrition determinants, particularly with regard to social norms.8 A mapping exercise using portfolio review data on interventions addressing nutrition determinants (food and care, WASH and health services, and social norms) shows that about 79 percent of the interventions in the portfolio align with the country needs, suggesting that the World Bank supports the right areas of intervention. The World Bank support has been especially relevant in addressing needs related to food and care (appropriate alignment in 95 percent of the cases), and access to health services (90 percent), which has the strongest association with country nutrition outcomes according to the heat map analysis. However, needs related to areas such as access to WASH and social norms have often not been addressed by interventions (64 percent and 52 percent, respectively; figure 2.10). Particular areas where the World Bank emphasis on social norms is thin include women's empowerment, early marriage, and pregnancy, which currently account for only 6 percent of the portfolio across all GPs. Moreover, case studies suggest that support to address needs related to nutrition determinants has been inconsistent in countries over the 10year evaluation period.

Figure 2.9. Undernutrition Determinants and Nutrition Outcomes

a. Overall composite of four determinants (2008) and composite measure of outcomes (2018)



b. Overall composite of four determinants (2008) and composite measure of outcomes (trend 2008–18)



Sources: Independent Evaluation Group; heat map analysis.

Note: Composite measures are based on principal component analysis. Nutrition outcomes include stunted growth, wasting, underweight, anemia, and low birthweight. Determinants include food and care; health services; water, sanitation, and hygiene services; and social norms indicators. AFR = Africa; EAP = East Asia and Pacific; ECA = Europe and Central Asia; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia.

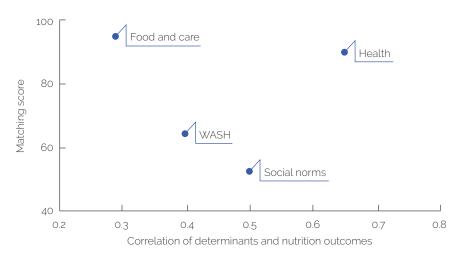


Figure 2.10. Alignment of Portfolio Interventions with Country Needs

Sources: Independent Evaluation Group; heat map and portfolio review and analysis.

*Note:* Matching score represents the degree of alignment of the portfolio interventions with the country needs in food and care; health; water, sanitation, and hygiene services; and social norms. WASH = water, sanitation, and hygiene.

In addressing needs, the key is strengthening the World Bank's withincountry alignment across sectors and targeting relevant interventions to address disaggregated needs in particular geographies and populations. Projects in different GPs are often implemented in different geographical areas and for different target groups and have lacked mechanisms to integrate or converge actions or build on achievements to improve nutrition outcomes in the same communities. Similarly, behavior change interventions are fragmented (across GPs, projects, timelines, and geography). To meaningfully improve outcomes, all priority needs should be addressed across targeted communities, given the synergistic nature of determinants. In Nicaragua, simultaneous support has been provided to needs in health, social protection, water, and agriculture only in one region of the country with vulnerable groups (Jinotega between FY11 and FY17). In Mozambique, health support has focused on the northern provinces with high rates of stunted growth. Although there has been some coordination with health on biofortification, most agriculture support focused on emergency food distribution and did not synergize with health interventions. Similarly, behavior change interventions to promote health, WASH, caregiving, and nutritious foods have been supported by different projects and implemented in different communities.

- <sup>1</sup> The identification of the relevant nutrition portfolio has focused on countries with rates of stunted growth at or above 20 percent at any point in time of the evaluation period (see portfolio identification strategy in appendix D).
- <sup>2</sup> See appendix D on nutrition portfolio for more details.
- <sup>3</sup> See appendix E for a detailed analysis of behavior change interventions.
- <sup>4</sup>The alignment analysis is based on the systematic review map's interventions that are also found in the nutrition portfolio in the areas of nutrition, health, social protection, water, agriculture, and institutional strengthening in the health sector for which there is existing evidence of their effectiveness. Twelve out of 84 interventions types of the systematic review map are not found in the nutrition portfolio. See appendix B for details on the scope of the alignment analysis.
- <sup>5</sup> Core nutrition projects are those that have *nutri* or *stunt* in their title or in their project development objectives and have a nutrition content share equal to or above the top two quintiles of the distribution (top 40 percent).
- <sup>6</sup> See appendix F on the heat map for more details and full correlation analysis.
- <sup>7</sup> These findings are consistent with those shown by Skoufias, Vinha, and Sato (2019) based on logit model estimates using 33 recent Demographic and Health Surveys from Sub-Saharan Africa.
- <sup>8</sup> For the purpose of the matching exercise, country need for a particular determinant (such as food and care) is defined as any of its comprised indicators (such as minimum dietary diversity of children ages 6–23 months) falling below their corresponding threshold that has been established by the literature, when available, or falling in the bottom 50 percent of the distribution at the beginning of the evaluation period. This means, for example, that a country with a minimum dietary diversity index below the threshold has an inadequate level of food and care determinant for which it would be desirable to find interventions in the area of food and care in the World Bank nutrition portfolio matching this need.

# 3 World Bank Contribution to Nutrition Results

### Highlights

The World Bank's nutrition portfolio has improved its overall performance over time, and support to institutional strengthening and underlying determinants shows better results than support to immediate determinants. The adequacy of the enabling environment underlies the potential for a country to improve the determinants of nutrition, which in turn can improve a country's nutrition outcomes for mother and child.

Community-based programs contribute to behavior changes that improve nutrition determinants. However, achieving sustained behavior change is challenging, and measurement of progress along the results chain is weak, undermining effective planning and evaluation to support behavior change. World Bank contributions to behaviors related to social norms are modest.

The measurement of nutrition results for projects exhibits persistent gaps, especially in tracking expected achievements from nutrition-specific and social norms interventions requiring behavior changes. Expected results from nutrition-sensitive interventions are most frequently measured, especially for those projects targeting health and family planning services, social safety nets, and agriculture and food systems.

Improving project performance in achieving nutrition results requires adequate monitoring and evaluation frameworks, sustained community-based implementation, strong government commitment and institutional capacity to support project activities, and a project design that intentionally integrates nutrition interventions that aim to improve nutrition determinants.

# Nutrition Results: Project Performance and World Bank Contributions

The World Bank's nutrition portfolio overwhelmingly aims to improve the underlying determinants of nutrition and institutional strengthening in countries. This aim is consistent with the distribution of interventions that tend to concentrate at the foundations of the conceptual framework discussed in chapter 2 (figure 3.1). Social norms (women's empowerment and early marriage and pregnancy) and to a lesser extent nutrition outcomes (anthropometric measurements, micronutrient status, and cognitive development) and immediate determinants (child feeding practices, diet diversity, and maternal and child health) are rarely part of the projects' objectives, accounting for 2 percent, 13 percent, and 18 percent, respectively. This tendency to focus on nutrition determinants is not surprising given the relatively short duration of investment projects and the longer-term nature of nutrition outcomes and social norms.

The World Bank's nutrition portfolio has good overall performance, but support to institutional strengthening and underlying determinants shows better results than support to immediate determinants that are more challenging to achieve. Project performance is measured by the achievement rates of results framework indicators for 131 closed projects that had relevant nutrition-related indicators across the dimensions of the conceptual framework. Overall portfolio performance is about 70 percent, which also depends on the adequacy of the results framework in terms of quality of indicators and the ambitiousness of indicators targets. Information from country case study evidence, impact evaluations, and regression analysis have also been used to assess results achieved by the portfolio.

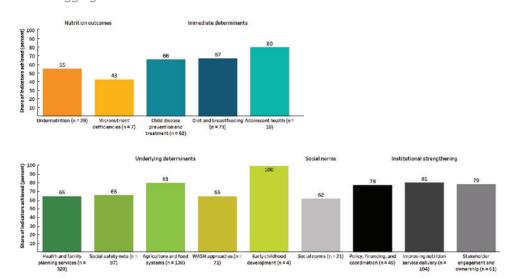
### Contributions to Institutional Strengthening

The World Bank contributes to institutional strengthening, but there is limited evidence on the continued application of knowledge gained by actors involved in training and other support to sustain change. Project performance in strengthening institutions has improved over time (figure 3.1). Overall portfolio investments in policy, service delivery, and stakeholder engagement

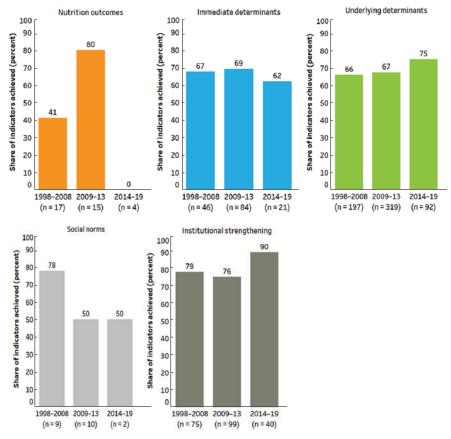
have achieved 79 percent of the expected results. Moreover, multivariate regression analysis of the portfolio offers some evidence that successful results in institutional strengthening, and in particular policy, financing, and coordination, are associated with better achievement of nutrition outcomes and its determinants at the project level. In addition, the World Bank's contribution toward stakeholder engagement (strengthening knowledge and participatory roles of networks of community volunteers, local leaders, farmers, nongovernmental organizations, and other local actors in SBCC) is also highlighted as a major factor behind project performance.<sup>2</sup> Further, institutional strengthening emphasizes the success of the World Bank in engaging actors (90 percent), especially service providers; in improving their knowledge (83 percent); and, to a lesser extent, in applying the acquired behavior (71 percent). However, there is limited tracking of these indicators beyond the level of engaging actors and learning, and no evidence is available on whether institutional strengthening has supported sustained behavior change, such as of frontline workers to consistently apply skills to deliver services.

Figure 3.1. Portfolio Performance

a. Disaggregated achievement rates of nutrition indicators







Sources: Independent Evaluation Group; portfolio review and analysis.

Note: WASH = water, sanitation, and hygiene.

In-depth analysis in country case studies provides good examples of the World Bank's contribution to strengthening institutions at national and subnational levels. Successful examples of institutional strengthening (through both ASA and lending) have included policy dialogue, leadership building, South-South knowledge exchange, evidence-based learning, support to M&E systems, and support to districts to oversee nutrition, use M&E, and strengthen extension services and community groups. A key variation across countries has been in the extent of support to policy and coordination relative to service delivery. At the national level, the World Bank has supported high-level leadership; coordination of nutrition, policies, financing, and strategies; and M&E systems, diagnostics, and research and evaluation. At the district level, it has supported learning, M&E, and supervision to oversee nutrition services. At the community level, the World Bank has strengthened the targeting of services, community groups, and extension workers (box 3.1).

### Box 3.1. Contributions to Institutional Strengthening in 12 Countries

Policy, Financing, and Coordination

Multisectoral coordination, strategies, financing, and planning. In Ethiopia, Indonesia, Malawi, Nepal, Rwanda, and Senegal, the World Bank has strengthened national nutrition coordination, policy dialogue, strategies, and planning. In Madagascar and Mozambique, however, the lack of continuity of this support across projects has limited the institutional strengthening of nutrition coordination capacities. In Senegal, the World Bank's Nutrition Enhancement Program has improved coordination efforts by identifying areas of collaboration among sector ministries, with an emphasis on the delivery of multidimensional nutrition services in communities. In Indonesia and Rwanda, the World Bank has strengthened the multisectoral nutrition strategy, including district-level plans, and a communication strategy through a range diagnostic work on the nutrition situation, financing, and policy options. For example, the development of the National Strategy for Stunting Reduction in Indonesia and the reforms to develop the interoperability of social sector information systems in Rwanda have been catalyzed through South-South knowledge sharing supported by the World Bank on Peru's experience in combating undernutrition.

### **Nutrition Service Delivery**

» Strengthening decentralized and community-level interventions. In Nicaragua, the World Bank has strengthened the supervision and management capacities of local governments for the decentralized delivery of a multisector package of social services. In Madagascar, the World Bank has contributed to the refinement of community-based nutrition services through years of analytic work and advocacy. In Rwanda, the World Bank is helping in the development of community services, which engage community health workers, and the convergence of nutrition-sensitive interventions in social protection, early childhood development, and agriculture. In many countries (Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Peru, Rwanda, and Senegal), the World Bank has contributed to strengthen an integrated multidimensional package of community-based nutrition interventions. However, learning to organize sectoral and community actors to integrate the delivery of services remains a challenge.

# Box 3.1. Contributions to Institutional Strengthening in 12 Countries (cont.)

» Monitoring and evaluation improvements. World Bank interventions in Ethiopia have helped develop nutrition surveillance capacity and geographic data. Support in Senegal has facilitated the measurement of multidimensional nutrition programs in communities. Activities in Peru have helped build capacity for the social monitoring of nutrition results. Indonesia and Rwanda are improving the accountability of service delivery by initiating village scorecard and child scorecards, which are planned to become an input into the formal management information system.

#### Stakeholder Engagement and Ownership

» Leadership building and stakeholder mobilization. In many countries, the engagement of government actors at all levels in nutrition strategy and planning has been instrumental for building leadership and government commitment. In Rwanda, Indonesia, and Senegal, the World Bank has supported high-level leadership and local leadership on nutrition. In Rwanda, the World Bank supports the monitoring of Imihigo, which is a contract between the president and local government leaders on achieving targets for key programs. In Indonesia, stunting summits are used to secure and sustain political leadership at national, provincial, district, and village levels, and provide a cascading system of accountability. Moreover, in most case study countries, the World Bank has strengthened social and behavior change communication to raise awareness and shape social norms at the community level. These ranged from awareness or advocacy campaigns (Bangladesh, Nicaragua, and Peru) to more intensive social mobilization programs (Madagascar, Malawi, and Senegal). Often these activities have involved multiple sectors and types of actors in communities.

Source: Independent Evaluation Group.

# Contributions to the Immediate and Underlying Determinants of Nutrition

The World Bank makes important contributions in determinants of nutrition—with performance improving for underlying determinants and slightly declining for immediate determinants. There is more evidence of results for underlying determinants because the World Bank has invested more in nutrition-sensitive interventions over time and measurement is better. The performance of projects in achieving underlying determinants results has slightly improved over the evaluation period, and the most successful area has been agriculture and food, which has included improvements in food supply and production (vegetables, legumes, dairy products, livestock) productivity, market access, and food storage and transformation. But project achievements in immediate determinants of nutrition resulting from nutrition-specific interventions have slightly declined more recently. Although achieved results in adolescent health appear to be remarkable, that is due to a very small sample of indicators. As we have shown before, the World Bank's attention to adolescent health interventions is limited and has considerable measurement gaps.

The World Bank has contributed to improving nutrition determinants in all case study countries. In terms of food and care, in Ethiopia, Madagascar, and Nicaragua this has included improvements in breastfeeding, child feeding, and diet. However, in most case study countries, feeding and dietary improvements are modest. Through SPJ, the World Bank has contributed in some countries to improved food consumption, parenting skills, access to health services, livelihoods, and school enrollment among lower-income households. Through Agriculture, the World Bank has improved seasonal availability of food and crops (in Ethiopia, Malawi, and Rwanda), and biofortification (in Mozambique, Nicaragua, and Rwanda). In terms of access to health, the World Bank has improved access to health services (in Ethiopia, Indonesia, Mozambique, Nicaragua, Niger, and Rwanda), including to immunizations, family planning, institutional delivery, and antenatal and postnatal care. In some countries, the World Bank has contributed to child health through expanding growth monitoring and promotion, screening, and treatment of malnourished children (in Ethiopia, Madagascar, Niger, and Rwanda). There were also gains

in the prevention and treatment of childhood diseases, including diarrhea, parasitic infection, and malaria, supported by health services. Contributions to maternal nutrition are limited across countries, whereas improvements have been made in the provision of iron–folic acid to pregnant women. In terms of access to WASH, in Ethiopia, Malawi, Nicaragua, and Rwanda, the World Bank has increased access to water and sanitation, such as piped water and latrines. Community programs in Madagascar likely improved WASH behaviors. However, in Madagascar, Mozambique, and Niger the World Bank's contribution to WASH has been modest.

Health, food, and care interventions, such as nutrition counseling, parent education, breastfeeding promotion, and support to backyard gardens, account for most behavior change results in nutrition determinants. These interventions have been quite successful in tracking evidence of actual behavioral practices, achieving 55–70 percent of behavior change indicators at the apply level and 58–72 percent of sustain level changes in the behavior of mothers or caregivers and communities.<sup>3</sup> Still, within most projects there is a lack of tracking incremental behavior changes along a results chain of engage-learn-apply-sustain, and sustained behaviors have been less measured overall.

Community-based programs supported by the World Bank contribute to behavior changes to improve nutrition determinants, but there was limited evidence of longer-term sustained changes. The behavior change framework and process mapping have been applied in case studies to assess how behavior changes have been supported by frontline workers, community groups, and nongovernmental organizations, among other types of stakeholders. Case study evidence suggests that the World Bank has contributed to engaging actors and learning (although this is not often measured), and in some cases to new practices by caregivers, farmers, and health workers, among others, but there was limited evidence that the World Bank has contributed to longer-term sustained changes in the behaviors of actors. In most of the countries, CBN programs are still being strengthened, providing an opportunity to improve evidence and learning regarding behavior change.<sup>4</sup>

Impact evaluations of specific project investments show positive results in improving nutrition determinants. For instance, a randomized controlled trial evaluation of over 3,000 villages and 1.8 million target beneficiaries of the

Generasi program in Indonesia found that community block grants to rural communities are an effective tool where the use of basic health care services is constrained not just by demand but also by supply and access. Moreover, positive impacts on the use of basic health care services have been higher in communities whose grants were linked to performance-based incentives, suggesting that the attempt of the Generasi program to replicate the conditionality of cash transfers on a community-wide level can produce positive results (Olken, Onishi, and Wong 2011).5 Another randomized controlled trial evaluation of a Total Sanitation and Sanitation Marketing program in Indonesia, when the program had been implemented at scale in rural East Java, found that sanitation improvements were largely driven by an increase in the rate of toilet construction by nonpoor households, whereas improvements remain limited for lower-income households, which are more likely to be credit constrained. Self-reported open defecation has decreased and parasitic infestations in the nonpoor sample with no sanitation at baseline has also been reduced. Diarrhea prevalence has dropped 30 percent in treatment communities compared with control communities among young children likely affected by differences in drinking water and hand washing behavior (Cameron, Shah, and Olivia 2013).

# Contributions to Social Norms

The World Bank is not contributing in a substantial way to improving social norms in the nutrition portfolio. The World Bank's nutrition portfolio gives insufficient attention to social norms interventions relating to early marriage, early pregnancy, birth spacing, and women's empowerment (decision-making regarding childcare, food production, and health care seeking) when designing nutrition projects. The alignment of the portfolio interventions falls short in addressing social norms needs given its relative importance for achieving better nutrition outcomes. Even when social norms are supported, expected results are rarely measured, further intensifying the lack of available results. The evidence base for project-level results is very thin, encompassing only 21 indicators.

Evidence gathered through case studies also reflects the modest contributions of the World Bank toward social norms outcomes. Projects likely had some contribution in improving knowledge on sexual and reproductive health and

rights and in delaying pregnancy (Ethiopia, Nicaragua, and Niger); gender roles in agriculture (Madagascar, Niger, and Rwanda); girls' enrollment in school (Niger); and family planning usage (Ethiopia, Niger, and Rwanda). For example, Nicaragua's support to sexual and reproductive health and rights likely helped increase contraceptive usage and reduce teen pregnancy and gender-based violence. Agriculture support has likely been particularly important to improve women's participation in food production, storage and transformation, and livestock farming for milk and meat.

#### **Contributions to Nutrition Outcomes**

In World Bank nutrition support, the pathway to improve nutrition outcomes for mothers and children has been through support to nutrition determinants. This approach is consistent with a low emphasis of nutrition outcomes in projects' objectives and consequently the limited measurement of nutrition outcome indicators in projects' results frameworks. In addition to their low frequency, improvements in nutrition outcomes at project level have been much harder to achieve (53 percent) compared with immediate and underlying determinants and institutional strengthening results. Moreover, the multivariate regression analysis found that the inclusion of nutrition indicators in results frameworks (such as anthropometric measurements, micronutrient status, and cognitive development) is associated with a lower project performance. This finding is likely due to the time lag to see movement in these indicators, which makes it difficult to measure improvement in outcomes in the time frame of a single project.

Anthropometric measures and the micronutrients status of children under five have improved in most case study countries over the evaluation period, but these changes are more difficult to attribute to World Bank support. The prevalence of wasting and underweight has decreased in most of the countries, likely because of investments in growth monitoring and promotion and treatment of malnutrition. In countries such as Malawi and Mozambique, repeat crises likely have led to limited improvements in nutrition indicators. Indicators of stunted growth, LBW, and anemia may have decreased, but levels remain high in most of the countries. The achievement of nutrition outcomes at the country level is more difficult to attribute to World Bank support given the multiplicity of factors and development partners involved,

the synergies among multisectoral interventions, and the rather longer time span for the changes in nutrition outcomes to materialize.

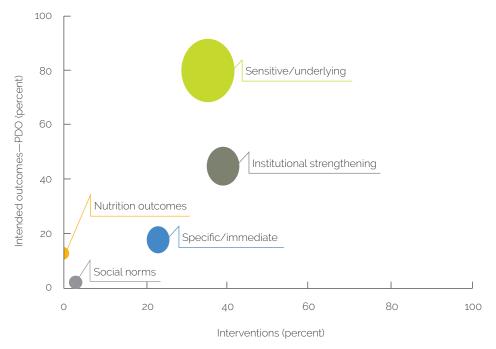
Impact evaluations for specific projects provide evidence on the positive impact of World Bank efforts on nutrition outcomes for target beneficiary groups. The impact evaluation of the Generasi program in Indonesia shows that nutrition outcomes for children in project implementation areas have improved compared with those of a control group. The impact was stronger in areas with higher undernutrition before project implementation, where underweight rates have declined by 8.8 percentage points (20 percent compared with control areas); severe underweight rates have dropped by 5.5 percentage points (33 percent compared with control areas); and severe stunted growth has been reduced by 6.6 percentage points (21 percent compared with control areas; Olken, Onishi, and Wong 2011). Another example is an experimental design evaluation of the ECD project for expanding access to community-based early childhood services in rural Indonesia, which has found that the project led to improvements in lower-income children's social competence, language, cognitive development, and their emotional maturity (Brinkman et al. 2015).

# **Measuring Nutrition Results**

Persistent gaps exist in the measurement of nutrition-related results within projects, especially when tracking expected achievements from nutrition-specific and social norms interventions. IEG has calculated a matching score reflecting the alignment between the supported nutrition interventions and the presence of indicators to track progress on results based on a classification of more than 2,500 indicators according to the dimensions of the conceptual framework. On average, the matching score between interventions and indicators for the entire nutrition portfolio is 57 percent, and it has slightly improved over time (figures 3.2 and 3.3). Expected results from nutrition-sensitive interventions are the most frequently measured, especially in health and family planning services, social safety nets, and agriculture and food systems. The high measurement gap in social norms further intensifies the lack of available results in an area where the World Bank has not given enough attention when designing nutrition projects. Among GPs, Water,

HNP, and Agriculture have most consistently tracked progress on results from their interventions.

Figure 3.2. Distribution of Interventions, Intended Outcomes, and Project Indicators

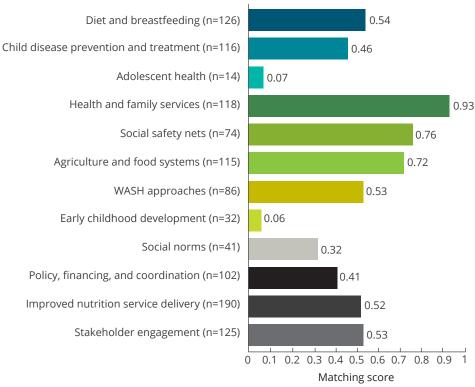


Sources: Independent Evaluation Group; portfolio review and analysis.

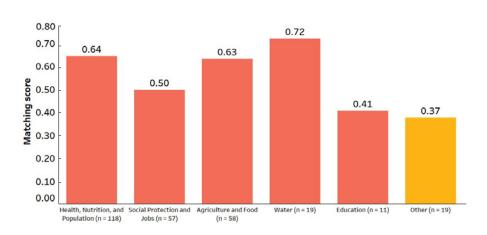
*Note:* The vertical axis represents the percentage of projects' objectives per dimension, and the horizontal axis represents percentages of interventions. The size of each bubble represents the share of project indicators by area. PDO = project development objective.

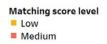
Figure 3.3. Measurement of Nutrition Results at the Project Level

a. Measurement of nutrition results by intervention area

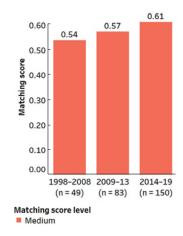


b. Measurement of nutrition results by Global Practice





#### c. Measurement of nutrition results by time period

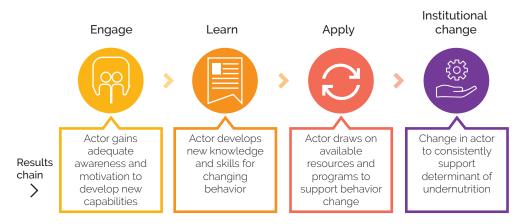


Sources: Independent Evaluation Group; portfolio review and analysis.

Note: The matching score is the share of interventions with an indicator to track progress of results in the same area. Matching score levels: Low, matching score <= 0.40; Medium, 0.40 < matching score <= 0.80; High, matching score > 0.80. The mean matching score is 0.59, the median is 0.57, the standard deviation is 0.29, and the range is 0–1. WASH = water, sanitation, and hygiene.

Similarly, weak measurement of the progression along the behavior change results chain hinders effective planning and evaluation. IEG has developed a framework and process map that traces evidence of behavior changes across different actors along the engage-learn-apply-sustain results chain (figure 3.4). The goal of behavior change interventions is to engage different actors to induce sustained practices in the long run. However, when tracking evidence of behavior change results, World Bank projects rarely follow the results chain, leading to an incomplete monitoring of change processes. Moreover, many projects do not measure behavior changes. For projects that measured behavior changes, they most often measured the apply level (43 percent), followed by the engage (23 percent), learn (14 percent), and sustain (23 percent) levels. For example, the case study found evidence of behavior change, although it was not always measured in the project indicators (appendix G). The behavior change map for Nicaragua shows that to improve access to food and care, at the engage level, parents were engaged by nutritionists and promoters in communities; at the learn level, parents learned to prepare new foods and learned practices for caregiving of children; at the apply level, families increased their consumption of a variety of foods, and women and children increased the number of food groups consumed; at the sustain level, there was no evidence available on sustained diet diversity.

Figure 3.4. Tracing Evidence of Behavior Change Levels in Actors



Sources: Independent Evaluation Group; behavior change analysis.

# Explaining Nutrition Results: Successes and Failures behind Project Performance

Effective pathways to improve project performance in achieving nutrition results are improving M&E of determinants across sectoral areas, community-based implementation, country ownership, and designing projects to address nutrition determinants and to strengthen country coordination capacity. Based on analysis of Implementation Completion and Results Reports, Implementation Completion and Results Report Reviews, and Project Performance Assessment Reports of closed projects, IEG has identified nutrition-relevant factors behind the success or failure in achievement of nutrition results. Unsupervised hierarchical clustering machine learning algorithms have been used to build a taxonomy of factors emerging from the text of project documents, suggesting that project failure factors are the reverse or absence of success factors in the nutrition portfolio.<sup>7</sup>

Successful projects had M&E frameworks that measured the expected contribution to nutrition determinants across sectoral areas. Important was measuring indicators that were related to nutrition determinant in a theory of change, such as feeding practices, micronutrient supplementation, and use of nutrition-sensitive services; that were at a geographical level supported by the project, such as the community level, rather than nationwide;

that measured changes that could be observed in the project time frame and at different levels of the results; that measured the expected achievements of a range of interventions supported by the project; that had a number of sources for routine (such as administrative data) and periodic data collection (such as population surveys and operational research studies), which could be triangulated to review progress; and that included indicators to measure the quality of services. Moreover, as observed in the country stocktaking (appendix H), the strengthening of the multisectoral collection of M&E data on nutrition interventions has been critical for implementation monitoring in Malawi, Peru, Rwanda, and Senegal.

Successful projects have a strong community-based implementation, which is also key to induce behavior changes that improve nutrition determinants. The strength of community engagement, participation, and leadership in implementing nutrition interventions; support for capacity building in communities for selecting and managing local subprojects; and collaboration between communities and local partners in delivering social services matter for the achievement of nutrition results. This evaluative finding is consistent with multivariate regression estimates. For example, community participation has been key for a project in Burundi that sought to strengthen the capacities of local community groups to work together in selecting, implementing, financing, and monitoring and maintaining priority community services. Project implementation has included timely contribution by beneficiaries to subproject costs so that they would own the subprojects and be very much involved in their maintenance and continued operation.

Other important factors explaining projects' success are country ownership and having a design to reinforce existing country structures and to develop country coordination capacity for nutrition. This includes supporting government commitment to nutrition and aligning projects to develop institutional capacity for nutrition in terms of coordinating adequate financing, supporting nutrition-related reforms, the availability and commitment of a skilled workforce to support nutrition, and developing the capacity of line ministries and executing agencies to coordinate action and service delivery. A project in Senegal that sought to reduce nutrition insecurity of children under five by expanding the country's National Enhancement Program, for instance, has seen that the institutional setup in the prime minister's office

has enhanced coordination of the policy dialogue among multiple stakeholders and sectors. This has increased stakeholders' shared responsibility of the observed nutrition-related problems, which in turn has contributed to the enhanced uptake of services.

The intentional design of interventions to support results in nutrition determinants matters for project success and is often better in projects with a heavy focus on nutrition than in sectoral projects. Where interventions are integrated in sectoral projects with few nutrition interventions, the design of support to achieve expected results in nutrition determinants is often weak. Multivariate regression analysis found that sectoral projects that integrated a few nutrition interventions had a lower achievement of nutrition outcomes and determinants when they planned interventions beyond their area of expertise, but projects that were designed with a heavy nutrition focus were able to contribute to results for nutrition determinants across a range of sectors. In case study countries, interventions integrated in Agriculture and Water projects have often lacked an intentional design to improve nutrition determinants, such as access to nutritious foods or hygiene and sanitation practices of households with children.

The use of diagnostics to inform project design and evidence-based policies contributes to project success in achieving nutrition results and is particularly important in multisectoral approaches toward reducing undernutrition for country programs and policy. In Rwanda and Indonesia, a nutrition situation analysis, rapid mapping on nutrition-specific and nutritionsensitive interventions, and nutrition public expenditure review have supported the government in developing its multisector strategy and identifying needs to improve nutrition financing for multisectoral coordination. Consistently, regression analysis has found a strong positive association between project performance and the use of diagnostic and analytical work at project design. Although some countries (Ethiopia, Indonesia, and Rwanda) have better leveraged a mix of knowledge activities to help strengthen the nutrition results of both projects and the country's program, countries' support seldom strategically balances analytical work, knowledge sharing, and leadership building for improving evidence-based policies and nutrition programming. For example, in Mozambique, although services have been emphasized, attention to relevant analytical work, support to leadership,

knowledge sharing, and coordination activities has been limited. Moreover, although Madagascar has done extensive evidence learning to develop its services, less support has been given to develop leadership, policies, and coordination of nutrition.

Over the years, a clear consensus has grown that the key to solving child undernutrition is multidimensionality in programming. Countries with a World Bank project portfolio that has a mix of nutrition-specific and nutritionsensitive interventions and institutional strengthening provide a pathway to improve nutrition determinants and contribute to outcomes. Regression analysis offers some evidence that multidimensional country portfolios. having a mix of nutrition-specific and nutrition-sensitive interventions, are slightly positively associated with project performance. But strengthening the World Bank's within-country alignment and targeting of relevant interventions to address disaggregated needs or priorities is key, and case studies showed that projects in different GPs have been mostly implemented in different geographical areas and target groups, and they lacked mechanisms to integrate or converge actions or build on respective achievements to improve nutrition outcomes in the same communities. Although learning to integrate or converge the implementation of interventions of different sectors in the same geographical areas is emerging in countries, the World Bank needs to improve coordination across GPs in the implementation of interventions. Multidimensional projects offer one approach to overcome coordinated targeting challenges, but they do not perform better on average than those focusing on a narrow set of intervention areas. Moreover, noncore nutrition projects that integrate a small nutrition component tend to perform worse in achieving nutrition results in areas that are not related to their sectors.

- <sup>1</sup> See appendix I on multivariate regression analysis for more details.
- <sup>2</sup> See section on factors of success and failure in project performance in appendix D.
- <sup>3</sup> See table C.1 for examples of behavior change indicators at the engage-learn-apply-sustain levels.
- <sup>4</sup> See table G.3 for behavior change assessment in selected countries.
- <sup>5</sup> The Generasi program target health indicators are (i) four prenatal care visits; (ii) taking iron tablets during pregnancy; (iii) delivery assisted by a trained professional; (iv) two postnatal care visits; (v) complete childhood immunizations; (vi) adequate monthly weight increases for infants; (vii) weighing monthly for children under three and biannually for children under five; and (viii) vitamin A twice a year for children under five.
- <sup>6</sup> See appendix I on multivariate regression analysis for estimation results.
- <sup>7</sup> The emerging taxonomy of factors has been reviewed and validated by the evaluation team. See appendix D for the complete taxonomy of success and failures factors.
- <sup>8</sup> See appendix I on multivariate regression analysis.

# 4 Conclusions and Way Forward

The evaluation confirms that the World Bank approach to nutrition—addressing nutrition determinants—provides a plausible pathway to improve nutrition outcomes. Among those determinants, the associations between access to health services and social norms and a country's nutrition outcomes are the strongest, followed by access to WASH and food and care. Moreover, multivariate regression analysis using portfolio data suggests that institutional strengthening achievements contribute to the success of interventions that address nutrition determinants in countries.

The evaluation highlights encouraging bright spots, including an increase in the number of projects and improved nutrition outcomes in some countries. In countries burdened by undernutrition, the World Bank invested an estimated \$22 billion in nutrition across multiple sectors from FY08 to FY19 (including about \$5.8 billion in RETFs). This financing has supported evidence-based interventions, with the number of projects tripling in recent years. Some countries, Madagascar and Senegal among them, now have more than a decade of experience using a combination of financing and knowledge work to improve nutrition outcomes through multidimensional nutrition programs, from which other countries can learn.

In many countries, the World Bank has supported a mix of nutrition-specific and nutrition-sensitive interventions affecting access to food and care, health, and WASH to address multidimensional needs that can improve nutrition determinants. The World Bank has also consistently invested in institutional strengthening, particularly to improve services. Achieving a mix of interventions in a country portfolio can be accomplished through multidimensional projects that deliver a broad set of nutrition interventions or through a multisectoral approach by coordinating and integrating nutrition interventions implemented by projects across GPs. Although most projects across GPs continue to support activities related to their respective sectors (about three-quarters of them), GPs increasingly attempt to integrate into projects

nutrition-related interventions that belong to other sectors, suggesting that the World Bank is beginning to work beyond sector silos.

The overall performance of the World Bank's nutrition portfolio is improving over time and, based on the evaluation's portfolio analysis, shows good results in improving nutrition determinants and institutional strengthening. At the same time, the nutrition portfolio is young, providing for opportunities to further improve the evidence base of interventions, knowledge work, the addressing of nutrition in the country programs, and results achievement and measurement.

# Lessons

The following five lessons arising from the evaluative evidence are offered to inform the design of the World Bank's future multidimensional and multisectoral nutrition support and improve how the World Bank operationalizes the conceptual framework.

Lesson 1: More intentional planning of nutrition support (financing and ASA) is needed in the country portfolio within countries to improve nutrition outcomes through supporting nutrition determinants, social norms, behavior change, and institutional strengthening. The evaluation finds that the multidimensionality of the country portfolio matters for results.

- » Nutrition interventions can be supported by multidimensional projects that implement a range of interventions to address nutrition determinants or by trust funds and partnership, and better GP coordination. Interventions can also be supported by sector projects in GPs if accompanied by learning to design nutrition interventions and efforts to coordinate implementation. Trust funds and partnerships have been especially catalytic to design new support in countries, which can be expanded with government ownership to develop comprehensive nutrition services.
- » Institutional strengthening can be done at national and local levels through support to coordinate and develop intervention packages and policies that engage multiple actors. At the national level, institutional strengthening can help develop multisectoral nutrition approaches, including arrangements to coordinate, finance, plan, and communicate nutrition. Recent

Program-for-Results investments in Indonesia focused on ensuring effective coordination and accountability mechanisms across sectors and levels of government. At the local level, institutional strengthening has been important (for example, in Rwanda and Senegal) to operationalize the delivery of interventions (such as nutrition counseling, child disease management, maternal health, home gardens, cash transfers, ECD, and hand washing) in country nutrition programs.

» Addressing social norms is important for improving nutritional outcomes in countries. More emphasis on social norms, which currently accounts for only 6 percent of the portfolio across all GPs and sectors, is needed since it can also facilitate expanded actions on nutrition, for example, as women become more involved in food, health, family planning, and caregiving decisions in households. This emphasis links to the concept of accelerator actions from the behavior change findings, where supporting the empowerment of key change agents can influence other behaviors and facilitate changes toward nutrition determinants.

Lesson 2: The targeting and continuity of support in countries matter to successfully influence nutrition determinants. The evaluation finds that the targeting, continuity, and sustainability of nutrition interventions are important to achieve expected results from multisectoral nutrition approaches.

The quality and extent of subnational targeting of multisectoral interventions matter for the ability to address (disaggregated) needs within countries. The evaluation's heat map analysis shows that most countries have had interventions to address their needs across nutrition determinants. However, the case studies show that interventions are often small in scale. Moreover, interventions of different GPs or sectors often have not converged in the same communities to address synergistic needs for food, care, health, and WASH. To meaningfully improve outcomes, given the synergistic nature of determinants, all priority needs should be addressed across targeted communities. Recent approaches to improve the convergence of interventions and needs in countries, such as Indonesia and Rwanda, are promising. Multidimensional projects offer one option to coordinate interventions to meet needs in the same community, but they have not performed better or worse overall. An alternative is improved coordination across GPs and with oth-

er development partners in the implementation of multisectoral interventions within countries. The evaluation did not examine the relative cost-effectiveness of these two options.

» Continuity of support, particularly at the community level, is important to successfully influence nutrition determinants for results. Madagascar and Senegal offer strong examples of the contribution made by continuity of support across projects and years to strengthening interventions. Community interventions involve building the capacity of a wide range of actors and promoting behavior change, which need to be sustained to successfully influence nutrition determinants. Strong community-based implementation is shown to be a success factor for improving project performance.

Lesson 3: Improving the measurement of results of interventions addressing nutrition determinants and of behavior change will improve nutrition outcomes in countries.

- » Although the World Bank has improved its results measurement in the past 10 years, some areas still are not well measured. Projects measure only about 60 percent of achievements toward nutrition determinants. The evaluation consistently identifies M&E of nutrition indicators as a pathway to improve project performance.
- » The World Bank's nutrition-sensitive interventions increasingly have achieved results that contribute to nutrition determinants in countries. Yet, nutrition-specific interventions, mainly implemented by HNP, have not seen the same improvements, and these results are more challenging to achieve and require consistent support in countries. Areas where projects had limited success include diet diversity, child feeding, and micronutrient outcomes in women and children.
- » Most projects did not measure the results of behavior change. The evaluation's behavior change process map and framework (engage-learn-apply-sustain) shows that the World Bank's contributions to behavior change focus mostly on lower-level indicators related to the engagement of actors and stops short of looking at results. This limitation is a concern for interventions at the community level and those that focus on the institutional strengthening of actors involved in delivering services, since the goal of behavior change interventions

is to engage various actors to induce sustained practices in the long run. There is a need for learning in countries to better track behavior change.

Lesson 4: Refocusing the portfolio to have greater emphasis on nutrition-specific interventions, balanced with nutrition-sensitive interventions across GPs can improve nutrition programs in countries. Although nutrition-sensitive interventions have increased in the portfolio, a similar proportional increase in nutrition-specific investments supported by health and other sectors is not seen except in some countries (such as Rwanda), despite the critical importance of supporting these interventions in countries. The evaluation's SRM shows that effective interventions can be delivered by health, social protection, agriculture, and WASH sectors. Investing in improving nutrition-specific interventions in countries is needed, together with nutrition-sensitive support.

Lesson 5: Learning—the systematic generation and use of knowledge work—is important to help countries to design and expand effective nutrition policy and programming. Some case study countries use a combination of knowledge work—such as analytical work, knowledge sharing, and leadership activities—to help the development of nutrition interventions and policies. Key examples are Ethiopia, Indonesia, Madagascar, Rwanda, and Senegal.

- » Country-level learning requires a stream of analytical work (evaluations, diagnostics, and so on) to improve interventions and expand their targeted delivery in national programs. For example, Madagascar had over a decade of ASA to develop its community-based program, which is being expanded; Rwanda has employed ASA to develop its nutrition-sensitive social protection support and to roll out innovative tools, including a child length mat and child scorecard; and Nicaragua used years of evaluation evidence to develop its integrated models for health and social protection services. Consistent attention to learning is weaker in Malawi, Mozambique, and Niger.
- » Since nutrition is often not the objective of GP projects (such as in Agriculture and Water), interventions do not target to improve nutrition determinants and in some cases might even negatively affect child undernutrition (as in the example of support for cash crops). Attention to this issue and learning has already started at the global level, for example, through research on nutrition-sensitive agriculture. In other sectors supporting nutrition-sensitive

- interventions (such as SPJ), case studies suggest learning to improve the design of interventions to better target nutrition determinants is more advanced.
- » Combining analytical work (evaluations, diagnostics) with knowledge sharing (within and across countries) and leadership building activities in countries helps generate political commitment and the use of evidence to inform policies and programs and to leverage resources. In Malawi, multisectoral learning forums led to policies and strategies on nutrition. In Ethiopia, the convening of actors pooled resources for nutrition. In Indonesia, Madagascar, and Rwanda, South-South learning led to commitment and technical knowledge to implement interventions. In Indonesia, Rwanda, and Senegal, high-level leadership activities pivoted the nutrition agenda to a priority for the country.

# Recommendations

The preceding lessons support two broad recommendations to strengthen the support of the World Bank to nutrition:

- » Recommendation 1. Adjust nutrition programming in country portfolios to (i) give more priority to institutional strengthening for coordination and implementation of multisectoral nutrition interventions and (ii) increase focus on subnational targeting of interventions to reflect areas of greatest disadvantage and persistency of need.
- » Recommendation 2. Strengthen nutrition support in GPs to (i) rebalance investments to have greater emphasis on nutrition-specific interventions and (ii) increase focus on social norms interventions and behavior changes, with more attention to tracking expected achievements to improve nutrition determinants.

# Glossary

Behavior change interventions. Interventions that engage changes agents (such as frontline workers, opinion leaders, and households) and mothers and primary caregivers to shift behaviors to influence determinants of nutrition.

Behavior change results chain. The delineation of levels along a results chain (engage-learn-apply-sustain) that lead from initial inputs and outputs all the way to sustained behavior change that could be expected to persist after interventions are completed.

Core nutrition project. A project with an explicit focus on nutrition in its objectives or title and a heavy focus on supporting nutrition interventions.

Institutional strengthening support. Support to strengthen nutrition-related stakeholder engagement and ownership, policy, financing, and coordination, and service delivery.

Multidimensional portfolio. This describes the inclusion of a mix of nutrition-specific and nutrition-sensitive interventions in the World Bank's nutrition portfolio or portfolio of support in a country.

Multidimensional project. These are projects that include a mix of nutrition-specific and nutrition-sensitive interventions that are inherently implemented by different sectors.

Multisectoral nutrition support. This refers to World Bank nutrition support that involves multiple World Bank Global Practices to support sector-focused nutrition interventions.

Noncore project. Projects that do not have an explicit focus on nutrition in their title or objectives and integrate nutrition interventions in their components.

Nutrition determinants. There are immediate and underlying nutrition determinants. Immediate determinants of child nutrition relate to caregiving practices, dietary intake or diversity, and the health status of the mother and child. It is not possible to realize these factors when communities lack

adequate access to underlying determinants of nutrition, including nutrient-rich food, caregiving resources, health services, and water, sanitation, and hygiene.

Nutrition results. Projects can improve underlying determinants (nutrient-rich food, caregiving resources, health services, and water, sanitation, and hygiene); immediate determinants (child feeding practices, diet diversity, and maternal and child health); social norms (women's empowerment and early marriage and pregnancy); and institutional strengthening, and to a lesser extent nutrition outcomes (anthropometric measures and micronutrients deficiencies).

Nutrition-sensitive interventions. These are interventions, such as cash transfers, water, sanitation and hygiene approaches, girls' education, and food system improvements, that are expected to address the underlying determinants of nutrition.

Nutrition-specific interventions. These are interventions, such as adolescent nutrition, maternal nutrition, breastfeeding support, micronutrient supplementation, child disease prevention, and management and treatment of undernutrition, that are expected to influence the immediate determinants of nutrition.

Social norms interventions. These are interventions that address social norms relating to early marriage, early pregnancy, birth spacing, and women's empowerment (decision-making regarding childcare, food production, health care seeking) to influence nutrition determinants.

# Bibliography

- ACC/SCN (United Nations Administrative Committee on Coordination/Sub-Committee on Nutrition). 2000. *Fourth Report on the World Nutrition Situation: Nutrition throughout the Life Cycle*. Geneva: ACC/SCN in Collaboration with International Food Policy Research Institute. https://www.unscn.org/web/archives\_resources/html/resource 000135.html.
- Alderman, H. 2016. Leveraging Social Protection Programs for Improved Nutrition:

  Summary of Evidence Prepared for the Global Forum on Nutrition-Sensitive Social Protection Programs, 2015. World Bank, Washington, DC.
- Berg, A. 1987. *Malnutrition: What Can Be Done? Lessons from World Bank Experience*. Washington, DC: World Bank.
- Brinkman, S. A., A. Hasan, H. Jung, A. Kinnel, and M. Pradhan. 2015. "The Impact of Expanding Access to Early Childhood Services in Rural Indonesia (Evidence from Two Cohorts of Children)." Policy Research Working Paper 7372, World Bank, Washington, DC.
- Cameron, L., M. Shah, and S. Olivia. 2013. "Impact Evaluation of a Large-Scale Rural Sanitation Project in Indonesia." Policy Research Working Paper 6360, Impact Evaluation Series 83, World Bank, Washington, DC.
- Denboba, A., R. Sayre, Q. Wodon, L. Elder, L. Rawlings, and J. Lombardi. 2014. *Stepping Up Early Childhood Development: Investing in Young Children for High Returns*. Washington, DC: World Bank.
- Development Initiatives. 2020. 2020 Global Nutrition Report: Action on Equity to End Malnutrition. Bristol: Development Initiatives.
- Galasso, E., and A. Wagstaff. 2018. "The Aggregate Income Losses from Childhood Stunting and the Returns to a Nutrition Intervention Aimed at Reducing Stunting." Policy Research Working Paper 8536, World Bank, Washington, DC.
- Gillespie, S., M. McLachlan, and R. Shrimpton, eds. 2003. *Combating Malnutrition: Time to Act.* Health, Nutrition, and Population Series. Washington, DC: World Bank.

- Hawkes, C., and M. T. Ruel. 2008. "From Agriculture to Nutrition: Pathways, Synergies and Outcomes." Agricultural and Rural Development Notes 40, World Bank, Washington, DC.
- Heaver, R. 2005. *Strengthening Country Commitment to Human Development: Lessons from Nutrition*. Directions in Development Series. Washington, DC: World Bank.
- Horton, S., M. Shekar, C. McDonald, A. Mahal, and J. K. Brooks. 2010. *Scaling Up Nutrition: What Will It Cost?* Directions in Development Series. Washington, DC: World Bank.
- Laviolette, L., S. Gopalan, L. Elder, and O. Wouters. 2016. *Incentivizing Nutrition: Incentive Mechanisms to Accelerate Improved Nutrition Outcomes*. Washington, DC: World Bank.
- MacNally, W. 1983. "World Bank Assistance to Food and Agriculture 1974–84." AGREP Division Working Paper 82, World Bank, Washington, DC.
- Maternal and Child Nutrition Study Group. 2013. "Maternal and Child Nutrition." Series, *Lancet* 382 (9890). https://www.thelancet.com/series/maternal-and-child-nutrition.
- Maternal and Child Undernutrition Study Group. 2008. "Maternal and Child Undernutrition." Series, Lancet 371 (9608). https://www.thelancet.com/series/maternal-and-child-undernutrition.
- Olken, B., J. Onishi, and S. Wong. 2011. *Indonesia's PNPM Generasi Program: Final Impact Evaluation Report*. World Bank, Washington, DC.
- Pearson, R., M. Killedar, J. Petravic, J. Kakietek, N. Scott, K. L. Grantham, R. M. Stuart, D. J. Kedziora, C. C. Kerr, J. Skordis-Worrall, M. Shekar, and D. P. Wilson. 2018. "Optima Nutrition: An Allocative Efficiency Tool to Reduce Childhood Stunting by Better Targeting of Nutrition-Related Interventions." *BMC Public Health* 18 (384). https://doi.org/10.1186/s12889-018-5294-z.
- Rokx, C. 2006. "Governance and Malnutrition, Exploring the Contribution of 'Good Governance' to Malnutrition Reduction in Developing Countries." PhD thesis, Maastricht University.

- Shekar, M., J. Kakietek, J. Dayton Eberwein, and D. Walters. 2017. *An Investment Framework for Nutrition: Reaching the Global Targets for Stunting, Anemia, Breastfeeding, and Wasting*. Directions in Development Series. Washington, DC: World Bank.
- Skoufias, E., K. Vinha, and R. Sato. 2019. *All Hands on Deck: Reducing Stunting through Multisectoral Efforts in Sub-Saharan Africa*. Africa Development Forum. Washington, DC: World Bank.
- SUN (Scaling Up Nutrition) Movement. 2010. *Scaling Up Nutrition: A Framework for Action*. Geneva: SUN Movement.
- SUN (Scaling Up Nutrition) Movement. 2019. *Nourishing People and Planet Together: Scaling Up Nutrition (SUN) Movement Progress Report 2019*. Geneva: SUN Movement. https://scalingupnutrition.org/wp-content/uploads/2019/11/SUN-Annual-Report-2019-ENG web FINAL.pdf.
- UNCNC21 (United Nations Commission on the Nutrition Challenges of the 21st Century). 2000. *Ending Malnutrition by 2020: An Agenda for Change in the Millennium*. Geneva: United Nations. https://www.unscn.org/uploads/web/news/2000-FEB-Ending-Malnutrition-by-2020-Agenda-for-Change-in-the-Millennium-Report.pdf.
- UNICEF (United Nations Children's Fund), WHO (World Health Organization), and World Bank. 2019. *Levels and Trends in Child Malnutrition: Key Findings of the 2019 Edition of the Joint Child Malnutrition Estimates*. Geneva: WHO.
- UNICEF (United Nations Children's Fund). 1990. *Strategy for Improved Nutrition of Children and Women in Developing Countries*. New York: UNICEF.
- UNICEF (United Nations Children's Fund). 2015. "UNICEF's Approach to Scaling Up Nutrition for Mothers and Their Children." Discussion Paper, Programme Division, UNICEF, New York.
- WHO (World Health Organization). 2014. *Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition*. Geneva: WHO.
- World Bank. 2006. *Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action*. Directions in Development Series. Washington, DC: World Bank.
- World Bank. 2013a. *Improving Nutrition through Multisectoral Approaches*. Washington, DC: World Bank.

- World Bank. 2013b. World Bank Group Strategy. Washington, DC: World Bank.
- World Bank. 2014. *Learning from World Bank History: Agriculture and Food-Based Approaches for Addressing Malnutrition*. Washington, DC: World Bank.
- World Bank. 2017. SecureNutrition History, Adaptation, and Selected Impact from Inception through December 2017. Washington, DC: World Bank.
- World Bank. 2018. The Human Capital Project. Washington, DC: World Bank.
- World Bank. 2020. *The World's Bank: An Evaluation of the World Bank Group's Global Convening*. Washington, DC: World Bank.



# **APPENDIXES**

Independent Evaluation Group

World Bank Support to Reducing

Child Undernutrition

# **Appendix A. Overall Methodology**

## **Evaluation Questions**

The overarching question that the evaluation answers is: What has been the contribution of World Bank support in improving outcomes and intermediate outcomes in reducing child undernutrition and improving nutrition determinants in countries that are burdened by undernutrition? Underlying this question are three main lines of inquiry (box A.1).

#### Box A.1. Three Evaluation Questions Guide the Evaluation

- 1. To what extent is the World Bank supporting relevant interventions to improve outcomes and intermediate outcomes of child undernutrition and its determinants within the country context?
- 2. How is the World Bank implementing multidimensional approaches to support outcomes and intermediate outcomes that reduce child undernutrition and improve its determinants, and strengthen countries' institutional capacities?
- 3. To what extent have World Bank interventions contributed to outcomes and intermediate outcomes of reducing child undernutrition and improving its determinants, and what were the factors of success and failure?

  Source: Independent Evaluation Group.

# **Overarching Principles**

The evaluation design adopts a multilevel analysis at the global, portfolio, country, and intervention levels. It uses a mixed-methods approach that combines quantitative and qualitative evaluative evidence and applies participatory, theory-based, and case-based principles.

The conceptual framework underpinning this evaluation is adapted from the United Nations Children's Fund framework of child undernutrition. The framework models interlinked dimensions to sustainably address child undernutrition in a country context. These dimensions are nutrition-specific and nutrition-sensitive interventions addressing the immediate and underlying determinants of nutrition—respectively, social norms interventions and institutional strengthening support—considering factors within the country that are used to prioritize and target interventions. The conceptual framework guides the nutrition agenda of the World Bank and global efforts on nutrition. This framework is used to align the learning from the evaluation with existing efforts to support nutrition.

# **Evaluation Components**

Table A.1 lists the evaluation components, and figure A.1 shows their articulation within the overall evaluation design. The next two sections provide details on each component. The components are at the global, portfolio, country, and intervention levels to triangulate evidence from different methods and address the three evaluation questions.

**Table A.1. Evaluation Components** 

<b>Evaluation Component</b>	Description
Systematic review map	The systematic review map visually synthesizes the available evidence from systematic reviews of the literature on the effectiveness of nutrition-specific and nutrition-sensitive interventions on nutrition outcomes and determinants to benchmark this evidence against support in the portfolio (appendix B).
Literature review and behavior change process map	A structured literature review identifies and categorizes behavior change concepts and evidence to develop a set of process maps that reflect a basic results chain for benchmarking behavior change in projects (appendix C).
Stocktaking of multisector approaches	A qualitative stocktaking exercise of 12 countries is conducted to (i) understand multisectoral approaches to nutrition in different country contexts, and (ii) understand how the World Bank has helped enhance multisectoral coordination through institutional capacity building (appendix H).
Portfolio identification, review, and analysis	The systematic identification, coding, extraction, and analysis of the World Bank's nutrition lending portfolio (282 projects), on its relevance, its multidimensional approaches, and its contributions to nutrition results in countries (appendix D).
Indicators mapping	Indicators to measure nutrition results in project results frameworks are mapped to the conceptual framework to assess how the World Bank measures its results and achievement rates (appendix D).
Artificial intelligence: theory-based content analysis (topic modeling)	Lessons on success and failure factors explaining project performance have been extracted from closed project documents in the portfolio review. These are used for topic modeling to develop a taxonomy of common success and failure factors that influenced the results of nutrition projects (appendix D).
Heat map analysis	The heat map (i) uses data on nutrition outcomes and determinants to understand the situation of countries and their empirical links based on the conceptual framework; and (ii) assesses the extent to which the World Bank's nutrition interventions aligned with the country needs (appendix F).

# Appendix A

# Overall Methodology

Case studies	Case-based analyses of eight countries include a review of the nutrition country portfolio (projects, analytical work, impact evaluations, and partnerships), interviews, and analysis of the World Bank's contribution to results against the conceptual framework (appendix G).
Multivariate regression analysis	A multivariate regression analysis is anchored in the conceptual framework with the main objective of uncovering predictors of project performance, drawing on findings from the portfolio review and case studies (appendix I).

Source: Independent Evaluation Group.

**Evaluation Questions Data Collection, Methods, and Analyses** Global level Systematic review map Systematic literature EQ1—What and Why: To what review (on effectiveness of extent is the World Bank nutrition interventions and Refinement of conceptual supporting relevant interventions on behavioral change) framework to improve outcomes and intermediate outcomes of child undernutrition and its Stocktaking of Al Theory-based content determinants within the country multidimensional analysis context? approaches (supervised & unsupervised ML, (selected countries) knowledge graph) Indicators mapping (indicators from projects mapped against the Portfolio identification, framework) Heat map review, and analysis EQ2-How: How is the World (investments against the Bank implementing nutrition situation in countries) multidimensional approaches to support outcomes and intermediate outcomes that improve child undernutrition and Secondary data sources (country survey data) its determinants, and strengthen Country portfolio review (on World Bank strategies, countries' institutional capacities? interventions, populations and Country level geographies burdened by malnutrition, multidimensional Remote Interviews with Contribution analysis (use approaches) World Bank staff, theories of change and government, development EQ3-Results: To what extent evidence collected from partners have the World Bank projects to assess outcomes interventions contributed against the framework) outcomes, intermediate **Evidence from evaluations** outcomes, and outputs towards (impacts, and success and the building blocks of the failure factors) conceptual framework, and what were the factors of success and failure (contextual, design, Assessment of behavioral Remote Interviews with implementation, benefits to Process map for behavioral implementers of interventions change (on interventions in populations and geographies change interventions projects at local level) and beneficiaries burdened by undernutrition)?

Figure A.1. Evaluation Design Matrix

Source: Independent Evaluation Group. Note: EQ = evaluation question.

# **Ensuring Validity of Findings**

The Independent Evaluation Group (IEG) took several steps to guarantee a consistent approach across the evaluation team members—for example, using a case study template and interview protocols to ensure a common framework and evaluative lens across studies. Similarly, IEG uses consistent protocols and templates for the portfolio coding, multisector stocktaking exercise, and literature reviews. Furthermore, the team applies triangulation at multiple levels, first by cross-checking evidence sources within a given methodological component. Within case studies, for example, the team compares evidence from interviews with World Bank staff, country counterparts, beneficiaries and partners, project documents, and existing evaluations. Second, the team applies triangulation across evaluation components – for example, cross-validating findings from case studies with findings from the multisector stocktaking, systematic review map (SRM), heat map analysis, and portfolio analysis. Moreover, the multivariate regression analysis tests hypotheses based on findings from different evaluation methods. The evaluation team also applies external validation mechanisms at various intervals during the evaluation process. For example, the team identifies the portfolio of core activities through an iterative process in dialogue with the Global Practices. Peer reviewers provided feedback at the beginning, during, and end of the evaluation process. The team organized consultations with key stakeholders to validate the scope and methods of the evaluation, the design of the case studies, and at the end to ensure the relevance and feasibility of the evaluation messages.

#### Limitations

Notwithstanding these steps, the following are limitations of the evaluation design:

- A key strength of the literature review for the SRM is that no interventions are ruled out ex ante. However, the review is limited to evidence from systematic reviews (SRs) and thus may miss recent studies that are not included in SRs and gray literature. Moreover, there is a risk of duplication of the underlying studies included in the SRs, which may skew the results reported in either a positive or negative direction. Also, outcomes may have been measured differently by different studies (see appendix B for more detailed limitations).
- Although the behavior change map provides a useful results chain (engage-learn-apply-sustain) to benchmark behavior change in projects, the analysis of behavior change interventions in the portfolio and in case studies is limited by the lack of indicators and descriptive details on these interventions in project documents.

- The team purposefully centers the case study selection and multisector stocktaking analysis on countries in which the World Bank has a multidimensional portfolio of nutrition projects and on countries that Global Practice (GP) colleagues identify as being able to provide relevant learning. This purposive sampling of countries may not be representative of the total population of countries in which the World Bank is active (see appendix G for details on country selection).
- The team faced several challenges in identifying the nutrition portfolio, given its spread across GPs and the limited quality of the theme codes to identify nutrition projects. Therefore, a machine learning exercise was used to identify the nutrition portfolio. This missed some projects where nutrition interventions are not clearly articulated in project documents, although some relevant projects were recovered during case study analysis based on the suggestions of GPs.

  Nonetheless, the machine learning created algorithms that could be used by the GPs to support routine efforts to identify the nutrition portfolio.
- Moreover, given that projects often had other interventions not related to nutrition, the team calculated the total amount of World Bank financing of the nutrition portfolio based on an estimate of the proportion of nutrition interventions in each project from the portfolio coding.
- The portfolio analysis is limited by a lack of data on the intensity and timeline of
  interventions in countries. Moreover, some project documents lack details on the
  specific interventions being implemented in countries to compare the nutrition
  portfolio with the evidence base.
- Whereas the indicator mapping provides an estimate of World Bank achievements, some project indicators are not reported or are missing. Moreover, since the portfolio is young, many active projects and the achievements of these projects could not be assessed.
- For the heat map analysis, data on nutrition-related indicators are at the national level, limiting the assessment of disaggregated needs within countries.
   Moreover, data are missing for some countries, and years of available data differ across countries, which limits the calculation of trends to assess the change in the nutrition situation over the evaluation period.

# **Description of Evaluation Methods**

### Systematic Literature Review

**SRM.** The SRM is based on the conceptual framework and synthesizes the available evidence on the effectiveness of nutrition-specific and nutrition-sensitive interventions. The review of the literature is limited to evidence from SRs reporting effects of any type of nutrition-specific and nutrition-sensitive interventions on the following nutritionrelevant outcomes: child undernutrition and development (birthweight, micronutrient status and deficiencies, stunted and linear growth, and cognitive development); child feeding and caregiving (breastfeeding, complementary feeding, and parenting practices); child health and disease (enteric infection and diarrhea, and childhood illness and infection); maternal health (nutrition status and deficiencies, nutrient intake and dietary diversity, healthy pregnancy, and mental health); access to health services, water, sanitation, and hygiene (WASH) services and nutrient-rich food (maternal use of health services, child use of health services, WASH, and household food and nutrition security); maternal and childcare resources (household welfare, schooling, knowledge and attitudes, and household safety); and social norms (women's empowerment, early pregnancy, and birth spacing). Other manifestations of child malnutrition (such as overweight or obesity) are outside of the scope (appendix B).

Literature review and behavior change process map. A structured literature review identifies and categorizes behavior change concepts and evidence of how interventions have supported behavior change toward nutrition determinants. The evidence from the literature is used to understand the incremental sequences of actions that can lead to sustained behaviors to improve nutrition determinants, such as access to food, caregiving resources, health services, and WASH. The review includes qualitative studies (such as qualitative SR and empirical studies) on behavior change interventions. The findings are used to develop process maps that reflect a basic results chain for benchmarking behavior change in projects in the portfolio and in the case studies (appendix C).

# Stocktaking of Multisector Approaches

The stocktaking analysis focuses on a purposeful sample of 12 countries, 8 of which are also case studies: Bangladesh, Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nepal, Nicaragua, Niger, Peru, Rwanda, and Senegal. These countries are of interest because their lending portfolios have a high degree of multidimensionality in their mix of nutrition-specific and nutrition-sensitive interventions over the 10-year evaluation period. A qualitative stocktaking template captures descriptive details consistently across countries at the national and subnational levels. Data collection for each country

is conducted by reviewing country documents on nutrition (such as plans), and published case studies. The stocktaking exercise reviews country institutional arrangements for the coordination of nutrition, the delivery of interventions, and behavior change communication. The portfolio review data and case study evidence are then used to understand how the World Bank has contributed to institutional strengthening of multisectoral arrangements in these countries. These findings provide the basis for developing typologies for characterizing multisectoral approaches to nutrition in different country contexts and for highlighting factors that help facilitate or hinder multisectoral coordination (appendix H).

## Portfolio Identification, Review, and Analysis

The portfolio review and analysis are anchored in the dimensions of the conceptual framework, that is, nutrition outcomes for mothers and children, immediate and underlying determinants, and nutrition-specific, nutrition-sensitive, and social norms interventions and institutional strengthening support. It consists of a portfolio identification strategy followed by portfolio coding and analysis (appendix D).

**Portfolio identification strategy.** The strategy consists of four stages—search, delimitation, inclusion, and verification—to progressively define the nutrition-relevant portfolio for the evaluation.

- The **search stage** consists of data retrieval from the World Bank's Business Intelligence repository on active and closed lending projects that fall within the evaluation period fiscal years 2008–19 and are financed through International Bank for Reconstruction and Development, International Development Association, and recipient-executed trust fund agreements. The project features include project identification, titles, countries, regions, lead GP, lending instruments, approval and revised closing years, sector and theme codes, and additional financing flags. Project indicator data are also retrieved from Implementation Status and Results Reports.
- The **delimitation stage** uses relevant sector and theme codes as project filters and restricts the sample to those operations implemented in high countries with high rates of stunted growth. These countries are defined as those having stunted growth rates at or above 20 percent at any point during the evaluation period.
- In the inclusion stage, IEG defines a list of key nutrition concepts and associated keywords based on the conceptual framework as input for a machine learning exercise to improve the accuracy of project identification through text analytics. The machine learning algorithms use corpus of text (project development objectives [PDOs], project indicators, and project components extracted from

project documents) from 4,260 projects (see appendix D). Inclusion criteria are then applied to filter projects with relevant title, PDO, components, or indicators. For determining relevant PDO, components, and indicators, a combination of different thresholds for saliency and similarity scores are used to ensure that the most relevant projects are included in the portfolio.

• The **verification stage** consists of a manual verification of 291 projects against lists of nutrition projects from the Nutrition Global Solution Group, and the Agriculture; Health, Nutrition, and Population; and Water GPs.

Portfolio coding and analysis. The nutrition portfolio is manually reviewed and coded. The coding template is based on the conceptual framework and administered through Survey Monkey. It extracts project information on nutrition challenges, PDOs, interventions, project beneficiaries, and factors of success and failure relevant for a project's nutrition outcomes. Coders reviewing the projects also estimate each project's share of nutrition content and identify any remaining misclassified false-positive projects. Coders had training, a piloting phase, and periodic quality assessment and spot checks to ensure the reliability of their coding. The final input for portfolio analysis consists of 282 parent projects and 133 additional financing. Portfolio data analysis is in Excel, Stata, and Tableau software.

Indicators mapping. Indicators extracted from Implementation Status and Results Reports of projects in the final portfolio are coded in Excel. This codes nutrition-relevant indicators, measuring nutrition outcomes, immediate and underlying nutrition determinants, institutional strengthening, social norms, and behavior change. The evaluation uses the indicators to assess (i) the achievement rate of indicators for closed projects, and (ii) the extent that indicators in results frameworks measure the intended results of project interventions (open and closed projects). A total of 2,571 nutrition-related indicators are coded for the 282 projects (135 are from closed projects, of which 131 had information on project indicators).

Artificial intelligence: theory-based content analysis (topic modeling). In the portfolio coding, lessons (classified as success and failure factors) are extracted from Implementation Completion and Results Reports, Implementation Completion and Results Report Reviews, and Project Performance Assessment Reports of closed projects. For 117 of the 135 closed projects, 562 factors are identified. These factors are then analyzed through unsupervised hierarchical clustering machine learning algorithms by Oxford Analytics and Endeavour to develop a taxonomy of common success and failure factors emerging from the projects' texts. The taxonomy is manually reviewed to define a final list of 10 factors that influence nutrition project achievements in countries.

**Behavior change portfolio analysis.** The portfolio coding also codes behavior change indicators and interventions that support nutrition determinants. This is guided by the results chain (engage-learn-apply-sustain) and qualitative mapping of the behavior change toward nutrition determinants in the process map (appendix E).

### **Heat Map Analysis**

The heat map summarizes country nutrition outcomes and determinants. The analysis uses the main dimensions of the conceptual framework—nutrition outcomes, determinants (including access to nutrient-rich food, maternal and child caregiving, WASH, and health services), and social norms—to guide data collection on indicators to assess countries' situations. See appendix F for the list of indicators and secondary data sources for 64 countries. Principal component analysis is used to calculate a composite measure for each nutrition determinant (that is, access to food and care, WASH, and health services), social norms, and nutrition outcomes at the baseline level, the current level, and for their trends over the 10-year period. Pearson correlation analyses are conducted between the levels and trends of nutrition outcomes and their determinants in the evaluation countries to empirically test their links in the conceptual framework. Further, using portfolio data, nutrition-related interventions in the World Bank's portfolio in each country are mapped to the determinants to assess whether country needs are matched by World Bank interventions.

## **Country Case Studies**

**Selection of cases.** The evaluation includes a case-based analysis of the World Bank's nutrition portfolio in eight countries (Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nicaragua, Niger, and Rwanda), selected from the 65 countries in the evaluation's portfolio. The inclusion criteria for the countries are (i) countries with at least one closed IEG-evaluated project with a nutrition focus in the title or PDO; (ii) countries with support for institutional strengthening and behavior change interventions related to nutrition; and (iii) countries with projects in at least three GPs. Other considerations are the availability of impact evaluation evidence on interventions in the country; whether the country has a Human Capital Index rating in the bottom or third quartile compared with other countries; the extent that the country's experience is already documented; and the coverage of countries in different Regions. Criteria used to vary the selection of countries are the average annual change in stunted growth rates during the evaluation period (slow, medium, and fast, based on the quartiles of the data across countries) and the overall project performance based on achievement rates of nutrition indicators in the portfolio. Based on these criteria, 15 countries eligible for case studies were discussed with operational counterparts to finalize the country selection (appendix G).

Methods and data collection. The data collection in each country follows a case study protocol organized in relation to the conceptual framework and evaluation questions, looking at the relevance, multidimensionality, and results of World Bank support. The case study covers all active and closed lending projects and knowledge work in the country portfolio that supported nutrition-related interventions during the 10-year evaluation period (fiscal years 2008–19). Most data collection was remote because of travel restrictions related to the coronavirus pandemic. In each country, the IEG team worked with national consultants to facilitate country stakeholder interviews. Work on an IEG Project Performance Assessment Report was integral to the case study data collection in Madagascar and Malawi.

Evidence sources triangulated for each country include the following:

- A country portfolio review of relevant lending projects and analytical work, including a review of project appraisal documents, program documents, concept notes, Implementation Completion and Results Report Reviews, and knowledge work.
- Semistructured interviews with World Bank staff, government counterparts, partners, and project beneficiaries. Among the World Bank staff interviewees are task teams, country management, and experts involved in the implementation of nutrition projects in countries. Among government interviewees are key actors who coordinate and implement project interventions. Among partner interviewees are donor agencies and nongovernmental organizations that support nutrition activities in the same period to map synergies with other interventions. Among beneficiary interviewees are local leaders and community agents.
- **Secondary data on nutrition-related indicators** from the heat map analysis of country contexts and needs (appendix F).
- Evidence from evaluations, including existing impact evaluations and IEG evaluations.
- World Bank Country Partnership Frameworks and Strategies from the period, and each government's national development plan or nutrition strategy and plan.
- Evidence of behavior changes from project evaluations and interviews that were assessed using the behavior change process maps developed for the evaluation (appendix C).

Contribution analysis. Evidence sources are triangulated to assess the contribution of each country to nutrition improvements against the dimensions of the conceptual framework. A country-specific theory of change is developed to assess how the nutrition interventions in the country program contribute to the dimensions of the conceptual framework. The analysis includes (i) the assessment of nutrition-related interventions that are supported by World Bank projects in the portfolio against the conceptual framework, including target populations and geographies of interventions, and roles of other partners in supporting interventions; (ii) the assessment of the alignment of nutrition interventions in the portfolio against country context and needs; (iii) the identification of the achievements of World Bank support against outcomes, intermediate outcomes, and outputs in the conceptual framework; and (iv) mapping how behavior changes are supported by project interventions to contribute to improvements in nutrition determinants.

## **Multivariate Regression Analysis**

The multivariate regression analysis provides additional evidence for answering the third evaluation question (figure A.1) and for understanding the main drivers of project performance. Regression models test hypotheses that are based on findings from different exercises of the evaluation, including country case studies and portfolio review, and the relevant empirical literature. The analysis is based on the cross-section of 131 closed nutrition projects. The analysis uses information coded in the portfolio review and analysis, including indicators, nutrition interventions, factors of success and failure, and secondary data (appendix I).

## **Objective and Scope**

This appendix assesses the relevance of the World Bank's nutrition lending portfolio; that is, how well the supported nutrition interventions align with the available evidence of "what works," summarized in an systematic review map (SRM). An SRM is a visual presentation of the existing relevant evidence on effectiveness collected from a systematic review (SR) of the literature for a particular topic. SRMs are useful to help decision makers invest in interventions that are effective, and they highlight areas where further learning may be important to improve the implementation of evidence-based interventions.

The scope of the SRM is based on the conceptual framework of undernutrition and synthesizes the available evidence on effectiveness of nutrition-specific and nutritionsensitive<sup>1</sup> interventions that aim to reduce child undernutrition and improve nutrition determinants. The review of the literature is limited to evidence from SRs reporting effects of any type of nutrition-specific and nutrition-sensitive interventions on the following nutrition-relevant outcomes areas: child undernutrition and development (birthweight, micronutrient status and deficiencies, stunted growth, stunted and linear growth, and cognitive development); child feeding and caregiving (breastfeeding, complementary feeding, and parenting practices); child health and disease (enteric infection and diarrhea, and childhood illness and infection); maternal health (nutrition status and deficiencies, nutrient intake and dietary diversity, healthy pregnancy, and mental health); access to health services, water, sanitation, and hygiene (WASH) services and nutrient-rich food (maternal use of health services, child use of health services, WASH, and household food and nutrition security); maternal and childcare resources (household welfare, schooling, knowledge and attitudes, and household safety); and social norms (women's empowerment, early pregnancy, and birth spacing). Other manifestations of child malnutrition (low weight-for-age z score, low weight-forheight z score, and overweight or obesity) are outside of the scope, as are maternal overweight or obesity and excessive prenatal weight gain. Thus, the intervention axis of the SRM matrix was not defined from the outset but built from the literature review findings.

# Search Strategy

Twelve databases—3ie, Campbell Collaboration, Cochrane, Cochrane Nutrition, EconLit, eLENA, IFPRI, IPA, J-PAL, PubMed, Science Direct, and Wiley Online—were

searched between August and December 2019. Expert consultations and reference tracking were also used to identify SRs.

The search strategy focused on SRs that provide either a narrative synthesis or metaanalysis of studies published after 1993 in English. Search keywords reflecting the outcomes of interest listed above were used to identify relevant SRs. To maximize the capture of relevant SRs, the number of exclusion keywords was kept small, and articles were manually screened using context-sensitive keywords.<sup>2</sup>

#### **Inclusion and Exclusion Criteria**

Search results were aggregated and analyzed in Excel, removing duplicates and SRs that were updated. The remaining SRs were then reviewed in stages, first to remove articles outside of the initial search criteria using a text search. Next, the article titles and abstracts were manually screened. Finally, the remaining articles were reviewed indepth. To be included, every SR's underlying study must have used an experimental or quasi-experimental design with a counterfactual and have been conducted in low- or lower-middle-income countries.<sup>3</sup>

To keep the review manageable, the review excluded SRs comparing the efficacy of different drugs or therapeutic interventions, except for treatment of common childhood diseases, such as diarrhea. SRs focusing on other childhood conditions, such as birth defects, were excluded. SRs focusing on HIV/AIDS and humanitarian contexts were excluded, due to concern for lack of generalizability. SRs with bundled interventions were also excluded if the effect of discrete interventions could not be meaningfully differentiated. SRs of interventions exclusively targeting adolescent girls and school feeding programs in primary school children were excluded. Further, interventions targeting outcomes primarily associated with the mother, with no clear link to outcomes of child undernutrition, were also excluded.<sup>4</sup>

Due to the high volume of relevant SRs found, an in-depth quality assessment of each SR, such as the 3ie and SURE checklist, was not conducted. Notwithstanding, minimum quality standards were ensured by including only peer-reviewed SRs from highly reputable databases and requiring underlying studies to use experimental or quasi-experimental study designs. A nutrition expert reviewed the search results, which were validated by the IEG evaluation team to ensure the quality and consistency of findings.

## **Extraction and Synthesis of Evidence**

The following parameters were extracted from each SR article reviewed: study objective(s), design, and research setting; intervention target and components; method of

synthesis, number of underlying studies; method of quality assurance; outcomes measured; and the effect of each intervention. For meta-analyses, the pooled effects results were extracted, whereas for narrative SRs, results were extracted for each underlying study that fits the inclusion criteria. For "combination" interventions, such as education plus supplement, each component of the intervention received "credit" for the documented effect.

After extracting the parameters, results from the SRs were synthesized in the SRM by intervention and outcome after the conceptual framework of child undernutrition. For the SRM, the effectiveness of interventions in improving the outcomes of interest were categorized as positive, negative, no effect, inconsistent, or no evidence, and tabulated across SRs.<sup>5</sup>

## Results of the Literature Search and Description of Studies

The initial search yielded 6,324 SRs, which were reduced to 227 (figure B.1). Most of the SRs included in the review came from PubMed (22 percent), 3ie (16 percent), Cochrane (15 percent), and eLENA (14 percent). Expert consultation contributed 15 percent of included SRs.

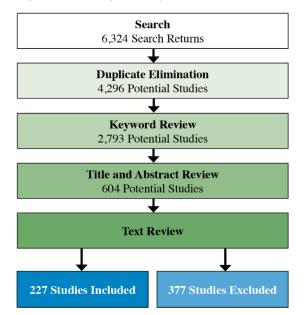


Figure B.1. Stages of Systematic Review Identification

Source: Independent Evaluation Group.

The search strategy yielded 84 interventions that are synthesized in the SRM. Among these, 30 are nutrition-specific interventions. Of the remaining 54 nutrition-sensitive

interventions, 17 are implemented by the health sector; 16 by the agriculture sector; 12 by the WASH sector; and 9 by the social protection sector.

In the next sections, the evidence on what works is summarized by outcome area based on the conceptual framework, organized by sector, intervention types, and target group. Findings for each outcome area are followed by their SRM visual.

## Systematic Review Map: What Works for Improving Nutrition Outcomes and its Determinants

## Reducing Child Undernutrition

**Birthweight:** Evidence on the effectiveness of interventions targeting improvements in birthweight comes from both nutrition-specific (19 SRs) and nutrition-sensitive interventions (16 SRs).

Among nutrition-specific interventions, strong and consistent evidence (6 SRs) supports the effectiveness of providing supplementary energy-dense foods to pregnant women (that is, micronutrients, including lipids, protein, and so on) to increase birthweight and reduce the risk of low birthweight (LBW). One SR also shows that supplementary feeding with energy-dense foods to children can have an intertemporal impact on the birthweight for the next generation. Another SR found that micronutrient supplementation with iron folate (iron-folic acid) to women reduces the risk of LBW. The evidence is less conclusive on the effectiveness of other micronutrient supplementation interventions for women, including iron (5 SRs), multiple micronutrients (MMNs; 4 SRs), and zinc (5 SRs), on improving birthweight outcomes, combining both positive and evidence of no effect. One SR shows positive effects of social and behavior change communication (SBCC) promoting nutrition and health practices through information and communication technology (ICT) on the risk of LBW, although another SR found no effect on such intervention in birthweight. Other micronutrient supplements for women, such as magnesium, omega 3, and vitamins A, C, and E, do not seem to be effective in improving birthweight.

Among nutrition-sensitive interventions, in the health sector, the provision of insecticide-treated bed nets (ITNs; 1 SR), e-health communications between providers and beneficiaries (1 SR), and performance-based incentives (1 SR) reduce the risk of LBW, but the evidence is limited. Preventive deworming (3 SRs) had mixed results on birth outcomes (birthweight and risk of LBW). In the social protection sector, the impact of conditional cash transfers (CCTs) on birth outcomes is widely studied (6 SRs) and the evidence combines both positive and lack of effect results.

**Micronutrient status and deficiencies:** There is abundant evidence on the effectiveness of interventions to improve children micronutrient status (50 SRs). Most of the evidence is for nutrition-specific interventions involving the direct supplementation of micronutrients to children.

Among nutrition-specific interventions, supplementation with iodine and MMNs, and SBCC on nutrition and health practices improves children micronutrients status, yet the evidence is still scarce (1 SR for each intervention). Other supplementation of micronutrients, such as iron (9 SRs), micronutrient powders (MNPs; 6 SRs), zinc (4 SRs), and vitamin A (3 SRs) show mixed but mostly positive results on micronutrient status of children. Similar results are found for supplementary energy-dense foods (4 SRs), and foods rich in micronutrients (2 SRs) for children. The available evidence is less conclusive on the indirect effects of micronutrient supplementation to pregnant women. Although iodine supplementation to women (3 SRs) decreases the risk of child cretinism, vitamin A supplementation (2 SRs) does not appear to affect child micronutrient status and deficiencies. At the household level, the use of iron cookpots does not have a clear effect on micronutrients status (1 SR).

Among nutrition-sensitive interventions, health interventions, such as delayed cord clamping (1 SR) and provision of ITNs (1 SR) are effective to reduce children anemia and improve hemoglobin concentration. The evidence is less conclusive, however, regarding the effectiveness of deworming on children's micronutrient status. In agriculture, there is limited evidence on the effectiveness of nutrition-sensitive value chains (1 SR), small-scale livestock production (1 SR), irrigation (1 SR), provision of agriculture inputs and training (1 SR), and SBCC to reduce micronutrients deficiencies. Home gardening (5 SRs), fortification with iron (4 SRs) and vitamin A (4 SRs), however, shows mixed results. In social protection, three SRs found also mixed results (both positive and no effect) on the impact of CCTs on anemia, ferritin, and hemoglobin levels.

**Stunted and linear growth:** This area comprises the largest body of evidence on effectiveness (71 SRs and 45 interventions). However, the SRM could not identify a single intervention with consistent and large amount of evidence to improve stunted and linear growth.

Among nutrition-specific interventions, one SR found that SBCC on nutrition and health practices via community and support groups was an effective intervention to improve stunted and linear growth. SBCC interventions through other channels (such as education or promotion; growth monitoring and promotion, and home visits and peer support) offers less conclusive evidence. Within interventions targeting children, most of the evidence studied the effects of providing supplementary energy-dense foods (11

SRs) followed by zinc supplementation (9 SRs), supplementary feeding with micronutrient-rich food (7 SRs), MMNs (3 SRs), vitamin A (2 SRs), and iodine (1 SRs). The evidence for these interventions shows mixed results, yet with mostly positive findings.

Within interventions in the health sector, few SRs found that family planning and contraception services, through their effects on birth spacing (1 SR), institutional strengthening policies (1 SR), and health insurance (1 SR) can contribute to reducing stunted growth. Deworming campaigns targeting children (6 SRs) and child stimulation (2 SRs) were found to have mixed results. Few nutrition-sensitive interventions in the agriculture sector seem to be effective in improving child growth, although the evidence remains limited. A meta-analysis found that consumption of biofortified quality protein maize led to an increase in the rate of growth in weight and height in infants and young children with mild to moderate undernutrition. Also, a significant and positive effect of land reforms conferring or providing land rights and autonomy to women in agricultural production was observed on the long-term nutritional status of women and child nutrition. The study revealed that a mother owning land halved the probability of her child being severely underweight. Home gardening (6 SRs), small-scale livestock production (3 SRs), and provision of agricultural inputs and training (1 SRs) are shown to have mixed results on improving stunted and physical growth. Other agriculture interventions, such as small-scale aquaculture (1 SR), fortification with iron, vitamin A or MMNs (1 SR), and cash cropping (1 SR), are shown to not be effective to improve stunted growth. In the social protection sector, the provision of daycare services, and the facilitation of access to microfinance, credit, and banking, were found to have mixed results. Notwithstanding the well-known positive impacts of CCTs on nutrition-related outcomes in the SRM, SRs show CCTs have an inconsistent effect on reducing stunted and physical growth. Evidence on the effect of nutrition-sensitive interventions in WASH is rather limited. One SR found evidence suggestive of a small benefit of improving quality of water supply, identifying a borderline statistically significant effect on height-for-age z score in children under five years old. Provision of latrines and potties for safe disposal of feces (4 SRs) and SBCC delivered through WASH (1 SR) show mixed results.

**Cognitive development:** The review identifies 22 interventions with evidence on their effectiveness in affecting child cognitive development (29 SRs).

Among nutrition-specific interventions, few SRs found positive effects of children supplementary feeding with micronutrient-rich food (1 SR), micronutrient supplementation with MMNs (1 SR), MNPs (1 SR), and SBCC via home visits or health

facility (interpersonal communication [IPC]; 1 SR) on cognitive development. The impact of supplementary energy-dense food (5 SRs), micronutrient supplementation with iron (5 SRs), and iodine (1 SR) show mixed but mostly positive results. Less is known about the impact of dietary support to pregnant women on child cognitive development. A few interventions have a mixed and sometimes positive effect, such as iodine supplementation for women (1 SR) and the provision of supplementary energy-dense foods for women (3 SRs) or micronutrient-rich food (1 SR).

Regarding nutrition-sensitive interventions in the health sector, one SR provided evidence that the service integration, such as including training in early infant stimulation programs into existing health services, can have a more significant effect on the development of young children. There is substantial evidence on child deworming (5 SRs) and early stimulation (5 SRs) interventions, yet results are mixed but with mostly positive effects. In social protection, by improving maternal and care resources, the evidence of CCTs (3 SRs) is also emerging, showing mixed results in enhancing children cognitive development. The evidence on childcare is overall inconsistent.

Figure B.2. Nutrition-Specific Interventions

Nutrition intervent	and dietary	y support	Target	Birth weight	Micronutrient status and deficiencie	Stunted and linear growth	Cognitive development
Micronutrie	ent suppleme	nt: iodine	Children		•	•	
Micronutrie	ent suppleme	nt: iron	Children				
Micronutrie	ent supplemer	nt: MMNs	Children		•		•
	ent suppleme	nt: MNP	Children				•
Micronutrie	ent suppleme	nt: vitamin A	Children			•	
Micronutrie	ent suppleme	nt: zinc	Children				
	ntary feeding v (lipid, protein		Children	_2			
	ntary feeding v	with	Children		•		•
Micronutrie	ent suppleme	nt: antioxidants	Women				
Micronutrie	ent suppleme	nt: calcium	Women				
Micronutrie	ent suppleme	nt: folic acid	Women				
Micronutrie	ent suppleme	nt: iodine	Women				
Micronutrie	ent suppleme	nt: iron	Women				
Micronutrie	ent supplemer	nt: iron-folate	Women	•			
Micronutrie	ent supplemer	nt: magnesium	Women				
Micronutrie	ent suppleme	nt: MMNs	Women				
Micronutrie	ent suppleme	nt: omega-3	Women	•			
Micronutrie	ent suppleme	nt: vitamin A	Women				
Micronutrie	ent suppleme	nt: vitamin D	Women				
Micronutrie	ent suppleme	nt: zinc	Women			•	•
	itary feeding v (lipid, protein		Women			•	
	ntary feeding v ent-rich food	with	Women		•	•	•
SBCC via he communica	ealth facility in ation (IPC)	nterpersonal	Women				•
SBCC via IC	Ts		Women	•			
Provision o	f iron cookpot	t	Household		•		
SBCC via co	mmunity or s	upport groups	Household			•	
SBCC via ma	ass communic	ation	Household				
SBCC via ed	lucation or pro	omotion	Household	•	•		•
SBCC via ho	me visits or p	eer support	Household				•
SBCC via gr promotion	owth monitor	ring and	Household		•		
nterventio	n study resul	lts				Numbe	er of references
Negative	No effect + Negative or Inconsistent (NE, N)	or Negative I		Positive Posi 3 studies) (3+ st		nce	3-5 6-9
		(UNSP or unspecified)					10+

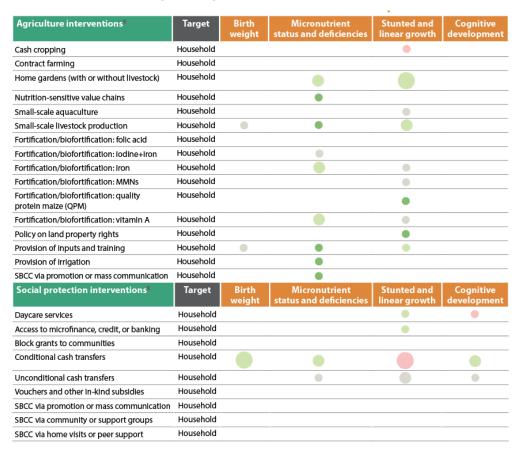
*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication.

Figure B.3. Nutrition-Sensitive Interventions: Health and Water, Sanitation, and Hygiene

Health in	terventions		Target	Birth	Micronutrient	Stunted and	Cognitive
				weight	status and deficienc		development
IMCI			Children			•	
Delayed cor	d clamping		Children		•		
Deworming	(single or pe	riodic)	Children				
E-health cor	mmunication		Women				
Deworming	(single or pe	riodic)	Women				
Provision of	emotional su	upport	Women				
Family plan	ning and con	traception	Women			•	
Prophylactic pregnancy)	c medication	(during	Women	•			
Deploymen	t of CHWs		Household				
Health facili	ty communit	y outreach	Household				
Provision of	ITNs		Household		•		
Provision of	early child st	imulation	Household				
User fee elir	nination/red	uction	Household				
WASH int	erventions		Target	Birth weight	Micronutrient status and deficience	Stunted and ies linear growth	Cognitive development
Provision of	clean cookst	oves	Household				
Provision of	insect contro	ol	Household				
Sanitation (l and so on)	atrines, potti	es, safe dispos	al, Household				
Piped water	(household	connection)	Household				
Point-of use	water treatm	nent	Household				
Provision of	safe water st	orage	Household				
Provision of	sewerage		Household				
Provision of	soap		Household				
Source water	er treatment		Household				
	ly (such as co or hand pump		Household			•	
SBCC via co	mmunity or s	upport group	s Household				
	omotion, hon rt, or mass co	ne visits or mmunication	Household			•	
	n study resu					Numb	er of references
							● 1-2
Negative	No effect + Negative or Inconsistent	Postive +/ or Negative +/or				No Jence	3–5
	(NE, N)	Inconsistent (P, N) or Inconsistent (UNSP or unspecified)	(P, NE)				6-9

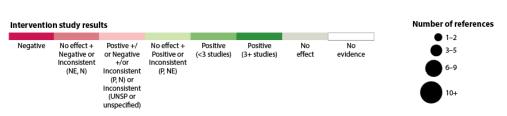
*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.4. Nutrition-Sensitive Interventions: Agriculture and Social Protection; with Institutional Strengthening Interventions



#### INSTITUTIONAL STRENGTHENING INTERVENTIONS: Child Undernutrition and Development

Health care interventions	Target	Birth weight	Micronutrient status and deficiencies	Stunted and linear growth	Cognitive development
Health care approach: service Integration	Institutions				
Health care demand: health insurance	Institutions			•	
Health care supply: performance-based Incentives	Institutions	•	•		
Health care supply: system strengthening (training, BFHI, mHealth)	Institutions			•	



Source: Independent Evaluation Group.

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication.

## **Improving Child Feeding and Caregiving Behaviors**

**Breastfeeding:** There is substantial evidence (21 SRs) on interventions to improve breastfeeding practices.

Among nutrition-specific interventions, strong and consistent evidence indicates that SBCC delivered via home visits and peer support (7 SRs), mass media communication (6 SRs), IPC at health facilities (4 SRs), or education and promotion (2 SRs) are effective interventions for improving breastfeeding practices. SBCC through other channels, such as community support (9 SRs) or ICT (4SRs), shows mixed results with mostly positive evidence.

Within nutrition-sensitive interventions in the health sector, there is also limited but positive evidence for maternal emotional support (1 SR) and the deployment of community health workers (CHWs) to improve breastfeeding practices. The evidence is less consistent with respect to the effectiveness of health system strengthening interventions (5 SRs) and integrated management of childhood illness (IMCI; 1 SR). In the agriculture sector, there is limited but positive evidence of interventions, such as small-scale livestock production (1 SR) in combination with inputs and nutrition education (1 SR) to increase reported maternal practices in breastfeeding since cultural preferences toward some animal products (such as chicken and eggs) are believed to increase breast milk production. In the social protection sector, the evidence on provision of access to microfinance, credit, or banking (1 SR) is insufficient to draw conclusions. The pooled estimate from two studies suggests that conditional microcredit programs produce an average increase in the percentage of newborns receiving colostrum. Yet evidence from another two microcredit studies suggests no statistically significant effect on the prevalence of breastfeeding among children under two years.

**Complementary feeding:** There is some evidence (19 SRs) on interventions to improve complementary feeding practices, comprising 19 interventions.

Among nutrition-specific interventions, limited evidence suggests that supplementary feeding of children with micronutrient-rich foods (1 SR) and SBCC via different channels (5 SRs) improves diet quality and responsive feeding.

Among nutrition-sensitive interventions in the health sector, 3 SRs provide consistent evidence that strengthening health systems can improve complementary feeding through dietary diversity, feeding frequency, and energy intake. One SR also shows that IMCI has a positive effect. There is substantial evidence that some nutrition-sensitive agriculture interventions can improve dietary intake and diversity. Home gardens (6 SRs), vitamin A fortification (3 SRs), livestock production (2 SRs), and provision of inputs and training (1 SR) interventions have shown positive effects on complementary feeding practices. Although

limited, the available evidence for cash cropping (1 SR) and irrigation (1 SR) interventions may deteriorate children's diet. A study in Kenya found that children had the lowest intakes of energy, protein, and iron in their diets. Evidence from the social protection sector is highly variable. The provision of child daycare services (1 SR) may have a positive effect on complementary feeding. A study in Guatemala found a positive effect of a daycare program on the percentage of daily requirements consumed by children while at daycare (for example, energy, protein, iron, vitamin A), and child dietary intake improved while not at daycare. The effect of CCTs (3 SRs) on complementary feeding is too inconsistent to draw conclusions.

**Parenting practices:** There is little evidence (8 SRs) on interventions to improve parenting practices (such as stimulation, interaction, and other nonfeeding skills).

Nutrition-specific SBCC via IPC at the health facility (1 SR) was found to improve parenting practices in terms of skills and child stimulation. Other forms of SBCC (via community groups, home visits or peer support, or education and promotion) had mixed results with mostly positive effects.

Although the evidence of nutrition-sensitive interventions in the health sector is limited, IMCI (1 SR), child stimulation (1 SR), and maternal emotional support (1 SR) had a positive effect in improving parenting practices, whereas the evidence of deployment of CHWs (2 SRs) is less consistent. No evidence was found on other nutrition-sensitive interventions to effectively improve parenting practices.

## Improving Child Health and Disease Status

**Enteric infection and diarrhea:** Abundant evidence exists (50 SRs) on interventions to reduce the incidence, prevalence, or duration of child enteric infection and diarrheal diseases, although not always effective.

Among nutrition-specific interventions, one SR found that SBCC via mass communication reduced the incidence of diarrhea. Child supplementation with zinc (9 SRs) was widely studied, showing a mixed but often positive effect. Evidence on the effects of child supplementation with vitamin A (4 SRs) is still limited to draw conclusions. The evidence suggests that other interventions such as child supplementation with iron (3 SRs) and MNPs (3 SRs) may potentially increase diarrhea duration.

Among nutrition-sensitive interventions in the health sector, on SR shows that infants whose mothers were treated to reduce maternal depression, through maternal emotional support, experienced fewer episodes of diarrhea. Contracting out service provision through performance-based financing (1 SR), was also associated with lower incidence of diarrhea

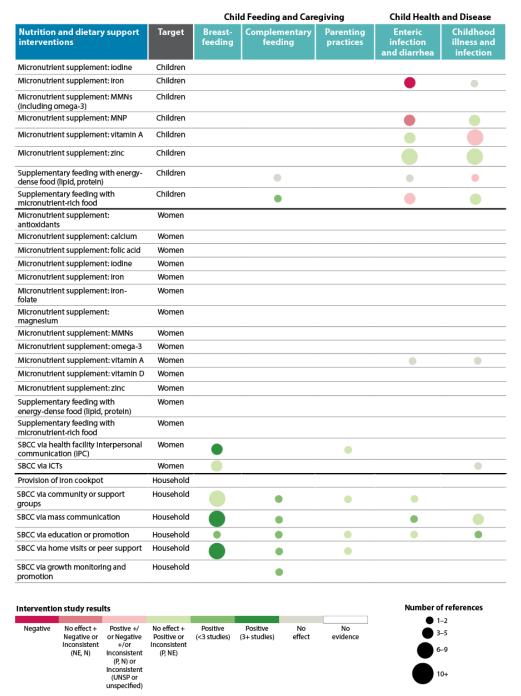
among young children, although evidence is scarce. In agriculture, biofortification of staple crops that are richer in essential micronutrients like vitamin A (1 SR) has been shown to reduce the prevalence and duration of diarrhea in children younger than five years, supporting the well-known role of vitamin A in protecting immunity. Evidence of home gardening (4 SRs) shows rather mixed results. In social protection, one SR found significant reductions in the prevalence of diarrhea for children with longer exposures to daycare services, whereas the evidence for CCT (2 SRs) is rather limited and inconclusive. In the WASH sector, provision of safe water storage (3 SRs) appears to reduce rates of enteric infection and diarrhea. Also, substantial and mostly positive evidence exists for the provision of latrines and potties for safe disposal of feces (10 SRs), point-of-use water treatment (10 SRs), source water treatment (7 SRs), and SBCC (9 SRs). There is less but still mostly positive evidence for provision of insect control (1 SR), piped water (4 SRs), sewerage (2 SRs), and community water supply (3 SRs). The evidence on the provision of soap (2 SRs) is too inconsistent to draw conclusions.

**Childhood illness and infection:** There is also abundant evidence (45 SRs) on the effectiveness of interventions aiming to reduce childhood illness and infections.

Among the nutrition-specific interventions, two SRs reported positive impacts of SBCC education on nutrition and health practices on reducing the incidence of respiratory tract infections in young children. The evidence offers mixed results for the effects of supplementation with zinc (8 SRs), MNP (3 SRs), and supplementary feeding with micronutrient-rich-food (3 SRs) on reducing childhood illnesses.

The evidence for nutrition-sensitive health interventions is somewhat limited. One SR found that performance-based financing improved parent-reported health status among children under five discharged after treatment for pneumonia. The provision of ITNs (2 SRs), health insurance (1 SR), and health system strengthening (1 SR) have rather limited evidence and mixed results on their effectiveness to reduce child illnesses. Within the agriculture sector, home gardening (5 SRs) is the most widely studied intervention. The results are mixed, but for respiratory tract infections especially, mostly positive. For other agriculture interventions (cash cropping, small-scale livestock production, provision of inputs and training, and irrigation), the evidence is limited and mixed. In the social protection sector, the evidence for CCTs (3 SRs), unconditional cash transfers (UCTs) (1 SR), and child daycare services (1 SR) is mostly positive, although rather limited. Within the WASH sector, the provision of sanitation (such as latrines and potties; 3 SRs) and SBCC (3 SRs) receive the most attention. The evidence for sanitation is too inconsistent to draw conclusions. For SBCC, the evidence is mixed but mostly positive. Provision of soap (1 SR) also seems to have a positive effect on childhood illness and infection.

Figure B.5.Child Feeding and Caregiving: Nutrition and Dietary Support Interventions



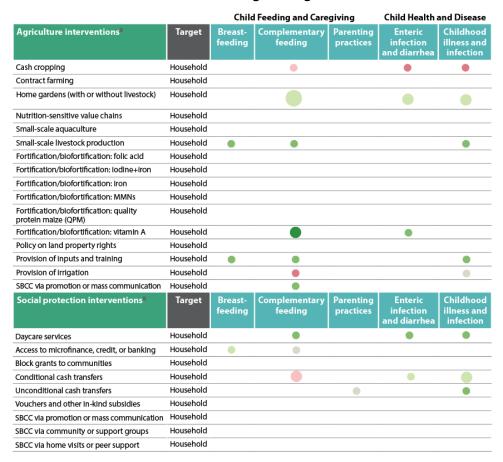
*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication.

Figure B.6. Child Feeding and Caregiving: Health and Water, Sanitation, and Hygiene Interventions

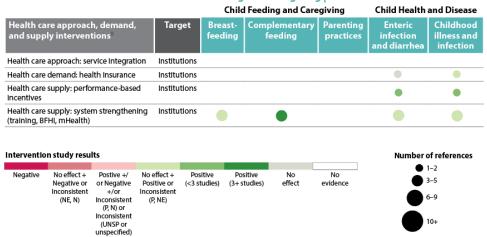
Health interventions	Child Feeding and Caregiving						
	Target	Breast- feeding	Complementary feeding	Parenting practices	Enteric infection and diarrhea	Childhood illness and infection	
IMCI	Children		•	•			
Delayed cord clamping	Children						
Deworming (single or periodic)	Children						
E-health communication	Women						
Deworming (single or periodic)	Women					•	
Provision of emotional support	Women	•		•	•		
Family planning and contraception	Women						
Prophylactic medication (during pregnancy)	Women						
Deployment of CHWs	Household	•					
Health facility community outreach	Household						
Provision of ITNs	Household						
Provision of early child stimulation	Household			•			
User fee elimination/reduction	Household						
WASH interventions	Target	Breast- feeding	Complementary feeding	Parenting practices	Enteric infection and diarrhea	Childhood illness and infection	
Provision of clean cookstoves	Household						
Provision of insect control	Household				•		
Sanitation (latrines, pottles, safe disposal, and so on)	Household						
Piped water (household connection)	Household						
Point-of use water treatment	Household						
Provision of safe water storage	Household						
	Household				•		
Provision of sewerage							
Provision of sewerage Provision of soap	Household					•	
	Household Household				•	•	
Provision of soap					•		
Provision of soap  Source water treatment  Water supply (such as community	Household				•	•	

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.7. Child Feeding and Caregiving: Agriculture and Social Protection Interventions; with Institutional Strengthening



#### INSTITUTIONAL STRENGTHENING: Child Feeding and Caregiving | Child Health and Disease



Source: Independent Evaluation Group.

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication.

## **Improving Maternal Health Status**

**Nutrition status and deficiencies:** There is substantial evidence for interventions aiming to improve maternal nutrition status and reduce micronutrient deficiencies (30 SRs), comprising 24 interventions.

Among nutrition-specific interventions, strong and consistent evidence shows that iron folate supplementation to women (3 SRs) reduces anemia and improves ferritin and hemoglobin levels. A lot of attention has been paid to maternal supplementation with iron alone (5 SRs), vitamin A (6 SRs), and MMNs (3 SRs), most of which show positive effects. For maternal zinc supplementation (1 SR) and provision of supplementary energy-dense foods (3 SRs), the results are too inconsistent to draw conclusions.

Among nutrition-sensitive interventions in the health sector, there is mixed evidence with mostly positive results on the effectiveness of deworming during pregnancy (4 SRs) on anemia and hemoglobin levels. Although limited, the evidence for use of e-health communications by health workers (such as for data collection, reporting, and decision-making; 1 SR) and prophylactic medication (such as intermittent preventive treatment for malaria; 1 SR) also appear to contribute to improved maternal nutrition status and deficiencies outcomes. In agriculture, the evidence is limited but positive effects were found for other agriculture interventions, such as small-scale livestock production (1 SR), land property rights (1 SR), and inputs and training (2 SRs). Most of the evidence concentrates in home gardening (6 SRs) reporting mixed results for their potential to improve maternal nutrition status and deficiencies. For fortification with folic acid (1 SR), iodine plus iron (1 SR), iron alone (2 SRs), and MMNs (1 SR), as well as nutrition promotion delivered through the agriculture sector (1 SR), the evidence is too limited or inconsistent to draw conclusions.

**Nutrient intake and dietary diversity:** Little evidence is available for interventions aiming to affect maternal nutrient intake and dietary diversity (7 SRs).

Scarce evidence shows that SBCC via mass communication delivered through the health sector (1 SR) was effective to improve women diet.

Among nutrition-sensitive interventions, most of the evidence is for home gardening (5 SRs), which demonstrated a mostly positive effect on maternal diet quality and micronutrients intake. The evidence for other nutrition-sensitive agriculture interventions is more limited. Vitamin A fortification (1 SR) and provision of agriculture inputs and training (1 SR) appear to have a positive effect on maternal nutrient intake and dietary diversity. The evidence for small-scale aquaculture (1 SR) and SBCC delivered through the agriculture sector (3 SRs) is too limited or inconsistent to draw conclusions on the effect on maternal

nutrient intake and diet diversity. In social protection sector, one SR shows that CCTs (1 SR) can be an effective intervention to improve diet intake and diversity.

**Healthy pregnancy:** There is some evidence on interventions aiming to promote healthy pregnancy (18 SRs), comprising 15 interventions.

The evidence for nutrition-specific interventions suggests that SBCC through community support (1 SR) or mass communication (2 SRs) can reduce maternal morbidity during pregnancy, yet the evidence is limited. Supplementary energy-dense foods for women (3 SRs) seem to prevent giving birth to babies that are small for gestational age. The evidence for maternal supplementation with antioxidants (such as vitamin C, vitamin E, or selenium; 1 SR), calcium (2 SRs), MMNs (3 SRs), and zinc (2 SRs) offers mixed results from which it is impossible to draw conclusions. There is no evidence of effect on gestational growth from maternal supplementation with folic acid (1 SR), iron (1 SR), or vitamin A (1 SR).

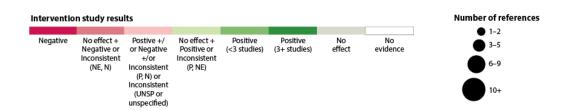
Evidence for nutrition-sensitive interventions is limited. The provision of ITNs (2 SRs) to reduce malaria incidence during pregnancy and the use of prophylactic medication (2 SRs) to reduce the risk of preterm birth are each inconclusive. In the WASH sector, although the evidence is limited, the provision of clean cookstoves (1 SR) appears to decrease respiratory tract infections for women through reducing household air pollution.

**Mental health:** There is some evidence on interventions aiming to improve maternal mental health (such as anxiety, confidence, depression, self-esteem, and stress; 12 SRs), comprising 12 interventions.

The strongest evidence is for SBCC through home visits or peer support (4 SRs). There is also more limited evidence that IPC delivered through the health sector (2 SRs), maternal emotional support (2 SRs), and health system strengthening (1 SR) can work to improve maternal mental health. In agriculture, a study in East Africa found that a farmer field school program in Kenya, Tanzania, and Uganda, which used education and training as a tool to support capacity development, increased competence and enhanced well-being of participating women. Limited evidence shows some positive effects from social protection interventions. Two SRs show that CCT can improve maternal emotional health. Women exposed to the Mexican Oportunidades program had lower depressive symptom scores, and in Brazil and Nicaragua CCT programs also showed improvements in women's enhanced self-esteem. A SR on the impacts of microfinance programs in South Asia revealed that the duration and depth of involvement in microfinance activities would make a difference in women's mental health and not just receiving loans (for example, lower levels of self-reported emotional stress, higher autonomy).

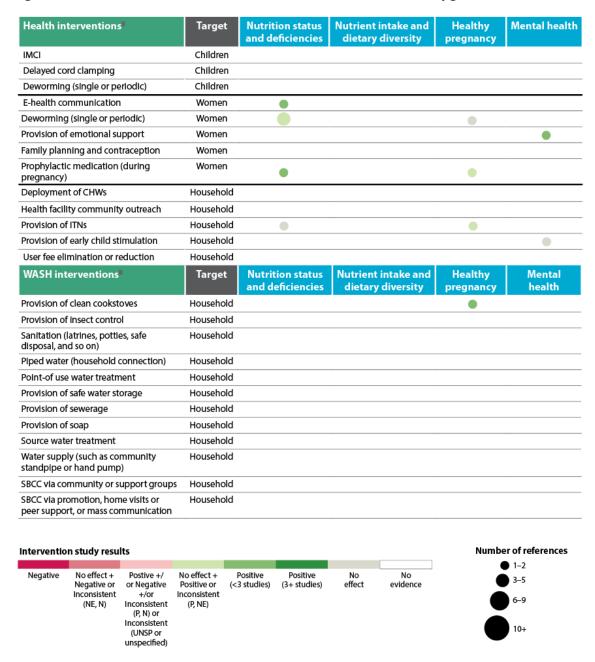
Figure B.8. Maternal Health: Nutrition and Dietary Support Interventions

Nutrition and dietary support interventions	Target	Nutrition status and deficiencies	Nutrient intake and dietary diversity	Healthy pregnancy	Mental health
Micronutrient supplement: iodine	Children			p. eg. ae)	
Micronutrient supplement: iron	Children				
Micronutrient supplement: MMNs (including omega-3)	Children				
Micronutrient supplement: MNP	Children				
Micronutrient supplement: vitamin A	Children				
Micronutrient supplement: zinc	Children				
Supplementary feeding with energy- dense food (lipid, protein)	Children				
Supplementary feeding with micronutrient-rich food	Children				
Micronutrient supplement: antioxidants	Women			•	
Micronutrient supplement: calcium	Women			•	
Micronutrient supplement: folic acid	Women				
Micronutrient supplement: iodine	Women				
Micronutrient supplement: iron	Women				
Micronutrient supplement: iron-folate	Women				
Micronutrient supplement: magnesium	Women	-			
Micronutrient supplement: MMNs	Women				
Micronutrient supplement: omega-3	Women				
Micronutrient supplement: vitamin A	Women				
Micronutrient supplement: vitamin D	Women				
Micronutrient supplement: zinc	Women				
Supplementary feeding with energy- dense food (lipid, protein)	Women				
Supplementary feeding with micronutrient-rich food	Women				
SBCC via health facility interpersonal communication (IPC)	Women	•			•
SBCC via ICTs	Women	•			•
Provision of iron cookpot	Household	•			•
SBCC via community or support groups	Household			•	•
SBCC via mass communication	Household		•	•	
SBCC via education or promotion	Household				
SBCC via home visits or peer support	Household				
SBCC via growth monitoring and promotion	Household				



*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication.

Figure B.9. Maternal Health: Health and Water, Sanitation, and Hygiene Interventions



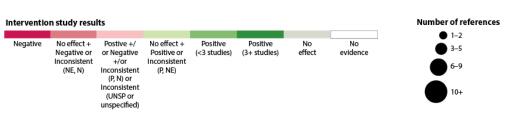
*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.10. Maternal Health: Agriculture and Social Protection Interventions; with Institutional Strengthening Interventions

Agriculture interventions	Target	Nutrition status and deficiencies	Nutrient intake and dietary diversity	Healthy pregnancy	Mental health
Cash cropping	Household				
Contract farming	Household				
Home gardens (with or without livestock)	Household				
Nutrition-sensitive value chains	Household				
Small-scale aquaculture	Household				
Small-scale livestock production	Household	•			
Fortification/biofortification: folic acid	Household				
Fortification/biofortification: lodine+iron	Household				
Fortification/biofortification: iron	Household				
Fortification/biofortification: MMNs	Household	•			
Fortification/biofortification: quality protein maize (QPM)	Household				
Fortification/biofortification: vitamin A	Household		•		
Policy on land property rights	Household	•			
Provision of inputs and training	Household	•	•		•
Provision of irrigation	Household				
SBCC via promotion or mass communication	Household	•			
Social protection interventions	Target	Nutrition status and deficiencies	Nutrient intake and dietary diversity	Healthy pregnancy	Mental health
Daycare services	Household				
Access to microfinance, credit, or banking	Household				•
Block grants to communities	Household				
SBCC via promotion or mass communication	Household				
Conditional cash transfers	Household		•		•
Unconditional cash transfers	Household				
Vouchers and other in-kind subsidies	Household				•
SBCC via promotion or mass communication	Household				
SBCC via community or support groups	Household				

#### INSTITUTIONAL STRENGTHENING INTERVENTIONS: Maternal Health

Health care approach, demand, and supply interventions	Target	Nutrition status and deficiencies	Nutrient intake and dietary diversity	Healthy pregnancy	Mental health
Health care approach: service integration	Institutions				
Health care demand: health insurance	Institutions				
Health care supply: performance-based Incentives	Institutions				
Health care supply: system strengthening (training, BFHI, mHealth)	Institutions				•



Source: Independent Evaluation Group.

*Note:* See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication.

## **Increasing Maternal and Childcare Resources**

**Household welfare:** There is ample evidence on the effectiveness of interventions aiming to improve household welfare (27 SRs), comprising 22 interventions.

Among nutrition-sensitive interventions in the health sector, there is strong and consistent evidence that health systems reforms (3 SRs), such as contracting out service provision and prospective payments lower individual out-of-pocket expenditures having an indirect effect on households' income. However, evidence also shows that health insurance (3 SRs) and performance payments (1 SR) may have unintended effects on income. For example, the combination of performance payments and reduced user fees to attract patients negatively affects health facilities budgets and therefore staff salaries. In agriculture, there is strong and consistent evidence that small-scale aquaculture (3 SRs) improves household income and welfare. There is limited evidence that other agriculture interventions also have a positive effect, such as contract farming (1 SR), land property rights (1 SR), provision of irrigation (1 SR), and nutrition promotion (1 SR). The evidence for home gardening (3 SRs), small-scale livestock production (2 SRs), and agriculture inputs and training (2 SRs) is mixed but with mostly positive effects on households' assets and income. In social protection, much attention has been paid to provision of access to microfinance, credit, and banking (9 SRs) and CCTs (4 SRs); however, the evidence for both is too inconsistent to draw conclusions. The evidence for other social protection interventions, such as UCTs (3 SRs), vouchers or other in-kind subsidies (4 SRs), community block grants (1 SR), and SBCC (3 SRs) is also mixed but mostly positive.

**Schooling:** There is some evidence on interventions aiming to increase schooling (17 SRs), comprising 15 mostly nutrition-sensitive interventions.

Among nutrition-specific interventions, provision of supplementary energy-dense (1 SR) and micronutrient-rich (2 SRs) foods for women seems to have a positive effect on education enrollment and attainment, whereas the evidence on provision of supplementary energy-dense (1 SR) and micronutrient-rich (1 SR) foods for children is too inconsistent to draw conclusions.

Among nutrition-sensitive interventions in the health sector, the evidence is limited yet it suggests that child stimulation (2 SRs), user fee elimination or reduction (1 SR), and health insurance (1 SR) can improve schooling outcomes. Deworming (2 SRs), however, does not appear to be an effect on school attainment. In social protection, CCT (6 SRs) is the most effective intervention to improve school enrollment, attendance, and attainment. The evidence for other social protection interventions, such as UCTs (3 SRs),

vouchers and other in-kind subsidies (4 SRs), and SBCC (3 SRs) is mixed but mostly shows a positive effect. There is also much evidence for provision of access to microfinance, credit, or banking (6 SRs), but it is too inconsistent to draw conclusions.

**Knowledge and attitudes:** There is substantial evidence on interventions that aim to affect knowledge and attitudes (29 SRs), comprising 29 interventions.

Numerous interventions delivered through the health sector appear to be effective in improving women's knowledge and attitudes toward nutrition practices. The evidence for SBCC delivered through the health sector (11 SRs) is mixed but mostly positive, except for health and nutrition promotion via ICT (1 SR), which thus far does not seem to influence knowledge and attitudes. Other interventions delivered through the health sector, such as user fee elimination or reduction (1 SR), health insurance (1 SR), health system strengthening (1 SR), CHWs (1 SR), health facility-to-community outreach (1 SR), child stimulation (i), maternal emotional support (1 SR), and family planning and contraception services (1 SR), have limited but still positive evidence. For instance, a quasi-experimental evaluation showed that an adolescent health program in Ethiopia supporting basic medical care services free of charge increased young girls' knowledge of HIV and where to get tested for HIV. Another study in the Arab Republic of Egypt showed that a program supporting adolescents to obtain health insurance improved family planning knowledge and successfully changed attitudes about family size. In Benin, health system strengthening through activities like task shifting (which involves equipping a cadre of staff with the appropriate skills to provide services that would otherwise be provided by higher cadre providers, who are often scarce), was an effective intervention to improve maternal knowledge on prenatal care, birth preparedness and recognition of danger signs.

Among nutrition-sensitive interventions in agriculture, there is consistent evidence indicating the effectiveness of agriculture inputs and training (3 SRs) nutrition-related knowledge and behavior, such as improved knowledge on balanced diets. However, there is limited evidence that home gardening (1 SR) and small-scale livestock production (1 SR) have a positive effect. In the social protection sector, CCTs (3 SRs) is the most studied intervention with consistent evidence on effectiveness. Although the evidence is limited, community block grants (1 SR) and UCTs (1 SR) also appear to positively affect knowledge and attitudes There is also positive evidence for vouchers and other in-kind subsidies (4 SRs); however, results are mixed though mostly positive. In the WASH sector, provision of soap (1 SR) and SBCC (4 SRs) on handwashing promotion seems to improve knowledge and attitudes toward better hygiene practices among households.

**Household safety:** There is little evidence on interventions that aim to affect household safety (6 SRs). The most abundant evidence, from the social protection sector, is for provision of access to microfinance, credit, or banking (4 SRs), for which the evidence is mixed but mostly positive in reducing intimate partner violence. There is also limited evidence that child stimulation (1 SR), CCTs (1 SR), UCTs (1 SR), and SBCC (1 SR) an improve household safety outcomes.

Figure B.11. Maternal and Childcare Resources: Nutrition and Dietary Support Interventions

Nutrition interventi	and dietary	y support	Target	House welfa		Schooling		vledge and ttitudes	Household safety
Micronutrie	nt supplemer	nt: iodine	Children				'		
Micronutrie	nt supplemer	nt: iron	Children						
Micronutrie (including o	nt supplemer mega-3)	nt: MMNs	Children						
Micronutrie	nt supplemer	nt: MNP	Children						
Micronutrie	nt supplemer	nt: vitamin A	Children						
	nt supplemer		Children						
	tary feeding v se food (lipid,		Children			•			
Supplemen nutrient-ricl	tary feeding v h food	with micro-	Children			•			
Micronutrie antioxidants	nt supplemer s	nt:	Women						
Micronutrie	nt supplemer	nt: calcium	Women						
Micronutrie	nt supplemer	nt: folic acid	Women						
/licronutrie	nt supplemer	nt: iodine	Women						
Micronutrie	nt supplemer	nt: iron	Women						
Micronutrie folate	nt supplemer	nt: iron-	Women						
Micronutrie magnesium	nt supplemer	nt:	Women						
Micronutrie	nt suppleme	nt: MMNs	Women						
/licronutrie	nt suppleme	nt: omega-3	Women						
Micronutrie	nt suppleme	nt: vitamin A	Women						
/licronutrie	nt suppleme	nt: vitamin D	Women						
	nt suppleme		Women						
Supplemen	tary feeding v se food (lipid	with	Women			•			
Supplemen	tary feeding v		Women			•			
SBCC via he	alth facility in	nterpersonal	Women					•	
SBCC via ICT			Women					•	
	Iron cookpot	<u> </u>	Household						_
	mmunity or s		Household	•					•
	ass communic	ation	Household						
			Household						•
BCC via gro	owth monitor		Household						
SBCC via ma SBCC via ed SBCC via ho SBCC via gro promotion	ucation or pro me visits or p owth monitor	omotion peer support ring and	Household Household	•				N	umber of reference
	"							]	● 1-2
Negative	No effect + Negative or	Postive +/ or Negative	No effect + Positive or	Positive (<3 studies)	Positive (3+ studies	No effect	No evidence		3-5
	Inconsistent (NE, N)	+/or Inconsistent (P, N) or	Inconsistent (P, NE)	(<2 studies)	(ST Studies	, enect	evidence		6-9
		(P, N) or Inconsistent (UNSP or unspecified)							10+

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication.

Figure B.12. Maternal and Childcare Resources: Health and Water, Sanitation, and Hygiene Interventions

Health in	terventions	1	Target		sehold elfare	Schooling		rledge and titudes	Household safety
IMCI			Children						
Delayed co	rd clamping		Children						
Dewormin	g (single or pe	riodic)	Children						
E-health co	mmunication		Women						
Dewormin	g (single or pe	riodic)	Women						
Provision o	f emotional su	pport	Women					•	
Family plan	nning and con	traception	Women					•	
Prenatal ca	re (prophylac	tic medicine)	Women						
Deploymer	nt of CHWs		Household	i				•	
Health facil	lity communit	y outreach	Household	ı				•	
Provision o	f ITNs	-	Household	i					
Provision o	f early child st	imulation	Household	i		•		•	•
User fee eli	mination or re	eduction	Household	1		•		•	
WASH int	terventions		Target		sehold elfare	Schooling		vledge and titudes	Household safety
Provision o	f clean cookst	oves	Household	1					
Provision o	f insect contro	ol	Household	i					
Sanitation disposal, ar	(latrines, potti nd so on)	es, safe	Household	i					
Piped wate	r (household	connection)	Household	i					
Point-of us	e water treatn	nent	Household	i					
Provision o	f safe water st	orage	Household	i					
Provision o	f sewerage		Household	i					
Provision o	f soap		Household	i .					
Source wat	ter treatment		Household	i					
	oly (such as co or hand pump		Household	i 					
SBCC via co	ommunity or s	upport group	s Household	i .					
	romotion, hon ort, or mass co		Household	i 					
Interventio	on study resu	lts						Nu	umber of references
Negative	No effect +	Postive +/	No effect +	Positive	Positive	No	No		<b>●</b> 1–2
	Negative or Inconsistent (NE, N)	or Negative +/or Inconsistent (P, N) or		(<3 studies)	(3+ studies)		evidence		6-9
		Inconsistent (UNSP or unspecified)							10+

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.13. Maternal and Childcare Resources: Agriculture and Social Protection Interventions; with Institutional Strengthening Interventions

Agriculture interventions	Target	Household welfare	Schooling	Knowledge and attitudes	Household safety
Cash cropping	Household				
Contract farming	Household	•			
Home gardens (with or without livestock)	Household			•	
Nutrition-sensitive value chains	Household				
Small-scale aquaculture	Household				
Small-scale livestock production	Household	•		•	
Fortification/biofortification: folic acid	Household				
Fortification/biofortification: iodine+iron	Household				
Fortification/blofortification: Iron	Household				
Fortification/biofortification: MMNs	Household				
Fortification/biofortification: quality protein maize (QPM)	Household				
Fortification/biofortification: vitamin A	Household				
Policy on land property rights	Household	•			
Provision of Inputs and training	Household	•			
Provision of Irrigation	Household	•			
SBCC via promotion or mass communication	Household	•			
Social protection interventions	Target	Household welfare	Schooling	Knowledge and attitudes	Household safety
Daycare services	Household				
Access to microfinance, credit, or panking	Household				
Block grants to communities	Household	•		•	
SBCC via promotion or mass communication	Household	•		•	
Conditional cash transfers	Household			•	•
Unconditional cash transfers	Household			•	•
ouchers and other in-kind subsidies	Household				
SBCC via community or support groups	Household	•		•	
SBCC via home visits or peer support	Household	•		•	
NSTITUTIONAL STRENGTHEN Health care approach, demand,	ING INTER	RVENTIONS: N	Maternal and (	Childcare Resour	CCES Household
and supply interventions		welfare	Schooling	attitudes	safety
	Institutions				
Health care approach: service integration					
Health care demand: health insurance	Institutions		•	•	
Health care demand: health Insurance Health care supply: performance-based ncentives	Institutions Institutions	•	•	•	
Health care demand: health Insurance Health care supply: performance-based	Institutions	•	•	•	
Health care demand: health insurance Health care supply: performance-based Incentives Health care supply: system strengthening training, BFHI, mHealth)	Institutions Institutions Institutions	sittve Positive			ober of reference

+/or Inconsistent (P, N) or Inconsistent (UNSP or unspecified)

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication.

## **Increasing Access to Health Services**

**Maternal use of health services:** There is substantial evidence on interventions aiming to improve maternal use of health services (31 SRs).

SBCC delivered through the health sector (16 SRs) though different channels has received the most attention. The evidence shows mixed results, but with mostly positive effects on care-seeking behaviors and adherence to care. Relatively limited evidence also indicates that CHWs (1 SR), health facility-to-community outreach (1 SR), service integration (1 SR), and maternal emotional support (1 SR) can improve maternal use of health services through enhancing care-seeking behaviors. However, the evidence shows mixed results, but mostly positive impacts for user fee elimination or reduction (5 SRs), health insurance (5 SRs), system strengthening (5 SRs), and e-health communications (4 SRs). In the social protection sector, CCTs (8 SRs) and vouchers and other in-kind subsidies (6 SRs) seem to increase the use of preventive and curative health and nutrition services.

**Child use of health services:** Similarly, substantial evidence exists on interventions (22) aiming to improve child use of health services (33 SRs).

In the health sector, SBCC via education, growth monitoring and promotion, IPC at health facilities or ICTs are shown to increase care-seeing behavior and in particular the use of immunization services, although the extent of the evidence is still limited. Three SRs report consistent evidence on the effectiveness of CHWs to increase the use of child health care services. There is also limited but positive evidence for health facility-to-community outreach (1 SR), e-health communications (1 SR), and maternal emotional support (1 SR) to improve the use of immunization services. The evidence for other interventions in the health sector, such as service integration (4 SRs), IMCI (1 SR), user fee elimination or reduction (1 SR), and health insurance (1 SR) offers rather mixed results is inconclusive.

Among nutrition-sensitive interventions delivered through the social protection sector, CCTs has been widely studied (6 SRs) and similar to the use of maternal health care services, CCTs programs and vouchers and other in-kind subsidies (2 SRs) can improve the uptake of child health care services. However, child daycare (1 SR) interventions may potentially reduce vaccination rates. A study of a daycare program had an unexpected negative impact on the proportion of children who were completely immunized.

## Increasing Access to Water, Sanitation, and Hygiene Services

There is some evidence on the effectiveness of interventions aiming to improve access to WASH services (10 SRs).

SBCC interventions have been widely studied. SBCC via community or support groups (2 SRs) and home visits (1 SR) seems to improve access to WASH services; whereas results for other SBCC channels (6 SRs) are more variable but sometimes positive. Although the evidence is limited, provision of point-of-use water treatment (1 SR), soap (2 SRs), and community water supply (1 SR) also seem to have a positive effect. The evidence on the provision of sanitation (3 SRs), source water treatment (1 SR), and insect control (1 SR) is too limited or less consistent to draw conclusions.

## **Increasing Access to Nutrient-Rich Food**

There is some evidence on interventions that aim to improve access to nutrient-rich food (18 SRs), comprising 14 interventions.

Strong and consistent evidence shows that CCTs (5 SRs) are effective for improving access to nutrient-rich food. Among social protection interventions, the evidence on provision of access to microfinance, credit, or banking (3 SRs) is mixed but mostly positive, and SBCC delivered through the social protection sector (1 SR) also seems effective. The evidence on UCTs (1 SR) is inconclusive.

Among nutrition-sensitive interventions in the agriculture sector, limited evidence indicates that provision of inputs and training (2 SRs), contract farming (1 SR), and fortification with iron (1 SR) and vitamin A (1 SR) can improve households' access to nutrient-rich food. Similarly, small-scale livestock production (4 SRs) and aquaculture (3 SRs) interventions have shown to increase households' food security although results are mixed. Home gardens (5 SRs) has been widely studied with mostly positive impacts on household food consumption, although in a handful of studies declines in household pulse consumption (dry beans, dry peas, lentils, and chickpeas), and lower consumption of staple cereals and animal food were also observed. The evidence for irrigation (3 SRs) and cash cropping (1 SR) is rather limited and less consistent to draw conclusions.

Figure B.14. Nutrition-Specific Interventions: Nutrition and Dietary Support Interventions

				Н	Access to ealth Servi			ess to Services	Access to Nutrient-Rich Food
Nutrition intervent	and dietar ions	y support	Target	Maternal of heal service		hild use of health services		iter, ation ygiene	Household food and nutrition security
Micronutrie	nt suppleme	nt: iodine	Children						
Micronutrie	nt suppleme	nt: iron	Children						
Micronutrie (including o	nt suppleme mega-3)	nt: MMNs	Children						
	nt suppleme		Children						
		nt: vitamin A	Children						
	nt suppleme		Children						
energy-den	tary feeding se food (lipid	, protein)	Children						
micronutrie	tary feeding ent-rich food		Children						
Micronutrie antioxidant	nt suppleme s	nt:	Women						
	nt suppleme		Women						
Micronutrie	nt suppleme	nt: folic acid	Women						
Micronutrie	nt suppleme	nt: iodine	Women						
Micronutrie	nt suppleme	nt: iron	Women						
Micronutrie folate	nt suppleme	nt: iron-	Women						
Micronutrie magnesium	nt suppleme I	nt:	Women						
Micronutrie	nt suppleme	nt: MMNs	Women						
Micronutrie	nt suppleme	nt: omega-3	Women						
Micronutrie	nt suppleme	nt: vitamin A	Women						
Micronutrie	nt suppleme	nt: vitamin D	Women						
Micronutrie	nt suppleme	nt: zinc	Women						
	tary feeding se food (lipic		Women						
	tary feeding ent-rich food	with	Women						
SBCC via he		nterpersonal	Women	•		•			
SBCC via IC	Ts		Women			•			
Provision of	firon cookpo	t	Household						
SBCC via co groups	mmunity or s	support	Household						
SBCC via ma	ass communi	cation	Household						
SBCC via ed	ucation or pr	omotion	Household			•			•
SBCC via ho	me visits or p	oeer support	Household					•	
SBCC via gropromotion	owth monito	ring and	Household			•			
Interventio	n study resu	lts							Number of references
Namethin	No offer-t	Death: - /	No official i	Desition	Desit'	Ne [	N		● 1-2
Negative	No effect + Negative or	Postive +/ or Negative	No effect + Positive or	Positive (<3 studies)	Positive (3+ studies)	No effect	No evidence		3-5
	Inconsistent (NE, N)	+/or Inconsistent (P, N) or	Inconsistent (P, NE)						6-9
		Inconsistent (UNSP or unspecified)							10+

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.15. Nutrition-Sensitive Interventions: Health and Water, Sanitation, and Hygiene Interventions

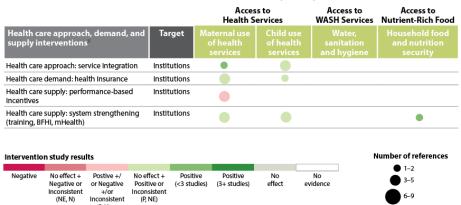
					Acce Health S			ccess to H Services	Access to Nutrient-Rich Food
Health in	terventions	•	Target	of	ernal use health rvices	Child use of health services		Water, nitation I hygiene	Household food and nutrition security
IMCI			Children	1					
Delayed co	rd clamping		Children	1					
Deworming	g (single or pe	riodic)	Children	1					
E-health co	mmunication	ı	Womer	1		•			
Deworming	g (single or pe	riodic)	Womer	1					
Provision o	f emotional s	upport	Women	1	•	•			
Family plan	ning and con	traception	Women	1					
Prophylacti pregnancy)	ic medication )	(during	Womer	1					
Deploymer	nt of CHWs		Househo	ld	•				
Health facil	lity communit	y outreach	Househo	ld	•	•			
Provision o	f ITNs		Househo	ld		•			
Provision o	f early child st	timulation	Househo	ld					
User fee eli	mination or re	eduction	Househo	ld		•			
WASH int	terventions		Target	use o	aternal of health ervices	Child use of health services		Water, nitation I hygiene	Household food and nutrition security
Provision o	f clean cookst	toves	Househo	ld					
Provision o	f insect contro	ol	Househo	ld				•	
Sanitation ( disposal, ar	(latrines, potti nd so on)	es, safe	Househo	ld					
Piped wate	r (household	connection)	Househo	ld					
Point-of use	e water treatn	nent	Househo	ld				•	
Provision o	f safe water st	torage	Househo	ld					
Provision o	f sewerage		Househo	ld					
Provision o	f soap		Househo	ld				•	
Source wat	er treatment		Househo	ld				•	
	oly (such as co or hand pump		Househo	ld				•	
SBCC via co	mmunity or s	support group	os Househo	ld					
	romotion, hor ort, or mass co		Househo	ld	•	•			
nterventio	on study resu	lts						ı	Number of references
Negative	No effect +	Postive +/	No effect +	Positive	Positive	No	No	_	3-5
	Negative or Inconsistent (NE, N)	or Negative +/or Inconsistent (P, N) or Inconsistent	Positive or Inconsistent (P, NE)	(<3 studies)	(3+ studies	effect	evidence		6-9
		(UNSP or unspecified)							10+

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.16. Nutrition-Sensitive Interventions: Agriculture and Social Protection Interventions; with Institutional Strengthening Interventions

		Access Health Se		Access to WASH Services	Access to Nutrient-Rich Food
Agriculture interventions	Target	Maternal use of health services	Child use of health services	Water, sanitation and hygiene	Household food and nutrition security
Cash cropping	Household				•
Contract farming	Household				•
Home gardens (with or without livestock)	Household				
Nutrition-sensitive value chains	Household				
Small-scale aquaculture	Household				
Small-scale livestock production	Household				
Fortification/biofortification: folic acid	Household				
Fortification/biofortification: iodine+iron	Household				
Fortification/biofortification: Iron	Household				•
Fortification/biofortification: MMNs	Household				
Fortification/biofortification: quality protein maize (QPM)	Household				
Fortification/biofortification: vitamin A	Household				•
Policy on land property rights	Household				
Provision of Inputs and training	Household				
Provision of Irrigation	Household				
SBCC via promotion or mass communication	Household				
Social protection interventions	Target	Maternal use of health services	Child use of health services	Water, sanitation and hygiene	Household food and nutrition security
Daycare services	Household		•		
Access to microfinance, credit, or banking	Household				
Block grants to communities	Household				
Conditional cash transfers	Household				•
Unconditional cash transfers	Household		•		•
Vouchers and other in-kind subsidies	Household		•		
SBCC via promotion or mass communication	Household				•
SBCC via community or support groups	Household				
SBCC via home visits or peer support	Household				

#### INSTITUTIONAL STRENGTHENING: Access to Health Services, WASH, and Nutritient-Rich Food



Source: Independent Evaluation Group.

(P, N) or Inconsistent (UNSP or unspecified)

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

## **Changing Social Norms**

**Women's empowerment:** There is some evidence on interventions aiming to effect women's empowerment (19 SRs), comprising 16 nutrition-sensitive interventions.

Among nutrition-sensitive interventions in the health sector, there is limited evidence on the effects of SBCC interventions on improving women's empowerment and decision-making. There is also limited evidence in the health sector that facility-to-community outreach (1 SR), user fee elimination or reduction (1 SR), and health insurance (1 SR) may improve women's empowerment, in theory by reducing the barriers to care seeking.

In the agriculture sector, the limited evidence on home gardening (2 SRs)—in theory, from income earned and capacity to feed nutritious homegrown foods—mostly indicates positive effects on women's income, control over resources, or influence in decision-making on a range of issues. However, in some cases like a project promoting orange sweet potato production in Kenya among women farmers showed that women gained control over selling the product, whereas men maintained control over income. Evidence on land property rights (1 SR) is limited but still suggests that land reforms conferring or providing land rights and autonomy to women in agricultural production have a positive influence on women's empowerment.

Among social protection interventions it is expected that the improved access to financial resources would enhance women's power within the household to make and act on decisions that benefit her and her children. Microfinance, credit, or banking interventions (10 SRs) have been widely studied, and although the evidence is mixed, mostly positive effects were observed on women's empowerment, control of resources and assets, decision-making, and reduced risk of interpersonal violence. There is also evidence that vouchers or other in-kind subsidies (2 SRs) have a positive effect, whereas the evidence on CCTs (3 SRs) and UCTs (1 SR) is rather limited to draw conclusions.

**Early pregnancy:** There is little evidence on interventions that aim to affect early pregnancy (8 SRs), comprising 12 interventions.

In the health sector, limited evidence suggests that user fee elimination or reduction (2 SRs) and family planning and contraception services (1 SR) are protective against early pregnancy. This is likely due to easier access to contraception counseling or methods. The evidence on the effect of SBCC delivered through the health sector (2 SRs) is mostly positive.

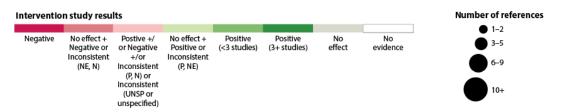
In social protection, transfers (cash or in-kind) are expected to reduce the financial pressures on households that contribute to early marriage and thereafter early pregnancy. Most of the available evidence is for CCTs (5 SRs) and vouchers and other in-kind subsidies (4 SRs), which show mixed but mostly positive effects on delaying early pregnancy and marriage. The evidence on provision of access to microfinance, credit, or banking (1 SR), UCTs (2 SRs), and SBCC delivered through the social protection sector (1 SR) is too limited or inconsistent to draw conclusions.

**Birth spacing:** There is some evidence on the effectiveness of interventions aiming to affect birth spacing (24 SRs), comprising 20 interventions.

In the health sector, there is consistent evidence showing that provision of family planning and contraception services (4 SRs) promotes birth spacing. There is also some evidence for other health sector interventions, such as CHWs (4 SRs), SBCC (7 SRs), service integration (3 SRs), and system strengthening (3 SRs), which shows a mixed but mostly positive effect. The evidence for health facility-to-community outreach (1 SR) is limited but positive. In the social protection sector, the evidence on CCTs (7 SRs), UCTs (2 SRs), and vouchers or other in-kind subsidies (3 SRs) is too inconsistent to draw conclusions.

Figure B.17. Nutrition-Specific Interventions: Social Norms and Behaviors

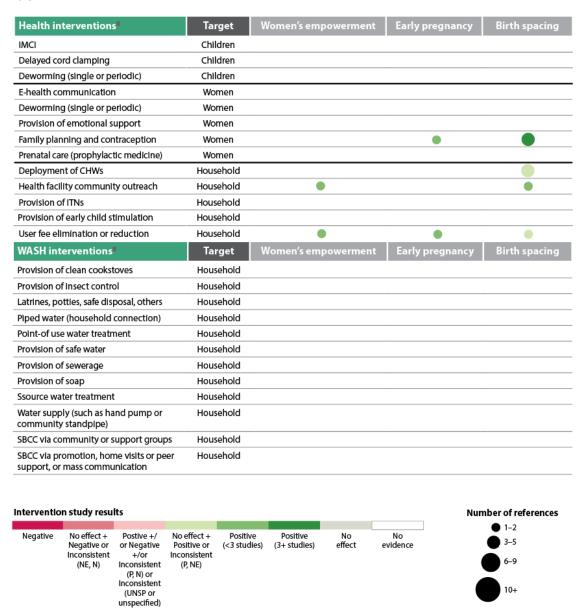
Nutrition and dietary support interventions	Target	Women's empowerment	Early pregnancy	Birth spacing
Micronutrient supplement: lodine	Children			
Micronutrient supplement: iron	Children			
Micronutrient supplement: MMNs (including omega-3)	Children			
Micronutrient supplement: MNP	Children			
Micronutrient supplement: vitamin A	Children			
Micronutrient supplement: zinc	Children			
Supplementary feeding with energy-dense food (lipid, protein)	Children			
Supplementary feeding with micronutrient-rich food	Children			
Micronutrient supplement: antioxidants	Women			
Micronutrient supplement: calcium	Women			
Micronutrient supplement: folic acid	Women			
Micronutrient supplement: lodine	Women			
Micronutrient supplement: Iron	Women			
Micronutrient supplement: Iron- folate	Women			
Micronutrient supplement: magnesium	Women			
Micronutrient supplement: MMNs	Women			
Micronutrient supplement: omega-3	Women			
Micronutrient supplement: vitamin A	Women			
Micronutrient supplement: vitamin D	Women			
Micronutrient supplement: zinc	Women			
Supplementary feeding with energy-dense food (lipid, protein)	Women			
Supplementary feeding with micronutrient-rich food	Women			
SBCC via health facility	Women			•
SBCC via ICTs	Women			
Provision of Iron cookpot	Household			
SBCC via community or support groups	Household	•	•	•
SBCC via mass communication	Household		•	
SBCC via education or promotion	Household		•	•
SBCC via home visits or peer support	Household	•		
SBCC via growth monitoring and promotion	Household			



Source: Independent Evaluation Group.

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. ICT = information and communication technology; IPC = interpersonal communication; MMN = multiple micronutrients; MNP = micronutrient powder; SBCC = social and behavior change communication.

Figure B.18. Nutrition-Sensitive Interventions: Health and Water, Sanitation, and Hygiene Interventions

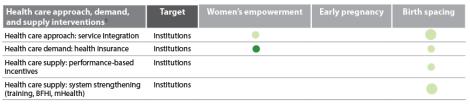


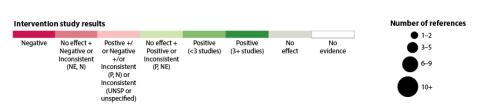
Source: Independent Evaluation Group.

*Note*: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. CHW = community health worker; IMCI = integrated management of childhood illness; ITN = insecticide-treated bed net; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Figure B.19. Nutrition-Sensitive Interventions: Agriculture and Social Protection Interventions; with Institutional Strengthening Interventions

Cash cropping	Household			
Contract farming	Household			
Home gardens (with or without livestock)	Household			
Nutrition-sensitive value chains	Household			
Small-scale aquaculture	Household			
Small-scale livestock production	Household			
Fortification/biofortification: folic acid	Household			
Fortification/biofortification: iodine+iron	Household			
Fortification/biofortification: iron	Household			
Fortification/biofortification: MMNs	Household			
Fortification/biofortification: quality protein maize (QPM)	Household			
Fortification/biofortification: vitamin A	Household			
Policy on land property rights	Household	•		
Provision of inputs and training	Household	•		
Provision of Irrigation	Household			
SBCC via promotion or mass	Household			
communication	Toward	W	Fach consumer	Disab sussinus
Social protection interventions	Target	Women's empowerment	Early pregnancy	Birth spacing
Daycare services	Household			
Access to microfinance, credit, or banking	Household		•	•
Block grants to communities	Household			
Conditional cash transfers	Household			
Unconditional cash transfers	Household	•	•	•
ouchers and other in-kind subsidies	Household	•		
SBCC via promotion or mass communication	Household	•	•	•
SBCC via community or support groups	Household	•	•	
SBCC via home visits or peer support	Household			





Source: Independent Evaluation Group.

Note: See the "Notes for Figures B.2–B.19 section for an explanation of superscript numbers. BFHI = Baby-Friendly Hospital Initiative; mHealth = mobile health; MMN = multiple micronutrients; SBCC = social and behavior change communication.

## Systematic Review Map Discussion

The range of what works for reducing child undernutrition and improving nutrition determinants outcomes is broad. Here, 227 SRs are reviewed. Studies cover nutrition-specific interventions, nutrition-sensitive interventions, or both. Of the 84 interventions included in the SRM, 30 are nutrition-specific interventions, and of the remaining 54 nutrition-sensitive interventions 17 are implemented by the health sector, 16 by the agriculture sector, 12 by WASH sector, and 9 by social protection sector.

## Interventions with a Broad Positive Impact

Across the nine nutrition-relevant outcome areas reviewed, some interventions show consistent positive influence across two or more outcome areas. These interventions would be well suited for programs aiming to achieve impact at immediate and underlying levels, and even sometimes nutrition outcomes (box B.1).

#### Box B.1. Interventions with a Broad Positive Impact

#### **Nutrition-Specific**

- Child supplementary feeding with micronutrient-rich foods
- Maternal supplementary feeding with energy-dense foods
- Women micronutrient supplementation: iron folate (iron-folic acid)
- Social and behavior change communication of nutrition and health promotion (via community and groups, education, growth monitoring and promotion, home visits, mass communication, and interpersonal communication at health facility)

#### **Nutrition-Sensitive**

#### Health

- Health system strengthening
- Maternal emotional support
- Family planning and contraception
- Health care approach: community health workers
- Health facility community outreach
- E-health communication
- Health insurance

#### **Agriculture**

- Provision of agriculture inputs and training
- Small-scale livestock

- Vitamin A fortification
- Land property rights

#### **Social Protection**

Conditional cash transfers

#### **WASH**

Provision of soap

Source: Independent Evaluation Group.

**Nutrition and health:** For nutrition-specific interventions the evidence suggests that children supplementary feeding with micronutrient-rich foods, maternal supplementary feeding with energy-dense foods, and iron folate (iron–folic acid) supplementation have a broad positive impact across outcomes areas. Also, SBCC on health and nutrition promotion via different channels have the most widespread positive impact across several outcome areas. Health systems strengthening and maternal emotional support interventions are shown to be widely effective.

Agriculture: Interventions, such as vitamin A fortification, provision of agriculture inputs and training, land property rights, and small-scale livestock, have a broad positive influence, highlighting the importance of agriculture in providing essential nutrients for home consumption and in affecting social norms. It is notable, however, that among agriculture interventions, cash cropping is particularly prone to negatively affecting child undernutrition and its associated outcomes. The cause for the consistently negative effect is often attributed to traditional gender roles. In low- and middle-income country contexts, men are more often responsible for—and receive the income from—cash crop farming, whereas income earned by women is more likely to be put toward nutritious food consumption.

Social protection: Regarding interventions that cut across multiple outcome areas, the best bet from the social protection sector is CCTs. However, along with provision of access to microfinance, credit, or banking, CCTs are also among the nutrition-sensitive interventions that have commonly demonstrated potential to do harm. This may indicate the need for more research to understand the contextual factors—or other program attributes—associated with positive and negative impact, and to account for them in program design. Also, although SBCC is among the most effective interventions when delivered by the health sector, the evidence is weak for the effectiveness of SBCC when delivered through the social protection sector. This finding underscores the importance of multisector collaboration in the delivery of high-quality health and nutrition messaging.

WASH: Overall, the evidence for improving nutrition through WASH is limited. The WASH sector covers a wide array of interventions to improve access, knowledge, and practices regarding the use of latrines, safe feces disposal, water supply and quality, hand washing, and pest control. From a nutrition-sensitive perspective, the goal of WASH interventions is to reduce exposure to the germs that cause child disease, especially diarrhea, which closely relates to malnutrition. Among the interventions included in this study, provision of soap is the key WASH intervention, with positive effects across multiple outcome groups.

### Interventions with a Consistent Impact on Particular Outcomes

Some interventions have positive and consistent evidence for just one or two outcomes. Many of these are nutrition-specific interventions that target the mother, such as maternal supplementation with iodine (to reduce the risk of cretinism), iron folate (to improve maternal nutrition status and reduce micronutrient deficiencies), and energy-dense food (to increase birthweight), and SBCC (to improve breastfeeding practices and maternal mental health). From the health sector, system strengthening interventions are effective for improving complementary feeding practices and household welfare, CHWs are beneficial for improving child use of health services, and family planning and contraception services are best for improving birth spacing.

Within the agriculture sector, small-scale aquaculture is a consistently effective intervention for improving household welfare, and provision of inputs and training is best for improving knowledge and attitudes.

Best options from the nutrition-sensitive social protection and WASH sectors are a little less clear, since few social protection or WASH interventions offer strong and consistent evidence. In the social protection sector, CCTs have proven effective for improving household access to nutrient-rich food, schooling, and knowledge and attitudes. Other promising interventions include provision of child daycare services and UCTs. In the WASH sector, provision of safe water storage appears to be the best option for reducing child enteric infection and diarrhea. Other promising interventions include provision of soap and community water supply.

That most interventions only have a narrow area of focus underscores the importance of designing programs with a clear understanding of which outcomes they aim to improve. Also, the few interventions that have the potential for negative effects underscore the importance of monitoring and designing programs to prevent unintended harmful effects. Many of the most effective interventions target the mother, underscoring the

importance of engaging women early (preconception) and across all stages of early child development.

Numerous interventions across all sectors show great promise, but more research into their impact on child nutrition and associated outcomes is needed. From the nutrition sector, this includes child supplementation with MMNs, MNPs, and maternal supplementary feeding with micronutrient-rich food. From the health sector, this includes IMCI, delayed cord clamping, health facility-to-community outreach, service integration, maternal emotional support, prophylactic medication during pregnancy, and health and nutrition promotion through information, communication, and technology. For agriculture, this includes contract farming, home gardening, nutrition-sensitive value chains, small-scale livestock production, fortification with iron and protein, and irrigation. For social protection, this includes community block grants and nutrition promotion delivered through the social protection sector. In the WASH sector, this includes only safe water storage.

## Gaps in Knowledge

The SRM highlights areas where further learning may be important to improve the implementation of evidence-based interventions. For some outcomes, numerous interventions are evaluated but with few clear winners. This includes birth spacing, gestational growth, early pregnancy, (nonfeeding) parenting practices, birthweight, and maternal use of health services. Either more innovative approaches, information about the contextual constraints and factors of success, or improved program implementation is needed. The least studied outcomes are household safety, maternal nutrient intake and dietary diversity, (nonfeeding) parenting practices, prevention of early pregnancy, and maternal health.

## Limitations of the Systematic Review Map

The scope of the literature review is comprehensive and ambitious, focusing on child undernutrition outcomes and its determinants guided by the conceptual framework. A strength of this review is that no interventions were ruled out ex ante. However, several limitations are noteworthy.

• The review is only based on SR evidence due to time constraints. SRs are conducted after several individual impact evaluation studies have been published. Consequently, this literature review may omit relevant nutrition-specific or nutrition-sensitive interventions that are not yet included in an SR.

- The review may be subject to publication bias. To ensure that the results of this literature review reflect high-quality research, "gray" literature (project reports, reports from international organizations, unpublished dissertations, and so on) is not included. It is then possible that relevant SRs not included in the searched databases are missed.
- There is a risk of duplication of the underlying studies included in the SRs. This would happen if a single impact evaluation is included in multiple SRs. The longer the maturity of the intervention and the higher the quality of the impact evaluation, the more likely the risk of duplication. Consequently, if the effect detected by the underlying study is strong, it may skew the results reported in this review in either a positive or negative direction.
- Some outcomes represent broader concepts that may have been
  operationalized differently by different studies. The interpretation of specific
  outcomes, such as fat intake and energy intake, might change depending on the
  context. Since the focus of this literature review is undernutrition in low- and
  lower-middle-income countries, increased fat intake and increased energy intake
  are both considered pronutrition effects.
- Evidence on the effectiveness of interventions should be interpreted exclusively for the nutrition-related outcomes of interest. For example, folic acid supplementation for women is found to have no effect on nutrition-related outcomes but is known to be highly effective for prevention of birth defects (neural tube defects), which are not included as outcomes of interest in this literature review.
- Several SRs report results on combined, potentially synergistic interventions, such as provision of soap and point-of-use water treatment, health and nutrition promotion via home visits, community support groups, and mass media. Thus, it becomes challenging, if not impossible, to attribute the effect to any single intervention and addressing all combinations of interventions quickly becomes unwieldy. Bundling of this sort is more common for SBCC and nutrition-sensitive interventions in the agriculture, social protection, and WASH sectors.

# Alignment of the World Bank Nutrition Portfolio with the Global Evidence on What Works

The SRM provides a useful visual of what works to help decision makers invest in those interventions that have been proved to be effective. In this section, we assess the extent

to which the interventions supported by the World Bank's lending nutrition portfolio align with the evidence summarized in the SRM.

## Scope and Methodology

The alignment analysis focuses on the intersection of the SRM and the World Bank's nutrition portfolio. Therefore, interventions that are not reflected in the SRM are outside the scope. The interventions supported through the World Bank's portfolio are individually classified according to the SRM's areas of nutrition and health, social protection, water, agriculture, and institutional strengthening in the health sector, for which there is evidence of their effectiveness. Overall, the alignment analysis covers about half of the portfolio (47 percent; figure B.20). The remaining interventions could not be mapped to the SRM either because it is outside the SRM set or the intervention description did not provide sufficient detailed information. Twelve out of 84 intervention types of the SRM are not found in the nutrition portfolio.

Since the evidence on what works for a particular intervention could vary for different outcomes (that is, the provision of zinc micronutrient supplementation to children is shown to improve micronutrients status of children, but has no effect on cognitive development outcomes) the alignment analysis makes the assumption that the World Bank's interventions were meant to affect the outcomes reflected in projects' results frameworks. Therefore, the analysis uses indicators classification from the portfolio review as proxies for intended outcomes. Three outcomes regarding the effectiveness of arrangements to deliver interventions—the efficiency of nutrition policies; financing and coordination; and the strength of stakeholder engagement and ownership—are excluded from the analysis since they were outside the scope of the SRM. The alignment analysis therefore expresses the World Bank's portfolio as a combination of interventions-outcomes to be mapped to the existing evidence summarized in the SRM.

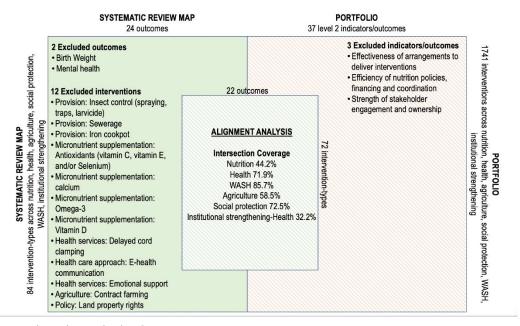


Figure B.20. Scope of the Alignment Analysis

Source: Independent Evaluation Group. Note: WASH = water, sanitation, and hygiene.

## **Findings**

The World Bank largely supports nutrition interventions that are known to work, because the nutrition portfolio as a whole mainly focuses on interventions that have positive evidence of effectiveness to improve the nutrition-relevant outcomes of interest. This holds for each of the intervention areas (nutrition, health, social protection, agriculture, WASH, and institutional strengthening; figure B.21).

Nutrition and health: Within the nutrition-specific interventions with consistent evidence of effectiveness, the World Bank's efforts mainly concentrate on supporting SBCC on nutrition and health practices known to work across different nutrition-relevant outcome areas. Other health interventions where the World Bank highly aligns with the literature are supporting health care approaches that implement health facilities outreach activities; the deployment of CHWs; and family planning and contraception services. Consistent with the findings of the portfolio review, the World Bank largely focuses on institutional strengthening support to improve the health system, expand health insurance, and implement performance-based financing and service integration approaches that the global evidence base shows to be effective for improving particular nutrition-relevant outcomes.

**Agriculture:** The most frequent agriculture intervention supported by the World Bank's nutrition portfolio is the provision of inputs and training. Biofortification of foods and the support for small-scale livestock production are also prominent within the group of interventions with consistent positive evidence of effectiveness.

**Social protection:** The World Bank aligns well with the evidence on what works by mainly focusing on supporting country cash transfer programs, which had positive effects in improving household food security and welfare, schooling attendance, health care use and child health and nutrition dietary practices. Support for the access to center- or home-based care services has been shown to be effective to improve complementary feedings and child health outcomes.

**WASH:** Within the most effective interventions according to evidence, the World Bank's support in the WASH sector has mainly focused on SBCC to promote handwashing and safe drinking water, community water supply through standpipes or hand pumps, safe water storage, and provision of soap. These interventions have consistent evidence of effectiveness in improving access to safe water, or household knowledge and attitudes, or reducing the incidence of childhood illness and diarrhea.

**Nutrition-sensitive** Nutrition-specific WASH IS Health Social Protection Agriculture Total 0.5 0.0 8.0 2.0 0.2 0.1 82 1.0 09 17 24 14 15.6 1.0 1.9 1.2 2.1 18.6 2.5 0.7 0.5 0.1 0.3 0.0 4.2 12 0.0 0.7 0.6 0.0 0.9 3 4 0.5 0.0 0.2 0.0 0.0 0.3 1.0 0.0 0.0 0.0 0.0 0.0 0.1 Share of total intervention outcomes (percent) Evidence type ■ Positive (3 + studies) 0.0 5.0 ■ Positive (< 3 studies) 10.0 ■ Positive or inconsistent + No effect 15.0 ■ No effect 18.6 ■ Positive +/or negative +/or inconsistent ■ Negative (< 2 studies) or inconsistent, no effect + negative ■ Negative (2 + studies)

Figure B.21. Alignment of World Bank's Nutrition Interventions with Evidence on What Works

Source: Independent Evaluation Group; systematic review map and portfolio review.

Note: Values show the percentage of the total intervention outcomes represented by each intervention—evidence type combination. Positive indicates that the pooled effect (for meta-analyses) or all underlying studies (for narrative syntheses) of the intervention are found to have a positive effect on the outcome of interest. No effect indicates that the intervention is neither significantly positive nor significantly negative on the outcome of interest. Inconsistent indicates that for a narrative synthesis the evidence of a particular intervention on a specific outcome shows a mix of positive and no effects across the underlying studies. Negative indicates that the intervention is found to have a negative effect on the outcome of interest. Given the direction of the evidence, the dark- and medium-green legends indicate that the evidence of an intervention on a particular outcome is found to be positive in more than three systematic reviews or in up to three systematic reviews, respectively. Similarly, the dark-red legend indicates that the evidence of an intervention on a particular outcome is found to be negative in more than two systematic reviews. The light-green legend indicates that the pool of evidence of a particular intervention on a specific outcome shows a mix of positive effects, no effect, or a combination of both (inconsistent) in narrative synthesis. IS = institutional strengthening; WASH = water, sanitation, and hygiene.

However, the World Bank could increase its attention to particular nutrition-specific and nutrition-sensitive interventions where evidence is consistently positive across a broad set of nutrition-relevant outcomes areas. Despite the World Bank supports many of the interventions identified as having a broad positive impact, some of them may not be receiving sufficient attention given their potential benefits (table B.1).

Among nutrition-specific interventions, few projects in the HNP portfolio include women's supplementary feeding with energy-dense food and children supplementary feeding with micronutrient-rich food. Within nutrition-sensitive interventions, vitamin A biofortification of foods in the agriculture portfolio, and provision of soap to stimulate hygiene and sanitation practices in the WASH portfolio have received little attention.

Furthermore, two interventions with broad positive impacts remain unexplored in the nutrition portfolio. The first refers to maternal emotional support interventions for which the global evidence suggest they are effective in improving breastfeeding and parenting practices, women's mental health, and use of health care services. The second intervention is land property right reforms that could be implemented through governance, macroeconomics, or the agriculture sector. Such reforms can be effective in improving household welfare (consumption and income), empowering women (increased control of resources), reducing micronutrient deficiencies of women, and even stunted growth.

Table B.1. Systematic Review Map Interventions with a Broad Positive Impact

Intervention Types	Interventions (%)	Projects (number)
Nutrition-specific		
Child supplementary feeding with micronutrient-rich foods	0.5	8
Maternal supplementary feeding with energy-dense foods	0.3	4
Women micronutrient supplementation: iron folate (iron-folic acid)	0.9	15
SBCC of nutrition and health promotion (via community and groups, education, growth monitoring and promotion, home visits, mass communication, and interpersonal communication at health facility)	21.5	107
Nutrition-sensitive		
Health		
Health system strengthening	8.8	101
Maternal emotional support	0.0	0
Family planning and contraception	2.1	32
Health care approach: community health workers	0.8	11
Health facility community outreach	0.7	11
E-health communication	0.0	0
Health insurance	0.7	11
Agriculture		
Provision of agriculture inputs and training	2.3	34
Small-scale livestock	2.1	30
Vitamin A fortification	0.5	7
Land property rights	0.0	0
Social protection		
Conditional cash transfers	2.2	32
Water, santitation, and hygiene		
Provision of soap	0.2	4
Total interventions with a broad positive impact	43.6	

*Source*: Independent Evaluation Group; systematic review map and portfolio review. *Note*: SBCC = social and behavior change communication.

## Limitations of the Analysis on the Alignment with the Evidence Base

 The alignment analysis focuses on the intersection of the SRM and the nutrition portfolio, covering about half of the interventions in the portfolio. Project documents sometimes lack detailed information on interventions, making it difficult to map them against the SRM.

- The SRM identifies interventions targeted to women or children or households. In a few cases, however, the same intervention can be targeted to both women and children, having different effects on relevant outcomes. These are the cases of supplementation with certain micronutrients and deworming. Since it is not possible to distinguish the target groups of particular interventions in the portfolio, the alignment analysis assumes that such interventions targeted both women and children. As a result, the analysis may overestimate the World Bank's support to these interventions.
- The alignment analysis uses data from the portfolio review to identify the
  intended outcomes of projects, proxied by the projects' indicators. Given the
  portfolio review's finding that the World Bank falls short of measuring the
  outcomes of certain interventions, the use of project indicators as proxies for
  outcomes likely introduces some bias.
- Many intervention-outcome pairs found in the portfolio have no available evidence in the SRM. This is either because the amount of impact evaluations for such intervention is not sufficient to be summarized in an SR (that is, there is a knowledge gap and the intervention has not been studied enough), or because there is not a theoretical causal pathway linking the intervention and the outcome (such as the effects of micronutrient supplementation in children on the mother's health).
- The SRM represents the stock of knowledge during a certain period and does not incorporate the time dimension. The alignment analysis, therefore, cannot make inferences about the evolution of the alignment between the portfolio interventions and the literature.

## **Systematic Reviews**

- Aboud, F. E., and A. K. Yousafzai. 2015. "Global Health and Development in Early Childhood." *Annual Review of Psychology* 66 (1): 433–57. doi:10.1146/annurev-psych-010814-015128.
- Acharya, A., S. Vellakkal, F. Taylor, E. Masset, A. Satija, M. Burke, and S. Ebrahim. 2012. *Impact of National Health Insurance for the Poor and the Informal Sector in Low- and Middle-Income Countries: A Systematic Review*. London: The EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Aggarwal, R., J. Sentz, and M. A. Miller. 2007. "Role of Zinc Administration in Prevention of Childhood Diarrhea and Respiratory Illnesses: A Meta-analysis." *Pediatrics* 119 (6): 1120–30. doi:10.1542/peds.2006-3481.

- Angermayr, L., and C. Clar. 2004. "Iodine Supplementation for Preventing Iodine Deficiency Disorders in Children." *Cochrane Database of Systematic Reviews* 2004 (2): CD003819. doi:10.1002/14651858.CD003819.pub2.
- Arnold, B. F., and J. M. Colford Jr. 2007. "Treating Water with Chlorine at Point-of-Use to Improve Water Quality and Reduce Child Diarrhea in Developing Countries: A Systematic Review and Meta-analysis." *American Journal of Tropical Medicine and Hygiene* 76 (2): 354–64. doi:10.4269/ajtmh.2007.76.354.
- Arrowsmith, M. E., C. R. H. Aicken, A. Majeed, and S. Saxena. 2012. "Interventions for Increasing Uptake of Copper Intrauterine Devices: Systematic Review and Meta-analysis." *Contraception* 86 (6): 600–5. doi:10.1016/j.contraception.2012.05.015.
- Ashworth, A., R. Shrimpton, and K. Jamil. 2008. "Growth Monitoring and Promotion: Review of Evidence of Impact. *Maternal and Child Nutrition* 4 (Suppl 1): 86–117. doi:10.1111/j.1740-8709.2007.00125.x.
- Athe, R., M. V. V. Rao, and K. M. Nair. 2014. "Impact of Iron-Fortified Foods on Hb Concentration in Children (<10 Years): A Systematic Review and Meta-analysis of Randomized Controlled Trials." *Public Health Nutrition* 17 (3): 579–86. doi:10.1017/S1368980013000062.
- Baird, S., F. H. G. Ferreira, B. Özler, and M. Woolcock. 2013. "Relative Effectiveness of Conditional and Unconditional Cash Transfers for Schooling Outcomes in Developing Countries: A Systematic Review." *Campbell Systematic Reviews* 9 (1): 1–124. doi:10.4073/csr.2013.8.
- Bassani, D. G., P. Arora, K. Wazny, M. F. Gaffey, L. Lenters, and Z. A. Bhutta. 2013. "Financial Incentives and Coverage of Child Health Interventions: A Systematic Review and Meta-analysis. *BMC Public Health* 13 (Suppl 3): S30. doi:10.1186/1471-2458-13-S3-S30.
- Bentley, M. E., H. M. Wasser, and H. M. Creed-Kanashiro. 2011. "Responsive Feeding and Child Undernutrition in Low- and Middle-Income Countries." *Journal of Nutrition* 141 (3): 502–7. doi:10.3945/jn.110.130005.
- Berti, P. R., J. Krasevec, and S. FitzGerald. 2004. "A Review of the Effectiveness of Agriculture Interventions in Improving Nutrition Outcomes." *Public Health Nutrition* 7 (5): 599–609. doi:10.1079/PHN2003595.
- Bhutta, Z. A., T. Ahmed, R. E. Black, S. Cousens, K. Dewey, E. Giugliani, B. A. Haider, B. Kirkwood, S. S. Morris, H. P. S. Sachdev, and M. Shekar. 2008. "What Works? Interventions for Maternal and Child Undernutrition and Survival." *Lancet* 371 (9610): 417–40. doi:10.1016/S0140-6736(07)61693-6.
- Bhutta, Z. A., G. L. Darmstadt, B. S. Hasan, and R. A. Haws. 2005. "Community-Based Interventions for Improving Perinatal and Neonatal Health Outcomes in Developing

- Countries: A Review of the Evidence." *Pediatrics* 115 (Suppl 2): 519–617. doi:10.1542/peds.2004-1441.
- Bird, F. A., A. Pradhan, R. V. Bhavani, and A. D. Dangour. 2019. "Interventions in Agriculture for Nutrition Outcomes: A Systematic Review Focused on South Asia." Food Policy 82: 39–49. doi:10.1016/j.foodpol.2018.10.015.
- Blacklock, C., E. MacPepple, S. Kunutsor, and S. Witter. 2016. "Paying for Performance to Improve the Delivery and Uptake of Family Planning in Low and Middle Income Countries: A Systematic Review." *Studies in Family Planning* 47 (4): 309–24. doi:10.1111/sifp.12001.
- Bourey, C., W. Williams, E. E. Bernstein, and R. Stephenson. 2015. "Systematic Review of Structural Interventions for Intimate Partner Violence in Low- and Middle-Income Countries: Organizing Evidence for Prevention." *BMC Public Health* 15: 1165. doi:10.1186/s12889-015-2460-4.
- Brody, C., T. de Hoop, M. Vojtkova, R. Warnock, M. Dunbar, P. Murthy, and S. L. Dworkin. 2015. "Economic Self-Help Group Programs for Improving Women's Empowerment: A Systematic Review." *Campbell Systematic Reviews* 11 (1): 1–182. doi:10.4073/csr.2015.19.
- Brown, K. H., J. M. Peerson, S. K. Baker, and S. Y. Hess. 2009. "Preventive Zinc Supplementation among Infants, Preschoolers, and Older Prepubertal Children." *Food and Nutrition Bulletin* 30 (Suppl 1): S12–40. doi:10.1177/15648265090301S103.
- Brown, T. W., F. C. van Urk, R. Waller, and E. Mayo-Wilson. 2014. "Centre-Based Day Care for Children Younger than Five Years of Age in Low- and Middle-Income Countries." *Cochrane Database of Systematic Reviews* 2014 (9): CD010543. doi:10.1002/14651858.CD010543.pub2.
- Buppasiri, P., P. Lumbiganon, J. Thinkhamrop, C. Ngamjarus, M. Laopaiboon, and N. Medley. 2015. "Calcium Supplementation (Other Than for Preventing or Treating Hypertension) for Improving Pregnancy and Infant Outcomes." *Cochrane Database of Systematic Reviews* 2015 (2): CD007079. doi:10.1002/14651858.CD007079.pub3.
- Byrne, A., A. Hodge, E. Jimenez-Soto, and A. Morgan. 2014. "What Works? Strategies to Increase Reproductive, Maternal and Child Health in Difficult to Access Mountainous Locations: A Systematic Literature Review." *PLoS ONE* 9 (2): e87683. doi:10.1371/journal.pone.0087683.
- Caminha, M. de F. C., M. Batista Filho, T. F. dos S. Fernandes, I. K. G. de Arruda, and A. da S. Diniz. 2009. "Vitamin A Supplementation during Puerperium: Systematic Review." *Revista de Saúde Pública* 43 (4): 699–706. doi:10.1590/S0034-89102009005000038.
- Chen, H., Q. Zhuo, W. Yuan, J. Wang, and T. Wu. 2008. "Vitamin A for Preventing Acute Lower Respiratory Tract Infections in Children up to Seven Years of Age." *Cochrane Database of Systematic Reviews* 2008 (1): CD006090. doi:10.1002/14651858.CD006090.pub2.

- Choi, L., S. Majambere, and A. L. Wilson. 2019. "Larviciding to Prevent Malaria Transmission." Cochrane Database of Systematic Reviews 2019 (8): CD012736. doi:10.1002/14651858.CD012736.pub2.
- Clasen, T. F., K. T. Alexander, D. Sinclair, S. Boisson, R. Peletz, H. H. Chang, F. Majorin, and S. Cairncross. 2015. "Interventions to Improve Water Quality for Preventing Diarrhoea." *Cochrane Database of Systematic Reviews* 2015 (10): CD004794. doi:10.1002/14651858.CD004794.pub3.
- Colaci, D., S. Chaudhri, and A. Vasan. 2017. "mHealth Interventions in Low-Income Countries to Address Maternal Health: A Systematic Review." *Annals of Global Health* 82 (5): 922–35. doi:10.1016/j.aogh.2016.09.001.
- Curtis, V., and S. Cairncross. 2003. "Effect of Washing Hands with Soap on Diarrhoea Risk in the Community: A Systematic Review." *Lancet Infectious Diseases* 3 (5): 275–81. doi:10.1016/S1473-3099(03)00606-6.
- Dangour, A. D., L. Watson, O. Cumming, S. Boisson, Y. Che, Y. Velleman, S. Cavill, E. Allen, and R. Uauy. 2013. "Interventions to Improve Water Quality and Supply, Sanitation and Hygiene Practices, and Their Effects on the Nutritional Status of Children." *Cochrane Database of Systematic Reviews* 2013 (8): CD009382. doi:10.1002/14651858.CD009382.pub2.
- Darvesh, N., J. K. Das, T. Vaivada, M. F. Gaffey, K. Rasanathan, and Z. A. Bhutta. 2017. "Water, Sanitation and Hygiene Interventions for Acute Childhood Diarrhea: A Systematic Review to Provide Estimates for the Lives Saved Tool." *BMC Public Health* 17 (Suppl 4): 776. doi:10.1186/s12889-017-4746-1.
- Das, J. K., Y. B. Hadi, R. A. Salam, M. Hoda, Z. S. Lassi, and Z. A. Bhutta. 2018. "Fly Control to Prevent Diarrhoea in Children." *Cochrane Database of Systematic Reviews* 2018 (12): CD011654. doi:10.1002/14651858.CD011654.pub2.
- Das, J. K., Z. S. Lassi, R. A. Salam, and Z. A. Bhutta. 2013. "Effect of Community Based Interventions on Childhood Diarrhea and Pneumonia: Uptake of Treatment Modalities and Impact on Mortality." *BMC Public Health* 13 (Suppl 3): S29. doi:10.1186/1471-2458-13-S3-S29.
- Das, J. K., R. A. Salam, Y. B. Hadi, S. S. Sheikh, A. Z. Bhutta, Z. W. Prinzo, and Z. A. Bhutta. 2019. "Preventive Lipid-Based Nutrient Supplements Given with Complementary Foods to Infants and Young Children 6 to 23 Months of Age for Health, Nutrition, and Developmental Outcomes." *Cochrane Database of Systematic Reviews* 2019 (5): CD012611. doi:10.1002/14651858.CD012611.pub3.
- Dawson, A. J., J. Buchan, C. Duffield, C. S. E. Homer, and K. Wijewardena. 2014. "Task Shifting and Sharing in Maternal and Reproductive Health in Low-Income Countries: A Narrative Synthesis of Current Evidence." *Health Policy and Planning* 29 (3): 396–408. doi:10.1093/heapol/czt026.

- De Buck, E., H. Van Remoortel, K. Hannes, T. Govender, S. Naidoo, B. Avau, A. V. Veegaete, A. Musekiwa, V. Lutje, M. Cargo, H. -J. Mosler, P. Vandekerckhove, and T. Young. 2017. "Approaches to Promote Handwashing and Sanitation Behaviour Change in Low- and Middle-Income Countries: A Mixed Method Systematic Review." *Campbell Systematic Reviews* 13: 1–447. doi:10.4073/csr.2017.7.
- De Buck, E., H. Van Remoortel, A. Vande Veegaete, and T. Young. 2017. "Promoting Handwashing and Sanitation Behaviour Change in Low- and Middle-Income Countries, 3ie Systematic Review Summary 10." London: International Initiative for Impact Evaluation (3ie).
- De-Regil, L. M., M. E. D. Jefferds, and J. P. Peña-Rosas. 2017. "Point-of-Use Fortification of Foods with Micronutrient Powders Containing Iron in Children of Preschool and School-Age." *Cochrane Database of Systematic Reviews* 2017 (11): CD009666. doi:10.1002/14651858.CD009666.pub2.
- De-Regil, L. M., M. E. D. Jefferds, A. C. Sylvetsky, and T. Dowswell. 2011. "Intermittent Iron Supplementation for Improving Nutrition and Development in Children under 12 Years of Age." *Cochrane Database of Systematic Reviews* 2011 (12): CD009085. doi:10.1002/14651858.CD009085.pub2.
- De-Regil, L. M., P. S. Suchdev, G. E. Vist, S. Walleser, and J. P. Peña-Rosas. 2013. "Home Fortification of Foods with Multiple Micronutrient Powders for Health and Nutrition in Children under Two Years of Age." *Evidence-Based Child Health* 8 (1): 112–201. doi:10.1002/ebch.1895.
- Dewey, K. G., and S. Adu-Afarwuah. 2008. "Systematic Review of the Efficacy and Effectiveness of Complementary Feeding Interventions in Developing Countries." *Maternal and Child Nutrition* 4 (Suppl 1): 24–85. doi:10.1111/j.1740-8709.2007.00124.x.
- Dewey, K. G., Z. Yang, and E. Boy. 2009. "Systematic Review and Meta-analysis of Home Fortification of Complementary Foods." *Maternal and Child Nutrition* 5 (4): 283–321. doi:10.1111/j.1740-8709.2009.00190.x.
- Dickson, K., and M. Bangpan. 2012. *Providing Access to Economic Assets for Girls and Young Women in Low- and Lower-Middle Income Countries. A Systematic Review of the Evidence*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Dudley, L., and P. Garner. 2011. "Strategies for Integrating Primary Health Services in Low- and Middle-Income Countries at the Point of Delivery." *Cochrane Database of Systematic Reviews* 2011 (7): CD003318. doi:10.1002/14651858.CD003318.pub3.
- Eaton, J. C., P. Rothpletz-Puglia, M. R. Dreker, L. Iannotti, C. Lutter, J. Kaganda, and P. Rayco-Solon. 2019. "Effectiveness of Provision of Animal-Source Foods for Supporting Optimal Growth and Development in Children 6 to 59 Months of Age." *Cochrane Database of Systematic Reviews* 2019 (2): CD012818. doi:10.1002/14651858.CD012818.pub2.

- Eichler, R., K. Agarwal, I. Askew, E. Iriarte, L. Morgan, and J. Watson. 2013. "Performance-Based Incentives to Improve Health Status of Mothers and Newborns: What Does the Evidence Show?" *Journal of Health, Population and Nutrition* 31 (4 Suppl 2): S36–47.
- Elder, J. P., W. Pequegnat, S. Ahmed, G. Bachman, M. Bullock, W. A. Carlo, V. Chandra-Mouli, N. A. Fox, S. Harkness, G. Huebner, J. Lombardi, V. M. Murry, A. Moran, M. Norton, J. Mulik, W. Parks, H. H. Raikes, J. Smyser, C. Sugg, and M. Sweat. 2014. "Caregiver Behavior Change for Child Survival and Development in Low- and Middle-Income Countries: An Examination of the Evidence." *Journal of Health Communication* 19 (Suppl 1): 25–66. doi:10.1080/10810730.2014.940477.
- Fernández-Gaxiola, A. C., and L. M. De-Regil. 2019. "Intermittent Iron Supplementation for Reducing Anaemia and Its Associated Impairments in Adolescent and Adult Menstruating Women." *Cochrane Database of Systematic Reviews* 2019 (1): CD009218. doi:10.1002/14651858.CD009218.pub3.
- Fewtrell, L., and J. M. Colford Jr. 2004. "Water, Sanitation and Hygiene: Interventions and Diarrhoea. A Systematic Review and Meta-analysis." Health, Nutrition, and Population (HNP) Discussion Paper. Washington, DC: World Bank.
- Fewtrell, L., R. B. Kaufmann, D. Kay, W. Enanoria, L. Haller, and J. M. Colford. 2005. "Water, Sanitation, and Hygiene Interventions to Reduce Diarrhoea in Less Developed Countries: A Systematic Review and Meta-analysis." *Lancet Infectious Diseases* 5 (1): 42–52. doi:10.1016/S1473-3099(04)01253-8.
- Finkelstein, J. L., J. D. Haas, and S. Mehta. 2017. "Iron-Biofortified Staple Food Crops for Improving Iron Status: A Review of the Current Evidence." *Current Opinion in Biotechnology* 44: 138–45. doi:10.1016/j.copbio.2017.01.003.
- Freeman, M. C., J. V. Garn, G. D. Sclar, S. Boisson, K. Medlicott, K. T. Alexander, G. Penakalapati, D. Anderson, A. G. Mahtani, J. E. T. Grimes, E. A. Rehfuess, and T. F. Clasen. 2017. "The Impact of Sanitation on Infectious Disease and Nutritional Status: A Systematic Review and Meta-analysis." *International Journal of Hygiene and Environmental Health* 220 (6): 928–49. doi:10.1016/j.ijheh.2017.05.007.
- Gajaria, A., and A. V. Ravindran. 2018. "Interventions for Perinatal Depression in Low and Middle-Income Countries: A Systematic Review." Asian Journal of Psychiatry 37: 112–20. doi:10.1016/j.ajp.2018.08.014.
- Gamble, C. L., J. P. Ekwaru, and F. O. ter Kuile. 2006. "Insecticide-Treated Nets for Preventing Malaria in Pregnancy." *Cochrane Database of Systematic Reviews* 2006 (2): CD003755. doi:10.1002/14651858.CD003755.pub2.
- Garcia-Casal, M. N., J. P. Peña-Rosas, L. M. De-Regil, J. A. Gwirtz, and S. R. Pasricha. 2018. "Fortification of Maize Flour with Iron for Controlling Anaemia and Iron Deficiency in

- Populations." *Cochrane Database of Systematic Reviews* 2018 (12): CD010187. doi:10.1002/14651858.CD010187.pub2.
- Garn, J. V., G. D. Sclar, M. C. Freeman, G. Penakalapati, K. T. Alexander, P. Brooks, E. A. Rehfuess, S. Boisson, K. O. Medlicott, and T. F. Clasen. 2017. "The Impact of Sanitation Interventions on Latrine Coverage and Latrine Use: A Systematic Review and Meta-analysis." *International Journal of Hygiene and Environmental Health* 220 (2): 329–40. doi:10.1016/j.ijheh.2016.10.001.
- Garner, P., R. Panpanich, and S. Logan. 2000. "Is Routine Growth Monitoring Effective? A Systematic Review of Trials." *Archives of Disease in Childhood* 82 (3): 197–201. doi:10.1136/adc.82.3.197.
- Gebreselassie, S. G., and F. E. Gashe. 2011. "A Systematic Review of Effect of Prenatal Zinc Supplementation on Birthweight: Meta-analysis of 17 Randomized Controlled Trials." *Journal of Health, Population and Nutrition* 29 (2): 134–40.
- Geerligs, P. D. P., B. J. Brabin, and A. A. A. Omari. 2003. "Food Prepared in Iron Cooking Pots as an Intervention for Reducing Iron Deficiency Anaemia in Developing Countries: A Systematic Review." *Journal of Human Nutrition and Dietetics* 16 (4): 275–81. doi:10.1046/j.1365-277X.2003.00447.x.
- Gera, T., and H. P. S. Sachdev. 2002. "Effect of Iron Supplementation on Incidence of Infectious Illness in Children: Systematic Review. *BMJ* 325 (7373): 1142. doi:10.1136/bmj.325.7373.1142.
- Gera, T., H. P. S. Sachdev, and P. Nestel. 2009. "Effect of Combining Multiple Micronutrients with Iron Supplementation on Hb Response in Children: Systematic Review of Randomized Controlled Trials." *Public Health Nutrition* 12 (6): 756–73. doi:10.1017/S1368980008003145.
- Gera, T., H. P. S. Sachdev, P. Nestel, and S. S. Sachdev. 2007. "Effect of Iron Supplementation on Haemoglobin Response in Children: Systematic Review of Randomised Controlled Trials. *Journal of Pediatric Gastroenterology and Nutrition* 44 (4): 468–86. doi:10.1097/01.mpg.0000243440.85452.38.
- Gera, T., D. Shah, P. Garner, M. Richardson, and H. S. Sachdev. 2016. "Integrated Management of Childhood Illness (IMCI) Strategy for Children under Five. *Cochrane Database of Systematic Reviews* 2016 (6): CD010123. doi:10.1002/14651858.CD010123.pub2.
- Gera, T., D. Shah, and H. S. Sachdev. 2018. "Impact of Water, Sanitation and Hygiene Interventions on Growth, Non-diarrheal Morbidity and Mortality in Children Residing in Low- and Middle-Income Countries: A Systematic Review." *Indian Pediatrics* 55 (5): 381–93. doi:10.1007/s13312-018-1279-3.
- Ghogomu, E. T., S. Suresh, P. Rayco-Solon, A. Hossain, J. McGowan, J. P. Peña-Rosas, and V. Welch. 2018. "Deworming in Non-pregnant Adolescent Girls and Adult Women: A

- Systematic Review and Meta-analysis." *Systematic Reviews* 7: 239. doi:10.1186/s13643-018-0859-6.
- Gilmore, B., and E. McAuliffe. 2013. "Effectiveness of Community Health Workers Delivering Preventive Interventions for Maternal and Child Health in Low- and Middle-Income Countries: A Systematic Review." *BMC Public Health* 13: 847. doi:10.1186/1471-2458-13-847.
- Girard, A. W., J. L. Self, C. McAuliffe, and O. Olude. 2012. "The Effects of Household Food Production Strategies on the Health and Nutrition Outcomes of Women and Young Children: A Systematic Review." *Paediatric and Perinatal Epidemiology* 26 (Suppl 1): 205– 22. doi:10.1111/j.1365-3016.2012.01282.x.
- Glassman, A., D. Duran, L. Fleisher, D. Singer, R. Sturke, G. Angeles, J. Charles, B. Emrey, J. Gleason, W. Mwebsa, K. Saldana, K. Yarrow, and M. Koblinsky. 2013. "Impact of Conditional Cash Transfers on Maternal and Newborn Health." *Journal of Health, Population and Nutrition* 31 (4 Suppl 2): S48–66.
- Glasziou, P. P., and D. E. Mackerras. 1993. "Vitamin A Supplementation in Infectious Diseases: A Meta-analysis." *British Medical Journal* 306 (6874): 366–70. doi:10.1136/bmj.306.6874.366.
- Gogia, S., and H. S. Sachdev. 2009. "Neonatal Vitamin A Supplementation for Prevention of Mortality and Morbidity in Infancy: Systematic Review of Randomised Controlled Trials." *BMJ* 338 (7699): b919. doi:10.1136/bmj.b919.
- Gogia, S., and H. S. Sachdev. 2010. "Maternal Postpartum Vitamin A Supplementation for the Prevention of Mortality and Morbidity in Infancy: A Systematic Review of Randomized Controlled Trials." *International Journal of Epidemiology* 39 (5): 1217–26. doi:10.1093/ije/dyq080.
- Gogia, S., and H. S. Sachdev. 2012. "Zinc Supplementation for Mental and Motor Development in Children." *Cochrane Database of Systematic Reviews* 2012 (12): CD007991. doi:10.1002/14651858.CD007991.pub2.
- Gopalaswamy, A. K., M. S. Babu, and U. Dash. 2016. *Systematic Review of Quantitative Evidence on the Impact of Microfinance on the Poor in South Asia*. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London.
- Goudet, S. M., P. L. Griffiths, B. A. Bogin, and N. J. Madise. 2015. "Nutritional Interventions for Preventing Stunted Growth in Children (0 to 5 Years) Living in Urban Slums. *Cochrane Database of Systematic Reviews* 2015 (5): CD011695. doi:10.1002/14651858.CD011695.
- Grantham-McGregor, S. M., L. C. H. Fernald, R. M. C. Kagawa, and S. Walker. 2014. "Effects of Integrated Child Development and Nutrition Interventions on Child Development and Nutritional Status." *Annals of the New York Academy of Sciences* 1308 (1): 11–32. doi:10.1111/nyas.12284.

- Gunaratna, N. S., H. De Groote, P. Nestel, K. V. Pixley, and G. P. McCabe. 2010. "A Meta-analysis of Community-Based Studies on Quality Protein Maize." *Food Policy* 35 (3): 202–10. doi:10.1016/j.foodpol.2009.11.003.
- Hagen-Zanker, J., A. McCord, R. Holmes, F. Booker, and E. Molinari, E. 2011. *Systematic Review of the Impact of Employment Guarantee Schemes and Cash Transfers on the Poor*. London: Overseas Development Institute.
- Haider, B. A., R. Sharma, and Z. A. Bhutta. 2017. "Neonatal Vitamin A Supplementation for the Prevention of Mortality and Morbidity in Term Neonates in Low and Middle Income Countries." *Cochrane Database of Systematic Reviews* 2017 (2): CD006980. doi:10.1002/14651858.CD006980.pub3.
- Hall, J. 2011. "Effective Community-Based Interventions to Improve Exclusive Breast Feeding at Four to Six Months in Low- and Low-Middle-Income Countries: A Systematic Review of Randomised Controlled Trials." *Midwifery* 27 (4): 497–502. doi:10.1016/j.midw.2010.03.011.
- Hatt, L., B. Johns, C. Connor, M. Meline, M. Kukla, and K. Moat. 2015. *Impact of Health Systems Strengthening on Health*. Bethesda: Health Finance and Governance Project, Abt Associates.
- Hermoso, M., V. Vucic, C. Vollhardt, A. Arsic, B. Roman-Viñas, I. Iglesia-Altaba, M. Gurinovic, and B. Koletzko. 2011. "The Effect of Iron on Cognitive Development and Function in Infants, Children and Adolescents: A Systematic Review." *Annals of Nutrition and Metabolism* 59 (2–4): 154–65. doi:10.1159/000334490.
- Hess, S., L. Tecklenburg, and K. Eichler. 2016. "Micronutrient Fortified Condiments and Noodles to Reduce Anemia in Children and Adults—A Literature Review and Meta-analysis." *Nutrients* 8 (2): 88. doi:10.3390/nu8020088.
- Hindin, M. J., A. M. Kalamar, T. -A. Thompson, and U. D. Upadhyay. 2016. "Interventions to Prevent Unintended and Repeat Pregnancy among Young People in Low- and Middle-Income Countries: A Systematic Review of the Published and Gray Literature." *Journal of Adolescent Health* 59 (3 Suppl): S8–15. doi:10.1016/j.jadohealth.2016.04.021.
- Hombali, A. S., J. A. Solon, B. T. Venkatesh, N. S. Nair, and J. P. Peña-Rosas. 2019. "Fortification of Staple Foods with Vitamin A for Vitamin A Deficiency." *Cochrane Database of Systematic Reviews* 2019 (5): CD010068. doi:10.1002/14651858.CD010068.pub2.
- Imdad, A., Z. Ahmed, and Z. A. Bhutta. 2016. "Vitamin A Supplementation for the Prevention of Morbidity and Mortality in Infants One to Six Months of Age." *Cochrane Database of Systematic Reviews* 2016 (9): CD007480. doi:10.1002/14651858.CD007480.pub3.
- Imdad, A., and Z. A. Bhutta. 2011a. "Effect of Balanced Protein Energy Supplementation during Pregnancy on Birth Outcomes." *BMC Public Health* 11 (Suppl 3): S17. doi:10.1186/1471-2458-11-S3-S17.

- Imdad, A., and Z. A. Bhutta. 2011b. "Effect of Preventive Zinc Supplementation on Linear Growth in Children under 5 Years of Age in Developing Countries: A Meta-analysis of Studies for Input to the Lives Saved Tool." *BMC Public Health* 11 (Suppl 3): S22. doi:10.1186/1471-2458-11-S3-S22.
- Imdad, A., and Z. A. Bhutta. 2012a. "Maternal Nutrition and Birth Outcomes: Effect of Balanced Protein-Energy Supplementation." *Paediatric and Perinatal Epidemiology* 26 (Suppl 1): 178–90. doi:10.1111/j.1365-3016.2012.01308.x.
- Imdad, A., and Z. A. Bhutta. 2012b. "Routine Iron/Folate Supplementation during Pregnancy: Effect on Maternal Anaemia and Birth Outcomes." *Paediatric and Perinatal Epidemiology* 26 (Suppl 1), 168–77. doi:10.1111/j.1365-3016.2012.01312.x.
- Imdad, A., E. Mayo-Wilson, K. Herzer, and Z. A. Bhutta. 2017. "Vitamin A Supplementation for Preventing Morbidity and Mortality in Children from Six Months to Five Years of Age." Cochrane Database of Systematic Reviews 2017 (3): CD008524. doi:10.1002/14651858.CD008524.pub3.
- Imdad, A., M. Y. Yakoob, and Z. A. Bhutta. 2011. "Impact of Maternal Education about Complementary Feeding and Provision of Complementary Foods on Child Growth in Developing Countries. *BMC Public Health* 11 (Suppl 3): S25. doi:10.1186/1471-2458-11-S3-S25.
- Imhoff-Kunsch, B., and V. Briggs. 2012. "Antihelminthics in Pregnancy and Maternal, Newborn and Child Health." *Paediatric and Perinatal Epidemiology* 26 (Suppl 1): 223–38. doi:10.1111/j.1365-3016.2012.01280.x.
- Jenkins, M., C. Byker Shanks, and B. Houghtaling. 2015. "Orange-Fleshed Sweet Potato: Successes and Remaining Challenges of the Introduction of a Nutritionally Superior Staple Crop in Mozambique." Food and Nutrition Bulletin 36 (3): 327–53. doi:10.1177/0379572115597397.
- Jeong, J., H. O. Pitchik, and A. K. Yousafzai. 2018. "Stimulation Interventions and Parenting in Low- and Middle-Income Countries: A Meta-analysis." *Pediatrics* 141 (4): e20173510. doi:10.1542/peds.2017-3510.
- Jones-Hughes, T., J. Peters, R. Whear, C. Cooper, H. Evans, M. Depledge, and M. Pearson. 2013. "Are Interventions to Reduce the Impact of Arsenic Contamination of Groundwater on Human Health in Developing Countries Effective? A Systematic Review." *Environmental Evidence* 2: 11. doi:10.1186/2047-2382-2-11.
- Kabeer, N., and H. Waddington. 2015. "Economic Impacts of Conditional Cash Transfer Programmes: A Systematic Review and Meta-analysis." *Journal of Development Effectiveness* 7 (3): 290–303. doi:10.1080/19439342.2015.1068833.
- Kågesten, A., J. Parekh, Ö. Tunçalp, S. Turke, and R. W. Blum. 2014. "Comprehensive Adolescent Health Programs that Include Sexual and Reproductive Health Services: A Systematic Review." *American Journal of Public Health* 104 (12): e23–36. doi:10.2105/AJPH.2014.302246.

- Kalamar, A. M., S. Lee-Rife, and M. J. Hindin. 2016. "Interventions to Prevent Child Marriage among Young People in Low- and Middle-Income Countries: A Systematic Review of the Published and Gray Literature." *Journal of Adolescent Health* 59 (3 Suppl): S16–21. doi:10.1016/j.jadohealth.2016.06.015.
- Karra, M., D. Canning, J. Hu, M. Ali, and C. Lissner. 2016. "Community-Based Financing of Family Planning in Developing Countries: A Systematic Review." *Studies in Family Planning* 47 (4): 325–39. doi:10.1111/sifp.12000.
- Khan, M. E., A. Hazra, A. Kant, and M. Ali. 2016. "Conditional and Unconditional Cash Transfers to Improve Use of Contraception in Low and Middle Income Countries: A Systematic Review." *Studies in Family Planning* 47 (4): 371–83. doi:10.1111/sifp.12004.
- Kim, S. K., S. Park, J. Oh, J. Kim, and S. Ahn. 2018. "Interventions Promoting Exclusive Breastfeeding up to Six Months after Birth: A Systematic Review and Meta-analysis of Randomized Controlled Trials." *International Journal of Nursing Studies* 80: 94–105. doi:10.1016/j.ijnurstu.2018.01.004.
- Korachais, C., E. Macouillard, and B. Meessen. 2016. "How User Fees Influence Contraception in Low and Middle Income Countries: A Systematic Review." *Studies in Family Planning* 47 (4): 341–56. doi:10.1111/sifp.12005.
- Kristjansson, E., D. K. Francis, S. Liberato, M. Benkhalti Jandu, V. Welch, M. Batal, T. Greenhalgh, T. Rader, E. Noonan, B. Shea, L. Janzen, G. A. Wells, and M. Petticrew, M. 2015. "Food Supplementation for Improving the Physical and Psychosocial Health of Socio-Economically Disadvantaged Children Aged Three Months to Five Years." *Cochrane Database of Systematic Reviews* 2015 (3): CD009924. https://doi.org/:10.1002/14651858.CD009924.pub2.
- Kristjansson, E., D. Francis, S. Liberato, T. Greenhalgh, V. Welch, M. Benkhalti Jandu, M. Batal, T. Rader, E. Noonan, L. Janzen, B. Shea, G. A. Wells, and M. Petticrew. 2015. "Supplementary Feeding for Improving the Health of Disadvantaged Infants and Young Children: A Systematic and Realist Review." *3ie Systematic Review* 15. London: International Initiative for Impact Evaluation (3ie).
- Lagarde, M., and N. Palmer. 2011. "The Impact of User Fees on Access to Health Services in Lowand Middle-Income Countries." *Cochrane Database of Systematic Reviews* 2011 (4): CD009094. doi:10.1002/14651858.CD009094.
- Lamstein, S., T. Stillman, P. Koniz-Booher, A. Aakesson, B. Collaiezzi, T. Williams, K. Beall, and M. Anson. 2014. "Evidence of Effective Approaches to Social and Behaviour Change Communication for Preventing and Reducing Stunting and Anemia: Findings from a Systematic Literature Review." Arlington: USAID/Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project. https://www.spring-nutrition.org/publications/series/evidence-effective-approaches-social-and-behavior-change-communication.

- Langer, L., Y. Erasmus, N. Tannous, E. Obuku, Z. Ravat, C. Chisoro, M. Opondo, P. Nduku, J. Tripney, C. van Rooyen, and R. Stewart. 2018. "Women in Wage Labour: A Systematic Review of the Effectiveness and Design Features of Interventions Supporting Women's Participation in Wage Labour in Higher-Growth and/or Male-Dominated Sectors in LMICs." Technical report. London: EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London.
- Lassi, Z. S., and Z. A. Bhutta. 2015. "Community-Based Intervention Packages for Reducing Maternal and Neonatal Morbidity and Mortality and Improving Neonatal Outcomes." *Cochrane Database of Systematic Reviews* 2015 (3): CD007754. doi:10.1002/14651858.CD007754.pub3.
- Lassi, Z. S., J. K. Das, G. Zahid, A. Imdad, and Z. A. Bhutta. 2013. "Impact of Education and Provision of Complementary Feeding on Growth and Morbidity in Children less than 2 Years of Age in Developing Countries: A Systematic Review." *BMC Public Health* 13 (Suppl 3): S13. doi:10.1186/1471-2458-13-S3-S13.
- Lassi, Z. S., P. F. Middleton, Z. A. Bhutta, and C. Crowther. 2016. "Strategies for Improving Health Care Seeking for Maternal and Newborn Illnesses in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis." *Global Health Action* 9 (1): 31408. doi:10.3402/gha.v9.31408.
- Lassi, Z. S., A. Moin, and Z. A. Bhutta. 2016. "Zinc Supplementation for the Prevention of Pneumonia in Children Aged 2 Months to 59 Months. *Cochrane Database of Systematic Reviews* 2016 (12): CD005978. doi:10.1002/14651858.CD005978.pub3.
- Lassi, Z. S., A. Moin, J. K. Das, R. A. Salam, and Z. A. Bhutta. 2017. "Systematic Review on Evidence-Based Adolescent Nutrition Interventions." *Annals of the New York Academy of Sciences* 1393 (1): 34–50. doi:10.1111/nyas.13335.
- Lassi, Z. S., G. Zahid, J. K. Das, and Z. A. Bhutta. 2013. *Systematic Review of Complementary Feeding Strategies amongst Children Less Than Two Years of Age*. HEART, UK. 76 pp. https://www.heart-resources.org/assignment/systematic-review-of-complementary-feeding-strategies-amongst-children-less-than-two-years-of-age/.
- Lawry, S., C. Samii, R. Hall, A. Leopold, D. Hornby, and F. Mtero. 2014. "The Impact of Land Property Rights Interventions on Investment and Agricultural Productivity in Developing Countries: A Systematic Review." *Campbell Systematic Reviews* 10 (1): 1–104. doi:10.4073/csr.2014.1.
- Lawson, T. M. 2012. "Impact of School Feeding Programs on Educational, Nutritional, and Agricultural Development Goals: A Systematic Review of Literature." Master's Degree Paper, Michigan State University. doi:10.22004/ag.econ.142466.
- Lazzerini, M., and H. Wanzira. 2016. "Oral Zinc for Treating Diarrhoea in Children." *Cochrane Database of Systematic Reviews* 2016 (12): CD005436. doi:10.1002/14651858.CD005436.pub5.

- Lee, S. H., U. B. Nurmatov, B. I. Nwaru, M. Mukherjee, L. Grant, and C. Pagliari. 2016. "Effectiveness of mHealth Interventions for Maternal, Newborn and Child Health in Low- and Middle-Income Countries: Systematic Review and Meta-analysis." *Journal of Global Health* 6 (1): 010401. doi:10.7189/jogh.06.010401.
- Leroy, J. L., P. Gadsden, and M. Guijarro. 2012. "The Impact of Daycare Programmes on Child Health, Nutrition and Development in Developing Countries: A Systematic Review." *Journal of Development Effectiveness* 4 (3): 472–96. doi:10.1080/19439342.2011.639457.
- Leroy, J. L., M. Ruel, and E. Verhofstadt. 2009. "The Impact of Conditional Cash Transfer Programmes on Child Nutrition: A Review of Evidence Using a Programme Theory Framework." *Journal of Development Effectiveness* 1 (2): 103–29. doi:10.1080/19439340902924043.
- Leung, B. M. Y., K. P. Wiens, and B. J. Kaplan. 2011. "Does Prenatal Micronutrient Supplementation Improve Children's Mental Development? A Systematic Review." *BMC Pregnancy and Childbirth* 11: 12. doi:10.1186/1471-2393-11-12.
- Liberato, S. C., G. Singh, and K. Mulholland. 2015. "Zinc Supplementation in Young Children: A Review of the Literature Focusing on Diarrhoea Prevention and Treatment." *Clinical Nutrition* 34 (2): 181–88. doi:10.1016/j.clnu.2014.08.002.
- Liu, E., L. Pimpin, M. Shulkin, S. Kranz, C. P. Duggan, D. Mozaffarian, and W. W. Fawzi. 2018. "Effect of Zinc Supplementation on Growth Outcomes in Children under 5 Years of Age. *Nutrients* 10 (3): 377. doi:10.3390/nu10030377.
- Lucas, P. J., C. Cabral, and J. M. Colford Jr. 2011. "Dissemination of Drinking Water Contamination Data to Consumers: A Systematic Review of Impact on Consumer Behaviors." *PLoS ONE* 6 (6): e21098. doi:10.1371/journal.pone.0021098.
- Lynch, U., S. McGrellis, M. Dutschke, M. Anderson, P. Arnsberger, and G. Macdonald. 2017.

  What Is the Evidence That the Establishment or Use of Community Accountability Mechanisms and Processes Improves Inclusive Service Delivery by Governments, Donors and NGOs to Communities? London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Madhani, F. I., C. Tompkins, S. M. Jack, and A. Fisher. 2015. "Participation in Micro-finance Programmes and Women's Mental Health in South Asia: A Modified Systematic Review." *Journal of Development Studies* 51 (9): 1255–70. doi:10.1080/00220388.2015.1036037.
- Mahomed, K., and A. M. Gülmezoglu. 1997. "Maternal Iodine Supplements in Areas of Deficiency." *Cochrane Database of Systematic Reviews* 1997 (4): CD000135. doi:10.1002/14651858.CD000135.

- Manley, J., S. Gitter, and V. Slavchevska. 2013. "How Effective Are Cash Transfer Programmes at Improving Nutritional Status?" *World Development* 48: 133–55. doi:10.1016/j.worlddev.2013.03.010.
- Masset, E., L. Haddad, A. Cornelius, and J. Isaza-Castro. 2011. *A Systematic Review of Agricultural Interventions That Aim to Improve Nutritional Status of Children*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Matangila, J. R., P. Mitashi, R. A. Inocêncio da Luz, P. T. Lutumba, and J. P. Van Geertruyden. 2015. "Efficacy and Safety of Intermittent Preventive Treatment for Malaria in Schoolchildren: A Systematic Review." *Malaria Journal* 14: 450. doi:10.1186/s12936-015-0988-5.
- Mayo-Wilson, E., A. Imdad, K. Herzer, M. Y. Yakoob, and Z. A. Bhutta. 2011. "Vitamin A Supplements for Preventing Mortality, Illness, and Blindness in Children Aged under 5: Systematic Review and Meta-analysis." *BMJ* 343: d5094. doi:10.1136/bmj.d5094.
- Mayo-Wilson, E., J. A. Junior, A. Imdad, S. Dean, X. H. S. Chan, E. S. Chan, A. Jaswal, and Z. A. Bhutta. 2014. "Zinc Supplementation for Preventing Mortality, Morbidity, and Growth Failure in Children Aged 6 Months to 12 Years of Age." *Cochrane Database of Systematic Reviews* 2014 (5): CD009384. doi:10.1002/14651858.CD009384.pub2.
- McCauley, M. E., N. van den Broek, L. Dou, and M. Othman. 2015. "Vitamin A Supplementation during Pregnancy for Maternal and Newborn Outcomes." *Cochrane Database of Systematic Reviews* 2015 (10): CD008666. doi:10.1002/14651858.CD008666.pub3.
- McCorriston, S., D. J. Hemming, J. D. Lamontagne-Godwin, M. J. Parr, J. Osborn, and P. D. Roberts. 2013. What Is the Evidence of the Impact of Agricultural Trade Liberalisation on Food Security in Developing Countries? A Systematic Review. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- McGready, R., N. White, and F. Nosten. 2011. "Parasitological Efficacy of Antimalarials in the Treatment and Prevention of *Falciparum* malaria in Pregnancy 1998 to 2009: A Systematic Review." *BJOG* 118 (2): 123–35. doi:10.1111/j.1471-0528.2010.02810.x.
- McQueston, K., R. Silverman, and A. Glassman. 2013. "The Efficacy of Interventions to Reduce Adolescent Childbearing in Low- and Middle-Income Countries: A Systematic Review." Studies in Family Planning 44 (4): 369–88. doi:10.1111/j.1728-4465.2013.00365.x.
- Menon, K., S. Puthussery, A. Ravalia, P. Panchal, R. Rana, S. Mistry, P. Tseng, J. Bhandol, and D. Mavalankar. 2018. "Effectiveness of Nutrition Interventions in Low and Middle Income Countries: An Evidence Summary." Indian Institute of Public Health Gandhinagar; Public Health Foundation of India; University of Bedfordshire, UK and BRAC, Bangladesh.

- Meyer, C., N. Bellows, M. Campbell, and M. Potts. 2011. *The Impact of Vouchers on the Use and Quality of Health Goods and Services in Developing Countries: A Systematic Review*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Middleton, P. F., Z. S. Lassi, T. S. Tran, Z. Bhutta, T. K. Bubner, V. Flenady, and C. A. Crowther. 2013. "Nutrition Interventions and Programs for Reducing Mortality and Morbidity in Pregnant and Lactating Women and Women of Reproductive Age: A Systematic Review," in "Abstracts of the 17th Congress of the Perinatal Society of Australia and New Zealand (PSANZ), 14–17 April 2013, Adelaide Convention Centre, Adelaide, South Australia," special issue, *Journal of Paediatrics and Child Health* 49 (Suppl 2): 71.
- Mitra, S., M. Palmer, S. Pullaro, D. Mont, and N. Groce. 2017. "Health Insurance and Children in Low- and Middle-income Countries: A Review." *Economic Record* 93 (302): 484–500. doi:10.1111/1475-4932.12331.
- Morgan, C., A. Petrosino, and T. Fronius. 2012. *A Systematic Review of the Evidence of the Impact of Eliminating School User Fees in Low-Income Developing Countries*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Morgan, C., A. Petrosino, and T. Fronius. 2013. *A Systematic Review of the Evidence of the Impact of School Voucher Programmes in Developing Countries*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Morita, T., S. Godfrey, and C. M. George. 2016. "Systematic Review of Evidence on the Effectiveness of Safe Child Faeces Disposal Interventions." *Tropical Medicine and International Health* 21 (11): 1403–19. doi:10.1111/tmi.12773.
- Muanda, F. T., S. Chaabane, T. Boukhris, F. Santos, O. Sheehy, S. Perreault, L. Blais, and A. Bérard. 2015. "Antimalarial Drugs for Preventing Malaria during Pregnancy and the Risk of Low Birth Weight: A Systematic Review and Meta-analysis of Randomized and Quasirandomized Trials. *BMC Medicine* 13: 193. doi:10.1186/s12916-015-0429-x.
- Murray, S. F., B. M. Hunter, R. Bisht, T. Ensor, and D. Bick. 2012. "Demand-Side Financing Measures to Increase Maternal Health Service Utilisation and Improve Health Outcomes: A Systematic Review of Evidence from Low- and Middle-Income Countries." *JBI Library of Systematic Reviews* 10 (58): 4165–67. doi:10.11124/jbisrir-2012-408.
- Murray, S. F., B. M. Hunter, R. Bisht, T. Ensor, and D. Bick. 2014. "Effects of Demand-Side Financing on Utilisation, Experiences and Outcomes of Maternity Care in Low- and Middle-Income Countries: A Systematic Review." *BMC Pregnancy and Childbirth* 14: 30. doi:10.1186/1471-2393-14-30.
- Mwaikambo, L., I. S. Speizer, A. Schurmann, G. Morgan, and F. Fikree. 2011. "What Works in Family Planning Interventions: A Systematic Review." *Studies in Family Planning* 42 (2): 67–82. doi:10.1111/j.1728-4465.2011.00267.x.

- Nelson, K. N., A. S. Wallace, S. V. Sodha, D. Daniels, and V. Dietz. 2017. "Assessing Strategies for Increasing Urban Routine Immunization Coverage of Childhood Vaccines in Low and Middle-Income Countries: A Systematic Review of Peer-Reviewed Literature." *Vaccine* 34 (46): 5495–503. doi:10.1016/j.vaccine.2016.09.038.
- Neuberger, A., J. Okebe, D. Yahav, and M. Paul. 2016. "Oral Iron Supplements for Children in Malaria-Endemic Areas." *Cochrane Database of Systematic Reviews* 2016 (2): CD006589. doi:10.1002/14651858.CD006589.pub4.
- Nissensohn, M., A. Sánchez Villegas, D. Fuentes Lugo, P. Henríquez Sánchez, J. Doreste Alonso, N. M. Lowe, V. Hall Moran, A. L. Skinner, M. Warthon Medina, and L. Serra-Majem. 2013. "Effect of Zinc Intake on Serum/Plasma Zinc Status in Infants: A Meta-analysis. *Maternal and Child Nutrition* 9: 285–98. doi:10.1111/mcn.12045.
- Nissensohn, M., A. Sánchez Villegas, D. Fuentes Lugo, P. Henríquez Sánchez, J. Doreste Alonso, L. Peña Quintana, C. Ruano, N. L. Lowe, V. Hall Moran, A. L. Skinner, M. Warthon Medina, and L. Serra-Majem. 2016. "Effect of Zinc Intake on Growth in Infants: A Meta-analysis." *Critical Reviews in Food Science and Nutrition* 56 (3): 350–63. doi:10.1080/10408398.2013.802661.
- Nissensohn, M., A. Sánchez Villegas, D. Fuentes Lugo, P. Henríquez Sánchez, J. Doreste Alonso, A. L. Skinner, M. Warthon Medina, N. M. Lowe, V. Hall Moran, and L. Serra-Majem. 2013. "Effect of Zinc Intake on Mental and Motor Development in Infants: A Meta-Analysis." *International Journal for Vitamin and Nutrition Research* 83 (4): 203–15. doi:10.1024/0300-9831/a000161.
- Odendaal, W. A., K. Ward, J. Uneke, H. Uro-Chukwu, D. Chitama, Y. Balakrishna, and T. Kredo. 2018. "Contracting Out to Improve the Use of Clinical Health Services and Health Outcomes in Low- and Middle-Income Countries." *Cochrane Database of Systematic Reviews* 2018 (4): CD008133. doi:10.1002/14651858.CD008133.pub2.
- Oliveira, I. B. B., L. P. Leal, M. W. de L. Coriolano-Marinus, A. H. da S. Santos, B. L. Horta, and C. M Pontes. 2017. "Meta-analysis of the Effectiveness of Educational Interventions for Breastfeeding Promotion Directed to the Woman and Her Social Network. *Journal of Advanced Nursing* 73 (2): 323–35. doi:10.1111/jan.13104.
- Oliveira, J. M., R. Allert, and C. E. East. 2016. "Vitamin A Supplementation for Postpartum Women." *Cochrane Database of Systematic Reviews* 2016 (3): CD005944. doi:10.1002/14651858.CD005944.pub3.
- Olufunlayo, T. F., A. A. Roberts, C. MacArthur, N. Thomas, K. A. Odeyemi, M. Price, and K. Jolly. 2019. "Improving Exclusive Breastfeeding in Low and Middle-Income Countries: A Systematic Review." *Maternal and Child Nutrition* 15 (3): e12788. doi:10.1111/mcn.12788.
- Orton, L., A. Pennington, S. Nayak, A. Sowden, M. White, and M. Whitehead. 2016. "Group-Based Microfinance for Collective Empowerment: A Systematic Review of Health

- Impacts." Bulletin of the World Health Organization 94 (9): 694–704A. doi:10.2471/BLT.15.168252.
- Owusu-Addo, E., and S. B. Owusu-Addo. 2014. "Effectiveness of Health Education in Community-Based Malaria Prevention and Control Interventions in Sub-Saharan Africa: A Systematic Review." *Journal of Biology, Agriculture and Healthcare* 4 (3): 22–34. http://hdl.handle.net/123456789/8835.
- Owusu-Addo, E., A. M. N. Renzaho, A. S. Mahal, and B. J. Smith. 2016. "The Impact of Cash Transfers on Social Determinants of Health and Health Inequalities in Sub-Saharan Africa: A Systematic Review Protocol." *Systematic Reviews* 5: 114. doi:10.1186/s13643-016-0295-4.
- Oyo-Ita, A., C. S. Wiysonge, C. Oringanje, C. E. Nwachukwu, O. Oduwole, and M. M. Meremikwu. 2016. "Interventions for Improving Coverage of Childhood Immunisation in Low- and Middle-Income Countries." *Cochrane Database of Systematic Reviews* 2016 (7): CD008145. doi:10.1002/14651858.CD008145.pub3.
- Pandey, V. L., S. M. Dev, and U. Jayachandran. 2016. "Impact of Agricultural Interventions on the Nutritional Status in South Asia: A Review." *Food Policy* 62: 28–40. doi:10.1016/j.foodpol.2016.05.002
- Panjwani, A., and R. Heidkamp. 2017. "Complementary Feeding Interventions Have a Small but Significant Impact on Linear and Ponderal Growth of Children in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis." *Journal of Nutrition* 147 (11 Suppl): 2169–78S. doi:10.3945/jn.116.243857.
- Panpanich, R., and P. Garner. 1999. "Growth Monitoring in Children." *Cochrane Database of Systematic Reviews* 1999 (4): CD001443. doi:10.1002/14651858.CD001443.
- Pasricha, S., E. Hayes, K. Kalumba, and B. Biggs. 2013. "Effect of Daily Iron Supplementation on Health in Children Aged 4–23 Months: A Systematic Review and Meta-analysis of Randomized Controlled Trials." *Lancet Global Health* 1 (2): e77–86. doi:10.1016/S2214-109X(13)70046-9.
- Patel, A. B., M. Mamtani, N. Badhoniya, and H. Kulkarni. 2011. "What Zinc Supplementation Does and Does Not Achieve in Diarrhea Prevention: A Systematic Review and Meta-analysis." *BMC Infectious Diseases* 11: 122. doi:10.1186/1471-2334-11-122.
- Pega, F., S. Y. Liu, S. Walter, R. Pabayo, R. Saith, and S. K. Lhachimi. 2017. "Unconditional Cash Transfers for Reducing Poverty and Vulnerabilities: Effect on Use of Health Services and Health Outcomes in Low- and Middle-Income Countries." *Cochrane Database of Systematic Reviews* 2017 (11): CD011135. doi:10.1002/14651858.CD011135.pub2.
- Peña-Rosas, J. P., P. Mithra, B. Unnikrishnan, N. Kumar, L. M. De-Regil, N. S. Nair, M. N. Garcia-Casal, and J. A. Solon. 2019. "Fortification of Rice with Vitamins and Minerals for

- Addressing Micronutrient Malnutrition." *Cochrane Database of Systematic Reviews* 2019 (10): CD009902. doi:10.1002/14651858.CD009902.pub2.
- Petry, N., I. Olofin, E. Boy, M. D. Angel, and F. Rohner. 2016. "The Effect of Low Dose Iron and Zinc Intake on Child Micronutrient Status and Development during the First 1,000 Days of Life: A Systematic Review and Meta-analysis." *Nutrients* 8 (12): 773. doi:10.3390/nu8120773.
- Pilkington, G., S. Panday, M. N. Khatib, E. Kotas, R. A. Hill, P. Simkhada, and L. Jones. 2017. The Effectiveness of Community Engagement and Participation Approaches in Low and Middle Income Countries: A Review of Systematic Reviews with Particular Reference to the Countries of South Asia. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Polec, L. A., J. Petkovic, V. Welch, E. Ueffing, E. T. Ghogomu, J. P. Pardo, M. Grabowsky, A. Attaran, G. A. Wells, and P. Tugwell. 2015. "Strategies to Increase the Ownership and Use of Insecticide-Treated Bednets to Prevent Malaria." *Campbell Systematic Reviews* 11 (1): 1–127. doi:10.4073/csr.2015.17.
- Prost, A., T. Colbourn, N. Seward, K. Azad, A. Coomarasamy, A. Copas, T. A. Houweling, E. Fottrell, A. Kuddus, S. Lewycka, C. MacArthur, D. Manandhar, J. Morrison, C. Mwansambo, N. Nair, B. Nambiar, D. Osrin, C. Pagel, T. Phiri, A. M. Pulkki-Brännström, M. Rosato, J. Skordis-Worrall, N. Saville, N. S. More, B. Shrestha, P. Tripathy, A. Wilson, and A. Costello. 2013. "Women's Groups Practising Participatory Learning and Action to Improve Maternal and Newborn Health in Low-Resource Settings: A Systematic Review and Meta-analysis." *Lancet* 381 (9879): 1736–46. doi:10.1016/S0140-6736(13)60685-6.
- Pryce, J., M. Richardson, and C. Lengeler. 2018. "Insecticide-Treated Nets for Preventing Malaria." *Cochrane Database of Systematic Reviews* 2018 (11): CD000363. doi:10.1002/14651858.CD000363.pub3.
- Radeva-Petrova, D., K. Kayentao, F. O. ter Kuile, D. Sinclair, and P. Garner. 2014. "Drugs for Preventing Malaria in Pregnant Women in Endemic Areas: Any Drug Regimen versus Placebo or No Treatment." *Cochrane Database of Systematic Reviews* 2014 (10): CD000169. doi:10.1002/14651858.CD000169.pub3.
- Rahman, A., J. Fisher, P. Bower, S. Luchters, T. Tran, M. T. Yasamy, S. Saxena, and W. Waheed. 2013. "Interventions for Common Perinatal Mental Disorders in Women in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis." *Bulletin of the World Health Organization* 91 (8): 593–601I. doi:10.2471/BLT.12.109819.
- Ramakrishnan, U., P. Nguyen, and R. Martorell. 2009. "Effects of Micronutrients on Growth of Children under 5 y of Age: Meta-analyses of Single and Multiple Nutrient Interventions." American Journal of Clinical Nutrition 89 (1): 191–203. doi:10.3945/ajcn.2008.26862.

- Ramírez-Luzuriaga, M. J., L. M. Larson, V. Mannar, and R. Martorell. 2018. "Impact of Double-Fortified Salt with Iron and Iodine on Hemoglobin, Anemia, and Iron Deficiency Anemia: A Systematic Review and Meta-analysis." *Advances in Nutrition* 9 (3): 207–18. doi:10.1093/advances/nmy008.
- Roberts, J. L., and A. D. Stein. 2017. "The Impact of Nutritional Interventions beyond the First 2 Years of Life on Linear Growth: A Systematic Review and Meta-analysis." *Advances in Nutrition* 8 (2): 323–36. doi:10.3945/an.116.013938.s.
- Ruel, M. T., and H. Alderman. 2013. "Nutrition-Sensitive Interventions and Programmes: How Can They Help to Accelerate Progress in Improving Maternal and Child Nutrition?" Lancet 382 (9891): 536–51. doi:10.1016/S0140-6736(13)60843-0.
- Ruel, M. T., A. R. Quisumbing, and M. Balagamwala. 2018. "Nutrition-Sensitive Agriculture: What Have We Learned So Far?" *Global Food Security* 17: 128–53. doi:10.1016/j.gfs.2018.01.002.
- Sachdev, H. P. S., T. Gera, and P. Nestel. 2005. "Effect of Iron Supplementation on Mental and Motor Development in Children: Systematic Review of Randomised Controlled Trials." *Public Health Nutrition* 8 (2): 117–32. doi:10.1079/PHN2004677.
- Sachdev, H. P. S., T. Gera, and P. Nestel. 2006. "Effect of Iron Supplementation on Physical Growth in Children: Systematic Review of Randomised Controlled Trials." *Public Health Nutrition* 9 (7): 904–20. doi:10.1017/PHN2005918.
- Saeterdal, I., S. Lewin, A. Austvoll-Dahlgren, C. Glenton, and S. Munabi-Babigumira. 2014. "Interventions Aimed at Communities to Inform and/or Educate about Early Childhood Vaccination." *Cochrane Database of Systematic Reviews* 2014 (11): CD010232. doi:10.1002/14651858.CD010232.pub2.
- Salam, R. A., B. A. Haider, Q. Humayun, and Z. A. Bhutta. 2015. "Effect of Administration of Antihelminthics for Soil-Transmitted Helminths during Pregnancy." *Cochrane Database of Systematic Reviews* 2015 (6): CD005547. doi:10.1002/14651858.CD005547.pub3.
- Salam, R. A., C. MacPhail, J. K. Das, and Z. A. Bhutta. 2013. "Effectiveness of Micronutrient Powders (MNP) in Women and Children." *BMC Public Health* 13 (Suppl 3): S22. doi:10.1186/1471-2458-13-S3-S22.
- Saronga, N. J., T. Burrows, C. E. Collins, A. M. Ashman, and M. E. Rollo. 2019. "mHealth Interventions Targeting Pregnancy Intakes in Low and Lower-Middle Income Countries: Systematic Review." *Maternal and Child Nutrition* 15 (2): e12777. doi:10.1111/mcn.12777.
- Scott, V. K., L. B. Gottschalk, K. Q. Wright, C. Twose, M. A. Bohren, M. E. Schmitt, and N. Ortayli. 2015. "Community Health Workers' Provision of Family Planning Services in Low- and Middle-Income Countries: A Systematic Review of Effectiveness." Studies in Family Planning 46 (3): 241–61. doi:10.1111/j.1728-4465.2015.00028.x.

- Seguin, M., and M. Niño Zarazúa. 2015. "Non-clinical Interventions for Acute Respiratory Infections and Diarrhoeal Diseases among Young Children in Developing Countries." Tropical Medicine and International Health 20 (2): 146–69. doi:10.1111/tmi.12423.
- Sguassero, Y., M. de Onis, A. M. Bonotti, and G. Carroli. 2012. "Community-Based Supplementary Feeding for Promoting the Growth of Children under Five Years of Age in Low and Middle Income Countries." *Cochrane Database of Systematic Reviews* 2012 (6): CD005039. doi:10.1002/14651858.CD005039.pub3.
- Shah, P. S., and A. Ohlsson. 2009. "Effects of Prenatal Multimicronutrient Supplementation on Pregnancy Outcomes: A Meta-analysis." *Canadian Medical Association Journal* 180 (12): E99–108. https://doi.org/10.1503/cmaj.081777.
- Shakya, P., M. K. Kunieda, M. Koyama, S. S. Rai, M. Miyaguchi, S. Dhakal, S. Sandy, B. F. Sunguya, and M. Jimba. 2017. "Effectiveness of Community-Based Peer Support for Mothers to Improve Their Breastfeeding Practices: A Systematic Review and Metaanalysis. *PLoS ONE* 12 (5): e0177434. doi:10.1371/journal.pone.0177434.
- Sibley, L. M., T. A. Sipe, C. M. Brown, M. M. Diallo, K. McNatt, and N. Habarta. 2007. "Traditional Birth Attendant Training for Improving Health Behaviours and Pregnancy Outcomes." *Cochrane Database of Systematic Reviews* 2007 (3): CD005460. doi:10.1002/14651858.CD005460.pub2.
- Soares, M. M., M. A. Silva, P. P. C. Garcia, L. S. Silva, G. D. Costa, R. M. A. Araújo, and R. M. M. Cotta. 2019. "Effect of Vitamin A Supplementation: A Systematic Review." *Ciência & Saúde Coletiva* 24 (3): 827–38. doi:10.1590/1413-81232018243.07112017.
- Sondaal, S. F. V., J. L. Browne, M. Amoakoh-Coleman, A. Borgstein, A. Miltenburg, M. Verwijs, and K. Klipstein-Grobusch. 2016. "Assessing the Effect of mHealth Interventions in Improving Maternal and Neonatal Care in Low- and Middle-Income Countries: A Systematic Review." *PloS One* 11 (5): e0154664. doi:10.1371/journal.pone.0154664.
- Soubeiga, D., L. Gauvin, M. A. Hatem, and M. Johri. 2014. "Birth Preparedness and Complication Readiness Interventions to Reduce Maternal and Neonatal Mortality in Developing Countries: Systematic Review and Meta-analysis." *BMC Pregnancy and Childbirth* 14 (1): 129. doi:10.1186/1471-2393-14-129.
- Steinert, J. I., J. Zenker, U. Filipiak, A. Movsisyan, L. D. Cluver, and Y. Shenderovich. 2018. "Do Saving Promotion Interventions Increase Household Savings, Consumption, and Investments in Sub-Saharan Africa? A Systematic Review and Meta-analysis." World Development 104: 238–56. doi:10.1016/j.worlddev.2017.11.018.
- Stevens, B., P. Buettner, K. Watt, A. Clough, J. Brimblecombe, and J. Judd. 2015. "The Effect of Balanced Protein Energy Supplementation in Undernourished Pregnant Women and Child Physical Growth in Low- and Middle-Income Countries: A Systematic Review and Meta-analysis." *Maternal and Child Nutrition* 11 (4): 415–32. doi:10.1111/mcn.12183.

- Stewart, R., L. Langer, N. Rebelo Da Silva, E. Muchiri, H. Zaranyika, Y. Erasmus, N. Randall, S. Rafferty, M. Korth, N. Madinga, and T. de Wet. 2015. "The Effects of Training, Innovation and New Technology on African Smallholder Farmers' Economic Outcomes and Food Security: A Systematic Review." *Campbell Systematic Reviews* 11 (1): 1–224. doi:10.4073/csr.2015.16.
- Stewart, R., C. van Rooyen, M. Korth, A. Chereni, N. Rebelo Da Silva, and T. de Wet. 2012. Do Micro-credit, Micro-savings and Micro-leasing Serve as Effective Financial Inclusion Interventions Enabling Poor People, and Especially Women, to Engage in Meaningful Economic Opportunities in Low- and Middle-Income Countries? A Systematic Review of the Evidence. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Suchdev, P. S., J. P. Peña-Rosas, and L. M. De-Regil. 2015. "Multiple Micronutrient Powders for Home (Point-of-Use) Fortification of Foods in Pregnant Women." *Cochrane Database of Systematic Reviews* 2015 (6): CD011158. doi:10.1002/14651858.CD011158.pub2.
- Sudfeld, C. R., W. W. Fawzi, and C. Lahariya. 2012. "Peer Support and Exclusive Breastfeeding Duration in Low and Middle-Income Countries: A Systematic Review and Meta-analysis." PLoS ONE 7 (9): e45143. doi:10.1371/journal.pone.0045143.
- Sunguya, B. F., K. C. Poudel, L. B. Mlunde, P. Shakya, D. P. Urassa, M. Jimba, and J. Yasuoka. 2013. "Effectiveness of Nutrition Training of Health Workers toward Improving Caregivers' Feeding Practices for Children Aged Six Months to Two Years: A Systematic Review." Nutrition Journal 12: 66. doi:10.1186/1475-2891-12-66.
- Tan, S. Y., and G. J. Melendez-Torres. 2018. "Do Prospective Payment Systems (PPS) Lead to Desirable Providers' Incentives and Patients' Outcomes? A Systematic Review of Evidence from Developing Countries." *Health Policy and Planning* 33 (1): 137–53. doi:10.1093/heapol/czx151.
- Taylor-Robinson, D. C., N. Maayan, S. Donegan, M. Chaplin, and P. Garner. 2019. "Public Health Deworming Programmes for Soil-Transmitted Helminths in Children Living in Endemic Areas." Cochrane Database of Systematic Reviews 2019 (9): CD000371. doi:10.1002/14651858.CD000371.pub7.
- Taylor-Robinson, D. C., N. Maayan, K. Soares-Weiser, S. Donegan, and P. Garner. 2015.
  "Deworming Drugs for Soil-Transmitted Intestinal Worms in Children: Effects on Nutritional Indicators, Haemoglobin, and School Performance." Cochrane Database of Systematic Reviews 2015 (7): CD000371. doi:10.1002/14651858.CD000371.pub6.
- Tenório, M. B., R. C. Ferreira, F. A. Moura, N. B. Bueno, M. O. F. Goulart, and A. C. M. Oliveira. 2018. "Oral Antioxidant Therapy for Prevention and Treatment of Preeclampsia: Metaanalysis of Randomized Controlled Trials." *Nutrition, Metabolism and Cardiovascular Diseases* 28 (9): 865–76. doi:10.1016/j.numecd.2018.06.002.

- Thakur, M., P. A. W. Nuyts, E. A. Boudewijns, J. Flores Kim, T. Faber, G. R. Babu, O. C. P. van Schayck, and J. V. Been. 2018. "Impact of Improved Cookstoves on Women's and Child Health in Low and Middle Income Countries: A Systematic Review and Meta-analysis. *Thorax* 73 (11): 1026–40. doi:10.1136/thoraxjnl-2017-210952.
- Thinkhamrop, J., G. J. Hofmeyr, O. Adetoro, P. Lumbiganon, and E. Ota. 2015. "Antibiotic Prophylaxis during the Second and Third Trimester to Reduce Adverse Pregnancy Outcomes and Morbidity." *Cochrane Database of Systematic Reviews* 2015 (6): CD002250. doi:10.1002/14651858.CD002250.pub3.
- Thompson, J., and B. -A. Biggs, and S. -R. Pasricha. 2019. "Effects of Daily Iron Supplementation in 2- to 5-Year-Old Children: Systematic Review and Meta-analysis." *Pediatrics* 131 (4): 739–53. doi:10.1542/peds.2012-2256.
- Till, S. R., D. Everetts, and D. M. Haas. 2015. "Incentives for Increasing Prenatal Care Use by Women in Order to Improve Maternal and Neonatal Outcomes." *Cochrane Database of Systematic Reviews* 2015 (12): CD009916. doi:10.1002/14651858.CD009916.pub2.
- Ton, G., S. Desiere, W. Vellema, S. Weituschat, and M. D'Haese. 2017. "The Effectiveness of Contract Farming for Raising Income of Smallholder Farmers in Low- and Middle-Income Countries: A Systematic Review." Campbell Systematic Reviews 13 (1): 1–131. doi:10.4073/csr.2017.13.
- Tripathi, A., S. K. Kabra, H. P. S. Sachdev, and R. Lodha. 2016. "Home Visits by Community Health Workers to Improve Identification of Serious Illness and Care Seeking in Newborns and Young Infants from Low- and Middle-Income Countries." *Journal of Perinatology* 36: S74–82. doi:10.1038/jp.2016.34.
- Vaessen, J., A. Rivas, M. Duvendack, R. P. Jones, F. Leeuw, G. van Gils, R. Lukach, N. Holvoet, J. Bastiaensen, J. G. Hombrados, and H. Waddington. 2014. "The Effects of Microcredit on Women's Control over Household Spending in Developing Countries: A Systematic Review and Meta-analysis." *Campbell Systematic Reviews* 10 (1): 1–205. doi:10.4073/csr.2014.8.
- van Rooyen, C., R. Stewart, and T. de Wet. 2012. "The Impact of Microfinance in Sub-Saharan Africa: A Systematic Review of the Evidence." World Development 40 (11): 2249–62. doi:10.1016/j.worlddev.2012.03.012.
- Venkataramanan, V., J. Crocker, A. Karon, and J. Bartram. 2018. "Community-Led Total Sanitation: A Mixed-Methods Systematic Review of Evidence and Its Quality." Environmental Health Perspectives 126 (2): 026001. doi:10.1289/EHP1965.
- Visser, J., M. H. McLachlan, N. Maayan, and P. Garner. 2018. "Community-Based Supplementary Feeding for Food Insecure, Vulnerable and Malnourished Populations—An Overview of Systematic Reviews." *Cochrane Database of Systematic Reviews* 2018 (11): CD010578. doi:10.1002/14651858.CD010578.pub2.

- Vucic, V., C. Berti, C. Vollhardt, K. Fekete, I. Cetin, B. Koletzko, M. Gurinovic, and P. van't Veer. 2010. "Effect of Iron Intervention on Growth during Gestation, Infancy, Childhood, and Adolescence: A Systematic Review with Meta-analysis." *Nutrition Reviews* 71 (6): 386–401. doi:10.1111/nure.12037.
- Waddington, H., B. Snilstveit, J. Hombrados, M. Vojtkova, D. Phillips, P. Davies, and H. White. 2014. "Farmer Field Schools for Improving Farming Practices and Farmer Outcomes: A Systematic Review." *Campbell Systematic Reviews* 10 (1): i–335. doi:10.4073/CSR.2014.6.
- Waddington, H., B. Snilstveit, H. White, and L. Fewtrell. 2009. "Water, Sanitation and Hygiene Interventions to Combat Childhood Diarrhoea in Developing Countries." *3ie Synthetic Review* 001. Delhi: International Initiative for Impact Evaluation.
- Walker, C. L. F., and R. E. Black. 2010. "Zinc for the Treatment of Diarrhoea: Effect on Diarrhoea Morbidity, Mortality and Incidence of Future Episodes." International Journal of Epidemiology 39 (Suppl 1): i63–69. doi:10.1093/ije/dyq023.
- Wallace, A., V. Dietz, and K. L. Cairns. 2009. "Integration of Immunization Services with Other Health Interventions in the Developing World: What Works and Why? Systematic Literature Review." *Tropical Medicine and International Health* 14 (1): 11–19. doi:10.1111/j.1365-3156.2008.02196.x.
- Watson, J. A., J. H. J. Ensink, M. Ramos, P. Benelli, E. Holdsworth, R. Dreibelbis, and O. Cumming. 2017. "Does Targeting Children with Hygiene Promotion Messages Work? The Effect of Handwashing Promotion Targeted at Children, on Diarrhoea, Soil-Transmitted Helminth Infections and Behaviour Change, in Low- and Middle-Income Countries." *Tropical Medicine and International Health* 22 (5): 526–38. doi:10.1111/tmi.12861.
- Webel, A. R., J. Okonsky, J. Trompeta, and W. L. Holzemer. 2010. "A Systematic Review of the Effectiveness of Peer-Based Interventions on Health-Related Behaviors in Adults." *American Journal of Public Health* 100 (2): 247–53. doi:10.2105/AJPH.2008.149419.
- Wekesah, F. M., C. E. Mbada, A. S. Muula, C. W. Kabiru, S. K. Muthuri, and C. O. Izugbara. 2016. "Effective Non-drug Interventions for Improving Outcomes and Quality of Maternal Health Care in Sub-Saharan Africa: A Systematic Review." *Systematic Reviews* 5: 137. doi:10.1186/s13643-016-0305-6.
- Welch, V. A., E. Ghogomu, A. Hossain, S. Awasthi, Z. A. Bhutta, C. Cumberbatch, R. Fletcher, J. McGowan, S. Krishnaratne, E. Kristjansson, S. Sohani, S. Suresh, P. Tugwell, H. White, and G. A. Wells. 2017. "Mass Deworming to Improve Developmental Health and Wellbeing of Children in Low-Income and Middle-Income Countries: A Systematic Review and Network Meta-analysis." *Lancet Global Health* 5 (1): e40–50. doi:10.1016/S2214-109X(16)30242-X.
- Welch, V. A., E. Ghogomu, A. Hossain, A. Riddle, M. Gaffey, P. Arora, O. Dewidar, R. Salaam, S. Cousens, R. Black, T. D. Hollingsworth, S. Horton, P. Tugwell, D. Bundy, M. C. Castro, A.

- Eliott, H. Friis, H. T. Le, C. Liu, E. K. Rousham, F. Rohner, C. King, E. Sartono, T. Supali, P. Steinmann, E. Webb, F. Wieringa, P. Winnichagoon, M. Yazdanbakhsh, Z. A. Bhutta, G. Wells. 2019. "Mass Deworming for Improving Health and Cognition of Children in Endemic Helminth Areas: A Systematic Review and Individual Participant Data Network Meta-analysis." *Campbell Systematic Reviews* 15 (4): e1058. doi:10.1002/cl2.1058.
- Wolf, J., P. R. Hunter, M. C. Freeman, O. Cumming, T. Clasen, J. Bartram, J. P. T. Higgins, R. Johnston, K. Medlicott, S. Boisson, and A. Prüss-Ustün. 2018. "Impact of Drinking Water, Sanitation and Handwashing with Soap on Childhood Diarrhoeal Disease: Updated Meta-analysis and Meta-regression." *Tropical Medicine and International Health* 23 (5): 508–25. doi:10.1111/tmi.13051.
- Wolf, J., A. Prüss-Ustün, O. Cumming, J. Bartram, S. Bonjour, S. Cairncross, T. Clasen, J. M. Colford Jr, V. Curtis, J. De France, L. Fewtrell, M. C. Freeman, B. Gordon, P. R. Hunter, A. Jeandron, R. B. Johnston, D. Mäusezahl, C. Mathers, M. Neira, and J. P. T. Higgins. 2014. "Assessing the Impact of Drinking Water and Sanitation on Diarrhoeal Disease in Lowand Middle-Income Settings: Systematic Review and Meta-regression." *Tropical Medicine and International Health* 19 (8): 928–42. doi:10.1111/tmi.12331.
- World Bank. 2015. *Impacts of Interventions during Early Childhood on Later Outcomes: A Systematic Review*. Independent Evaluation Group. Washington, DC: World Bank.
- Yakoob, M. Y., E. Theodoratou, A. Jabeen, A. Imdad, T. P. Eisele, J. Ferguson, A. Jhass, I. Rudan, H. Campbell, R. E. Black, and Z. A. Bhutta. 2011. "Preventive Zinc Supplementation in Developing Countries: Impact on Mortality and Morbidity Due to Diarrhea, Pneumonia and Malaria." *BMC Public Health* 11 (Suppl 3): S23. doi:10.1186/1471-2458-11-S3-S23.
- Yoong, J., L. Rabinovich, and S. Diepeveen. 2012. *The Impact of Economic Resource Transfers to Women versus Men: A Systematic Review*. Technical report. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Zeng, W., G. Li, H. Ahn, H. T. H. Nguyen, D. S. Shepard, and D. Nair.. 2017. "Cost-Effectiveness of Health Systems Strengthening Interventions in Improving Maternal and Child Health in Low- and Middle-Income Countries: A Systematic Review. *Health Policy and Planning* 33 (2): 283–97. doi:10.1093/heapol/czx172.
- Zhou, S. J., A. J. Anderson, R. A. Gibson, and M. Makrides. 2013. "Effect of Iodine Supplementation in Pregnancy on Child Development and Other Clinical Outcomes: A Systematic Review of Randomized Controlled Trials." American Journal of Clinical Nutrition 98 (5): 1241–54. doi:10.3945/ajcn.113.065854.

Table B.2. Inclusion Keywords

Outcomes of Interest	Search Keywords
Child undernutrition and development	child undernutrition OR undernutrition
Birthweight	birthweight OR low birthweight
Linear growth	stunt* OR height-for-age z score* OR length-for-age z score* OR linear growth OR child growth OR infant growth OR foetal growth OR fetal growth OR length OR height
Cognitive development	Cognitive development OR psychosocial development OR motor development OR attachment
Micronutrient status	Haemoglobin OR hemoglobin OR serum ferritin OR serum vitamin D or plasma zinc OR plasma folate OR iodine OR serum retinol
Breastfeeding practices	breastfeed*
Breastfeeding initiation	delayed initiation OR early initiation OR timely initiation
Exclusive breastfeeding	exclusive breastfeed* OR mixed feed* OR infant formula OR formula feed* OR pre-lacteal
Breastfeeding duration	early cessation OR breastfeed* duration OR continued breastfeed* OR any breastfeeding
Complementary feeding practices	complementary feed* OR complementary food* OR infant feed* OR child feed*
Diet	nutrient intake* OR micronutrient* OR diet* OR excessive intake* OR diet* divers* OR food intake*OR food group* OR food quality OR diet quality OR animal-source food OR meat consumption OR antinutrient* OR phytate* OR energy intake* OR macronutrient*
Weaning	weaning OR weaning food* OR introduction of solid food* OR appropriate food* OR appropriate feed* OR food consistency OR meal frequency OR feed* amount OR feed* quantity
Responsive feeding	responsive feed* OR responsive care OR feeding during illness
Childcare practices	child care OR child caregiv* OR caregiv*
Parenting	psychosocial care OR Psychosocial stimulation OR parent* style OR child development OR cognitive stimulation OR cognitive development OR father* OR paternal care OR father engagement OR male engagement
Care seeking	uptake OR utilisation OR use OR immunization OR vaccination OR growth monitoring* OR care seeking
Appropriate caregivers	alternative caregiv* OR secondary caregiv* OR childcare OR daycare OR day care

Food and water safety	food safety OR water safety OR water quality OR clean water OR safe water OR drink* water
Fecal contamination	faecal* OR fecal* OR excreta
Hygiene practices	hand wash* OR hand-wash* OR hygiene OR soap
Food preparation and storage	food storage OR food preparation
Harmful bacteria and toxins	listeria OR listeriosis OR toxoplasmosis OR aflatoxin OR mercury OR pesticid*
Child health and disease	child* illness OR child* disease OR child* infectio*
Enteric infection	diarrhoea* OR diarrhea* OR enteric OR enteropathy OR helmin*
Respiratory infection	respiratory infection* OR respiratory tract infection* OR cough OR pneumonia
Fever	fever
Micronutrient deficiency	anaemia OR anemia OR deficienc*
Malaria	malaria
Appetite	appetite
Inflammation, air pollution	inflammation OR air pollution
Maternal factors	Intergeneration* transmission
Nutrition	maternal undernutrition OR maternal underweight OR thin* OR maternal height OR maternal stature
Diet, nutrient intake	women* diet OR prenatal diet* OR antenatal diet* OR maternal diet* OR maternal nutrient intake* OR food taboo* OR diet* restriction
Health, infection, deficiency	women* infectio* OR prenatal infectio* OR antenatal infectio* OR maternal infectio* OR maternal health OR deficienc*
Early pregnancy	adolescent pregnancy OR teen pregnancy OR teen mother* OR early age OR adolescent* OR teen* OR child marriage
Mental health	depression OR stress OR distress OR anxiety OR mental health OR self-esteem
Women's status, work, empowerment, gender	women* autonomy OR women* empowerment OR women* decision-making OR autonomy OR empowerment OR decision-making
IUGR, preterm, SGA, gestational weight gain	intrauterine growth restriction OR low birthweight OR pre-term OR preterm
Birth spacing	birth interval OR birth spacing OR family planning OR contraception
Hypertension	pre-eclampsia OR eclampsia OR high blood pressure OR hypertensi*
Knowledge, intention	education level OR literacy OR maternal knowledge OR caregiver knowledge OR education* OR training

Utilization of services	antenatal care OR prenatal care OR postnatal care OR postpartum care OR vaccination
Home environment	home environment OR home safety
Sanitation	sanitation OR latrine OR faeces OR feces OR faecal OR fecal OR WASH OR disposal OR fly population
Water supply	water supply OR water access
Food and nutrition security	food security OR food insecurity OR household food supply OR food environment OR food system* OR genetic* modifi* OR biofortifi* OR fortifi*OR household diet* diversity
Intra-household food allocation	intra-household OR food allocation
Domestic abuse	domestic violence OR gender-based violence OR intimate partner violence
Household income and costs	Household income OR out-of-pocket

*Note*: IUGR= intrauterine growth restriction; SGA = small for gestational age.

Table B.3. Exclusion Keywords

Domain	Exclusion Keywords
Contexts and populations	biracial OR crisis OR critically ill OR disaster* OR elderly OR foster OR hospitalized OR hospitalization OR "in low birthweight" OR nosocomial OR older adult* OR older people OR parenter* OR in preterm OR seriously ill OR terminally ill OR trauma* OR travel* OR in very low birthweight
Conditions	acne OR allerg* OR anthrax OR arthritis OR asthma OR atop* OR autism OR autoimmune OR bone OR bowel OR cancer OR cardiac OR cardiovascular OR cardiology OR celiac OR cerebral* OR caesarean OR cholesterol OR cleft OR colic OR colitis OR crohn* OR cushing* OR cystic* OR dental OR dermat* OR dysmenorrhea OR ebola OR epileps* OR haemorrhage OR headache OR hearing loss OR hepatitis OR hirsutism OR HIV OR hypoglycemia OR infert* OR kawasaki OR kidney OR laryngitis OR leprosy OR leukaemia OR lung OR lymphoma OR macular OR melanoma OR Ménière* OR migraine OR miscarriage OR myocardial OR pancrea* OR parkinson* OR noncommunicable disease* OR pain OR palsy OR psoriasis OR pulmonary OR reflux OR sclerosis OR seizure OR sepsis OR sexual dys* OR sickle OR speech OR spina bifida OR spinal OR spine OR stillbirth OR strep OR thyroid* OR tuberculosis OR ulcer* OR urinary OR west nile OR zika
Mental health, behaviors, and cognitive issues	ADHD OR alzheimer* OR anorexia OR borderline personality disorder OR bulimia OR cannabis OR child

abuse OR child maltreatment OR dementia OR gang OR obsessive compulsive OR opioid OR schizophrenia OR smoking

Medical procedures, treatments, and diagnoses

abortion OR catheter\* OR dialysis OR fertility treatment OR in-vitro OR IVF OR surgery OR ventilator

Source: Independent Evaluation Group.

## Notes for Figures B.2-B.19

- <sup>1</sup> Portfolio review categories for nutrition and dietary support include the following nutritionspecific interventions: micronutrient supplementation for children; provision of supplementary feeding for children; provision of supplementary micronutrient foods for children; provision of supplementary energy and protein supplement (macronutrients) for women; micronutrient supplementation for women; and SBCC on nutrition and health practices.
- <sup>2</sup> In this instance of supplementary feeding, birthweight pertains to the next generation.
- <sup>3</sup> Portfolio review categories for child disease prevention and treatment interventions include the following: deworming (such as soil-transmitted helminthiasis); other integrated management of childhood illness for children; malaria prevention (promotion on the use of ITNs with or without the provision of ITNs; treatment of diarrhea (oral rehydration therapy or solution); and treatment of moderate or severe malnutrition of children (such as ready-to-use supplementary food). Portfolio review categories for health and family planning services interventions include the following: supporting demand for family planning and contraception (provision of contraceptives, emergency contraception for birth spacing, and adolescent pregnancy); supporting demand for health care services use, such as fee removal; and supporting maternal mental health.
- <sup>4</sup>Portfolio review categories for WASH approaches include the following: hygiene interventions, such as SBCC promotion and counseling on handwashing with soap and support for a healthy home environment (for example, reduction of indoor air pollution, provision of cookstoves, and fly control); sanitation interventions, such as the provision, construction and promotion of latrines; and water interventions, such as water treatment at point-of-use (for example, chlorination and filtration and solar disinfection), water treatment at source (for example, protected wells, communal tap stands, or chlorination and filtration of community sources), and support for piped water.
- <sup>5</sup> Portfolio review categories for agriculture interventions include the following: support for small-scale animal protein development and livestock production (dairy development, animal husbandry, and poultry development); support for small-scale fisheries and aquaculture; support for development of home garden (household and community own production); support for food safety (food preparation and storage); support for food production, diversification, agriculture machinery and technology, contract farming, food safety (pesticides); fortification and biofortification of food products; cash cropping, that is production of coffee, sugarcane, or other crops intended for sale rather than home consumption, goal income earned from growing cash crops; and support for commercialization of food products (marketed production of crops and animal products by smallholder farmers).

Appendix B
Systematic Review Map and Relevance
of the World Bank Nutrition Portfolio

- <sup>6</sup> Portfolio review categories for early childhood development interventions include support for child play spaces (stimulation environment) and school feeding programs. Social safety nets include cash transfers for families with children or in-kind transfers for families with children (school uniforms).
- <sup>7</sup> Portfolio review categories for institutional strengthening offer support to improve nutrition service delivery and supply and policy, financing, and coordination (nutrition financing and budgeting).

#### **Notes**

- <sup>1</sup> Nutrition-specific interventions or programs address the immediate determinants of fetal and child nutrition and development—adequate food and nutrient intake; feeding, caregiving, and parenting practices; and low burden of infectious diseases. Nutrition-sensitive interventions or programs address the underlying determinants of fetal and child nutrition and development—food security; adequate caregiving resources at the maternal, household and community levels; and access to health services and a safe and hygienic environment—and incorporate specific nutrition goals and action (Ruel and Alderman 2013).
- <sup>2</sup> Keywords lists are available at the end of the appendix. Context-sensitive keywords are related to document type, study type, context (such as developed countries), health outcomes (such as obesity), population (such as migrant or twin), intervention (such as vaccine or clinical), and condition (such as colic).
- <sup>3</sup> Income-level status is based on Bank Group lending status in 2018. Countries that changed from lower-middle-income status to upper-middle-income status during the evaluation timeline are included (for example, Guatemala).
- <sup>4</sup> For example, institutional delivery is included in the literature review due to its link to early initiation of breastfeeding, whereas skilled birth attendance is not.
- <sup>5</sup> As shown in SRM Figures B.2–B.19: Positive indicates that the pooled effect (for meta-analyses) or all underlying studies (for narrative syntheses) of the intervention are found to have a positive effect on the outcome of interest. No effect indicates that the intervention is neither significantly positive nor significantly negative on the outcome of interest. Inconsistent indicates that for a narrative synthesis the evidence of a particular intervention on a specific outcome shows a mix of positive and no effects across the underlying studies. Negative indicates that the intervention is found to have a negative effect on the outcome of interest. Given the direction of the evidence, the dark- and medium-green legends indicate that the evidence of an intervention on a particular outcome is found to be positive in more than three systematic reviews or in up to three systematic reviews, respectively. Similarly, the dark-red legend indicates that the evidence of an intervention on a particular outcome is found to be negative in more than two systematic reviews. The light-green legend indicates that the pool of evidence of a particular intervention on a specific outcome shows a mix of positive effects, no effect, or a combination of both (inconsistent) in narrative synthesis. No evidence indicates that there are no systematic reviews identified in the review.

# **Appendix C. Behavior Change Process Map**

A process map is a practical tool that conveys the relationships and sequencing among inputs, outputs, outcomes, and longer-term impacts across different groups of actors who have roles for achieving development objectives. Mapping the processes through which the World Bank's interventions in the nutrition portfolio help facilitate and support behavior change provides guidance that can be applied both for evaluating the contributions of the World Bank in addressing undernutrition and for planning engagements that are more likely to support sustainable behavior change in the future.

A multitiered approach is used to understand the behavior change sequence and to analyze the extent to which the World Bank has supported interventions within the nutrition portfolio at stages along this sequence. This exercise starts with a structured literature review to identify and categorize behavior change concepts and evidence of how interventions have supported behavior change processes. These findings are used to develop process maps for benchmarking behavior change in projects. The resulting process maps reflect basic results chains by types of actors that can contribute to improvements in nutrition determinants and be adapted to a country context.

#### Structured Literature Review

The structured literature review was conducted to understand the incremental sequences of actions that can lead to sustained behaviors to improve nutrition determinants (access to food, caregiving resources, health services, and water, sanitation, and hygiene [WASH]). The review includes qualitative studies, such as qualitative systematic review and empirical studies, on behavior change interventions. The search protocol (i) uses a list of keywords to search databases (PubMed, Econlit); (ii) uses a snowball sampling approach to identify other relevant sources cited in references; and (iii) identifies references recommended in consultations. Five categories of keywords are used to search for articles for the review: keywords related to undernutrition and stunted growth; keywords related to nutrition determinants (breastfeeding, dietary, diversity, and so on); keywords related to types of actors; keywords related to the type of study; and keywords to limit the search to countries or regions.

The inclusion criteria for the structured review are that the study provides evidence of effectiveness (that is, confirming that an intervention had facilitated a behavior change related to a nutrition determinant), the intervention and target population(s) are in a low- or middle-income country, the study is published within the past 10 years (2009 or later), and the intervention is designed to address undernutrition rather than obesity. All the reviewed studies are published in English. The initial list of 151 publications was

reviewed manually to exclude any studies that did not report on outcomes using transparent, objective, and consistent indicators with some evidence of a results chain (that is, a description of a causal or contributing link between an intervention and improved outcomes). This process yielded a final list of 57 sources that provides relevant qualitative details related to the pathways and processes needed for behavior change. The literature review also reviewed existing behavior change frameworks to identify key concepts from existing behavior change experiences (box C.1). These concepts are used to frame the synthesis of the evidence from the literature using qualitative modeling, as described in the next section.

## **Process Maps to Analyze Behavior Change**

#### **Box C.1 Key Behavior Change Concepts**

**Actions by change agents.** The review of the studies identifies evidence on accelerator actions that may influence one or more behaviors to improve nutrition determinants, as well as related actions that may support caregivers to carry out accelerator behaviors. These changes are identified for the sphere of actors that can influence the mother or caregiver. This draws on the Communication for Development (C4D) framework, the Framework for Scaling Up Infant and Young Child Feeding (IYCF), and The Behavioral Change Framework (UNICEF 2018; Alive and Thrive 2016; USAID 2015).

Capabilities and barriers to motivating behaviors. The review of the studies identifies evidence on actions to influence capabilities, and systemic barriers that, if addressed, may motivate behaviors to improve nutrition determinants. This approach is informed by the World Bank's Mind, Behavior, and Development (eMBeD) group's work to identify barriers or biases to behaviors, the Crl2SP Framework, the COM-B model, and the Integrated Behavior Model for Water, Sanitation, and Hygiene (IBM-WASH) (Flanagan and Tanner 2016; World Bank 2015; Michie 2011; Dreibelbis et al. 2013). In a country context, the specific barriers are diagnosed to inform intervention design.

**Measuring progress toward institutional change.** The review of the studies identifies evidence to articulate the incremental sequence from activities and outputs to sustained behavior modification. This draws on the Institutional Change Assessment Method and the COM-B theory of change model also informed this process (Roberts and Torkos 2017; Michie et al. 2011).

Tracing the sequence from inputs and interventions to outputs and longer-term outcomes provides a basis for understanding how to achieve sustainable behavior change. The first step in this exercise was to synthesize the evidence from the literature as it related to the nutrition determinants (access to food, caregiving resources, health services, and WASH), and types of actors (figure C.1). Synthesizing the evidence by actor provides an understanding of the interactions among change agents and mothers and primary caregiver beneficiaries to improve nutrition determinants. Policy actors are outside the scope of the analysis, and primary caregivers have served dual roles in the analysis, sometimes acting as change agents empowered to shift behaviors and sometimes serving as beneficiaries. Evidence related to determinants of food and

caregiving (food and care) is merged given the overlap between feeding and caregiving behaviors in the literature.

Service Providers Includes frontline extension and Government and outreach workers and individual Non-government workers in facilities of relevant sectors (health, agriculture, water, and so on) Community Includes opinion leaders, community organizations and volunteers, and the Family/ local population more broadly Households Most notably husbands and mothers-Mothers/ Caregivers Mothers of children under 5, especially in first 1,000 days

Figure C.1. Actors for Behavior Change Interventions to Reduce Child Undernutrition

Source: Independent Evaluation Group.

Evidence regarding the sequence of changes by actor groups presented in the literature was used to draft results chains or "process maps," by determinant and actor. Each study typically provides evidence supporting only selected steps along the results chain; these examples were collectively analyzed to understand changes in actions across actors.

The evidence on behavior change processes from the literature is synthesized in table C.1 by determinant, actor, and levels of the results chain. These progressive changes reflect the translation of information into action assuming that there is access to and control of other resources. Examples of indicators tracking progress for changes in behavior by different actors were also extracted during the literature review for each part of the results chain. These indicators are not exhaustive, but instead, illustrate actual measurement approaches used in the reviewed literature. The measurement of knowledge transfer and use relies heavily on qualitative approaches (interviews and focus groups) given the limited availability of existing timely data from administrative sources (management information systems) or household surveys.

A notable contribution of the process maps is the delineation of levels along a results chain (engage-learn-apply-sustain), which lead from initial inputs and outputs all the way to sustained behavior change that could be expected to persist after interventions are completed. Behavior change processes are rarely linear and require interactions

across actors and complex reinforcement (or looping) among different types of outputs and outcomes; nonetheless, the definition of clear levels of progress toward behavior change could facilitate effective planning and evaluation (figure C.2).

Figure C.2. Tracing Evidence of Behavior Change in Actors



Source: Independent Evaluation Group.

The synthesized literature is used to develop process maps for key groups of actors that highlight behavior changes for supporting nutrition determinants. Although this progression is complex—with non-linear interactions across types of actors and many contextual variations in how actions are carried out in countries—the articulation of results chains is useful to outline inputs, outputs and outcomes, which can facilitate measurement, as well as the understanding of more complex, contextualized theories of change. An aggregate process map is provided in figure C.3, with results chains that are synthesized across actor groups (mothers and caregivers, family and household, and community and service providers) to understand how factors across the determinants can play a role in inhibiting or advancing achievements. Figures C.4–C.7 expand the process map for a more detailed understanding of the incremental progression for each type of actor.

Together, the classification of actors, synthesis of literature, and indicators for measuring incremental changes, and the process map diagrams serve as tools to benchmark nutrition interventions facilitating behavior change. The maps could help inform project planning and evaluation within each area of nutrition determinant.

Table C.1. Synthesis Tables Tracing Behavior Change Levels by Determinant and Actor

### **Access to Food and Care**

ESULTS HAIN >	Engage	Learn	Apply	Change
ctors >	Mothers/Caregivers			
	Caregivers understand bene- fits of infant and young child feeding (IYCF) and nurturing	Caregivers are aware of programs and/or services available to improve child care and feeding.	Caregivers develop and imple- ment a plan for exclusive breastfeeding (EBF).	
	care practices (such as breast-feeding and timely initiation of solid food).  Caregivers understand risks associated with poor dietary quality, and the need to prepare and store food for the lean season.  Caregivers perceive it is acceptable (that is, have a supportive environment in household and community) to implement IYCF and diet diversification practices.  Example indicators:  Reported perceptions in interviews about the importance of breastfeeding.  Reported extent to which surveyed mothers reach out to authorities or neighbors to address emerging problems (measure of trust, often a precondition for participating in community groups and services).	Caregivers gain knowledge related to maternal nutrition and child care and feeding practices (such as breastfeeding, lactation management, complementary feeding, and dietary diversity). Caregivers develop adequate confidence in their ability to breastfeed. Caregivers learn how to prepare diverse, nutritious foods using ingredients available in the local community. Caregivers learn practical food storage and preservation techniques to save food for the lean season.  Example indicators: % of caregivers who heard of available nutrition service/program. Knowledge score for caregivers based on health and nutrition knowledge questions (breastfeeding quantity and quality of complementary foods, feeding during	Caregivers demand and/or pool resources to meet child feeding and care needs (such as share of household expenditures, nutrients, and agricultural inputs). Caregivers participate in community-based nutrition interventions (such as support groups, cooking demonstrations, and knowledge sharing). Caregivers use knowledge, skills, and resources to prepare more nutritious meals.  Example indicators: Binary indicator of whether children had consumed any animal-sourced foods. Number of community social groups where caregiver is an active member.  % of caregivers who developed prenatal EBF plan. Percentage of target population who used IVCE counseling.	Caregivers implement recommended care and feeding practices for infants, young children, and pregnant women Mothers and their young children have adequate dietary diversity.  Households support dietary diversity through increased agricultural production diversity and/or food purchasing practices.  Household pools resources (increased equality between men and women for making decisions about expenditures and/or agricultural inputs).  Example indicators:  % of pregnant women getting daily iron/folate.
TCILITE	Services).	illness, and responsive feeding).	tion who used IYCF counseling.	months
ESULTS HAIN >	Engage Eamily/Household	Learn	Apply	<ul> <li>% of children receiving timely introduction of solid, semi-solid, or soft foods.</li> </ul>
CTORS >	Family/Household  - Household adults (husband, mother-in-law, and so on) share common understanding that child nutrition and nurturing care is a "concern	Husbands learn concrete actions that can help to support better maternal nutrition practices.     Household members develop	Household increases/shifts labor supply or income as needed to support nutritious food consumption for women	<ul> <li>Minimum dietary diversity for women of reproductive age (MDD-W).</li> <li>Children's (6 to 59 months of</li> </ul>
	for all" (no gender gap).  • Household adults gain	knowledge to support good child care and feeding practices.	and children, such as by own- ing poultry and/or goats or planting a "kitchen garden".	
	Household adults gain awareness of the importance of adequate maternal, infant, and young child nutrition and the benefits of recom- mended practices.	care and feeding practices.  Household members learn skills related to food production, including composting, pest management, and growing a "kitchen garden".  Smallholder households under-	ing poultry and/or goats or planting a "kitchen garden".  • Husbands promote feeding animal-sourced food to children.  • Household adults support mothers in adopting	sured as the number of food groups consumed in the last 24 hours from seven food groups.  Household dietary diversity score (food groups consumed in the past week).  Number of crop and livestock
	Household adults gain awareness of the importance of adequate maternal, infant, and young child nutrition and the benefits of recom-	care and feeding practices.  Household members learn skills related to food production, including composting, pest management, and growing a "kitchen garden".  Smallholder households understand opportunities to increase dietary diversity through crop selection.  Example indicators:	ing poultry and/or goats or planting a "kitchen garden".  Husbands promote feeding animal-sourced food to children.  Household adults support mothers in adopting recommended practices for nutrition during pregnancy and breastfeeding.  Smallholder households adopt practices to increase	sured as the number of food groups consumed in the last 24 hours from seven food groups.  Household dietary diversity score (food groups consumed in the past week).  Number of crop and livestock species produced on a farm (household crop and livestock production survey).  % of women who report being able to make household
	Household adults gain awareness of the importance of adequate maternal, infant, and young child nutrition and the benefits of recommended practices.      Example indicators:     % of husbands that attended husband's forum during wife's pregnancy.     % of household adults perceiving dietary diversity as important.	care and feeding practices.  Household members learn skills related to food production, including composting, pest management, and growing a "kitchen garden".  Smallholder households understand opportunities to increase dietary diversity through crop selection.	ing poultry and/or goats or planting a "kitchen garden".  • Husbands promote feeding animal-sourced food to children.  • Household adults support mothers in adopting recommended practices for nutrition during pregnancy and breastfeeding.  • Smallholder households adopt practices to increase agricultural production diversity (such as irrigation).	sured as the number of food groups consumed in the last 24 hours from seven food groups.  Household dietary diversity score (food groups consumed in the past week).  Number of crop and livestock species produced on a farm (household crop and livestock production survey).  % of women who report being able to make household decisions about expenditures,
	Household adults gain awareness of the importance of adequate maternal, infant, and young child nutrition and the benefits of recommended practices.      Example indicators:     % of husbands that attended husband's forum during wife's pregnancy.     % of household adults perceiving dietary diversity as	care and feeding practices.  Household members learn skills related to food production, including composting, pest management, and growing a "kitchen garden".  Smallholder households understand opportunities to increase dietary diversity through crop selection.  Example indicators:  Husbands' knowledge scores related to maternal nutrition and	ing poultry and/or goats or planting a "kitchen garden".  • Husbands promote feeding animal-sourced food to children.  • Household adults support mothers in adopting recommended practices for nutrition during pregnancy and breastfeeding.  • Smallholder households adopt practices to increase agricultural production	sured as the number of food groups consumed in the last 24 hours from seven food groups.  Household dietary diversity score (food groups consumed in the past week).  Number of crop and livestock species produced on a farm (household crop and livestock production survey).  % of women who report being able to make household

- Actor gains awareness and motivation to develop new capabilities Actor develops new knowledge and skills for changing behavior

  Actor draws on available resources and programs to support change | Change in actor to consistently support determinant of nutrition

### Access to Food and Care, continued

En	gage	Learn	Apply	Change
> Communi	ity			
awareness of mended IVG and adequal nutrition.  Community awareness a tial roles for related to reto ensure the women and community awareness a urgency for storage and practices and social norm conservation viewed as period to social norm and committee a	CF practices ate maternal y leaders gain about poten-community soource pooling he nutrition of d children. Y leaders gain about the improving food d preservation had changing is (that is, food on should not be orimitive).  Ilicators:  Ilicators:	Women's associations and faith-based groups develop outreach skills to promote IYCF practices. Community leaders/elders understand the dangers of traditional practices (such as diluted porridge or "leaky baby") and learn how to support and promote recommended care and feeding practices. Community members recognize dietary quality as a community concern and understand minimum dietary requirements for healthy child development. Community members develop knowledge and skills related to sustainable agricultural practices, animal management, and gender awareness for improving dietary quality.  Example indicators: % of community workshop participants demonstrating an increased understanding of a specific topic (safe food storage, sustainable agriculture). Quality of knowledge/awareness held by community leader (explored through structured).	Community entities (such as health and/or agricultural committees, women's groups, community leaders, and community and faith-based groups) reinforce messages delivered by service providers about nurturing care and feeding for children and maternal nutrition. Community entities offer activities and services to promote IYCF norms (such as community conversations, cooking demonstrations, and family recognition awards). Community leaders endorse peer counselors or local service providers to promote good nutrition and caregiving practices on an ongoing basis. Community entities teach caregivers about food conservation (such as using the sun for drying and underground cellars for cooling).  Example indicators: EBF Social Support Scale for low-resource settings (Uganda experience). Number of monthly community activities implemented to promote IYCF. Endorsement of community leader for programs (through ceremony, allocation of funds, or other resources, and so on).	Community leaders demonstrat ongoing commitment to supporting IYCF practices. Social norms promote good practices for care and feeding of children—community members widely perceive minimum dietary quality for women and children as a community concern. Communities establish mechanisms to reinforce food security for households with low income or limited resources.  Example indicators: Husbands' social norms scores—% surveyed who believ most other husbands in villages took similar actions to support their wives. Existence of supportive community policy or program (confirmed through expert review).
S Eng	gage	Learn	Apply	Change
	roviders/NGO	s		
Public servi (that is, hea agricultural and NGOs u local contex service delivitation of the community providers, in volunteers) standard guincentives fidelivery.  Example ind Completion evaluation of analysis. Existence of reward systrence of reward systrence of agricultural and context of the context of	ce providers Ilth facilities and sextension units understand the kt and current very gaps.  orkers y-based including understand the idelines and for IYCF service  dicators:  of formative or situational	Public service providers and NGOs identify resource needs for effective delivery of nutrition and child health services (understanding requirements for staffing, supervision, and support).     Frontline workers develop adequate technical knowledge and skills related to feeding and care of infants and children.  Frontline workers develop effective communication skills to facilitate knowledge transfer and/or behavioral change.  Example indicators:  IYCF and nutrition knowledge scores collected through health provider survey.  Development of strategic/	Public service providers and NGOs establish adequate household coverage and/or outreach strategies and/or outreach strategies and/or partnerships to provide continued frequent support to families.      Public service providers and NGOs develop job aids, incentives, and supportive supervision to adequately support frontline workers and/or community volunteers.      Example indicators:         Rating of health staff competence and performance during IYCF counseling.         Ratio of service providers to households.         Frequency of supervision of services.         Rating of knowledge-sharing efficacy (comparing knowledge	Public service providers and NGOs improve their delivery of services to support IYCF practice     Frontline workers deliver a pack age of nutrition services accessible to the targeted population(in partnership with public sector services.     Health facilities/service organizations integrate IYCF counseling into their services for ongoing coverage.     Public sector services and NGOs use routine monitoring data to improve service delivery.     Health facilities/service organizations are accountable to community with reputation for quality.  Example indicators:     Level of mothers' satisfaction with services and/or reasons for

Sources: Agrawal et al. 2012; Baker, Hajeebhoy, and Abrha 2013; Balogun et al. 2015; Bazzano et al. 2017; Belachew et al. 2012; Benson 2015; Black et al. 2015; Darrouzet-Nardi et al. 2016; Favara 2018; Fitzsommons et al. 2012; Gelli et al. 2018; Goyal and Sekher 2016; Haroon et al. 2013; Haselow, Stormer, andPries 2016; Hilmye et al. 2011; Hirani and Roozina 2012; Imdad and Bhutta 2011; Kavle et al. 2017; Kumar, Harris, and Rawat 2015; Malapit et al. 2015; Mduduzi et al. 2015; Nguyen et al. 2018; Noack and Pouw 2015; Numeri et al. 2018; Reerink et al. 2017; Sanghvi et al. 2013; Shi et al. 2010; Yourkavitch et al. 2017. Note: EBF = exclusive breastfeeding; IYCF = infant and young child feeding; NGO = nongovernmental organization.

## **Improving WASH Practices**

RESULTS CHAIN >	Engage	Learn	Apply	Change
ACTORS >	Mothers/Caregivers			
	Caregivers understand the risks of not practicing good hygiene and water treatment practices for child health and nutrition.	Caregivers gain knowledge on handwashing with soap and hygiene behaviors for safe food storage and preparation.	Caregivers maintain adequate personal hygiene (cleanliness of clothes, cleanliness of the body, and care of hair and fingernalls).	
	Caregivers gain awareness of the social desirability of handwashing.     Caregivers perceive open defecation to be shameful and avoided if possible.      Example indicators:     % of mothers/caregivers who have heard of water purification methods and potential value, by type of method.     % of mothers reporting that handwashing (or other targeted WASH behavior) is socially desirable.     % of mothers who believe it is better to drink purified water.	Caregivers understand adequate sanitation practices, including using a latrine and disposing of a child's feces.  Example indicators:  So of surveyed mothers who accurately identify moments when they need to wash hands to prevent germs from reaching food.  Knowledge and attitude scores for mothers regarding household water purification.	Caregivers perform the steps needed to ensure clean drinking water (such as using effective water treatment or a designated water source). Caregivers ensure children play in sanitary areas. Caregivers use available resources to improve sanitation for themselves and children.  Example indicators:  % of caregivers reporting uptake of recommended hygiene and sanitation practices during food preparation and complementary feeding of children, collected by observation checklist.  % of interviewed mothers reporting that they always treat	<ul> <li>Handwashing is established as a habit in critical times (such as after defecation, after changing diapers, and before food preparation and eating).</li> <li>Caregivers consistently use safely managed sanitation services, not shared with other households.</li> <li>Caregivers and children consistently consume safely managed drinking water.</li> <li>Households have sustained access to safe drinking water.</li> </ul>
RESULTS	Engago	Loarn	their drinking water.  Rating of play area conditions using observation checklist.	Household members have decreased exposure to known causes of gastro- intestinal illness: drinking contaminated water, eating
CHAIN >	Engage Family/Household	Learn	Apply	spoiled food, having poor personal hygiene, and hav- ing contact with standing water in the environment.
	Household adults are aware of the risks of not practicing good hygiene and water treatment practices for the health and nutrition of children and family members.     Household adults and older children perceive open defecation to be shameful and avoided if possible.  Example indicators:     % of households reporting that construction of a latrine is a high priority.     % of surveyed adults reporting that they are ashamed to not have a toilet or latrine at their house (disaggregated by gender).  RESULTS CHAIN KEY	Household adults and older children learn good water management and WASH behaviors—including effective water treatment, handwashing with soap, using a latrine. and disposing of a child's feces.      Example indicators:	Household members apply knowledge to practice adequate water treatment and storage, hand hygiene, and sanitation practices.      Example indicators:	Number of households within 1 km of water (depends on geographic characteristics).     % of households with a handwashing facility and soap.     Household ratings for sanitation.

Actor develops new knowledge and skills for changing behavior

Actor draws on available resources and programs to support change | Change in actor to consistently support determinant of nutrition

Sources: Alzua et al. 2015; Bauza, Routray, and Clasen 2019; Cumming and Cairncross 2016; Davis et al. 2011; Islam et al. 2013; Luby et al. 2018; Newson et al. 2013; Pattanayak et al. 2009; Unicomb et al. 2018; Venkataramanan, Crocker, and Bartram 2018; Watson et al. 2017; Wodnik et al. 2018; Wood and Kols 2012; WHO, USAID, and UNICEF 2015.

# **Improving WASH Practices, continued**

.TS  }	Engage	Learn	Apply	Change
s <b>&gt;</b>	Community			
	Community members gain awareness of risks and loss of dignity associated with open defecation. Community leaders commit to establishing good WASH behaviors.  Example indicators: Agreement by community leaders to begin action planning to become open defecation free (ODF).	Community leaders learn about resource requirements and needed actions for improving access to clean water and sanitation.  Example indicators:  Community leaders and/or key stakeholders demonstrate an adequate understanding of sources of financing and sanitation providers to help end open defecation (post-triggering phase of Community-Led Total Sanitation initiative).	Community and school facilities  Establish handwashing stations with soap and water.  Incorporate architectural nudges to encourage handwashing.  Provide safe (hygienic) play environments for children.  Improve the collection and storage of drinking water.  Promote the use of latrines to reduce open defecation.  Apply architectural nudges, such as painting a path on the floor from a latrine to a handwashing basin to generate a measurable effect for behavioral change.  Example indicators:  Establishment of community sanitation committee (number of members, bylaws).  ODF certification.	Social norms promote good hygiene and sanitation practices. Community allocates adequate budget and/or resources for sanitation services. Community is ODF.  Example indicators: Number of villages/areas where all nutrition programs that are implemented include a WASH element.  Go f community members indicating a strong preference and support for WASH behaviors (through survey, focus group, or community forum).
.TS	Engage	Learn	Apply	Change
I > RS >	Service Providers/NGOs			
	Frontline workers gain awareness of their potential impact on WASH behaviors and the link to nutrition outcomes.      Example indicator:	Service providers understand preventative behaviors to avoid four known causes of gastrointestinal illness: drinking contaminated water, eating spoiled food, having poor personal hygiene, and having contact with standing water in the environment.  Frontline workers have effective communication skills to facilitate knowledge transfer and/or behavior change for teaching water treatment, hygiene, and sanitation practices.  Example indicator:  Frontline workers' knowledge scores regarding causes of gastrointestinal illness.	Frontline workers teach effective sanitation and/or hygiene practices and monitor progress at household and community levels.     Health facilities establish handwashing stations with soap and water and incorporate architectural nudges to encourage handwashing.  Example indicators:     % of facilities that have modified follow-up supervision and monitoring to include WASH elements.     Proportion of health facilities where the main source of water is an improved source, located on premises, from which water is available.	Community/local administrative unit has established policies and procedures for participation in water and sanitation management. Health facilities establish standards and accountability for WASH services.  Example indicator: Quality of standards for accountability assessed through expert review.

- Actor develops new knowledge and skills for changing behavior
   Actor draws on available resources and programs to support change | Change in actor to consistently support determinant of nutrition

## **Access to Health Services**

RESULTS THAIN >	Engage	Learn	Apply	Change
CTORS >	Mothers/Caregivers			
	Caregivers understand the urgency to seek treatment for malnutrition, diarrhea, and infections that threaten early child development.     Caregivers understand the importance and benefits of vaccinations.	<ul> <li>Caregivers learn appropriate prevention and treatment skills, such as how to care for children with diarrhea.</li> <li>Caregivers understand the signs of malnutrition and/or dehy- dration and when to seek assis- tance outside the household.</li> </ul>	<ul> <li>Caregivers prepare recommended home-based treatment (such as oral rehydration therapy, or ORT) or seek care from a health provider to treat children with diarrhea.</li> <li>Caregivers adhere to treatment guidelines.</li> </ul>	
	Women understand the importance of antenatal and post-natal care (ANC and PNC) and birth spacing for maternal and child health outcomes.      Women perceive that the health system provides bene-	Caregivers learn key details about immunizations—what, where, when, and possible adverse effects. Pregnant women gain knowledge about recommended procedures included in ANC and PNC and where and when they	Caregivers comply with immunization schedules for children and seek care for any adverse effects.  Pregnant women attend ANC and PNC visits on a recommended schedule.	Children consistently receive needed treatment for diarrhea at onset of symptoms.
	fits and good quality care.	should receive them.  Example indicator:	Example indicators:     % of children receiving sched-	Children receive a full course of timely vaccinations.
	W of mothers reporting they were referred to seek services or attended recommended a health appointment.     Reported perceptions in interviews about the need to	• % of surveyed caregivers who can identify when and where to seek treatment for diarrhea for their children.	uled immunizations.  • % of mothers in intervention group that reported not missing more than two antenatal visits.	Pregnant women attend all recommended ANC visits during pregnancy.     Caregivers consistently seek health services for children under 5 years old with fever or
TCILL TC	use services if child is well.			other symptoms of chronic or acute infection.
RESULTS THAIN >	Engage	Learn	Apply	Example indicators:
CTORS >	Family/Household			% of children under age 5 who had diarrhea in two weeks
	Household adults perceive health system provides benefits and good quality care and recommendations for prevention and treatment should be followed.     Household adults understand the importance of seeking treatment for malnutrition, diarrhea, and/or other infections that threaten early child development.  Example indicators:     % of households reporting no plans to use/attend a recommended health service for children until they were contacted by a community volunteer.     % of husbands reporting that they had accepted or looked at offered materials/illustrations to become more familiar with the pregnancy experience and potential complications.     % of husbands indicating that severe acute malnutrition is a serious condition requiring medical treatment.	<ul> <li>Household adults understand the signs of malnutrition and/ or dehydration of infants and children and when to seek assistance outside the household.</li> <li>Household adults understand recommendations of the health care system related to immunizations and the procedures and timing for ANC and PNC.</li> <li>Household adults know when to seek care in response to complications from pregnancy.</li> <li>Example indicators:</li> <li>% of interviewed adults who could accurately list signs of malnutrition or dehydration.</li> <li>For women pregnant during the last 12 months, % of husbands that could list some or all of the danger signs to watch out for during pregnancy or postpartum.</li> </ul>	Household adults and older children support actions as relevant to enable the use of health services, such as babysitting other children, helping with transportation, covering household chores, etc.      Household adults help to administer in-home remedies for infection and dehydration as needed.      Husbands/household adults reserve savings/resources to cover any costs related to pregnancy and/or incurred for care-seeking in response to obstetrical and neonatal complications.  Example indicator:      % of households where children received regular recommended health services (via self-reported data, administrative data or through visual confirmation, such as an immunization card).      % of households where adults described administering treatments as recommended in a designated time period.      % of maternal and newborn health visits attended by the husband/father.	preceding survey and received ORT or oral rehydration salts or solutions (ORS) in conjunction with zinc.  • % of children 12 to 23 months old who received all basic vaccinations.  • Among women with a live birth in the last three years, % of women who received at least four ANC visits during the most recent pregnancy.

- RESULTS CHAIN KEY

   Actor gains awareness and motivation to develop new capabilities | Actor develops new knowledge and skills for changing behavior
   Actor draws on available resources and programs to support change | Change in actor to consistently support determinant of nutrition

## Access to Health Services, continued

CTORS >	Community			
	Community members gain awareness of the risks of malnutrition, diarrhea, and/ or other infections for early child development and the need to seek or support prompt treatment.  Community leaders agree to participate in activities to promote community awareness of the importance of birth preparedness and complication readiness.  Example indicator:  % of invited community members attending sensitization event.  % of community members in designated group that recognize severe acute malnutrition as a serious condition requiring medical treatment.  Stated commitment of community leader/representative for increasing birth preparedness and complication readiness (recognized as a community concern).	Community leaders understand appropriate treatment options for malnutrition and infections and the need for broad awareness raising (such as to promote the use of ORS over antibiotics). Community leaders understand the roles and reasons for the community to support birth preparedness and complication readiness.  Example indicator:  % of community members who could identify available community-based programs or services for preventing or treating malnutrition.	Community promotes vaccination uptake and infection prevention and treatment-seeking behaviors for mother and child. Community mobilizes available resources as needed to address signs of undernutrition or disease outbreaks. Community representatives/organizations collaborate with health service providers to ensure adequate birth preparedness and complication readiness. Community monitoring system includes measures of health care usage as a measure of progress.  Example indicators: % of community volunteers who reported that they felt "a lot" of support from village headmen or other community leaders to ensure adequate child nutrition and care. Implementation of a community awareness strategy, endorsed by leaders, to promote planning for birth preparedness and complications.	Community broadly trusts local health providers and recommended immunization and treatment practices (supportive social norms).  Women's access to and use of ANC and PNC services is widely viewed as a human right rather than a privilege or charity.
ESULTS HAIN >	Engage	Learn	Apply	Change
CTORS >	Service Providers/NGOs			
	Health providers gain formative understanding of local barriers to health services and the need for appropriate treatments (that is, increased awareness of reasons for and extent of health service delivery gaps).     Community-based providers are aware of and accountable for adhering to standard treatment guidelines.  Example indicator:     Existence of an incentive system or supportive supervision mechanism to help ensure service providers perform expected roles.	Facility and community-based health providers develop knowledge and skills to promote and deliver services for preventing and treating infections.      Health providers learn approaches for educating mothers and the broader community on appropriate treatment options for infections.      Health facilities understand resource needs (staffing, training, infrastructure) for providing adequate care.      Example indicators:      Knowledge scores of health providers for area of focus (that is, risks of malnutrition, treatment protocols, birth preparedness, and signs of complications).      Reported level of confidence among community health workers for performing their daily tasks.	Community-based providers implement communications campaign to generate demand for health services. Health facilities develop plan for efficient and effective service delivery with available resources. Health facilities and community leaders develop partnerships to increase the access to and quality of community health care. Facility and community-based health providers deliver appropriate treatment and care.  Example indicators: Adherence of community-based providers to essential care practices at the household level in their catchment area (household survey).  6 of newborns receiving checkups by a skilled health professional (household survey of recently delivered women assessing coverage). Satisfaction ratings of health care quality by mother. Compliance level of frontline health workers for submitting administrative data (such as, registering pregnancies and updating child growth charts in records).	Health system effectively promotes and delivers adequate, accessible, and affordable health services for maternal health and for preventing and treating infections in infants and children.      Under Universal Health Coverage, provisions are available to support families or reduce out-of-pocket expenses for care seeking in response to obstetric complications.  Example indicators:      Alignment of missions among relevant service providers in targeted area (NGOs, public sector).      % of women of reproductive age (15 to 49 years), either married or in a union, who have their need for family planning satisfied (noted as one widely available indicator related to availability of maternal health services).

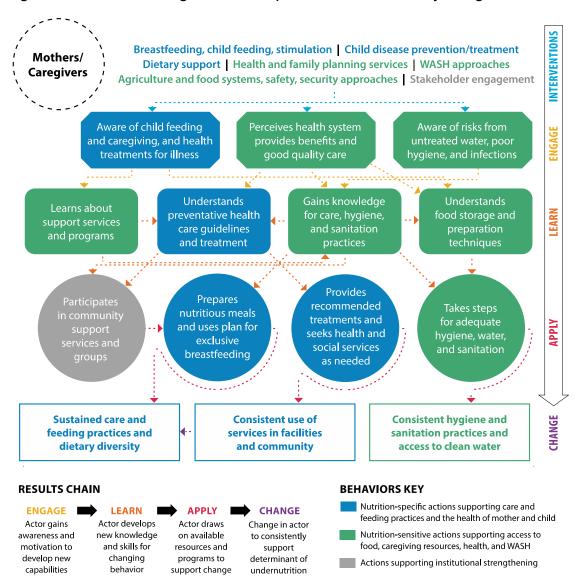
Sources: Agrawal et al. 2012; CORE Group 2009; Dewey and Mayers 2011; Manda-Taylor et al. 2017; Mutanda, Waiswa, and Namutamba 2016; Okuga et al. 2017; Pell et al. 2013; Rahman et al. 2018; Taleb et al. 2015; Watterson, Walsh, and Madeka 2015

Note: ANC = antenatal care; NGO = nongovernmental organization; ORT = oral rehydration therapy; PNC = postnatal care.

**ENGAGE LEARN APPLY CHANGE** Interventions for Mothers/Caregivers Sustained Prepares - nutritious meals Breastfeeding, child Aware of child feeding, stimulation preventative health care feeding and and feeding Child disease practices and dietary prevention/treatmen ealth treatments breastfeeding diversity 4 for illness Dietary support Health and family planning services Consistent **Provides** Agriculture and hygiene and Perceives health system provides benefits and quality care Takes steps for adequate hygiene, water and sanitation Consistent sanitation food systems, safety, recommended knowledge for care, hygiene, and use of services practices and security approaches in facilities preparation techniques seeks health and access to clean WASH approaches and community social services Stakeholder as needed engagement Aware of risks from untreated water, poor hygiene, and infections Interventions for Pooled Family/Household Breastfeeding, child and decisionfeeding, stimulation making between for women and children men and women Child disease to improve food access prevention/treatment Learns skills Dietary support in food production, storage, and/or crop selection Health and family water treatment Use of planning services safe water and Agriculture and handwashing to reduce food systems, safety, crops, livestock, infection and adequate child eeding and care security approaches consumption of child feeding and care practices diverse foods WASH approaches Social norms promotion Improved community norms Interventions for Community and support structure Stakeholde engagement, Established mechanisms to including prevent food insecurity community-based interventions Increased Social norms trust in service promotion providers Interventions for Improved Service Providers/ delivery of sectoral **Government and** nutrition services Non-government Improved (health, WASH, delivery of Strengthening of agriculture) frontline services nutrition services that reach 4. (caregiving, WASH, househo**l**ds rontline workers to acilitate behavioral agricultural, child disease, dietary) **RESULTS CHAIN BEHAVIORS KEY** Nutrition-specific actions supporting care and ENGAGE LEARN **APPLY CHANGE** feeding practices and the health of mother and child Actor gains Actor develops Actor draws Change in actor awareness and new knowledge on available to consistently Nutrition-sensitive actions supporting access to and skills for motivation to resources and support food, caregiving resources, health, and WASH develop new changing programs to determinant of Actions supporting institutional strengthening behavior capabilities support change undernutrition

Figure C.3. Behavior Change Process Map by Actor Type

Figure C.4. Behavior Change Process Map for Mothers or Primary Caregivers

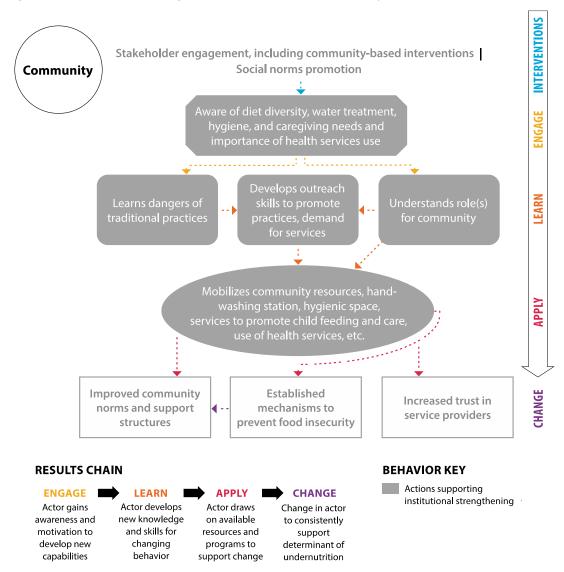


INTERVENTIONS Breastfeeding, child feeding, stimulation | Child disease prevention/treatment Family/ **Dietary support** | Health and family planning services | WASH approaches Household Agriculture and food systems, safety, security approaches | Social norms promotion Aware of adequate child feeding and hygiene, and infections care practices Learns water Learns skills in food Learns to support child feeding and and/or crop selection care practices Adopts water **Promotes** treatment and nutritious foods food diversity for women practices, such as and children crops, livestock, and poultry Use of safe water and hand-Pooled resources and decisionwashing to reduce infection and making between men and consumption of diverse foods women to improve food access **RESULTS CHAIN BEHAVIORS KEY** Nutrition-specific actions supporting care and **ENGAGE CHANGE** LEARN APPLY feeding practices and the health of mother and child Actor gains Actor develops Actor draws Change in actor new knowledge Nutrition-sensitive actions supporting access to on available awareness and to consistently food, caregiving resources, health, and WASH motivation to and skills for resources and support changing develop new programs to determinant of Actions supporting institutional strengthening capabilities behavior support change

undernutrition

Figure C.5. Behavior Change Process Map for Family/Household

Figure C.6. Behavior Change Process Map for Community Actors



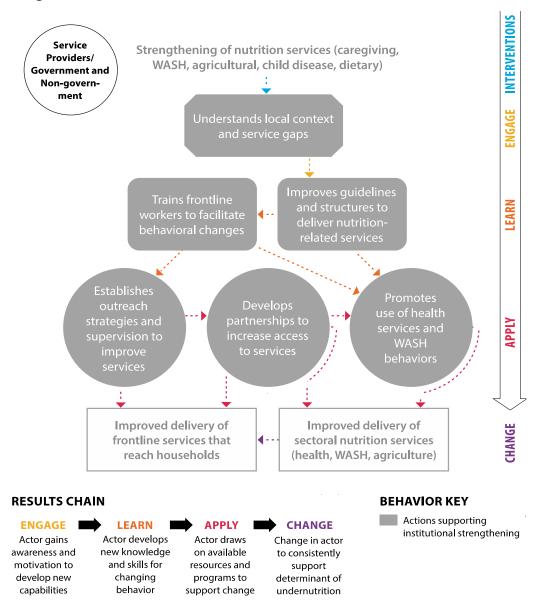


Figure C.7. Behavior Change Process Map for Service Providers/Government and Nongovernment

#### References

## **General Guidance for Conceptual Approach**

Alive and Thrive. 2016. "Changing Behaviors, Improving Lives: Scaling Up Nutrition." https://www.aliveandthrive.org/wp-content/uploads/2018/07/Overview-brief-final.pdf

Dreibelbis, R., P. J. Winch, E. Leontsini, K. R. S. Hulland, P. K. Ram, L. Unicomb, and S. P. Luby. 2013. "The Integrated Behavioral Model for Water, Sanitation, and Hygiene: a systematic

- review of behavioral models and a framework for designing and evaluating behavior change interventions in infrastructure-restricted settings." *BMC Public Health*. 2013(13): 1015. Published 2013 Oct 26.
- Flanagan, Ann Elizabeth, and Jeffery Tanner. 2016. *A framework for evaluating behavior change in international development operations (Vol. 2) (English)*. IEG Working Paper 2016/No. 2. Washington, DC: World Bank Group.
- Mayne, J. 2015. "Useful Theory of Change Models." *Canadian Journal of Program Evaluation* 30(2): 119–142.
- Michie, Susan, Maartje M. van Stralen, and Robert West. 2011. "The Behavior Change Wheel: A New Method for Characterizing and Designing Behavior Change Interventions." *Implementation Science* 6: 42. http://doi.org/10.1186/1748-5908-6-42.
- Mosler, HJ. 2012. "A systematic approach to behaviour change interventions for the water and sanitation sector in developing countries: a conceptual model, a review and a guideline." *Int J Environ Health Res.* 22(5): 431–49.
- Roberts, D., and A. Torkos. 2017. *Results of the World Bank's RAS program in Romania*, 2012–15. Washington, DC: World Bank Group.
- United Nations Children's Fund (UNICEF). 2018. Communication for Development (C4D) Strategic Framework 2018–21. UNICEF Regional Office for South Asia. Kathmandu.
- United States Agency for International Development (USAID). 2015. The Behavior Change Framework: A template for accelerating the impact of behavior change in USAID-supported MCH programs in 24 priority countries. Washington, DC
- World Bank. 2015. World Development 2015: Mind, Society, and Behavior. Washington, DC: World Bank Group.

#### Food and Care

- Agrawal, P. K., S. Agrawal., S. Ahmed, G. L. Darmstadt, E. K. Williams, H. E. Rosen, and A. H. Baqui. 2012. "Effect of knowledge of community health workers on essential newborn health care: a study from rural India." *Health policy and planning* 27(2): 115–126.
- Baker, J., T. Sanghvi, N. Hajeebhoy, and T. H. Abrha. 2013. "Learning from the Design and Implementation of Large-Scale Programs to Improve Infant and Young Child Feeding." Food and Nutrition Bulletin, 34(3\_suppl2), S226–S230.
- Balogun, O., A. Dagvadorj, K. Anigo, E. Ota, and S. Sasaki. 2015. "Factors influencing breastfeeding exclusivity during the first 6 months of life in developing countries: a quantitative and qualitative systematic review." *Maternal & child nutrition*. 11. 10.1111/mcn.12180.

- Bazzano, A. N., A. Kaji, E. Felker-Kantor, L. A. Bazzano, and K. S. Potts. 2017. "Qualitative Studies of Infant and Young Child Feeding in Lower-Income Countries: A Systematic Review and Synthesis of Dietary Patterns." *Nutrients* 9(10): 1140. doi:10.3390/nu9101140.
- Belachew, T., D. Lindstrom, A. Gebremariam, C. Jira, M. K. Hattori, C. Lachat, ... P. Kolsteren. 2012. "Predictors of chronic food insecurity among adolescents in Southwest Ethiopia: a longitudinal study." *BMC public health* 12: 604. doi:10.1186/1471-2458-12-604
- Benson, Todd. 2015. "Association between Irrigated Farming and Improved Nutrition in Farm Households in Malawi." *Agrekon* 54(3): 62–86.
- Black, M. M., R. Pérez-Escamilla, and S. F. Rao. 2015. "Integrating nutrition and child development interventions: scientific basis, evidence of impact, and implementation considerations." *Advances in Nutrition* (Bethesda, Md.) 6(6): 852–859. doi:10.3945/an.115.010348.
- Darrouzet-Nardi, A., L. Miller, N. Joshi, S. Mahato, M. Lohani, and B. Rogers. 2016. "Child Dietary Quality in Rural Nepal: Effectiveness of a Community-Level Development Intervention." *Food Policy* 61(0): 185–97.
- Favara, M. 2018. "Maternal Group Participation and Child Nutritional Status in Peru." *Review of Development Economics* 22(2): 459–83.
- Fitzsimons, E., B. Malde, A. Mesnard, and M. Vera-Hernandez. 2012. "Household Responses to Information on Child Nutrition: Experimental Evidence from Malawi." CEPR Discussion Papers, CEPR Discussion Papers: 8915. (OR also published by Institute for Fiscal Studies, IFS Working Papers: W–12/07, 2012.)
- Gelli, A., A. Margolies, M. Santacroce, N. Roschnik, A. Twalibu, M. Katundu, ... M. Ruel. 2018. "Using a Community-Based Early Childhood Development Center as a Platform to Promote Production and Consumption Diversity Increases Children's Dietary Intake and Reduces Stunting in Malawi: A Cluster-Randomized Trial." *The Journal of nutrition*, 148(10): 1587–1597. doi:10.1093/jn/nxy148.
- Geresomo, Numeri C., Elizabeth Kamau Mbuthia, Joseph W. Matofari, and Agnes M. Mwangwela. 2018. "Targeting caregivers with context specific behavior change training increased uptake of recommended hygiene practices during food preparation and complementary feeding in Dedza district of Central Malawi." *Ecology of Food and Nutrition* 57(4): 301–313, DOI: 10.1080/03670244.2018.1492379.
- Goyal, Jaya, and Madhushree Sekher. 2016. "Accountability, Nutrition and Local Institutions in India." *Development* 58(1): 79–87.
- Haroon, S., J. K. Das, R. A. Salam, A. Imdad, and Z. A. Bhutta. 2013. "Breastfeeding promotion interventions and breastfeeding practices: a systematic review." *BMC public health* 13 Suppl 3(Suppl 3), S20.

- Haselow, N. J., A. Stormer, and A. Pries. 2016. "Evidence-based evolution of an integrated nutrition-focused agriculture approach to address the underlying determinants of stunted growth." *Maternal & child nutrition*, 12 Suppl 1(Suppl 1), 155–168. doi:10.1111/mcn.12260.
- Hilmiye Aksu, Mert Küçük, and Gülergün Düzgün. 2011. "The effect of postnatal breastfeeding education/ support offered at home 3 days after delivery on breastfeeding duration and knowledge: a randomized trial." *The Journal of Maternal-Fetal & Neonatal Medicine* 24(2): 354–361.
- Hirani, Shela, and Rozina Karmaliani. 2012. "Evidence based workplace interventions to promote breastfeeding practices among Pakistani working mothers." Women and birth: journal of the Australian College of Midwives. 26. 10.1016/j.wombi.2011.12.005.
- Imdad, A., M. Y. Yakoob, and Z. A. Bhutta. 2011. "Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries." *BMC public health* 11 Suppl 3(Suppl 3), S24.
- Kavle, J., E. LaCroix, H. Dau, and C. Engmann. 2017. "Addressing barriers to exclusive breast-feeding in low- and middle-income countries: A systematic review and programmatic implications." Public Health Nutrition 20(17): 3120–3134.
- Kim, S. S., T. Roopnaraine, P. H. Nguyen, K. K. Saha, M. I. Bhuiyan, and P. Menon. 2018. "Factors influencing the uptake of a mass media intervention to improve child feeding in Bangladesh." *Maternal & child nutrition* 14(3), e12603. doi:10.1111/mcn.12603.
- Kumar, Neha, Jody Harris, and Rahul Rawat. 2015. "If They Grow It, Will They Eat and Grow? Evidence from Zambia on Agricultural Diversity and Child Undernutrition." *Journal of Development Studies* 51(8): 1060–77.
- Malapit, Hazel Jean L., Suneetha Kadiyala, Agnes R. Quisumbing, Kenda Cunningham, and Parul Tyagi. 2015. "Women's Empowerment Mitigates the Negative Effects of Low Production Diversity on Maternal and Child Nutrition in Nepal." *Journal of Development Studies*, 51(8): 1097–1123.
- Mbuya, Mduduzi N. N., Purnima Menon, Jean-Pierre Habicht, Gretel H. Pelto, Marie T. Ruel. 2015. "Maternal Knowledge after Nutrition Behavior Change Communication Is Conditional on Both Health Workers' Knowledge and Knowledge-Sharing Efficacy in Rural Haiti." *The Journal of Nutrition* 143(12): 2022–28.
- Mgongo, M., T. H. Hussein, B. Stray-Pedersen, S. Vangen, S. E. Msuya, and M. Wandel. 2019. "Facilitators and Barriers to Breastfeeding and Exclusive Breastfeeding in Kilimanjaro Region, Tanzania: A Qualitative Study." *International journal of pediatrics*, doi:10.1155/2019/8651010.
- Muraya, K. W., C. Jones, J. A. Berkley, and S. Molyneux. 2017. "If it's issues to do with nutrition...I can decide...: gendered decision-making in joining community-based child

- nutrition interventions within rural coastal Kenya." *Health policy and planning* 32(suppl 5), v31–v39. doi:10.1093/heapol/czx032.
- Nguyen, P. H., E. A. Frongillo, T. Sanghvi, G. Wable, Z. Mahmud, L. M. Tran, ... P. Menon. 2018. "Engagement of Husbands in a Maternal Nutrition Program Substantially Contributed to Greater Intake of Micronutrient Supplements and Dietary Diversity during Pregnancy: Results of a Cluster-Randomized Program Evaluation in Bangladesh." *The Journal of nutrition* 148(8): 1352–1363. doi:10.1093/jn/nxy090.
- Nguyen, Phuong H., Sunny S. Kim, Sarah C. Keithly, Nemat Hajeebhoy, Lan M. Tran, and Marie T. Ruel. 2014. "Incorporating Elements of Social Franchising in Government Health Services Improves the Quality of Infant and Young Child Feeding Counselling Services at Common Health Centres in Vietnam." *Health Policy and Planning* 29(8): 1008–.
- Noack, Anna-Lisa, and Nicky R. M. Pouw. 2015. "A Blind Spot in Food and Nutrition Security: Where Culture and Social Change Shape the Local Food Plate." *Agriculture and Human Values* 32(2): 169–82.
- Okuga, M., M. Kemigisa, S. Namutamba, G. Namazzi, and P. Waiswa. 2015. "Engaging community health workers in maternal and newborn care in eastern Uganda." *Global health action* 8, 23968. doi:10.3402/gha.v8.23968.
- Picolo, M., I. Barros, M. Joyeux, A. Gottwalt, E. Possolo, B. Sigauque, and J. A. Kavle. 2019. "Rethinking integrated nutrition-health strategies to address micronutrient deficiencies in children under five in Mozambique." *Maternal & child nutrition*, 15 Suppl 1(Suppl 1), e12721. doi:10.1111/mcn.12721.
- Reerink, I., S. M. Namaste, A. Poonawala, C. Nyhus Dhillon, N. Aburto, D. Chaudhery, ... R. Rawat. 2017. "Experiences and lessons learned for delivery of micronutrient powders interventions." *Maternal & child nutrition*, 13 Suppl, e12495. doi:10.1111/mcn.12495.
- Sanghvi, T., A. Jimerson, N. Hajeebhoy, M. Zewale, and G. Huong Nguyen. 2013. Tailoring Communication Strategies to Improve Infant and Young Child Feeding Practices in Different Country Settings. doi: 10.1177/15648265130343S204.
- Shi, L., J. Zhang, Y. Wang, L. Caulfield, and B. Guyer. 2010. "Effectiveness of an educational intervention on complementary feeding practices and growth in rural China: A cluster randomised controlled trial." *Public Health Nutrition* 13(4): 556–565. doi:10.1017/S1368980009991364.
- Touré, O., S. Coulibaly, A. Arby, F. Maiga, and S. Cairncross. 2013. "Piloting an intervention to improve microbiological food safety in peri-urban Mali." *Int J Hyg Environ Health* 216(2): 138–45.
- Yourkavitch, J. M., J. L. Alvey, D. M. Prosnitz, and J. C. Thomas. 2017. "Engaging men to promote and support exclusive breastfeeding: a descriptive review of 28 projects in 20 low- and middle-income countries from 2003 to 2013." *Journal of health, population, and nutrition* 36(1): 43. doi:10.1186/s41043-017-0127-8.

#### **WASH**

- Alzua M. L., A. J. Pickering, H. Djebbari, F. C. Lopez, J. C. Cardenas, M. A. Lopera, N. Osbert, and M. Coulibaly. 2015. Final report: Impact evaluation of community-led total sanitation (CLTS) in rural Mali. Buenos Aires: Universidad Nacional de La Plata, Facultad de Ciencias Económicas, Centro de Estudios Distributivos Laborales y Sociales (CEDLAS)
- Bauza, V., H. Reese, P. Routray, and T. Clasen. 2019. "Child Defecation and Feces Disposal Practices and Determinants among Households after a Combined Household-Level Piped Water and Sanitation Intervention in Rural Odisha, India." *The American journal of tropical medicine and hygiene* 100(4): 1013–1021. doi:10.4269/ajtmh.18-0840.
- Cumming, O., and S. Cairncross. (2016). "Can water, sanitation and hygiene help eliminate stunted growth? Current evidence and policy implications." *Maternal & child nutrition* 12 Suppl 1(Suppl 1): 91–105. doi:10.1111/mcn.12258.
- Davis, J., A. J. Pickering, K. Rogers, S. Mamuya, and A. B. Boehm. 2011. "The effects of informational interventions on household water management, hygiene behaviors, stored drinking water quality, and hand contamination in peri-urban Tanzania." *The American journal of tropical medicine and hygiene* 84(2): 184–191. doi:10.4269/ajtmh.2011.10-0126.
- Islam, M. S., Z. H. Mahmud, P. S. Gope, R. U. Zaman, Z. Hossain, M. S. Islam, D. Mondal, M. A. Y. Sharker, K. Islam, H. Jahan, A. Bhuiya, H. P. Endtz, A. Cravioto, V. Curtis, O. Touré, and S. Cairncross. 2013. "Hygiene intervention reduces contamination of weaning food in Bangladesh." *Trop Med Int Health* 18(3): 250–8.
- Luby, S. P., M. Rahman, B. F. Arnold, L. Unicomb, S. Ashraf, P. J. Winch, J. M. Colford Jr. 2018. "Effects of water quality, sanitation, handwashing, and nutritional interventions on diarrhoea and child growth in rural Bangladesh: a cluster randomised controlled trial." The Lancet: Global health 6(3): e302–e315. doi:10.1016/S2214-109X(17)30490-4.
- Newson, R. S., R. Lion, R. J. Crawford, V. Curtis, I. Elmadfa, G. I. Feunekes, C. Hicks, M. van Liere, C. F. Lowe, G. W. Meijer, B. V. Pradeep, K. S. Reddy, M. Sidibe, and R. Uauy. 2013. Behaviour change for better health: nutrition, hygiene and sustainability. *BMC Public Health*. 13(Suppl. 1):S1. doi:10.1186/1471-2458-13-S1-S1.
- Pattanayak, S. K., J. C. Yang, K. L. Dickinson, C. Poulos, S. R. Patil, R. K. Mallick, J. L. Blitsteinb, and P. Praharajf. 2009. "Shame or Subsidy Revisited: Social Mobilization for Sanitation in Orissa, India." *Bull World Health Organ* 87: 580–87.
- Unicomb, L., F. Begum, E. Leontsini, M. Rahman, S. Ashraf, A. M. Naser, and P. J. Winch. 2018. "WASH Benefits Bangladesh trial: management structure for achieving high coverage in an efficacy trial." *Trials* 19(1): 359. doi:10.1186/s13063-018-2709-1.
- Venkataramanan, V., J. Crocker, A. Karon, and J. Bartram. 2018. "Community-Led Total Sanitation: A Mixed-Methods Systematic Review of Evidence and Its Quality." Environmental health perspectives 126(2): 026001. doi:10.1289/EHP1965.

- Watson, J. A., J. H. J. Ensink, M. Ramos, P. Benelli, E. Holdsworth, R. Dreibelbis, and O. Cumming. 2017. "Does targeting children with hygiene promotion messages work? The effect of handwashing promotion targeted at children, on diarrhoea, soil-transmitted helminth infections and behaviour change, in low- and middle-income countries." *Trop Med Int Health* May; 22(5): 526–538.
- Wodnik, B. K., M. C. Freeman, A. S. Ellis, E. Awino Ogutu, A. Webb Girard, and B. A. Caruso. 2018. Development and Application of Novel Caregiver Hygiene Behavior Measures Relating to Food Preparation, Handwashing, and Play Environments in Rural Kenya. *International journal of environmental research and public health* 15(9): 1994. doi:10.3390/ijerph15091994.
- Wood, S., J. Foster, and A. Kols. 2012. "Understanding why women adopt and sustain home water treatment: insights from the insights from the Malawi antenatal care program." *Social Science & Medicine* 75(4), August 2012: 634–642.
- World Health Organization, USAID, and United Nations Children's Fund (UNICEF). 2015.

  Improving nutrition outcomes with better water, sanitation and hygiene: practical solutions for policies and programmes. World Health Organization.

#### **Access to Health Services**

- Agrawal, P. K., S. Agrawal, S. Ahmed, G. L. Darmstadt, E. K. Williams, H. E. Rosen, and A. H. Baqui. 2012. "Effect of knowledge of community health workers on essential newborn health care: a study from rural India." *Health policy and planning* 27(2): 115–126. doi:10.1093/heapol/czr018.
- CORE Group. 2009. Community approaches to child health in Malawi—Applying the C-IMCI Framework. Washington (DC): CORE Group.
- Dewey, K. G., and D. R. Mayers. 2011. "Early Child Growth: How Do Nutrition and Infection Interact?" *Maternal & Child Nutrition* 7: 129–42.
- Manda-Taylor, L., D. Mwale, T. Phiri, A. Walsh, A. Matthews, R. Brugha, V. Mwapasa, and E. Byrne. 2017. "Changing times? Gender roles and relationships in maternal, newborn and child health in Malawi." *BMC Pregnancy Childbirth* 17: 321.
- Mutanda, J. N., P. Waiswa, and S. Namutamba. 2016. "Community-made mobile videos as a mechanism for maternal, newborn and child health education in rural Uganda; a qualitative evaluation." *African health sciences:* 16(4), 923–928. doi:10.4314/ahs.v16i4.6.
- Okuga, M., P. Waiswa, R. Mandu, J. Wachira, C. Hanson, and F. Manzi. 2017. "Illness recognition and care-seeking for maternal and newborn complications in rural eastern Uganda." *Journal of health, population, and nutrition* 36(Suppl 1): 47. doi:10.1186/s41043-017-0125-x.
- Pell, C., A. Meñaca, F. Were, N. A. Afrah, S. Chatio, L. Manda-Taylor, and R. Pool. 2013. "Factors affecting antenatal care attendance: results from qualitative studies in Ghana, Kenya and Malawi." *PloS one* 8(1): e53747.

- Rahman, A. E., J. Perkins, S. Islam, A. B. Siddique, M. Moinuddin, M. R. Anwar, ... D. Hoque. 2018. "Knowledge and involvement of husbands in maternal and newborn health in rural Bangladesh." *BMC pregnancy and childbirth* 18(1): 247. doi:10.1186/s12884-018-1882-2.
- Taleb, F., J. Perkins, N. A. Ali, C. Capello, M. Ali, C. Santarelli, and D. M. Hoque. 2015. "Transforming maternal and newborn health social norms and practices to increase utilization of health services in rural Bangladesh: a qualitative review." *BMC pregnancy and childbirth* 15: 75. doi:10.1186/s12884-015-0501-8.
- Watterson, J., J. Walsh, and I. Madeka. 2015. "Using mHealth to Improve Usage of Antenatal Care, Postnatal Care, and Immunization: A Systematic Review of the Literature." *BioMed Research International* vol. 2015, Article ID 153402.
- Zwisler, G., E. Simpson, and M. Moodley. 2013. "Treatment of diarrhea in young children: results from surveys on the perception and use of oral rehydration solutions, antibiotics, and other therapies in India and Kenya." *Journal of Global Health* 3 (1): 010403.

# **Appendix D. Nutrition Portfolio**

The objective of this portfolio review is to systematically assess the World Bank's nutrition lending portfolio on its relevance, its multidimensional approaches, and its contributions to nutrition results in country clients. This appendix first describes the lending portfolio identification strategy and then presents findings from a detailed portfolio review using descriptive statistics.

## Portfolio Identification Strategy

IEG anchors the portfolio identification strategy on the conceptual framework. The fundamental dimensions of the conceptual framework, that is, nutrition outcomes for mothers and children, immediate and underlying determinants, and nutrition-specific, nutrition-sensitive, and social norms interventions and institutional strengthening support, are used at different stages of the portfolio identification process. The portfolio identification strategy consists of four stages—search, delimitation, inclusion, and verification—to progressively define the nutrition-relevant portfolio for this evaluation (figure D.1).

## Search Stage

The search stage consists of retrieving from the World Bank's Business Intelligence repository active and closed financing projects that fall under the evaluation period FY08–19 (irrespective of their approval date) and are financed through an IBRD, IDA, and Recipient-Executed Trust Fund (RETF) agreements. Several project features are extracted for about 10,000 projects, including project identification, titles, countries, regions, lead GPs, lending instruments, approval and revised closing years, Operations Policy and Country Services (OPCS) sector and theme codes, and additional financing flags. Project development objective (PDO) and intermediate outcome indicator data are also retrieved from Implementation Status and Results Reports (ISRs) in the World Bank's Systems, Applications and Products. In addition, IEG uses country-level data on nutrition outcomes, including stunted growth rates for children under five, from the Joint Child Malnutrition estimates (UNICEF, WHO, and World Bank 2019) to focus the nutrition portfolio on countries with high stunted growth rates.

# **Delimitation Stage**

The delimitation stage consists of selecting relevant Operations Policy and Country Services sector and theme codes as project filters guided by the conceptual framework.<sup>1</sup> The list of projects is further refined by restricting the sample to those operations implemented in high stunted growth countries. High stunted growth countries are defined as those having stunted growth rates on or above 20 percent at any point during

the evaluation period according to the Joint Child Malnutrition estimates. Eighty-four out the 88 high stunted growth countries have received World Bank support.<sup>2</sup> Projects led by the Energy and Transport GPs are removed because they are not relevant, reducing the list to 4,260 projects in 84 countries.

## **Inclusion Stage**

As a first step IEG defined a list of key nutrition concepts and associated keywords as input for a machine learning exercise to improve the accuracy of the project identification through text analytics. These key concepts and associated keywords are based on each building block of the conceptual framework: nutrition outcomes for mothers and children, immediate determinants (feeding and caring, nutrient intake and diet diversity, and health of mother and child), underlying determinants (access to nutrient-rich food, maternal and child resources, access to health, and water, sanitation, and hygiene [WASH] services), nutrition-specific, nutrition-sensitive, and social norms interventions and institutional strengthening support, and also a list of donors and partners in nutrition.

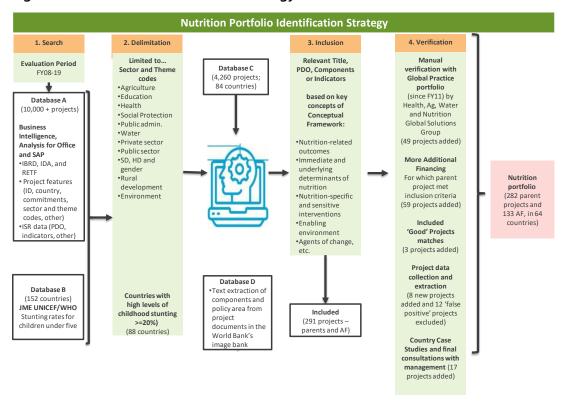


Figure D.1. Portfolio Identification Strategy

Source: Independent Evaluation Group.

Note: AF = additional financing; Ag = Agriculture and Food; health = Health, Nutrition and Population; HD = human development; ID = project identification number; ISR = Implementation Status and Results Report; Joint Child Malnutrition estimates = JME; SD = sustainable development.

Text extraction and machine learning algorithms are done in collaboration with DECGA.<sup>3</sup> The structured corpus of text for PDOs are retrieved for 3,366 projects (79 percent) and indicator text is retrieved for 2,523 projects (59 percent).<sup>4</sup> The unstructured corpus of text for project components or prior actions policy areas are extracted from Project Appraisal Document and Program Document (PD) sections (67 percent), respectively, using regular expressions language to identify them,<sup>5</sup> combined with project summary text that bundled shorter text segments from different document sections, including components, monitoring and evaluation (M&E), project finance, and lessons learned (33 percent) due to document quality limitations (table D.1). The unstructured text approach allows collecting text for all projects at the cost of possibly reducing content quality, to the extent unstructured text may not always contain information about what a project is doing in terms of nutrition.

Table D.1. Distribution of Unstructured Text Variable by Source

Text Source	IPF	DPL	PforR	Total
Components only	2,396	9	71	2,476
	56%	0%	2%	58%
Project Summaries only	1,303	70	14	1,387
	31%	2%	0%	33%
Combinations of prior actions,	_	397	_	397
program document policy area, and project summaries	_	9%	_	9%
Total	3,699	476	85	4,260
	87%	11%	2%	100%

Source: Independent Evaluation Group portfolio review and analysis.

*Note:* Table percentages are reported. Independent Evaluation Group manually extracted text for 166 of the 2,476 projects with component text. Project summaries bundled shorter text segments from different document sections including abstracts, components, M&E, project finance, and lessons. Prior actions were retrieved either from program document sections or Operations Policy and Country Services Prior Actions Database.

A first semisupervized machine learning exercise consists of applying a natural language processing technique called "word2vec" to the text corpus database to obtain nutrition concepts that are similar to the original list of key concepts and suggest new keywords resulting in an improved list.<sup>6</sup> Next, a recommendation engine is used to identify projects that are similar to the list of key concepts and associated keywords.

Similarity scores are assigned to each project, for each text corpus (PDO, component, and indicators) and disaggregated by dimensions of the conceptual framework. In addition, semantic tagging is used to tabulate the 4,260 projects with the text corpus classified across dimensions so that each project is tagged for specific building block information contained in their text. Saliency scores are calculated by IEG based on these tabulations, defined as the frequency of key concepts within each building block divided

Appendix D Nutrition Portfolio

by the total number of key concepts in that building block. Like similarity scores, saliency scores are assigned for each text corpus (PDO, component, and indicators).

This exercise involves several iterations triggered by the refinement of the list of key concepts and associated keywords, adjustments of proximity (that is, distance between keywords measured in character spaces), and removal of acronyms (figure D.2). Similarity and saliency scores are recalculated in each iteration and used as part of the inclusion criteria.

In a second supervised exercise, a different NLP algorithm is applied to determine the share of nutrition content in a project based on a set of preidentified core nutrition projects. A set of 19 core nutrition projects are manually identified by IEG as the input training set for the exercise, and DECGA implemented a Random Forest Classification and Regression Analysis to predict the share of nutrition content in a project: matching scores. Unlike similarity and saliency scores, each of the 4,260 projects has only one matching score based on the combined corpus text of PDOs, components, and indicators.

Inclusion criteria are applied to the sample of 4,260 projects on the basis that projects have relevant title, or PDO, or components, or indicators. Relevant project titles have a reference to nutrition or stunted growth. For determining relevant PDO, components and indicators a combination of different thresholds for saliency and similarity scores are used to ensure that the most relevant projects are included in the portfolio. The inclusion stage filters 291 projects as nutrition-relevant.

# **Verification Stage**

This stage consists of a systematic manual verification of the included projects against relevant nutrition projects identified by the Nutrition Global Solution Group, and the Agriculture and Food, Health, Nutrition, and Population (HNP), and Water GPs that have been shared during the consultations. Additional financing of parent projects that met the inclusion criteria as well as few projects with good project matching score are also added.<sup>8</sup> In addition, the data coding and extraction process, explained in the next section, adds eight projects and eliminates 12 false positives that did not include nutrition content. The final nutrition portfolio includes 282 parent projects and 133 additional financing.

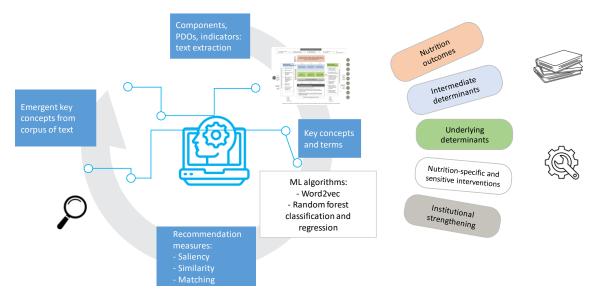


Figure D.2. Machine Learning Exercises

Source: Independent Evaluation Group.

Note: ML = machine learning.

# **Portfolio Coding and Analysis**

The nutrition portfolio is manually reviewed and coded by the evaluation team. A coding template is designed based on the conceptual framework and administered through Survey Monkey. The coding template facilitates the extraction of project information on nutrition challenges, PDOs, interventions (including behavior change and emergency interventions), project beneficiaries, service delivery mechanisms, and project-level factors of success and failure relevant for a project's nutrition outcomes. Document type, document section, relevant input text, and classification based on a predefined typology are extracted for all the above except for factors of success and failure that lacked such typology and were later analyzed through topic modeling. Project indicators are coded in Excel according to typologies developed from the conceptual framework. Coders estimate each project's share of nutrition content, making judgments based on their review and flagging any remaining false-positive projects.

Each coder is assigned a subset of projects. Training, a piloting phase, and periodic quality assessment and spot check are conducted to ensure coder reliability. The resulting information from this exercise is manually reviewed and cleaned by the core evaluation team, yielding the final input for portfolio analysis. Portfolio data are analyzed in Excel, Stata, and Tableau software.

## **Findings: World Bank Support for Nutrition**

The World Bank's nutrition portfolio consists of 282 projects in 64 countries that account for over \$22 billion in estimated nutrition commitments, over half of them in Africa. The portfolio is led by the HNP GP with 42 percent of projects, followed by the Agriculture and Food (Agriculture) GP (21 percent), and Social Protection and Jobs (SPJ) GP (20 percent). About half of the projects in the portfolio are closed. Active projects account for almost 62 percent of nutrition commitments (\$13.5 billion). Africa led the regions with more than half of the project portfolio (53 percent) and nutrition commitments (55 percent), followed by South Asia and Latin America and the Caribbean (figures D3 A and B). Over 90 percent of projects (260) and 87 percent of commitments (\$19.0 billion) are investment project financing (4 percent of projects were Program-for-Results financing and 4 percent were development project financing).

The World Bank focuses its nutrition support in IDA countries, particularly those with slow stunted growth reduction. About 74 percent (209 projects) of the World Bank's support for nutrition is directed toward IDA countries and almost half focuses on countries with slow or no stunted growth reduction (132 projects) (figures D.3 C and D). IDA support accounted for \$14.4 Billion of nutrition estimated commitments (65 percent).

Over time, the portfolio has shifted to include more projects from the Agriculture and SPJ GPs. Over half the projects in the nutrition portfolio were approved in FY14–19. This includes projects led by HNP (37 percent), Agriculture (29 percent), and SPJ (19 percent). This is a shift from FY98–08, with most of the projects led by HNP (55 percent). In contrast, both the Education and Water GPs decreased their participation in nutrition over time (figures D.3 E and F).

A. Portfolio by Global Practice

b. Portfolio by Region

Health, Nutrition, and Population (n = 10, 120)

Approach to many projects for the second (n = 18)

Social Protection

Water (n = 19)

Urban, Realilience

And Land (n = 11)

Social (n = 13)

Social (n = 13)

Education (n = 11)

Social (n = 13)

Social (n = 13)

Social (n = 13)

Social (n = 14)

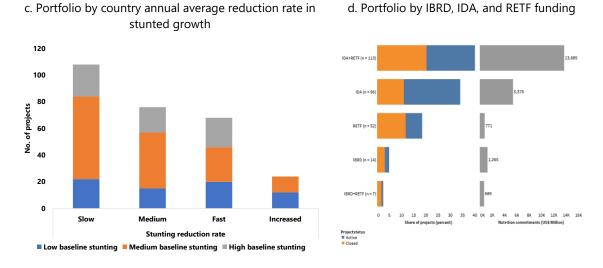
Social (n = 15)

Social (n

Figure D.3. Nutrition Financing Portfolio

Sources: Independent Evaluation Group portfolio review and analysis.

*Note*: Nutrition commitments are based on the manual portfolio review exercise. The total committed amount of each project was multiplied by the estimated share of nutrition content in the project to estimate the share of the project commitments (IDA, IBRD, and RETFs) supporting nutrition. N = 282 projects. The total committed amount is \$21,785 million (\$13,483 active; \$8,302 closed).

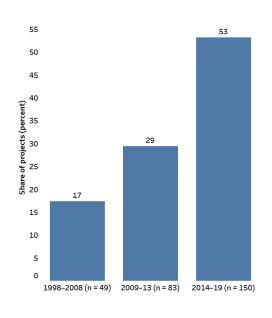


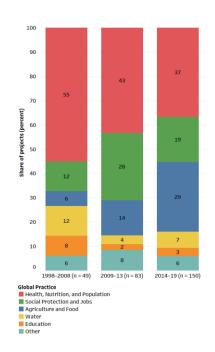
Sources: Independent Evaluation Group calculations based on Joint Child Malnutrition Estimates (UNICEF, WHO, and World Bank, March 2019 update) and World Bank historical data on income classification.

Note: In panel C shows the distribution of the project portfolio across countries by the average annual reduction rate in stunted growth: fast stunted growth reduction (average of > 1.33 percentage points per year); medium stunted growth reduction (average of 0.94–1.32 percentage points/ year); slow stunted growth reduction (average of 0–0.93 percentage points per year); increased stunted growth (stunted growth levels increased); Low baseline stunted growth (20.0–34.8), Medium baseline stunted growth (34.9–47.8), High baseline stunted growth (48.0–59.3). Data are from 2008 and 2019 or for the closest years available. Six regional projects are excluded. RETF = Recipient-Executed Trust Funds. In panel C, N = 276. In panel D, N = 282.

e. Projects by approval period

f. Projects by approval period and Global Practice





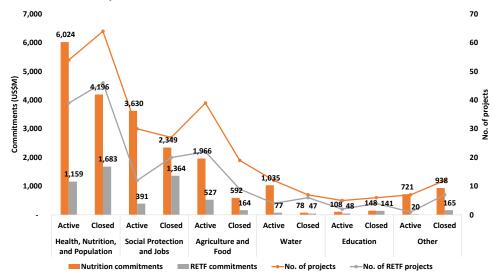
Sources: Independent Evaluation Group portfolio review and analysis.

Note: Figures present data by fiscal years. Other GPs include Macroeconomics, Trade and Investment, Social Sustainability and Inclusion, Urban, Disaster Risk Management, Resilience and Land, and Governance. N = 282 projects.

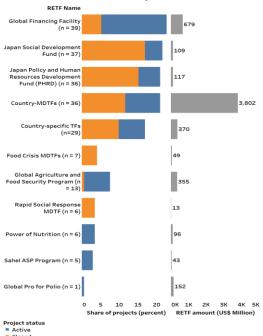
The nutrition portfolio is also supported by RETFs. RETF total commitments account for \$5.8 billion across 172 parent projects, with about half of the commitments in HNP (\$2.8 billion, of which \$1.7 billion are from closed projects). 11 The most important RETF in terms of number of projects is the Global Financing Facility (GFF), followed by the Japan Social Development Fund, and the Japan Policy and Human Resources Development Fund (PHRD). In volume, however, individual country Multi-Donor Trust Funds (MDTFs) account for two-thirds of RETF commitments (figures D4A and B). Country MDTFs with the largest contributions include the Ethiopia Promoting Basic Services Program Phase III MDTF (EPBS III) with \$615 million, Afghanistan Reconstruction Trust Fund with \$480 million, and Bangladesh Health Sector Development Program MDTF with \$328 million. The Power of Nutrition accounted for 3.5 percent of the 172 parent projects and \$96 Million.

Figure D.4. Commitment Amounts to Nutrition of Recipient-Executed Trust Funds

#### a. Commitment amounts by Global Practice



#### b. Commitment amounts by trust fund name



Sources: Independent Evaluation Group portfolio review and analysis; data from World Bank Client Connection. Note: Total nutrition commitments includes IDA, IBRD, and RETF amounts committed. Other Global Practices include MTI, Social Sustainability and Inclusion, Urban, Disaster Risk Management, Resilience and Land, and Governance. ASP = Adaptive Social Protection; MDTF = multi-donor trust fund; RETF = recipient-executed trust fund. In panel a, N = 282 projects; in panel b, N =172 projects. RETF commitments are estimated from the amount of parent projects. RETF linked with additional financing projects and World Bank managed are not included. The Power of Nutrition Trust Fund includes projects in Côte d'Ivoire (P161770), Madagascar (P160848), Ethiopia (P123531), Rwanda (P162646 and P164845), and Tanzania (P152736); Burkina Faso is excluded because the associated project (P168823) was approved outside the evaluation period. Ethiopia's project, P123531, is the parent project of an AF project funded by the Power of Nutrition (P175166).

#### **Nutrition Interventions and Multidimensionality**

The evaluation identifies nutrition interventions in projects across the dimensions of the conceptual framework (nutrition-specific, nutrition-sensitive, and social norms interventions, and institutional strengthening support). A total of 1,792 interventions are identified in the 282 projects in the portfolio. In addition, to understand how projects and the country portfolio have supported a mix of interventions in the conceptual framework, the evaluation defines two measures of *multidimensionality*, one at the project level and one at the country level (table D.2).

Table D.2. Multidimensional Projects and Country Portfolios

Measure	Definition	
Project-level Multidimensionality	Project multidimensionality score: The sum of the number of nutrition-specific and nutrition-sensitive intervention areas present in a project divided by the eight possible number of intervention areas. The score had a mean value of 0.24 (approximately two dimensions out of the possible eight) with a standard deviation of 0.15, a minimum value of 0 and a maximum of 0.75.	
Country-level Multidimensionality	Country portfolio multidimensionality score: The sum of the number of nutrition-specific and nutrition-sensitive intervention areas present in a country's portfolio divided by the eight possible number of intervention areas. The score had a mean value of 0.52 (approximately four dimensions out of the possible eight) with a standard deviation of 0.25, a minimum value of 0 and maximum of 1.	

World Bank nutrition interventions emphasize institutional strengthening, followed by nutrition-sensitive and nutrition-specific interventions. GPs mostly support interventions related with their own sectors as well as institutional strengthening. Of the 1,792 nutrition interventions, almost 40 percent are institutional strengthening with a focus on improving nutrition service delivery. This is followed by nutrition-sensitive interventions which mostly address health and family planning services and agriculture and food systems; and nutrition-specific interventions which focus on supporting diet and breastfeeding, and child disease prevention and treatment (figures D.5A and B).

Over time, support for institutional strengthening has persisted, and nutrition-sensitive interventions have increased, while support for nutrition-specific interventions remains relatively constant. The World Bank continues to emphasize support for nutrition service delivery over other types of institutional strengthening, and attention to health and family planning services has reduced in favor of other nutrition-sensitive interventions (notably social safety nets and agriculture and food systems). Recent investments in nutrition-specific interventions have increased support for dietary diversity and breastfeeding relative to child disease prevention and treatment. World Bank support for adolescent health is limited throughout (figure D.5C). The progression of World Bank support for nutrition interventions holds across regions. The increase in nutrition-sensitive interventions during the evaluation period is notable in AFR, SAR

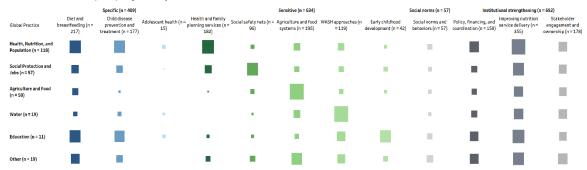
and EAP; support for social norms is highest in EAP, but numbers are too small to comment on a trend for social norms interventions (figure D.5D).

Figure D.5. Nutrition Interventions

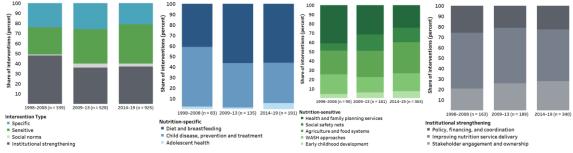
a. Share of nutrition interventions, by area



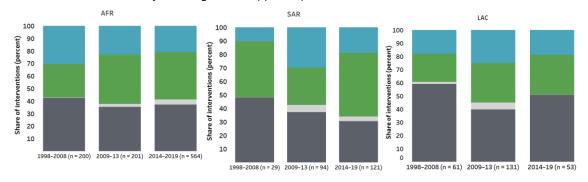
b. Interventions per project, by Global Practice



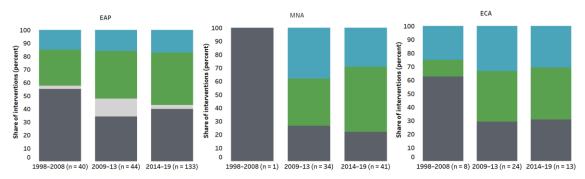
c. Share of interventions, by area and approval period



d. Share of interventions, by area, region and approval period



#### Appendix D Nutrition Portfolio



Source: Independent Evaluation Group portfolio
Note: Other GPs include Macroeconomics, Trade and Investment, Social Sustainability and Inclusion, Urban, Disaster Risk
Management, Resilience and Land, and Governance. N = 1,792 interventions

Project multidimensionality has increased over time. On average, projects have integrated two nutrition intervention areas per project out of the possible eight areas (equivalent to an average project multidimensionality score of 24 percent). Among GPs, Education and SPJ have higher project multidimensionality in that the projects integrate a range of nutrition-specific and nutrition-sensitive interventions. Education often combines ECD interventions with nutrition-specific interventions (diet and breastfeeding, and child disease prevention and treatment) and WASH interventions, while SPJ combines social safety nets support with a range of interventions from health, agriculture and food systems, WASH, and ECD. Overall, the average number of nutrition interventions included in a project increased between 1998–08 and 2014–19 (figure D.6C).

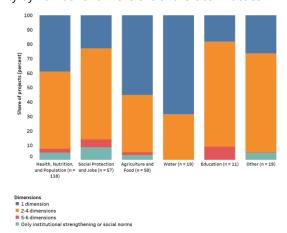
The multidimensionality of countries' portfolios varies, with some countries having a greater investment in multidimensionality. Countries have invested, on average, in four of the following eight areas: diet and breastfeeding, child disease prevention and treatment, adolescent health, health and family planning services, social safety nets, agriculture and food systems, WASH approaches, and ECD. In some countries, such as Guatemala, Indonesia, Pakistan, and Senegal, the country portfolio has a high level of multidimensionality (figure D.7). This suggests a more comprehensive support from the World Bank to address nutrition determinants in these countries. The multidimensionality of the country portfolio is highest in countries with a lower GDP per capita and Human Capital Index, which would be consistent with the need in these countries to address disadvantaged nutrition determinants in the country context. Other country portfolios such as Liberia, Nigeria, and Sierra Leone, have low multidimensionality, raising concerns about the extent that the World Bank is supporting nutrition determinants in the country context. The country portfolios of fragile and conflict-affected situations (FCS) countries on average have a slightly lower multidimensionality than non-FCS countries (figure D.6D). This is likely due to the implementation challenges in FCS contexts. Over time, however, country portfolio

multidimensionality has remained relatively constant with projects in the portfolio supporting an average of about five different types of nutrition intervention areas per approval period (1998–08, 2009–13, and 2014–19). The country portfolios vary in the extent that interventions are implemented by projects across GPs, or whether the country has a multidimensional project integrating multiple interventions and sector ministries.

About half of the countries have both multidimensional portfolios and medium-to-high support for institutional strengthening. The evaluation examines institutional strengthening across countries, based on the finding that it is important to improve nutrition determinants. Countries such as Indonesia, Panama, Nicaragua, and Rwanda have considerable investments in a mix of interventions in the portfolio, and institutional strengthening. This suggests strong World Bank support for improving the nutrition determinants. Other countries, such as Afghanistan, the Republic of Yemen, and Zambia, have a limited mix of interventions in the portfolio, and low institutional strengthening. This suggest a need for deeper attention to the nutrition support in these countries, and for addressing needed challenges (figure D.7).

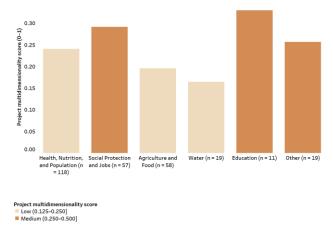
#### Figure D.6. Multidimensionality

a. Project multidimensionality by number of dimensions and Global Practice

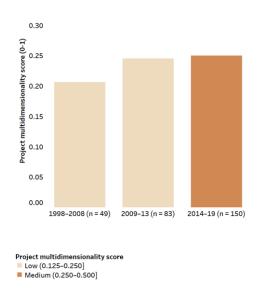


### Appendix D Nutrition Portfolio

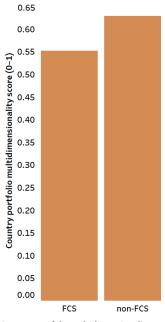
# b. Project multidimensionality score by Global Practice



#### c. Project multidimensionality score by approval period



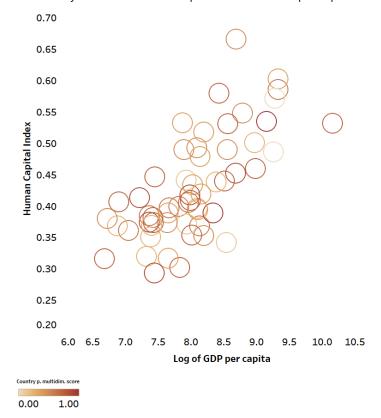
#### d. Country multidimensionality score by FCS status



Country portfolio multidimensionality score

Medium [0.375,0.750)

#### e. Country multidimensionality score and Human Capital Index and GDP per capita



Source: Independent Evaluation Group portfolio review and analysis.

Note: Color scale on the chart increases with the level of country portfolio multidimensionality.

SAR **AFR** pakistan (7 proj) togo (3 proj) senegal (6 proj) madagascar (10 proj) chad (6 proi) afghanistan (7 proj) uganda (3 proj) bhutan (1 proj) south sudan (2 proj) 0.0 0.2 0.4 0.6 0.8 1.0 OK 1K rwanda (7 proj) niger (8 proj) LCR malawi (7 proj) panama (4 proj) nicaragua (5 proj) cote d'ivoire (4 proj) comoros (1 proj) tanzania (5 proj) peru (7 proj) honduras (2 proj) REGIONAL (6 proj) mozambique (8 proj) belize (1 proj) gambia, the (4 proj) ecuador (2 proi) el salvador (2 proj) ethiopia (13 proj) 0.0 0.2 0.6 0.8 1.0 OK 1K benin (3 proj) mauritania (3 proj) EAP guinea (2 proj) indonesia (8 proj) burundi (6 proj) lao pdr (10 proj) mali (3 proj) philippines (1 proi) kenya (5 proj) odia (7 proj) eritrea (1 proj) congo (2 proj) marshall islands (1 proi) cameroon (5 proj) zambia (2 proj) MNA sierra leone (1 proj) djibouti (5 proj) liberia (2 proj) vemen (8 proi) guinea-bissau (1 proj) egypt (1 proj) 0.8 1.0 OK ghana (2 proj) congo dr (4 proj) car (3 proj) **ECA** burkina faso (4 proj) zimbabwe (1 proj) nigeria (4 proj) 0.8 1.0 OK 1K 20 lesotho (2 proj) 0.0 0.2 0.4 0.6 0.8 1.0 OK 0 20 40 60 80 100 Share of institutional stree
■ High [57.0,100.0]
■ Medium [36.7,57.0)
■ Low [0.0,36.7] Country portfolio multidii
High [0.750,1.000]
Medium [0.375,0.750)
Low [0.000,0.375) Country portfolio

Figure D.7. Country Multidimensionality, Institutional Strengthening, and Commitments

Source: Independent Evaluation Group portfolio review and analysis.

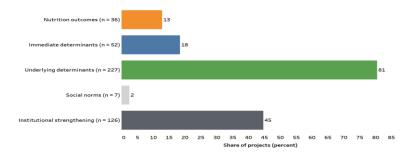
Note: The Pearson correlation between the country portfolio multidimensionality score and the share of institutional strengthening interventions is -0.17 and is statistically significant at the 10 percent level. the Arab Republic of Egypt and Armenia do not have a multidimensionality index because they only have institutional strengthening interventions. Levels of institutional strengthening support were coded for each project in the portfolio. Level of institutional strengthening in a country is defined as the average share of institutional strengthening share of total support coded within the country's projects. The data across countries is divided into terciles to classify countries as having low, medium, or high institutional support. N = 282 projects.

# Nutrition Results: World Bank Objectives and Measurement of Nutrition Outcomes and its Determinants

The World Bank's nutrition portfolio overwhelmingly focuses on improving the underlying nutrition determinants and institutional strengthening. Of the 282 projects, 78 (28 percent) are core nutrition projects (have the words "nutri" or "stunt" in their titles or PDOs <u>and</u> have a high share of nutrition content in the top two quintiles); the remainder are mainly sectoral projects that refer to other areas of the conceptual framework and include nutrition interventions in their components. Most projects (81 percent) have PDOs focused on improving underlying determinants of nutrition. The World Bank has sought to improve immediate determinants of nutrition in 18 percent of projects and to improve higher-level outcomes, such as stunted growth and underweight, in 13 percent of projects (figure D.8A). The focus on improving nutrition determinants is consistent with the timeline of projects. Higher-level outcomes are unlikely to be achieved through one project, while a series of projects may contribute to higher-level outcomes.

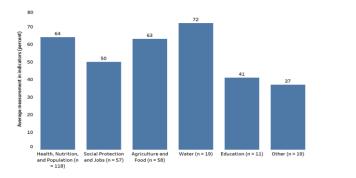
Figure D.8. PDOs and Results Measurement

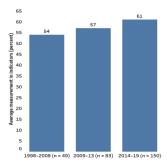
a. Objectives targeted by nutrition projects



b. Measurement of nutrition results in projects by Global Practice

c. Measurement of nutrition results in projects by approval period





Sources: Independent Evaluation Group; and calculations in panel B based on data from project ISRs.

Note: In panel a, one project can target multiple objectives. Panel b shows the average measurement of indicators by Global Practice; panel c shows the average measurement of indicators by approval period. The numerator is the number

#### Appendix D Nutrition Portfolio

of indicators in a project that measured results (outcome, intermediate outcomes, outputs) for relevant dimensions of the conceptual framework. The denominator is the total number of dimensions relevant to the project's interventions. N = 282 projects.

There were gaps in measuring nutrition results. The evaluation looks at the extent to which indicators in a project results framework measure the project's intended contribution to nutrition through its interventions. On average projects measure about 60 percent of their nutrition activities, and measurement has slightly improved over time. Among GPs, Water, HNP, and Agriculture are the best at measuring results, while Education and other GPs often did not track their results (figure D.8B). Nutrition-sensitive interventions are the most frequently measured, especially health and family planning services (93 percent), social safety nets (76 percent), and agriculture and food systems (72 percent), while support for ECD and social norms are seldomly measured (table D.3).

Table D.3. Average Measurement by Area and Examples of Project Indicators

Average	Building block of	
measurement	conceptual	
in indicators	framework	Example indicators
Not applicable	Undernutrition	Proportion of underweight children (W/A <2SD) < 3 years old; Percentage of children under 2 with weight-for-age <-2Z in project areas; Percentage of children 6–59 months who are stunted.
Not applicable	Micronutrient deficiencies	Decreased percent of anemic pregnant women; Proportion of children participating in the program with anemia.
54%, n=126	Diet and breastfeeding	Percentage of children age 6–8 months receiving solid or semisolid food and breastmilk; Percentage of delivered women having received full micronutrient supplementation.
46%, n = 116	Child disease prevention and treatment	Percentage of children between 12–59 months receiving deworming tablets; Number of children under 5 with confirmed malaria who received antimalarial treatment.
7%, n=14	Adolescent health	Percentage decrease of pregnancy among adolescent women; First time adolescent girls acceptant of modern contraceptives; Number of female adolescents receiving iron–folic acid supplements.
93%, n= 118	Health and family planning	Women 15–49 and children (<5) using the basic package of reproductive health and nutrition services (Number, Custom); Children 0–24 months who benefit from a package of nutrition and child stimulation services; Children 0–11 months fully immunized.
76%, n= 74	Social safety nets	Households benefiting from the emergency cash transfers program; Beneficiaries of Safety Nets programs—Cash-for-work, food-for-work and public works (number); Children 0–5 benefiting from cash transfers.
72%, n= 115	Agriculture and food systems	Households practicing integrated homestead farming; Proportion of targeted hammer mills fortifying maize flour at least once in the past month; Quantity of salt adequately iodized by small producers.

53%, n= 86	WASH approaches	Households that have installed appropriate hand washing points; Number of people benefiting from improved access to safe water; Latrines built or renovated for improved sanitation services (number).
6%, n = 32	Early childhood development	Percentage of children ages 3–5 in targeted villages with an overall child development score above 0.6; The number of tasks children are able to complete. These tasks cover the domains of gross motor, fine motor, language, cognitive and socio emotional development.
32%, n = 41	Social norms	Married women of reproductive age who usually make their own decision regarding health care; Women ages 15 to 49 years having benefited from functional literacy training with a focus on nutrition and stimulation through the project; Percentage of beneficiary households selecting a female household member as cash transfer recipient; Percentage of women 15–49 years using modern contraceptive methods.
41%, n = 102	Policy, financing and coordination	Multisectoral coordination and accountability plan and results dashboard ratified; Validation of manual of harmonized package of nutrition services; Industry guidelines for sugar, salt, fat, fortification developed.
52%, n = 190	Improving nutrition service delivery	Government and nongovernment providers fully trained and equipped in delivery of basic health and nutrition services in targeted communities; Percentage of community health and nutrition workers achieving satisfactory score on the community service delivery indicator score; States with nutrition intervention mapping system developed and updated at least annually.
53%, n = 125	Stakeholder engagement and ownership	Model Mothers trained in community nutrition; Percentage of children 0–23 months of age participating in CBN activities in target areas; Number of community health development committees who submitted quarterly activity reports.

Note: No measurement score is calculated for nutrition outcome indicators.

#### **Nutrition Results: Contributions of the World Bank**

Most indicators in project results frameworks measure underlying nutrition determinants. IEG identifies and classifies nutrition-related outcomes, intermediate outcomes, and output indicators for the nutrition portfolio. A total of 2,571 nutrition-related indicators have been coded for the 282 projects during data collection and extraction. The evaluation team classified them according to the dimensions of the conceptual framework. The bulk of the indicators (60 percent) measure underlying nutrition determinants, mostly health and family planning services through supply-side health service provision and use/uptake of health services by mothers and children. Health services include basic packages of reproductive health and nutrition, antenatal and postnatal service uptake by mothers, immunization of children, and disease prevention for mothers (such as intermittent preventive treatment doses for preventing malaria), among others. Indicators of institutional strengthening mostly measure the

improvement of nutrition service delivery, for example training of community health and nutrition workers on nutrition service delivery at the community level, or nutrition interventions at the subnational level. Indicators of immediate determinants often measure children receiving breastmilk and micronutrient supplementation of mothers and children (figure D.9).

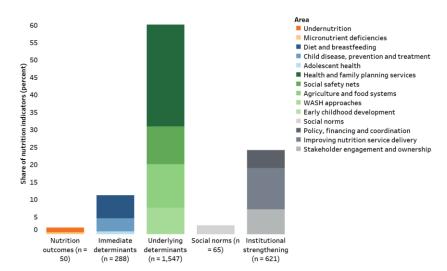


Figure D.9. Distribution of Nutrition Indicators in the Portfolio, by Area

Source: Independent Evaluation Group portfolio review and analysis. Note: N = 2,571 indicators in 282 projects.

IEG evaluates the achievement of outcomes, intermediate outcomes, and outputs in closed projects. Among the 282 nutrition projects, 135 are closed (48 percent), of which 131 have available information on development outcome and intermediate or output level indicators. <sup>12</sup>

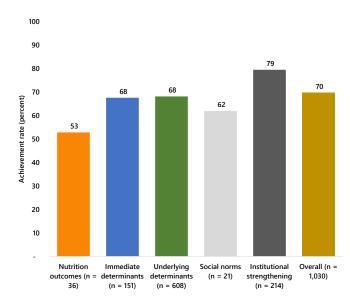
The overall achievement rate of nutrition indicators is good (70 percent), yet the breakdown by the dimensions of the conceptual framework highlights important differences. For instance, the World Bank is making important contributions to institutional strengthening (79 percent of indicators achieved) and nutrition determinants (68 percent of indicators achieved), while improvements in nutrition outcomes and social norms have been harder to achieve (62 percent and 53 percent, respectively). At a more disaggregated level, the most successful areas are agriculture and food, and improving nutrition service delivery, both with an 81 percent achievement rate. Adolescent health and ECD have high achievement rates, but these rates are based on very small samples. (figures D.10A and B)

Project performance is improving over time except for immediate nutrition determinants. Whereas the achievement rates of institutional strengthening and

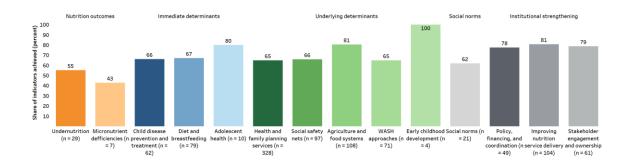
underlying determinants has increased in recent years from 79 to 90 percent and from 66 to 75 percent, respectively, the achievement rate for immediate determinants has dropped from 67 to 62 percent (figure D.10C).

Figure D.10. Overall Nutrition Indicator Achievement

a. Achievement rates of nutrition indicators by area of conceptual framework

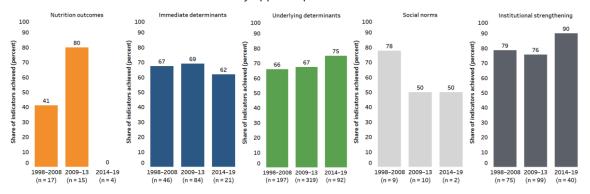


b. Disaggregated achievement rates of nutrition indicators



#### Appendix D Nutrition Portfolio

#### c. Achievement rates of nutrition indicators by approval period

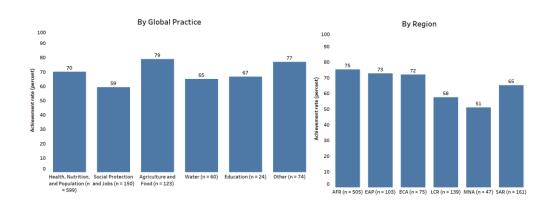


Source: Independent Evaluation Group portfolio review and analysis. Note: N = 1,030 indicators in 131 projects

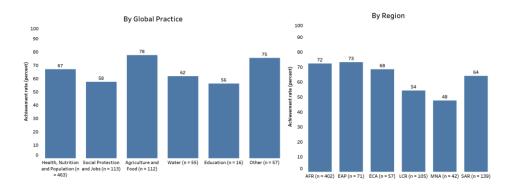
The Agriculture GP outperformed most other GPs in overall achievement, the achievement of nutrition determinants and outcomes, and cross-sector achievements, while Sub-Saharan Africa and East Asia and Pacific had the highest achievements across regions. IEG assesses overall achievement rates, and achievement rates for nutrition outcomes and determinants, and cross-sector support (figure D.11). Cross-sector support captures achievements toward immediate and underlying determinants that are supported by interventions in sectors that differed from the project's leading GP. For example, in a project led by the SPI, this measure excludes the achievement of social safety net indicators, and rather looks at achievements related to health services, WASH, and other areas of the conceptual framework. The Agriculture GP shows high achievement rates of 79 percent, 78 percent, and 73 percent in these three groups of indicators, respectively (nutrition outcomes, determinants, and cross-sector support); higher than other GPs, except for cross-sector support, where HNP and other GPs have higher performance. Africa and East Asia and Pacific have consistent achievement rates above 70 percent irrespective of the measure and their achievement rates are above other regions; and Latin America and the Caribbean consistently underperformed. Overall achievement rates have increased steadily from 68 to 69 to 75 percent between the 1998– 08, 2009-13, and 2014-19 approval periods, and nutrition determinants and outcomes have had a similar increased achievement. Cross-sector achievement has improved from 64 to 71 percent between 1998–08 and 2009–13, but then dropped to 67 percent in 2014– 19. This achievement rate is important given the increasing emphasis on projects in GPs supporting a range of nutrition interventions that are traditionally implemented by other sectors.

Figure D.11. Nutrition Indicator Achievement by Global Practice and Region

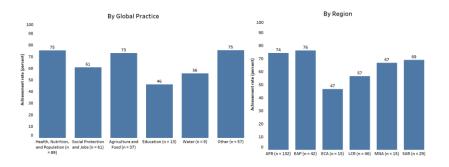
#### a. All indicators



#### b. Nutrition determinants and outcomes



#### c. Cross-sector determinants



Source: Independent Evaluation Group portfolio review and analysis.

Note: I y-axes always show achievement rates. Figures are based on indicators coded for 131 closed projects

# **Explanatory Factors and Lessons of Portfolio Performance: Successes and Failures**

IEG identifies factors of success and failure behind the achievement of nutrition results. Identification of factors is based on relevant text from ICRs, ICRRs, and PPARs. <sup>13</sup> Factors are flagged if they are considered relevant for nutrition-related outcomes in a project and have been classified by direction (success/ failure). A total of 562 factors are identified for 117 of the 135 closed projects based on this definition, where multiple factors could be identified for a single project. Of the 64 countries, 46 are included in this analysis in addition to regional projects, as per the availability of factors data. Table D.4 presents a description of each of the 10 factor topics.

**Table D.4. Definition of Factor Topics** 

Factor Topic	Definition	
Country context	Refers to country contextual conditions including the local political economy and governance, fragility and conflict, and economic and natural disaster shocks.	
Strengthening of government	Refers to the specific role of World Bank activities in improving institutional capacity in government agencies (or lack thereof) in project implementation and achievement of objectives.	
Country ownership and institutional arrangements	Refers to government commitment and level of institutional capacity for supporting project activities. For example, government commitment and capacity for coordinating adequate financing; government use of World Bank projects for boosting initiatives and reforms related with nutrition; the availability and commitment of a skilled workforce for project implementation; and the capacity of line ministries and executing agencies to coordinate action and service delivery.	
Use of diagnostics to inform project design and implementation	Refers to the extent to which lessons drawn from previous projects, country diagnostics, IEG evaluative documents or other World Bank analytical work were incorporated in project design and implementation.	
Project design	Refers to whether projects had a well-defined scope with realistic objectives given contextual factors and to the influence of their stand-alone or programmatic nature on project implementation. For example, whether a project with objectives involving coordination between multiple sectors had realistic expectations about the feasibility of such coordination between implementing ministries and agencies.	
M&E	Refers to the extent to which the strength of M&E frameworks (or lack thereof) affected the implementation of a project and its ability to reach objectives, including having realistic nutrition-related indicators to measure progress as well as baseline and attainable and measurable targets.	
World Bank systems and performance	Refers to internal World Bank processes affecting project implementation, including adequacy of financing, timeliness of disbursements, procurement, quality of supervision, and quality of team composition.	

Community- based implementation	Refers to the strength of community engagement and ownership in implementing nutrition interventions; for example, the strength of community participation through user groups in delivering nutrition-sensitive services like water supply and sanitation; the extent of support for capacity building in communities for selecting and managing local subprojects; the strength of community leadership; and the collaboration between communities and local partners in delivering social services; among others.
Innovations and adaptation	Refers to (i) the existence (or lack thereof) of adaptative and innovative changes for improving project implementation when needed, including those that make use of a group's comparative advantage. For example, the flexibility to transfer management and implementation of service delivery to subnational or nongovernment actors when their capacity is greater compared with the central government. And (ii) adding new elements to project design that are expected to improve outcomes, for example behavior change activities to raise awareness about nutrition practices.
Stakeholder engagement	Refers to the role that collaboration with stakeholders including donor partners (or its absence), had in project implementation and achievement of objectives.

Source:

coordination

and

The most frequent success/failure factors are (i) project design, (ii) community-based implementation, (iii) country ownership and institutional arrangements, and (iv) M&E. These topics account for 60 percent of the total factors identified, irrespective of factor direction. Factors (i), (ii), and (iii) are also the most frequent success factors, accounting for about half of all project success factors; and factors (i), (iii), (iv) together with country context, are the most frequent failure factors, accounting for 72 percent of them (figure D.12).

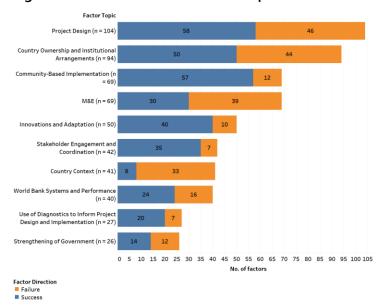


Figure D.12. Distribution of Factor Topics and Factor Direction

Source: Independent Evaluation Group portfolio review and analysis. Note: N = 562 factors: 336 success factors and 226 failure factors.

Project design, country ownership and institutional arrangements, and communitybased implementation stand out as success factors in countries with high project achievement. Project design, for example, is a success factor for a project with an achievement rate of 91 percent in Nepal (a medium stunted growth reduction country). The project sought to enhance food and nutritional security of targeted communities in selected locations. Its design has a multisectoral approach that successfully integrated agricultural development, food security, nutrition, and public health as part of fostering Nutritionally Sensitive Agriculture systems, by bringing together several wellcoordinated technical ministries and specialized entities to operate under the same project umbrella. Country ownership and institutional arrangements is a success factor for a project in Peru (a fast stunted growth reduction country) with an achievement rate of 73 percent. The project sought to increase demand for nutrition services by strengthening the operational effectiveness of a CCT program (Juntos); and, to improve coverage and quality of supply of basic preventive health and nutrition services in the communities covered under the Program (Articulated Nutrition Program [PAN]), including Juntos. In Peru, the Ministry of Economy and Finance has played an important role in achieving synergies to formalize commitment for better results and greater accountability on nutrition outcomes by including the PAN among the programs to be monitored under the performance-based budgeting pilots. According to the ICR and ICRR, the success of PAN has rested on three pillars: use of result-based budgeting; a

unified approach with no one entity having "ownership" of nutrition (a shared priority under shared responsibility); and specialized training for public servants.

Finally, community-based implementation is a success factor for a project with a 75 percent achievement rate in Indonesia (a slow stunted growth reduction country). The project sought to empower local communities in low-income, rural subdistricts in project provinces to increase use of health and education services. It has revitalized community health posts (posyandu), which are critical for the achievement of health and nutrition outcomes. Instead of creating new institutions, the project has enabled communities to allocate portions of their block grants to fund interventions that incentivize participation at the posyandu, such as providing nutritional supplements to mothers who attended, funding subsidies for pre- and postnatal care, and remunerating posyandu volunteers. As a result, community participation in posyandu activities has improved significantly and has sustained throughout project implementation. Overall, project design, community-based implementation, and country ownership are the most frequent success factors identified in countries with good project performance irrespective of their pace in stunted growth reduction (figure D.13A). Additional countries that have similar success factors and high achievement are Benin, Djibouti, India, Lao PDR, Madagascar, Rwanda, and Senegal. Further, these factors are often absent in countries with projects that have lower achievement. 14

Conversely, weak project design, lack of country ownership, difficult country contexts and low-quality M&E frameworks are frequent failure factors in low performing projects spread across different stunted growth reduction rate countries. Just as good project design and strong government commitment are seen in high achieving countries, weak project design and the absence of country commitment are seen frequently in countries with lower achievement. In addition, problems related with country context and M&E are frequent. For example, M&E issues are seen in a project with only 43 percent achievement rate in Pakistan (a slow stunted growth reduction country). The project sought to increase the coverage, in project areas, of interventions that are known to improve the nutritional status of children under two years of age, of pregnant and of lactating women. The delayed start of the project has had a negative impact on the monitoring and supervision activities. Data are not collected for the indicators intended to measure changes in knowledge about nutrition among communities or health workers, and the midterm review mission has identified issues in data quality with incomplete reporting and inconsistencies between data gathered at facilities and communities. The project also reports a lack of adequate field level staff and support mechanisms, so even routine information could not be collected. M&E issues are also found for other projects in countries like Ethiopia, Guatemala, and Malawi. Finally, country context is often an obstacle for the achievement of nutrition results. This factor

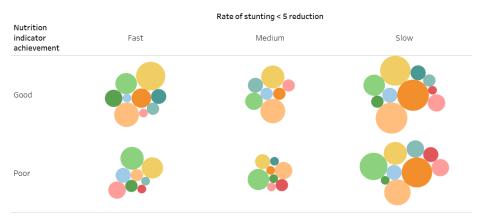
#### Appendix D Nutrition Portfolio

captured exogenous conditions like fragility and conflict or natural disasters and how this affected projects. For example, the deteriorated security situation in the Republic of Yemen has resulted in the halting of operations in March 2015; or the extremely dry climate conditions in Timor-Leste due to El Niño phenomenon since late 2015 has resulted in late planting seasons and reduced ability of families to feed their children, negatively affecting the results of the Community-Driven Nutrition Improvement Project. The distribution of failure factor topics is shown in figure D.13B.

Figure D.13. Success/failure factors by project performance and stunted growth reduction rate of countries

# a. Success factors Rate of stunting < 5 reduction Nutrition indicator achievement Fast Medium Slow Good Factor Topic Community-Based implementation Community-Based implementation Country Ownership and institutional Arrangements. Immage and Apparatum and Apparatum

#### b. Failure factors



Source: Independent Evaluation Group portfolio review and analysis.

Note: Bubble size increases with the share of total success factors or total failure factors, whichever the case may be. Success factor shares range from 0.3 percent to 7 percent; failure factors range from 0.4 percent to 6 percent. Good nutrition indicator achievement captures countries with average achievement rates above the country median of 0.67; Low nutrition indicator achievement captures countries with average achievement rates on or below 0.67. Fast stunted growth

reduction (average of > 1.33 percentage points/ year); medium stunted growth reduction (average of 0.94–1.32 percentage points/ year); slow stunted growth reduction (average of –1.125–0.93 percentage points/ year—it includes countries with increasing stunted growth rates); figures are based on 332 success factors and 226 failure factors in 111 closed projects, excluding regional projects.

#### Factors of Success and Failure and Multidimensionality

Community-based implementation, project design, and country ownership, followed by innovations and adaptations, are the most frequent success factor in countries with multidimensional portfolios (more than six nutrition dimensions in the portfolio) and high achievement of nutrition results (achievement rates above two-thirds) (figure D.14A). Community-based implementation is consistently the most frequent success factor. It accounts for 16 percent of factors in countries with high portfolio multidimensionality, 8 percent in those with medium portfolio multidimensionality (3–6 dimensions) and 30 percent in those with low portfolio multidimensionality (0-2 dimensions). The country case studies found that supporting community-based programs is one way to support a multidimensional package of nutrition interventions to benefit rural communities. In Malawi, for example, community-based program support led by one project is the main nutrition support in the country portfolio. Importantly, failure in countries is often not addressing these success factors (that is, community-based implementation, project design and country ownership, innovations and adaptations). M&E quality is also important with 18 percent, 12 percent and 8 percent of failure factors in countries with low, medium and high portfolio multidimensionality, respectively, and weaker project performance. Lastly, communitybased implementation is rarely a failure factor, suggesting that having community-based support to nutrition in a country portfolio often improved performance (figure D.14B). At project level, success and failure factors are similar, but World Bank systems and performance have more importance to support project performance (figures D.14C and D).

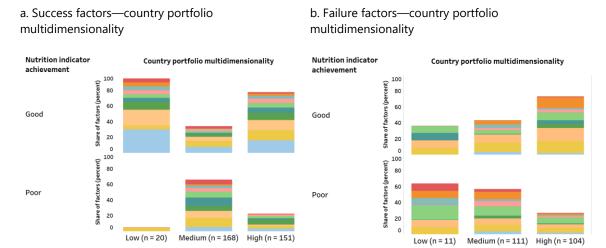
# Factors of Success and Failure and Relevance of Support (Needs and Literature)

The three top success factors (that is, community-based implementation, project design, and country ownership) are also consistent for well performing projects in countries with a high percent of interventions matching the country needs, strong alignment of their portfolio with the evidence in the literature, and for core nutrition projects with nutrition addressed in their title or PDO. Community-based implementation remains the most frequent success factor in countries with a high percent of interventions matching their country's nutrition needs (high: > 50 percent), with 13 percent of factors in that category identified for projects that performed well (figure D.15A); and for projects with interventions aligned to the evidence in the literature (figure D.16A); and for core

#### Appendix D Nutrition Portfolio

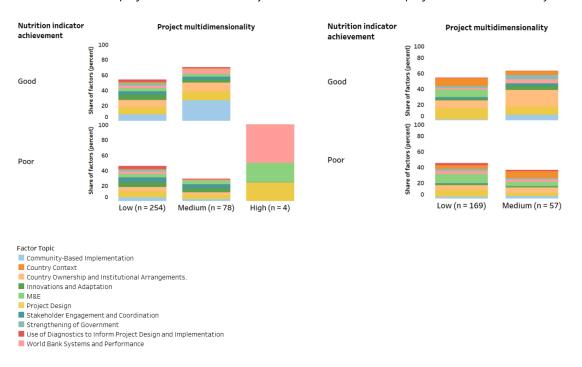
nutrition projects (23 percent) (figure D.17A). M&E again is the most frequent failure factor (figures D.15B, D.16B, and D.17B). In addition, weaker country ownership and institutional arrangements are a notable negative factor in countries with a low percent of matching of interventions to needs.

Figure D.14. Success and Failure Factors and Multidimensionality<sup>15</sup>



c. Success factors—project multidimensionality





Source: Independent Evaluation Group portfolio review and analysis.

*Note*: High country portfolio multidimensionality [0.750,1.000]; medium country portfolio multidimensionality [0.375, 0.75); low country portfolio multidimensionality [0.000,375). High project multidimensionality (0.500, 1.000]; medium project multidimensionality (0.250, 0.500]; low project multidimensionality [0.000, 0.250]. Good nutrition indicator achievement

captures countries with average achievement rates above the country median of 0.67; Low nutrition indicator achievement captures countries with average achievement rates on or below 0.67. N = 562 factors: 336 success factors and 226 failure factors.

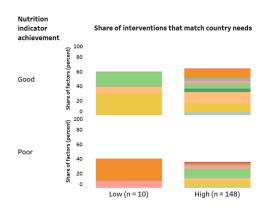
Figure D.15. Success and Failure Factors and Address of Country Needs

High (n = 203)

#### a. Success factors

#### 

#### b. Failure factors



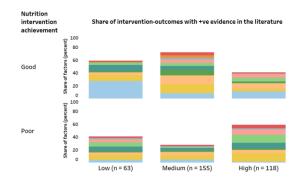
Source: Independent Evaluation Group portfolio review and analysis.

Low (n = 20)

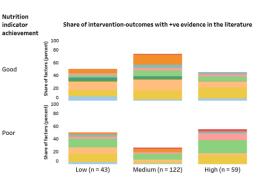
*Note*: A country need is defined as any country-level indicator of a nutrition determinant falling in the bottom 50 percent (see appendix F). The percent match is the extent to which the nutrition portfolio matched interventions to the needs of the countries. High matching percent (>50 percent match); low matching percent (<=50 percent match). Figures are based on 381 factors: 223 success factors and 158 failure factors, coded for 93 projects in 33 countries. Both data on success/failure factors and needs was available for only 33 countries.

Figure D.16. Success and Failure Factors by Share of Intervention with Positive Evidence <sup>16</sup>

#### a. Success factors



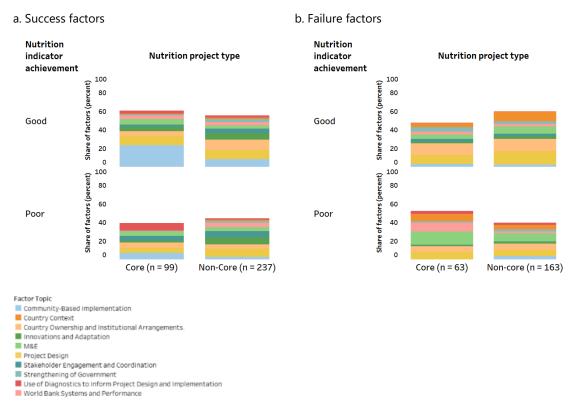
#### b. Failure factors



Source: Independent Evaluation Group portfolio review and analysis.

*Note*: Low share of intervention outcomes with positive evidence in the literature [0.0000, 0.0860], medium [0.0862, 0.1354], high [0.1379, 0.2800]. N=560 factors: 336 success factors and 224 failure factors. Two factors for projects in the Arab Republic of Egypt are excluded because the project only had institutional strengthening support, which is not mapped in the systematic review map.

Figure D.17. Success and Failure Factors for Core Nutrition Projects



Source: Independent Evaluation Group portfolio review and analysis.

*Note*: A core nutrition project has the words "nutri" or "stunt" in its title, PDO or both, and has a nutrition content share equal or above the top two quintiles of the distribution (top 40 percent). N=562 factors: 336 success factors and 226 failure factors.

#### **Notes**

<sup>1</sup> Selected sector codes are *New codes* — AH, AL, AI, AB, AT, AF, AK, AZ, EC, EP, ES, ET, EW, EL, EF, EZ, HG, HQ, HF, SA, SG, YA, BC, BH, BG, BZ, WA, WB, WC, WF and WZ; *Old codes* — AB, AZ, BH, EC, JA and JB, WA, WZ. Selected theme codes were *New codes* — 20, 40, 50, 60, 70, 80, 24, 241, 242, 43, 434, 437, 52, 521, 523, 53, 531, 532, 533, 63, 632, 635, 636, 637, 67, 671, 672, 71, 711, 712, 716, 72, 721, 723, 724, 82, 822, 823, 85, 851; *Old codes* — 26, 54, 57, 58, 59, 60, 62, 63, 68, 69, 70, 71, 73, 75, 77, 78 and 79.

- <sup>2</sup> Countries with no relevant projects include Democratic People's Republic of Korea, Equatorial Guinea, Malaysia, and Nauru.
- <sup>3</sup> The Development Data Group of the Development Economics Vice Presidency.
- <sup>4</sup> Missing text does not affect portfolio identification because the final inclusion criteria are based on relevant components, PDOs, or indicator text; and there is component text for all projects.

- <sup>5</sup> Regular expressions is a language embedded inside Python software that allows specifying rules for a set of strings (text) that need to be matched, in this case document section titles.
- <sup>6</sup> The **word2vec** algorithm uses a neural network model to learn word associations from a large corpus of text, which in our case is one of the three text variables. Word2vec is one of several NLP word embedding techniques, where words or phrases from a vocabulary are mapped to vectors of real numbers. Once trained, the model can detect synonymous words or suggest additional words for a given sentence. There are two main learning algorithms in word2vec: continuous bag-of-words (CBOW) and continuous Skip-gram. Both algorithms learn the representation of a word that is useful for prediction of other words in the sentence. The CBOW architecture predicts the current word based on the context (surrounding words), and the Skip-gram predicts surrounding words (Mikolov, Corrado, Chen, and Dean 2013).
- <sup>7</sup> Cosine similarity is used to compute similarity scores, defined as the dot product of two nonzero vectors. One of the vector's elements are the key term frequencies (tf) from a specific conceptual framework building block weighted with their inverse project frequencies (ipf), a measure of how much information a key term provides (that is, it measures if a key term is common or rare across all projects). The weighted output is called the *term-frequencies-inverse-project-frequencies* or *tpif*, and *tfipf=tf×ipf*. The other vector's elements are the *tfipf* in one of the three text variables (such as PDOs). Formally, cosine similarity is defined as  $C_{(p|k_i)} = \frac{\overline{V_{k_1}} \overline{V_{k_2}}}{|\overline{V_{k_1}}||\overline{V_{k_2}}|'}$  where p represents the project; k1 is one of the three text variables and k2 one of the 12 building blocks from the CF;  $\overline{V_{k_1}}$  and  $\overline{V_{k_2}}$  represent each of the corresponding vectors with *tfipf* as their elements;  $\overline{V_{k_1}} \cdot \overline{V_{k_2}} = \sum_{i=1}^{96} V_{ik_1} V_{ik_2} = \sum_{i=1}^{96} (tf \times ipf)_{ik_1} (tf \times ipf)_{ik_2} = \sum_{i=1}^{96} (tfipf)_{ik_1} (tfipf)_{ik_2}$  where i takes on values between 1 and 96 based on the 96 nutrition key terms defined by IEG; tf is the frequency of key terms in a project from a specific building block;  $ipf(t, D) = log \frac{N}{1+|\{peP:tep\}|'}$  where N is the total number of projects and  $|\{peP:tep\}|$  is the number of projects where the term t appears. Finally,  $|\overline{V_{k_1}}||\overline{V_{k_2}}| = \sqrt{\sum_{i=1}^{96} V_{ik_1}^2} \sqrt{\sum_{i=1}^{96} V_{ik_1}^2}$ . The cosine similarity ranges between −1 and 1 where higher values imply higher similarity between the vectors.
- <sup>8</sup> After the identification process, engagement with country operations and further consultations highlighted 17 additional projects that are included in the evaluation portfolio.
- <sup>9</sup> List of countries in nutrition portfolio: AFR: 1. Benin, 2. Burkina Faso, 3. Burundi, 4. Cameroon, 5. Central African Republic, 6. Chad, 7. Comoros, 8. Congo Republic, 9. Congo Democratic Republic, 10. Côte d'Ivoire, 11. Eritrea, 12. Ethiopia, 13. The Gambia, 14. Ghana, 15. Guinea, 16. Guinea-Bissau, 17. Kenya, 18. Lesotho, 19. Liberia, 20. Madagascar, 21. Malawi, 22. Mali, 23. Mauritania, 24. Mozambique, 25. Niger, 26. Nigeria, 27. Rwanda, 28. Senegal, 29. Sierra Leone, 30. South Sudan, 31. Tanzania, 32. Togo, 33. Uganda, 34. Zambia, 35. Zimbabwe; LAC: 36. Belize, 37. Bolivia, 38. Ecuador, 39. El Salvador, 40. Guatemala, 41. Haiti, 42. Honduras, 43. Nicaragua, 44. Panama, 45. Peru; EAP: 46. Cambodia, 47. Indonesia, 48. Lao PDR, 49. Marshall Islands, 50. Philippines, 51. Timor-Leste, 52. Vietnam; SAR: 53. Afghanistan, 54. Bangladesh, 55. Bhutan, 56. India, 57. Nepal, 58. Pakistan; ECA: 59. Armenia, 60. Kyrgyz Republic, 61. Tajikistan;

**MENA:** 62. Djibouti, 63. Egypt, and 64. Yemen. In addition to the 64 countries above, a country category for regional projects is used in the analysis: 65. Regional projects.

- <sup>10</sup> Portfolio data were retrieved on November 10, 2019.
- <sup>11</sup> The estimated commitment for RETFs include the entire amount of the RETF, while in some cases nutrition interventions may have been limited to one component.
- <sup>12</sup> The status of some closed projects is updated during the portfolio review. Of the four closed projects for which indicators are not available, one is cancelled (P143608), and three are small grants without available indicator data (P121690, P132751, and P150974).
- <sup>13</sup> Factor topics are identified through unsupervised hierarchical clustering machine learning algorithms by Oxford Analytics and Endeavour, who partnered with IEG on a pilot exercise to apply machine learning methods in thematic evaluations. The nutrition evaluation's portfolio is the focus of the exercise and topic modeling of factors of success and failures is one of the main tasks performed. The team subsequently refined the final list of 10 topics through manual review.
- <sup>14</sup> Examples in text are from projects P128905, P117310, P132585, P131850, and P145491.
- $^{15}$  High country portfolio multidimensionality [0.750,1.000]; medium country portfolio multidimensionality [0.375, 0.75); low country portfolio multidimensionality [0.000,375). High project multidimensionality (0.500, 1.000]; medium project multidimensionality (0.250, 0.500]; low project multidimensionality [0.000, 0.250]. Good nutrition indicator achievement captures countries with average achievement rates above the country median of 0.67; Low nutrition indicator achievement captures countries with average achievement rates on or below 0.67. N = 562 factors: 336 success factors and 226 failure factors.
- $^{16}$  Low share of intervention outcomes with positive evidence in the literature [0.0000, 0.0860], medium [0.0862, 0.1354], high [0.1379, 0.2800]. N = 560 factors: 336 success factors and 224 failure factors. Two factors for projects in Egypt are excluded because the project only had institutional strengthening interventions, which were not mapped in the systematic review map analysis.

# References

Mikolov, T., K. Chen, G. Corrado, and J. Dean, J. (2013). "Efficient Estimation of Word Representations in Vector Space." In International Conference on Learning Representations (ICLR) Workshop Papers.

UNICEF, WHO (World Health Organization), and World Bank. 2019. Levels and Trends in Child Malnutrition: Key Findings of the 2019 Edition of the Joint Child Malnutrition Estimates. Geneva: WHO.

# **Appendix E. Behavior Change Portfolio Analysis**

The portfolio of projects supporting nutrition is analyzed to identify findings related to the World Bank's engagement in and effectiveness of behavior change interventions. In total, 236 projects are identified with at least one behavior change intervention (83 percent of the portfolio). Coding is conducted to identify behavior change interventions in projects, relevant indicators, and target actors of the interventions. This coding yields 673 behavior change interventions and 822 behavior change indicators, about 38 percent of interventions and indicators in the total portfolio. The main limitation of the analysis is that projects with few behavior change interventions often lack indicators and descriptive details. The interventions are mapped against the dimensions of the conceptual framework (access to food and care, health services, water, sanitation, and hygiene [WASH], social norms, and institutional strengthening)<sup>1</sup>, and the indicators are mapped to the results chain (engage-learn-apply-sustain). Descriptive data analysis is then conducted in SAS and Tableau.

## **Behavior Change Interventions**

Behavior change interventions equally cover nutrition-specific (32 percent) and nutrition-sensitive areas (35 percent) (figure E.1), while the intensity of interventions varies across projects. Most of the projects (64 percent) include behavior change interventions in at least two areas of the conceptual framework: 36 percent have interventions in one area; 27 percent in two or three areas; 8 percent in four areas; and 3 percent in all five areas. In terms of the dimensions of the conceptual framework, interventions in areas of food and care (38 percent), institutional strengthening (27 percent), and health services (21 percent) are more widespread in the portfolio, whereas fewer interventions support WASH (9 percent) and social norms (6 percent).

Figure E.1. Behavior Change Interventions in the Portfolio



Source: Independent Evaluation Group.

*Note*: A project is coded as having an intervention in the behavior change category if it had at least one relevant intervention. Boxes show percent of interventions. N = 673 interventions.

# Interventions by Global Practice, Region, and Time

By GP, projects in Health, Nutrition, and Population (HNP) (92 percent), Social Protection and Jobs (SPJ) (91 percent), and Education (91 percent) equally integrated behavior change interventions, whereas behavior change in projects is less frequent in Water (74 percent), and Agriculture and Food (Agriculture) and other GPs<sup>2</sup> (67 percent).

HNP has the largest number of projects integrating behavior change since the nutrition lending portfolio predominates in the health sector (HNP 53 percent, SPJ 20 percent, Agriculture 13 percent, Education 4 percent, Water 4 percent, and other 6 percent). Across regions, the share of projects with behavior change interventions varies notably. Regions with a high proportion of projects integrating behavior change interventions are East Asia and Pacific (91 percent), South Asia (89 percent), Latin America and the Caribbean (89 percent), and Africa (81 percent), whereas behavior change in projects is less frequent in Middle East and North Africa (71 percent) and Europe and Central Asia (67 percent).

The interventions in each GP are multidimensional in that they spread across different behavior change areas, with the largest proportion of interventions in food and care, and institutional strengthening (often training activities) (figure E.2). In HNP and SPJ, health services is also an important behavior change area. In Water, most behavior change interventions focus on WASH. By region, the share of interventions by behavior change area is similar, with most interventions in food and care (about 40 percent), followed by institutional strengthening (about 25 percent), health services (21 percent), WASH (about 9 percent), and social norms (about 5 percent). However, Europe and Central Asia stands out with more interventions in food and care (57 percent), and limited institutional strengthening (7 percent). Moreover, Latin America and the Caribbean has a greater emphasis on social norms (10 percent) than other regions.

The share of behavior change interventions in the portfolio has remained similar over time, while the total number of interventions has increased, with more nutrition projects, and there has been an increasing focus on food and care. About 85 percent of projects have at least one behavior change intervention, and behavior change interventions are about 38 percent of total nutrition interventions. There has been a shift to focus on behavior change interventions in the food and care area since 2008, while the share of behavior change interventions in health services and institutional strengthening has decreased (figure E.3).

Behavior change area Health, Nutrition, and 6 32 ■ Health services Population (n = 359) Food and care WASH Social Protection and 5 6 44 24 Social norms Jobs (n = 134)■ Institutional strengthening Agriculture and Food 29 3 8 57 (n = 86)Water (n = 28) 36 Education (n = 29) 28 10 31 14 43 Other (n = 37)30

Figure E.2. Behavior Change Interventions by Practice and Area

*Note*: Other GPs include Macroeconomics, Trade and Investment, Social Sustainability and Inclusion, Urban, Disaster Risk Management, Resilience and Land, and Governance.

Percent of interventions

Behavior change area Projects approved in ■ Health services and before 2008 (n = 36 3 9 22 29 Food and care 129) WASH Social norms ■ Institutional strengthening Projects approved 8 7 40 between 2009 and 26 2013 (n = 199) Projects approved between 2014 and 5 41 11 2019 (n = 345)

Percent of interventions

Figure E.3. Behavior Change Interventions by Project Approval Fiscal Year and Area

Source: Independent Evaluation Group.

# Actors Engaged in Behavior Change

Most of the behavior change interventions target mothers and caregivers and communities, while the targeting of actors varies by intervention area, with service providers the main target of institutional strengthening (55 percent). Among the interventions that are implemented, 50 percent target mothers/caregivers, 29 percent target households, 53 percent target communities, 30 percent target service providers, and 7 percent target adolescents. Food and care interventions often target mothers and caregivers (53 percent) or households (55 percent). Social norms interventions mainly focus on adolescent behaviors (28 percent) (figure E.4).

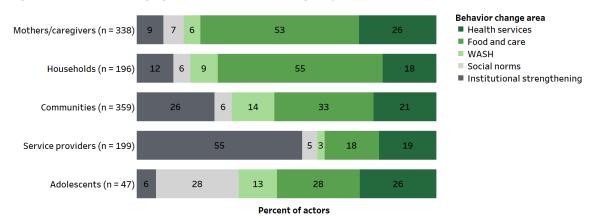


Figure E.4. Actors Engaged in Behavior Change by Area

Note: One intervention can engage multiple types of actors.

# **Behavior Change Measurement**

The World Bank's operations most often measure behavior change at the level of practice, while engagement, learning, and sustained behavior changes are less often measured (table E.1). In terms of actors, projects most often measure behavior change related improvements among mothers and caregivers (62 percent), given most interventions target these actors. Interventions for other actors are often not measured: service providers, 17 percent; households, 13 percent; and communities, 8 percent.

Overall, there is weak measurement of the progression along the results chain to sustain behavior change. Sustained changes are most often measured in areas of food and care and health services and less often in institutional strengthening (figure E.5). The measurement of institutional strengthening is often limited to the engage (51 percent) and learn levels (61 percent), whereas health services often do not measure learning-related changes (4 percent). WASH behavior changes are often less measured.

Table E.1 Examples of Indicators by Results Chain Level of Behavior Change Framework

Level	Example actions	Example indicators
Engage (23%, n=187)	<ul> <li>Attending community         awareness event</li> <li>Joining community         mobilization session         (such as for CLTS             campaign)</li> <li>Participating in training         on nurturing care</li> </ul>	<ul> <li>Number of women attending community events</li> <li>Number of mothers of targeted children participating in monthly information and education session in intervention areas</li> <li>Number of community households attending triggering session</li> <li>Children 36–59 months with adult member engaged in at least four learning activities in past three days</li> </ul>

Learn (14%, n = 114)	<ul> <li>Attending training of women's groups on the preparation of nutritious foods</li> <li>Receiving family planning counseling</li> <li>Receiving livelihood and skill training</li> </ul>	<ul> <li>Proportion of women participating in the program with sufficient knowledge about childcare, food consumption, and home hygiene</li> <li>Proportion of parents able to correctly name at least three key actions to improve child nutrition</li> <li>Percent of participating girls and women (10–19) with improved knowledge on RMNCHN</li> <li>Proportion of primary health care workers able to correctly answer questions on management of common childhood illnesses</li> </ul>
Apply (41%, n=336)	<ul> <li>Following breastfeeding and complementary feeding guidelines</li> <li>Adhering to community health worker recommendations</li> <li>Applying livelihood and skill training</li> </ul>	<ul> <li>Percent of newborns put to breast within the first hour</li> <li>Health facility use rates</li> <li>Percent of children fed a diverse diet (at least four food groups)</li> <li>Percent of female farmers using improved methods</li> </ul>
Sustained behavior and institutional change (23%, n= 185)	<ul> <li>Consistently applying breastfeeding and complementary feeding guidelines</li> <li>Consistently applying livelihood and skill training</li> <li>Community-level change in applying WASH principles</li> </ul>	<ul> <li>Percent of children ages 0–24 months fed in accordance with all three IYCF practices</li> <li>Diet diversity score of mother</li> <li>Prenatal care (four or more visits)</li> <li>Percent of communities free of open defecation</li> <li>Average percentage increase in crop production</li> </ul>

*Note*: RMCHN = Reproductive, Maternal, Newborn, Child Health and Nutrition; PHC = Primary Health Care; IYCF = Infant and Young Child Feeding.

Engage (n = 187)

51

2

9

39

Health services
Food and care
WASH
Social norms
Institutional strengthening

Apply (n = 336)

7

11

3

45

Percent of indicators

Figure E.5. Indicators by Behavior Change Area and Results Chain Level

Source: Independent Evaluation Group

# **Achievement Rate of Behavior Change**

Moving from the engage level to sustained behavior changes appears to be challenging, as is achieving behavior changes for mother and caregiver beneficiaries compared with other groups, such as service providers and community. Achievement rates of indicators by level are as follows (figure E.5): engage (84 percent); learn (79 percent); apply (61 percent); and sustained behavior change (69 percent). Further analysis of the achievement rates of indicators by actor shows that interventions supporting service providers and communities have the highest achievement rate (81 percent), followed by households (73 percent), and mothers and caregivers (66 percent). The achievement rates of indicators also vary by GP (Agriculture 75 percent, HNP 72 percent, SPJ 64 percent, Water 60 percent, and other sectors, including Education 80 percent).

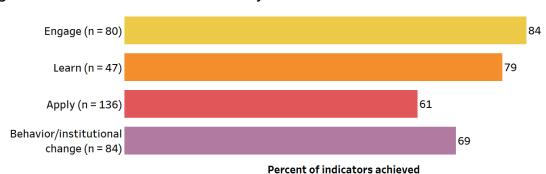
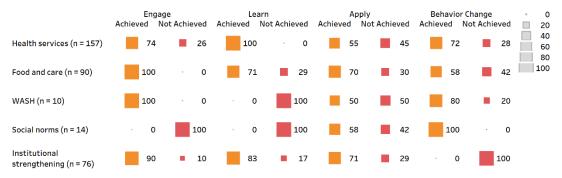


Figure E.6. Indicator Achievement Rate by Results Chain Level

Source: Independent Evaluation Group. Note: total number of indicators in closed projects is n = 347. Across intervention areas, the progression from practice to sustained behavior change may be challenging (figure E.6). However, in projects where behavior changes are measured, there is some success at achieving indicators. Health services, food and care and institutional strengthening interventions are most often tracked. The engage and learn level achievements may be easier in all intervention areas. The data on social norms and WASH, however, is based on too few results to make an assessment.

Figure E.7. Indicator Achievement by Area and Results Chain Level



Source: Independent Evaluation Group.

*Note*: WASH = water, sanitation and hygiene. Food and care: engage (n = 6), learn (n = 14), apply (n = 46), and sustained behavior change (n = 24). Health: engage (n = 34), learn (n = 2), apply (n = 67), and sustained behavior change (n = 54). Institutional strengthening: engage (n = 39), learn (n = 30), apply (n = 7), and sustained behavior change (n = 0). Social norms has 12 indicators at the apply level and other cells are <1. WASH has 4 indicators at apply level and 5 indicators at sustained behavior change, and other cells are <1.

### Notes

<sup>1</sup>Food and care include breastfeeding, child feeding, and stimulation; social safety nets; early childhood development; dietary support; and agriculture and food systems. Health services include adolescent health, child disease prevention and treatment, and health and family planning service.

<sup>2</sup>Other GPs include Macroeconomics, Trade and Investment, Social Sustainability and Inclusion, Urban, Disaster Risk Management, Resilience and Land, and Governance.

# **Appendix F. Heat Map of Country Needs**

# Objective

The objective of the heat map analysis is twofold: (i) to understand the situation of countries in the evaluation portfolio in relation to nutrition outcomes, their determinants, and their empirical links based on the conceptual framework; and (ii) to assess the extent to which the World Bank's interventions, which have been supported through lending, align well with the country needs. The latter aims to respond to evaluation question one on the relevance of World Bank interventions (see appendix A for methodology).

# **Data and Methodology**

The analysis uses key dimensions of the conceptual framework—nutrition outcomes, determinants (including access to nutrient-rich food, maternal and child caregiving, water, sanitation and hygiene [WASH], and health services), and social norms and behaviors—to guide the data collection and assess country situations.¹ The selection of indicators (table F.1) for each building block in all included countries² aligns with Skoufias et al. (2019), who analyze child undernutrition and nutrition determinants in African countries.

Child nutrition outcomes: Outcome indicators relate to the Global Nutrition Targets 2025.<sup>3</sup> They are re-expressed to reflect a positive outcome, such as no stunted growth (children under five years not stunted); no anemia (children under five years not anemic); no low birthweight (live births with weight more than 2,500 grams); no underweight (children under five years not underweight); and no wasting (children under five years not wasted).

Access to food and care: Access to food and care can influence diet diversity and maternal knowledge and behaviors to care for and feed children. Given the strong link between the access to nutritious food and maternal and child caregiving determinants, these two dimensions are combined. Indicators of food insecurity and mother's diet diversity are not available and thus are not included in the analysis.

Access to WASH: These environmental indicators reflect the sanitary and hygienic conditions in the child's household and community. Key indicators are access to drinking water, access to sanitation, and the disposal of a child's stool.

Access to health: These indicators capture maternal and child access to, and use of, skilled medical care for illness and preventive care. Skoufias et al. (2018) includes four indicators: use of antenatal care (ANC) services, births assisted by a health care

professional, postnatal checkups, age-appropriate immunization status, and mosquito nets. This analysis did not include mosquito nets to ensure comparability, since they are not relevant across all countries. The analysis did add provision of iron tablets during ANC, vitamin A supplementation, and distance barriers to health facilities to reflect the quality of care and access.

**Social norms:** Social norms can provide an understanding of gender roles, such as those related to decision-making in relation to the care of children, and social and cultural practices that may influence the nutrition status of children and pregnant and lactating women. Key indicators capture aspects of gender roles, sociocultural practices, and women's empowerment.

Table F.1 Indicators Used for Heat Map Analysis

Building block of conceptual framework	Area assessed	Data
Child undernutrition outcomes		
No stunted growth: percentage of children under age 5 NOT falling below -2 standard deviations (moderate and severe) from the median height-for-age of the reference population	Nutrition outcome	UNICEF 2008–18
No anemia: percentage of children under age 5 whose hemoglobin level is NOT less than 110 grams per liter at sea level	Nutrition outcome	UNICEF 2016
No low birthweight: percentage of live births that weighed NO less than 2,500 grams (5.51 pounds)	Nutrition outcome	UNICEF 2015
No wasted: percentage of children NOT wasted (below –2 standard deviations of weight-for-height according to the WHO standard)	Nutrition outcome	DHS 2000–18
No underweight: percentage of children NOT underweight (below –2 standard deviations of weight-for-age according to the WHO standard)	Nutrition outcome	DHS 2000–18
Access to food and care		
Minimum Dietary Diversity of children age 6–23 months	Child feeding	UNICEF 2008–18
Households consuming iodized salt	Access to nutrient-rich food	DHS 2008–18
Exclusive breastfeeding of infants age 0–5 months	Caring behavior	UNICEF 2004–18
Care seeking for diarrhea: children under age 5 with diarrhea for whom advice or treatment was sought from a health facility or provider	Health-seeking behavior	DHS 2008–18
Financial inclusion: women (age 15+) who reported having an account at a bank or another type of financial institution or personally using a mobile money service in the past 12 months	Women's knowledge and access to resources	World Bank 2014

WASH		
Access to water (at least basic): access to drinking water (improved and available)	Access to safe water	WHO/U NICEF 2017
No open defecation	Access to community-level sanitation	WHO/U NICEF 2017
Access to basic handwashing facility with water and soap	Access to handwashing facilities	WHO/U NICEF 2017
Access to health services		
DPT3: infants who received the third dose of DTP-containing vaccine (12–23 months old)	Child health	UNICEF 2018
Skilled birth attendant: deliveries attended by skilled health personnel	Safe delivery, newborn care	UNICEF 2010–18
Women (age 15–49) who received PNC within two days after birth	Access to quality services	UNICEF 2010–18
Distance not barrier: women not reporting distance to health facility as a problem in accessing health care	Access to services	DHS 2001–18
Women (age 15–49) who attended at least four ANC visits during pregnancy by any provider	Healthy pregnancy	UNICEF 2007–18
Iron tablets during ANC: women with a live birth in the three years preceding the survey who received iron tablets or syrup during ANC	Access to quality services	DHS 2001–18
Vitamin A supplementation: children age 6–59 months who received vitamin A supplements in the 6 months preceding the survey	Access to quality services	DHS 2008–18
Social norms		
Women's decision power: women who said that they alone or jointly have the final say in all three main decisions (health care; making large purchases; visits to family, relatives, and friends)	Gender roles in the household	DHS 2001–18
No high-risk births of mothers age <18	Sociocultural practices	DHS 2000–18
Women currently using any modern method of contraception	Sociocultural practices	DHS 2000–18
Literacy: women who are literate	Women's empowerment	DHS 2001–18

Source: UNICEF, WHO, and World Bank 2019; USAID 2020; and World Bank 2017.

*Note*: DHS = Demographic and Health Survey; DPT3 = third dose of DPT (diphtheria, pertussis, and tetanus) vaccine; UNESCO = United Nations Educational, Scientific and Cultural Organisation; UNICEF = United Nations Children's Fund; WHO = World Health Organization.

**Level of indicators:** For each building block, the baseline and current levels of the indicators are categorized for each country at the national level as lowest (i), low (ii),

medium (iii), and high (iv), with high being the best situation of the indicator. The thresholds for the categories are based on the literature to the extent possible,<sup>4</sup> or calculated in quartiles based on the distribution of the data in the included countries for the available years. Data for the baseline levels are from 2008, and the current levels are from 2018 or the closest year available.

Trend of indicators: Similarly, indicator trends are calculated at the national level over the 10-year period, assuming a constant annual growth rate. The trend is categorized in quartiles, from high decrease (i), modest decrease (ii), modest increase (iii), to high increase (iv). As described above, thresholds are based on the global average from the literature or the average for the data in the evaluation countries. For indicators with only one data point available the trend is not calculated.

Composite scores: Using principal component analysis, composite measures are also constructed for each nutrition determinant (that is, access to food and care, WASH, and health services), social norms, and undernutrition outcomes at the baseline level, the current level, and their trends over the 10-year period. Due to data availability the composite scores are calculated for countries with complete data, or no more than 50 percent of the values for the indicators missing. Remaining missing values are replaced with the regional average for the indicator.<sup>5</sup> Based on the composite score for each building block, countries are categorized into quartiles at baseline and current levels from lowest <25% (i), low 25–<50% (ii), medium 50–<75% (iii), to high >75% (iv). For trends, the scale is from no increase or decrease (i), low increase (ii), medium increase (iii), to high increase (iv). The most desired situation is to observe a high increase, even if the current situation is categorized as low, compared with other countries.

Overall composite of determinants: The composite scores of access to food and care, WASH, health services, and social norms are combined to construct an overall composite that summarizes the situation of nutrition determinants in a country. The overall composite is the unweighted average of the baseline or current levels, or the trend of the four composite scores. The overall composite is calculated for countries with composite scores available for at least two of the determinants, replacing remaining missing values with the regional average, where relevant.<sup>6</sup>

Using the estimated data mentioned above, the following analyses are performed.

• First, a heat map is constructed combining the composite scores for nutrition outcomes and each of the four determinants to summarize country situation at baseline and its trend over the 10-year period (table F.2).

- Second, Pearson correlation analyses are conducted between the levels and trends of nutrition outcomes and their determinants in the evaluation countries to empirically test their links in the conceptual framework (figures F.1 and F.2).
- Third, using portfolio review data, nutrition-related interventions supported by lending operations are mapped into the determinants areas to assess whether country needs have been matched by World Bank interventions. A country need is defined as any individual indicator of a determinant falling below their corresponding threshold established by the literature to the extent possible, or falling in the bottom 50 percent of the distribution at the beginning of the evaluation period. The percent match of World Bank interventions with needs is calculated for the portfolio and by country (table F.2).

# Links between Nutrition Determinants, Outcomes, Country Needs, and the World Bank Portfolio

The countries' conditions in nutrition determinants matter for achieving better nutrition outcomes. Cross-country correlation analysis confirms the conceptual framework links between nutrition determinants and outcomes. Countries that are better off in terms of food and care, access to WASH and health services, and social norms indicators tend to have better nutrition outcomes at the beginning and at the end of the evaluation period. Correlations between the overall composite of determinants and outcomes are strong and positive, ranging from 0.54 to 0.57 for baseline and current levels. The association between overall determinants and specific nutrition outcomes, such as anemia, is particularly strong (ranging from 0.72 to 0.77), albeit data on anemia is only available for current levels (figure F.1).

The link between health determinants and outcomes is strongest across all nutrition outcomes. The correlation coefficients of health determinants and overall outcomes is 0.65, followed by social norms (0.50), WASH (0.40), and food and care (0.29) at baseline. Similar patterns emerge at current levels. This result reinforces the importance of having interventions in health synergized with multidimensional interventions across determinants to improve outcomes.

Countries with relatively disadvantaged determinants are slowly converging in outcomes, and thus there is potential for them to catch up over time. When comparing initial conditions to current outcomes, once again the association is positive and significant (0.56 for overall composite measures). Yet the magnitude of changes in outcomes is smaller among countries with higher baseline levels of determinants as indicated by the negative correlation (–0.46). This negative association holds for individual determinants related to access to WASH and health services and social

norms. Figure F.1 plots countries' overall determinants and nutrition outcomes showing their positive association over time (Panel A) and negative association with respect to outcome changes (Panel B). These results are encouraging and suggest the inequality in undernutrition outcomes among countries could decrease over time as determinants improve. However, once outcomes and determinants improve in a country, last mile improvements to benefit vulnerable populations may be slower.

The World Bank's lending support that tackles the determinants to reduce undernutrition largely aligns with country needs. Table F.2 shows baseline levels and trends for overall nutrition outcomes, determinants by area of concern, number of supported interventions by area, and the matching score by country. Overall, about 79 percent of countries in the sample implemented interventions that address nutrition determinants needs with financial support from the World Bank, suggesting that the World Bank supported the *right* interventions. Matching of country needs varies across determinants. For instance, identified needs related to food and care are addressed by appropriate interventions in 95 percent of the cases, and the World Bank support in access to health services was highly relevant to needs (90 percent). In contrast, needs related to other areas, such as access to WASH and social norms, are often not addressed by interventions (64 percent and 52 percent, respectively). Since the World Bank's nutrition portfolio has increasingly supported multidimensional interventions at project level beyond their respective technical sectors (see Annex D), these findings should not be interpreted as an assessment of the relevance of the nutrition portfolio for each GP.

The World Bank can do better in increasing its alignment of the portfolio interventions with country needs in areas where the association with country nutrition outcomes is the strongest. Heat map analysis shows that at the national level, the alignment of the portfolio is particularly high in access to health care, which shows the strongest association with country nutrition outcomes, respectively. However, alignment falls short in addressing social norms needs given its relatively importance for nutrition outcomes. The World Bank should increase its emphasis on social norms tackling women empowerment and early pregnancy, which currently accounts for only 6 percent of the portfolio across all GPs and sectors.

Table F.2. Comparing Undernutrition Needs and World Bank Interventions in Countries

REGION	OUT	СОМЕ	FOO	D AND C	ARE		WASH			HEALTH		soc	IAL NO	RMS	MATCH
Country	Base <sup>1</sup>	Trend <sup>2</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	% <sup>4</sup>
SOUTH ASIA															
% match interver	ntions for	region	Food	and care	100%	V	WASH 83% Health 83%		%	Social norms 80%		80%	Total 95%		
Afghanistan					7			1			12			0	75%
Bangladesh					12			1			8			2	100%
Bhutan					4			0			0			0	
India					19			6			9			1	100%
Nepal					19			4			9			5	100%
Pakistan					18			5			15			1	100%
EAST ASIA PAC	IFIC														
% match interver	tions for	region	Food	and care	100%	V	VASH 719	6	H.	lealth 83	%	Soc	ial norms	0%	Total 69%
Cambodia					7			5			6			0	75%
Indonesia					22			4			7			6	100%
Lao PDR					21			12			8			5	
Marshall Islands					3			0			1			0	
Philippines					3			0			3			0	50%
Timor-Leste					4			1			0			0	50%
Vietnam					3			1			5			0	
EUROPE AND C	ENTRAL	ASIA													
% match interven	ntions for	region	Food	and care	67%	V	VASH 339	6	F.	lealth 50'	%	Soc	ial norms	0%	Total 25%
Armenia					0			0			0			0	0%
Kyrgyzstan					11			2			5			0	
Tajikistan					8			0			3			0	50%
LATIN AMERICA	AND C	ARIBBE/	AN												
% match interver	tions for	region	Food	and care	100%	V	VASH 809	6	H	ealth 100	%	Soci	al norms	40%	Total 90%
Belize					4			2			3			1	
Bolivia					6			1			3			2	
Ecuador					4			0			1			1	
El Salvador					3			0			1			0	
Guatemala					9			5			9			1	100%
Haiti					9			5			7			0	75%
Honduras					5			1			2			0	75%
Nicaragua					2			1			6			2	100%
Panama					6			2			6			0	
Peru					13			1			5			1	100%
MIDDLE EAST A	AND NO	RTH AFI	RICA												
% match interven	ntions for	region	Food	and care	100%	V	VASH 679	6	F.	lealth 67'	%	Soc	ial norms	0%	Total 75%
Djibouti					9			3			9			0	
Egypt					0			0			0			0	
Yemen					17			5			13			0	

Notes:

Base level of the undernutrition outcome or determinant in the country compared to other countries; the lowest level (darkest color) signifies an area of

Source: Analysis of data from UNICEF, WHO, and World Bank 2019, UNICEF 2019 and USAID 2020, and data on the World Bank nutrition portfolio (2008–2019) from the Independent Evaluation Group.

Base Con	nparativ	e Level¹			Compara	tive T
		A 4 1:		N. 1.		
Lowest level	Low level	Medium level	High level	No data available	No increase/	Lo incre

Compara		
No increase/	Medium increase	No data available
decrease		

#### Bank Portfolio<sup>3,4</sup>

- # Number of interventions
- % Matched interventions to needs

concern.

<sup>2</sup>The trend of the undernutrition outcome or determinant in the country compared to other countries, based on the average annual growth rate between 2008 and 2018 or the closest years for which data were available; the lowest change (darkest color) signifies an area of concern.

<sup>3</sup>The total number of interventions to address the undernutrition determinant identified in the World Bank nutrition portfolio in the country.

<sup>4</sup>The percent match is the extent to which the World Bank nutrition portfolio matched interventions to the needs of the countries. A country need is defined as any indicator of a determinant falling in the bottom 50 percent.

### Appendix F

### Heat Map of Country Needs

REGION	OUT	COME	FOO	D AND C	ARE		WASH			HEALTH		soc	IAL NO	RMS	MATCH
Country	Base <sup>1</sup>	Trend <sup>2</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	Base <sup>1</sup>	Trend <sup>2</sup>	Bank <sup>3</sup>	% <sup>4</sup>
AFRICA															
% match interv	entions fo	r region	Food	and care	94%	V	VASH 57%	6	Н	lealth 94	%	Soci	Social norms 63%		Total 80%
Benin					11			4			11			2	100%
Burkina Faso					7			0			10			2	75%
Burundi					5			0			3			0	50%
Cameroon					12			1			14			3	100%
CAR					4			0			7			0	
Chad					10			2			6			2	100%
Comoros					4			1			3			0	67%
Congo					2			0			3			0	50%
Cote d'Ivoire					9			1			9			3	100%
DR of Congo					3			0			6			1	75%
Eritrea					2			0			1			0	
Ethiopia					21			4			15			5	100%
Gambia					9			1			4			0	75%
Ghana					2			0			7			0	50%
Guinea					3			2			8			4	100%
Guinea-Bissau					1			0			1			0	
Kenya					7			2			5			2	100%
Lesotho					4			1			0			0	50%
Liberia					3			0			0			1	50%
Madagascar					37			6			28			1	100%
Malawi					27			2			11			2	100%
Mali					6			0			8			3	75%
Mauritania					9			0			7			2	75%
Mozambique					11			8			5			2	100%
Niger					15			3			10			4	100%
Nigeria					5			0			5			1	75%
Rwanda					21			3			8			2	100%
Senegal					26			3			16			0	75%
Sierra Leone					1			1			2			0	75%
South Sudan					8			1			7			1	
Tanzania					10			2			7			0	
Togo					6			2			4			1	100%
Uganda					6			1			2			0	75%
Zambia					4			0			4			1	
Zimbabwe					0			0			3			0	25%

#### Notes

Total % match interventions

WASH 64%

Food and care 95%

Source: Analysis of data from UNICEF, WHO, and World Bank 2019, UNICEF 2019 and USAID 2020, and data on the World Bank nutrition portfolio (2008–2019) from the Independent Evaluation Group.

Base Comparative Level <sup>1</sup>											
Lowest	Low	Medium	High	No data							
level	level	level	level	available							

Compara			
No increase/	Medium increase		No data available
decrease			

Health 90%

### Bank Portfolio<sup>3,4</sup>

Social norms 52%

- # Number of interventions
- % Matched interventions to needs

<sup>&</sup>lt;sup>1</sup> Base level of the undernutrition outcome or determinant in the country compared to other countries; the lowest level (darkest color) signifies an area of concern.

<sup>&</sup>lt;sup>2</sup>The trend of the undernutrition outcome or determinant in the country compared to other countries, based on the average annual growth rate between 2008 and 2018 or the closest years for which data were available; the lowest change (darkest color) signifies an area of concern.

<sup>&</sup>lt;sup>3</sup>The total number of interventions to address the undernutrition determinant identified in the World Bank nutrition portfolio in the country.

<sup>&</sup>lt;sup>4</sup>The percent match is the extent to which the World Bank nutrition portfolio matched interventions to the needs of the countries. A country need is defined as any indicator of a determinant falling in the bottom 50 percent.

**Table F.3 Correlation Analysis of Outcomes and Determinants** 

	orrelation		Baselin	e level of	outcomes	(2008)			Curren	t level of	outcomes	(2018)				Trend of	outcomes	;	
	matrix	All five	No	No	No	No	No	All five	No	No	No	No	No	All five	No	No	No	No	No
			stunting	anemia	LBW	wasting	under-		stunting	anemia	LBW	wasting	underw		stunting	anemia	LBW	wasting	under-
							weight		_			-	eight		-				weight
	All four	0.5654	0.1897		0.3058	0.5275	0.4676	0.5563	0.3026	0.7172	0.2760	0.4112	0.4379	-0.4635	0.3415		-0.3679	-0.0556	-0.1377
	7 111 1001	p=0.000	p=0.2231		p=0.106	p=0.0007	p=0.003	p=0.001	p=0.0486	p=0.000	p=0.14	p=0.0076	p=0.004	p=0.001	p=0.0250		p=0.049	p=0.7401	p=0.409
뒫		N=43	N=43		N=29	N=38	N=38	N=43	N=43	N=43	N=29	N=41	N=41	N=43	N=43		N=29	N=38	N=38
.≅	Food and	0.287	-0.1140		0.234	0.330	0.203	0.2378	-0.0477	0.3153	0.2415	0.2424	0.1432	-0.1778	0.2700		-0.1267	-0.0666	-0.0741
E	care	p=0.035	p=0.4072		p=0.152	p=0.040	p=0.214	p=0.083	p=0.7295	p=0.020	p=0.13	p=0.1173	p=0.359	p=0.198	p=0.0462		p=0.44	p=0.6871	p=0.654
器		N=54	N=55		N=39	N=39	N=39	N=54	N=55	N=54	N=39	N=43	N=43	N=54	N=55		N=39	N=39	N=39
2	WASH	0.404	0.320		0.0666	0.239	0.305	0.4060	0.3919	0.5802	0.0440	0.1453	0.3376	-0.3748	0.1044		-0.1354	-0.1443	-0.1490
₽		p=0.00	p=0.0127		p=0.671	p=0.143	p=0.058	p=0.001	p=0.0016	p=0.000	p=0.779	p=0.3526	p=0.026	p=0.003	p=0.4275		p=0.386	p=0.3808	p=0.365
<u>8</u>		N=58	N=60		N=43	N=39	N=39	N=58	N=62	N=61	N=43	N=43	N=43	N=58	N=60		N=43	N=39	N=39
<u>- a</u>	Health	0.647	0.6599		0.5127	0.5215	0.64	0.693	0.6531	0.5627	0.4863	0.4657	0.6004	-0.3888	0.0736		-0.5500	0.0005	-0.2962
.≟		p=0.000	p=0.00		p=0.000	p=0.0007	p=0.00	p=0.000	p=0.000	p=0.000	p=0.001	p=0.0014	p=0.000	p=0.002	p=0.5864		p=0.000	p=0.9978	p=0.067
SS.		N=57	N=57		N=41	N=39	N=39	N=57	N=58	N=57	N=41	N=44	N=44	N=57	N=57		N=41	N=39	N=39
Bas	Social	0.5001	0.1466		0.2409	0.4574	0.363	0.4321	0.1789	0.6889	0.2258	0.3086	0.3210	-0.4361	0.1863		-0.2518	-0.1222	-0.0469
	norms	p=0.000	p=0.3256		p=0.199	p=0.0034	p=0.023	p=0.002	p=0.2289	p=0.000	p=0.230	p=0.0415	p=0.033	p=0.002	p=0.2099		p=0.179	p=0.4588	p=0.777
		N=46	N=47		N=30	N=39	N=39	N=46 0.5393	N=47 0.2845	N=46 0.7709	N=30 0.3695	N=44 0.4174	N=44 0.4582	N=46	N=47		N=30	N=39	N=39
	All four							p=0.000	p=0.0644	u=0.000	u=0.048	p=0.0066	n=0.002						
123								N=43	N=43	N=43	N=29	N=41	N=58						
a La	Food and							0.3266	0.1216	0.5269	0.1874	0.2581	0.2195						$\vdash$
- [=								p=0.015	p=0.3764	p=0.000	p=0.253	p=0.0948	p=0.157						
흥	care							N=54	N=55	N=54	N=39	N=43	N=43						
et l	WASH							0.5231	0.4419	0.6852	0.2854	0.1690	0.3150						
45	WASH							p=0.000	p=0.0003	p=0.000	p=0.063	p=0.2788	p=0.039						
<u>a</u>								N=58	N=62	N=61	N=43	N=43	N=43						
<u> </u>	Health							0.6095	0.5624	0.5380	0.6055	0.4462	0.5940						
붙								p=0.000	p=0.000	p=0.000	p=0.000	p=0.0024	p=0.000						
Ē								N=57	N=58	N=57	N=41	N=44	N=44						
3	Social							0.4646	0.1218	0.7546	0.3016	0.3952	0.3538						
	norms							p=0.001	p=0.4146	p=0.000	p=0.10	p=0.0079	p=0.018						
								N=46	N=47	N=46	N=30	N=44	N=44						

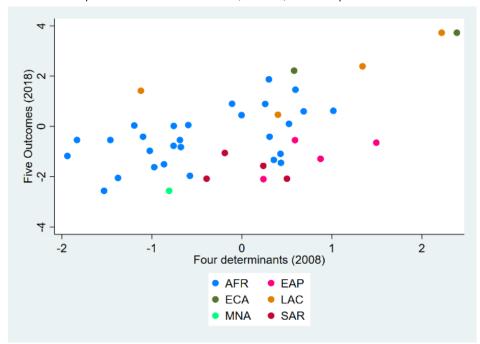
modest positive (<0.5) and significant (10%)
positive (>0.5<0.6) and significant (10%)
strong positive (>0.6) and significant (10%)
modest negative (below -0.5) and significant (10%)
negative (above -0.5) and significant (10%)

Source: Independent Evaluation Group.

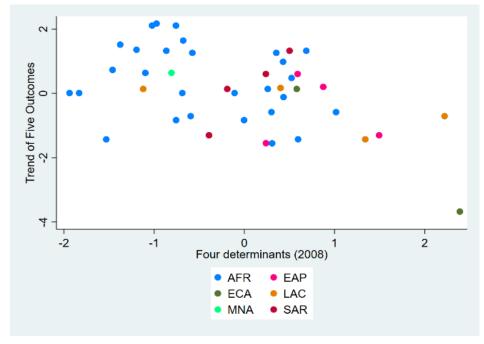
Note: The cells present the Pearson correlation coefficient, p-value (p), and the number of observations (N)., which varies due to the differences in the number of missing values of indicators by country. LBW = low birthweight.

Figure F.1. Undernutrition Determinants and Nutrition Outcomes

a. Overall Composite of Four Determinants (baseline) and Composite Measure of Outcomes (current)



b. Overall Composite of Four Determinants (baseline) and Composite Measure of Outcomes (trend)



Source: Independent Evaluation Group.

*Note*: Each scatter plot presents the Pearson correlation coefficient by country. Panels A and B correspond to figure 2; Health in Base level of determinants (2008) and Base level of outcomes (2008), Base level of composite determinants (2008) and Current level of outcomes (2018), and Base level of composite determinants (2008) and Trend of outcomes, respectively.

### **Notes**

- <sup>1</sup> Available indicators for the enabling environment do not fully capture the complexities embedded under the institutional strengthening building block and thus are not included in the analysis. Such indicators include the country's voice and accountability score, government's effectiveness of public services score, enabling environment score of Scaling Up Nutrition, and percent of districts with community programs that include infant and young child feeding and counseling.
- <sup>2</sup> Indicator data are gathered for 64 countries with high stunted growth rates; that is above 20 percent either at the beginning or at the end of the evaluation period.
- <sup>3</sup> See https://www.who.int/nutrition/global-target-2025/en/.
- <sup>4</sup> Global guidance is used to define thresholds to assess indicators as follows: stunted growth (UNICEF 2020); anemia (de Benoist B et al. 2008); low birthweight (UNICEF 2019b); wasted (WHO 2020c); underweight (Abarca-Gómez et al. 2017); MDD (Development Initiatives 2018); iodized salt (Tran et al. 2016); breastfeeding (UNICEF and WHO 2017, Cai et al. 2012); financial inclusion (Clement 2018); access to water (WHO 2019a and 2019b); open defecation (WHO 2019c); DPT3 (WHO 2018; Peck et al. 2018); skilled birth attendance (WHO 2020a); postnatal care (Maternal Health Task Force 2020); antenatal care (WHO 2020b); Iron tablet (Ba et al. 2019); first birth before 18 (UNICEF 2019); modern contraceptive use (United Nations 2019); and literacy (UNESCO Institute for Statistics 2010, 2015). For the indicators of care seeking for diarrhea, handwashing, distance not barrier, and vitamin A supplementation, the threshold is based on the distribution of the data in the evaluation countries.
- <sup>5</sup> The composite scores are calculated for 60 countries for child undernutrition outcomes, 55 countries for access to food and care, 62 countries for access to WASH, 58 countries for access to health, and 50 countries for social norms (total countries = 64). The missing values are replaced with the regional average for 6 percent of outcomes, 14 percent of countries for food and care, 3 percent of countries for WASH, 9 percent of countries for health, and 27 percent of countries for social norms. Due to missing data across countries, the correlation analyses are based on different samples with different sizes, which impose limits to the full comparability of correlation coefficients across determinants and outcomes.
- <sup>6</sup> Countries excluded from the analysis are Bolivia, Central African Republic, Djibouti, Ecuador, Marshall Islands, and South Sudan.

### References

- Abarca-Gómez, L., Z. Abdeen, Z. Hamid, N. Abu-Rmeileh, B. Acosta-Cazares, C. Acuin, R. Adams, W. Aekplakorn, K. Afsana, C. Aguilar-Salinas, and C. Agyemang. 2017. "Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128-9 million children, adolescents, and adults." *The Lancet* 390(10113): 2627–2642.
- Ba, D, P. Ssentongo, K. Kjerulff, M. Na, G. Liu, X. Gao, and P. Du, 2019. "Adherence to iron supplementation in 22 Sub-Saharan African countries and associated factors among pregnant women: a large population-based study." *Current Developments in Nutrition* 3(12): nzz120.
- Cai, X, T. Wardlaw, and D. Brown. 2012. "Global trends in exclusive breastfeeding." *International breastfeeding journal* 7(1): 12.
- Clement, M. 2018. "Gender gap in bank account ownership hasn't sifted in seven years" *Women's Advancement Daily*.

  https://www.newsdeeply.com/womensadvancement/articles/2018/04/18/gold-barred-in-rural-kenya-women-banned-from-mining-their-own-land.
- De Benoist, B., M. Cogswell, I. Egli, and E. McLean. 2008. Worldwide prevalence of anaemia 1993–05; WHO Global Database of anaemia.
- Development Initiatives. 2018. 2018 Global Nutrition Report: Shining a light to spur action on nutrition. Bristol, UK: Development Initiatives. Chapter 4
- Maternal Health Task Force. 2020. Postnatal care https://www.mhtf.org/topics/postnatal-care/
- Peck M, M. Gacic-Dobo, M. Diallo, Y. Nedelec, S. Sodha, A. Wallace. 2018. "Global Routine Vaccination Coverage." MMWR Morb Mortal Wkly Rep 2019(68): 937–942. DOI: http://dx.doi.org/10.15585/mmwr.mm6842a1.
- Skoufias, E., K. Vinha, and R. Sato. 2019. *All Hands on Deck: Reducing Stunting through Multisectoral Efforts in Sub-Saharan Africa*. World Bank Publications, 2019.
- Tran, T, B. Hetzel, and J. Fisher. 2016. "Access to iodized salt in 11 low-and lower-middle-income countries: 2000 and 2010." *Bulletin of the World Health Organization* 94(2): 122.
- United Nations. 2019. Global progress in satisfying the need for family planning. https://www.un.org/en/development/desa/population/publications/pdf/popfacts/PopFacts \_2019-3.pdf.
- UNESCO (The United Nations Educational, Scientific and Cultural Organization) Institute for Statistics (UIS). 2010. Adult and Youth Literacy: Global Trends in Gender Parity. http://uis.unesco.org/sites/default/files/documents/fs3-adult-and-youth-literacy-global-trends-in-gender-parity-2010-en.pdf.
- UNESCO. 2015. Literacy rate available at http://uis.unesco.org/.

- UNICEF (United Nations Children's Fund), Division of Data Research and Policy. 2019. Global UNICEF Global Databases: https://data.unicef.org/dv\_index/
- UNICEF. 2019a. Datasets. https://data.unicef.org/resources/resource-type/datasets/\_
- UNICEF. 2019b. Early Childbearing, available at https://data.unicef.org/topic/child-health/adolescent-health/.
- UNICEF. 2019c. Low birthweight, available at https://data.unicef.org/topic/nutrition/low-birthweight/.
- UNICEF. 2020. Malnutrition, available at https://data.unicef.org/topic/nutrition/malnutrition/\_
- UNICEF (United Nations Children's Fund), WHO (World Health Organization). 2017. *Tracking progress for breastfeeding policies and programmes: global breastfeeding scorecard* 2017. Geneva, Switzerland: World Health Organization.
- UNICEF (United Nations Children's Fund), WHO (World Health Organization), and World Bank. 2019. Levels and Trends in Child Malnutrition: Key Findings of the 2019 Edition of the Joint Child Malnutrition Estimates. Geneva: WHO.
- USAID (United States Agency for International Development). 2020. DHS Program STATcompiler. https://www.statcompiler.com/en/.
- WHO (World Health Organization). 2018. Diphtheria-tetanus-pertussis (DTP3) immunization coverage, https://www.who.int/gho/immunization/dtp3/en/.
- WHO. 2019a. Drinking Water. https://www.who.int/news-room/fact-sheets/detail/drinking-water
- WHO. 2019b. Drinking Water. https://www.who.int/water sanitation health/monitoring/water.pdf
- WHO. 2019c. Sanitation. https://www.who.int/news-room/fact-sheets/detail/sanitation
- WHO. 2020a. Skilled attendants at birth. https://www.who.int/gho/maternal\_health/skilled\_care/skilled\_birth\_attendance\_text/en/
- WHO. 2020b. Antenatal care. https://www.who.int/gho/maternal\_health/reproductive\_health/antenatal\_care/en/
- WHO. 2020c. Global Database on Child Growth and Malnutrition—Description. https://www.who.int/nutgrowthdb/about/introduction/en/index2.html
- WHO (World Health Organization) and UNICEF (United Nations Children's Fund). 2019. Joint Monitoring Programme for Water Supply, Sanitation and Hygiene: https://washdata.org/data/household!/.
- World Bank. 2017. Global Findex database: https://globalfindex.worldbank.org/\_
- World Bank. 2019. Worldwide Governance Indicators: https://info.worldbank.org/governance/wgi/.

# **Appendix G. Case Studies**

This appendix presents the main findings and evidence that have been collected for the eight case study countries—Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nicaragua, Niger, Rwanda—selected for this evaluation.

# Methodology

**Selection of cases.** The evaluation includes a case-based analysis of the World Bank's nutrition portfolio in 8 countries, selected from the 65 countries covered by the evaluation. The inclusion criteria for the countries are (i) countries with at least one closed and Independent Evaluation Group (IEG)-evaluated project with a nutrition focus in the title or project development objective; (ii) countries with support for institutional strengthening and behavior change interventions related to nutrition; and (iii) countries with projects in at least three Global Practices (GPs). Other considerations are the availability of impact evaluation (IE) evidence on interventions in the country; whether the country has a low Human Capital Index in the bottom or third quartile compared with other countries; the extent that the country's experience is already documented; and the coverage of countries in different Regions. Criteria used to vary the selection of countries are the average annual change in stunted growth rates during the evaluation period (slow, medium, and fast, based on the quartiles of the data across countries) and the overall project performance based on the achievement rates of nutrition indicators in the portfolio. These criteria result in a list of 15 eligible countries, which have been discussed with operational counterparts to finalize the country selection.

Methods and data collection. The data collection in each country follows a case study protocol organized in relation to the conceptual framework and evaluation questions that looked at the relevance, multidimensionality, and results of World Bank support. The case study covers all active and closed lending projects and knowledge work in the country portfolio that supported nutrition-related interventions during the 10-year evaluation period (fiscal years 08–19). Evidence sources that are triangulated for each country include the following:

- A portfolio review of relevant lending projects and analytical work, including a review of Project Appraisal Documents, program documents, Concept Notes, Implementation Completion and Results Reports, and knowledge work.
- Semistructured interviews with World Bank staff (task teams, country
  management, and experts engaged in nutrition support in each country), and
  stakeholders from government and civil society (national and subnational), and

development partners. Interviewees have been selected based on an analysis of actors involved in projects in the country's portfolio.

- Semistructured with beneficiaries of interventions at the subnational levels, including local leaders and community agents. Snowball sampling has been used to identify and interview beneficiaries from a purposeful sample of Regions and communities that have been supported by projects.
- Secondary data on nutrition-related indicators from the heat map analysis of country context and needs (appendix F).
- Evidence from existing IEs and IEG evaluations.
- World Bank Country Partnership Frameworks and Strategies from the evaluation period.
- Each government's national development plan and or nutrition strategy and plan.

Evidence sources are triangulated to assess the contribution of the World Bank to nutrition improvements in each country. A country-specific theory of change is developed to assess how the nutrition interventions in the country program have contributed to the dimensions of the conceptual framework. This includes (i) the assessment of nutrition-related interventions that are supported by World Bank projects in the portfolio against the conceptual framework, including target populations and geographies of interventions, and roles of other partners involved in supporting interventions; (ii) the assessment of the alignment of nutrition-related interventions in the portfolio against country context and needs; (iii) the identification of achievements of the World Bank support against outcomes, intermediate outcomes, and outputs in the conceptual framework; and (iv) mapping how behavior changes are supported by project interventions to contribute to improvements in nutrition determinants. Evidence of behavior changes is assessed using the behavior change process maps that have been developed for the evaluation (appendix C).

Case studies draw on the full portfolio of projects in a country, expanding the global nutrition portfolio. The global nutrition portfolio identifies about 90 percent of the projects in the countries with nutrition interventions. Some projects with nutrition interventions integrated in components are missed in the portfolio identification if nutrition activities are not detailed in project documents. These additional projects are identified and reviewed at the country portfolio level and part of the case study assessment. Moreover, the case studies portfolio also considers newly approved or pipeline projects, which are not part of the global portfolio.

Appendix G Case Studies

Most data collection has been done remotely because of travel restrictions related to coronavirus pandemic. In each country, the IEG team worked with national consultants to facilitate country stakeholder interviews. Integral to the case study data collection in Madagascar and Malawi are work on an IEG Project Performance Assessment Report, field missions, and extensive in country interviews that were conducted before these travel restrictions.

# **Findings**

Table G.1 summarizes the case study findings for each country.

# Multidimensionality of the Country Portfolio

All countries have had a continuum of support to nutrition interventions during the evaluation period. This includes projects implemented by different GPs across sectors (such as Health, Agriculture, Social Protection, Education, Water, and Macroeconomics) at different time frames. Nutrition interventions are embedded in project components. By design, the case studies are selected from countries that have received World Bank support to nutrition from different sectors. This selection criterion is important for understanding the different types of interventions supported by projects across GPs and sectors. In most countries, interventions remain at an early stage of implementation or require further support to bring their contributions to fruition. The interventions supported by projects in the country portfolios are described below and mapped to the conceptual framework (figures G.1–8).

• Community-based programs. In seven of the eight countries (Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nicaragua, and Rwanda), community-based programs are a principal component of nutrition support. These ongoing programs provide a unique platform to deliver a package of nutrition-specific and nutrition-sensitive interventions, such as household visits and community discussions. A key aspect is social and behavior change communication (SBCC) messaging. Community-based programs strengthened networks of frontline workers, such as care groups, community health workers (CHWs), and other volunteers, to deliver interventions for malnutrition prevention and treatment, pregnancy care, and other services. These interventions included infant and young child feeding, growth monitoring and promotion, cooking demonstrations, home-based care of childhood illness, parenting education, and referrals to health facilities. Improving the quality and coverage of services and monitoring and evaluation of nutrition interventions have been common challenges across countries.

- Health services. Six of the eight countries (Ethiopia, Madagascar, Mozambique, Nicaragua, Niger, and Rwanda) include nutrition as a core part of support to improve basic health services. This support includes improving policy and health facility services (such as pregnancy care, family planning, nutrition counseling, and iron deficiency supplementation) and the link between facility services and community-level programs to increase service demand. Interventions in maternal dietary and adolescent health services are more recent areas of support. Some countries, such as Madagascar, also have emphasized health and nutrition services in schools. Donor division of labor in some countries, such as Malawi and Rwanda, have limited World Bank investments in health services during the evaluation period.
- **Agriculture and food approaches.** These approaches were a main area of nutrition-sensitive support in two countries (Malawi and Rwanda) and less developed in others (Madagascar). Agriculture interventions often support smallholder farmers to improve their productivity and seasonal access to food crops. Interventions include support to water and land management, livestock and poultry, agriculture inputs (such as drought-resistant seeds of key food crops), appropriate technologies to boost productivity, and safe food storage. A critical area of support in Malawi, Mozambique, Nicaragua, and Rwanda has been biofortification and the promotion of protein-rich crops, such as legumes. Home gardens in Ethiopia, Madagascar, Malawi, Niger, and Rwanda are promoted to improve subsistence access to fruits and vegetables, and livestock and poultry for meat, milk, and eggs. In Niger, however, the scale of the support has been limited. Home gardens have often been supported by agriculture extension workers, nongovernmental organizations, or nutrition programs. In Malawi and Rwanda, agriculture diversification has supported access to a diversity of food crops for sustainable land management, but in most countries, productivity increases focus on a few staple crops.
- Early childhood development (ECD). This support includes child stimulation, parenting education, and early childhood development (ECD) programs, which are increasingly being delivered or piloted in communities across all eight countries.
- Social safety nets. Safety nets are an important nutrition-sensitive intervention
  in many of the countries (Ethiopia, Madagascar, Mozambique, Nicaragua, Niger,
  and Rwanda). These interventions include community block grants or cash
  transfers and accompanying measures, such as SBCC, incentives to use basic
  health services, and parenting education. Other interventions include livelihoods

skills building, income generation support, social funds in communities, and voluntary saving and credit support (for example, in Madagascar, Malawi, Niger, and Rwanda), intended to support household food security and resilience to shock. Safety nets are often integrated with health, education, and agriculture interventions.

- Water, sanitation, and hygiene approaches. Four countries have had strong investment in interventions to improve access to rural water, sanitation, and hygiene (WASH) development: Ethiopia, Malawi, Nicaragua, and Rwanda. Interventions include piped water, water treatment, WASH in schools and health facilities, and sanitation infrastructure, such as toilets and hand washing facilities. Collaboration with other donors to promote open defecation—free communities through latrines and campaigns is part of this support in some countries. WASH has also been mainstreamed in SBCC activities in community-based programs. In other countries, such as Madagascar, Mozambique, and Niger, WASH support has been weak or limited to SBCC promotion or integrated activities delivered by other sectors, such as social protection or health.
- Social norms support. All the case study countries have had some support aimed to empower women's engagement in agriculture (Madagascar, Rwanda, and recently Niger and Ethiopia) and promote life skills, family planning, and or girl's education (Ethiopia, Niger, and Rwanda). Across most countries, however, this support is limited or is a more recent development, which requires further expansion or investment. Nicaragua stands out for its consistent support to develop and implement strategies on sexual and reproductive health rights since 2011. Niger likewise stands out for its emphasis on investments in women and girls through education, health, and social protection, and more recently in agriculture.

# Alignment of Interventions with Country Situations

In most countries, the World Bank's portfolio has aligned with a need to improve nutrition determinants and institutionalize interventions in national and subnational programs. Challenges across countries include the limited timeline during which nutrition interventions have been implemented and the pilot scale of some interventions, with many interventions in an early stage requiring more years of implementation learning to contribute strongly to results. Moreover, countries differ in their approaches and investments to align to multisectoral efforts to coordinate nutrition, and only some countries coordinate support across World Bank projects in different GPs.

Countries have lacked consistent support to address all relevant dimensions of nutrition. Although the World Bank portfolio has included projects across Agriculture, Social Protection, Health, and other areas, interventions are at various stages of development. For example, most countries have lacked consistent and sustained support to improve dietary intake and diet diversity of mother and children. Often, a challenge for community-based programs is long-term support to institutionalize interventions of frontline services. In agriculture, the expansion of home gardens, biofortification, high-nutrient crops, and diverse cropping practices are promising for results, although still at an early stage. Health intervention packages continue to be strengthened across most of the countries to support maternal and child health. WASH requires additional attention, especially in disadvantaged rural areas, and more explicit links to nutrition. Support to improve access to maternal and childcare resources (such as fee exemptions, safety nets for households with children, parenting education, and childcare) is in an early phase, but shows promise. Social norms is an area where the World Bank has had limited project support, except for Nicaragua and Niger.

Interventions had weak intraportfolio alignment. Projects in different GPs are implemented in different geographical areas and for different target groups, and they often lack coordination to integrate or converge actions or build on respective achievements to improve nutrition outcomes in the same communities, such as by addressing food, care, WASH, and health. Health interventions often target women and children in rural communities with low nutrition indicators, and coverage of remote areas continues to be a challenge. Safety net and ECD interventions increasingly are coordinated with health interventions by focusing on lower-income households in the same communities, such as in Nicaragua. However, agriculture interventions target farmers and geographies important to the food supply or at risk of natural disasters, and WASH interventions are often in towns, neglecting rural households. Thus, agriculture and WASH approaches often do not benefit the same communities as those supported by social sectors such as Health, Social Protection, and Education. Yet, coordination to integrate or converge the implementation of interventions of different sectors in the same geographical areas are emerging in countries such as Indonesia and Rwanda. A key challenge is responding to tension that nutrition is not the only priority in these areas and may, at times, conflict with other priorities, such agriculture productivity. The challenge remains as to how to integrate nutrition interventions in a way that can maximize the role of each sector and the combined synergies of multiple sectors. In some countries this challenge has been addressed by integrating WASH, agriculture, and other interventions in community-based programs supported by Health or Social Protection projects (such as in Madagascar and Malawi). However, this often does not address the need for supply-side support to improve access to water and sanitation in remote areas.

Countries differ in their alignment with multisectoral nutrition agendas. In all eight countries, nutrition is a priority of the World Bank's Country Partnership Framework or Country Partnership Strategy. In countries such as Ethiopia, Indonesia, and Rwanda, the World Bank's strategy also has more recently aligned with the country's multisectoral nutrition coordination and the global agenda on nutrition. Other countries, such as Niger and Nicaragua, have lacked this alignment. In some countries, such as Madagascar, Malawi, and Mozambique, the World Bank has previously supported multisectoral coordination efforts, but in recent years has mainly focused on the development of community-based nutrition (CBN) and ECD interventions or shifted its focus to the health sector. Remaining challenges are the weak institutional capacity and lack of accountable mechanisms to effectively integrate interventions to improve nutrition across sectors.

Country portfolios have had good alignment with national or regional programs to expand interventions. Institutionalizing nutrition interventions supported by investment program financing has been achieved through alignment with national programs. Examples of this alignment include support to a health extension program in Ethiopia, an agriculture village kitchen garden demonstration program in Rwanda, a CHW network in Mozambique, and the development of community care group structures in Malawi. Moreover, in Niger and Nicaragua, the expansion of social norms interventions for women and girls aligns to regional and national programs. Development policy financing and Program-for-Results financing support in Indonesia and Rwanda has been strategically aligned with national programs to help institutionalize interventions, such as performance-based financing, inclusion of nutrition indicators to the performance contracts of subnational leaders, and new interventions in ECD.

# Policy Dialogue, Knowledge Generation, and Convening

Countries differ in how they leverage knowledge activities for learning. All countries offer a blend of knowledge activities that complement the portfolio of projects supporting nutrition. However, some countries (Ethiopia, Indonesia, Madagascar, and Rwanda) have better leveraged a mix of knowledge activities or have had a more consistent flow of learning, such as that from evaluations, knowledge sharing, diagnostics, and other activities, to help strengthen the nutrition results of projects and the country's program.

Evaluations have supported evidence-based learning to design effective interventions. Countries differ in how consistently they used evaluation evidence to adaptively improve nutrition interventions supported by operations. In Madagascar, IEs provided more than a decade of learning to strengthen the rollout of interventions. In some countries (Madagascar and Rwanda) partnership with the Development Economics Vice

Presidency of the World Bank is supporting increased attention to learning. In Ethiopia, Madagascar, Malawi, Nicaragua, and Rwanda, IE evidence has also been important for learning about CBN programs. In Rwanda, IEs have supported efforts to develop performance-based financing in health facilities and at the community level, and agriculture interventions; a recent IE will inform efforts to improve high-impact health services in facilities and nutrition interventions at the community level. In social protection, some countries (Madagascar, Malawi, Nicaragua, Niger, and Rwanda) have used IEs to improve the design of interventions, specifically the links between cash transfers and behavior nudges to improve the demand for child health services, parenting behaviors programs, or child feeding practices. IEs are also supporting learning on ECD programs in some countries (Ethiopia, Madagascar, Niger, and Rwanda). In Madagascar, the focus has been on the effects of adding ECD interventions to CBN programs. These evaluations provide learning to integrate nutrition interventions across social sectors. However, similar attention to designing nutritionsensitive interventions is lacking in the agriculture and WASH sectors. Even where the World Bank has worked in a small geographical area, evaluations have been important to facilitate the mainstreaming of interventions or experiences leveraged from World Bank support, that is, for more widespread institutionalization in the country's own program.

Diagnostics provide evidence for country programs and policy. In Ethiopia, studies have generated evidence on the cost-effectiveness of nutrition interventions, inequalities in maternal and child health, and the small-area estimation of child undernutrition to improve nutrition policy and programming. In Rwanda, a nutrition situation analysis, the mapping of nutrition-specific and nutrition-sensitive interventions, and a nutrition public expenditure review have supported the government in developing its multisector strategy and identifying needs to improve nutrition financing for multisectoral coordination. In Niger and several other countries (such as Madagascar), diagnostic evidence has been important to inform the development of social protection systems.

Leadership and convening activities support policy commitment and action. In Rwanda, a visit from the World Bank president has helped catalyze high-level leadership on and commitment to nutrition. In Indonesia and Rwanda, the engagement of government actors at all levels in nutrition strategy and planning has also been important for leadership building. In Malawi, the Scaling Up Nutrition Forum supported by the World Bank became important for learning across districts implementing nutrition plans, collaboration among partners and stakeholders, and dialogue on policies. Through these convening activities, the World Bank has supported the national multisectoral nutrition plan and policy and the development of its coordination structures. In Mozambique, the World Bank has supported the establishment of national multisectoral coordination

structures at the national and provincial levels that are taking an increasing role to promote the nutrition agenda and strengthen interagency coordination. In Ethiopia, the World Bank has helped convene donors to harmonize nutrition support, such as trust funds, monitoring, and surveillance. Also, in Ethiopia, policy dialogue has supported the development of the national multisectoral nutrition program and coordination structures. In Niger, although multisector coordination of nutrition is lacking, leadership technical assistance has been important to improve service delivery in nutrition.

South-South learning has supported new approaches. Engagement in South-South learning across countries, such as in Indonesia, Madagascar, and Rwanda, has facilitated high-level adoption of new approaches. For example, reforms to develop the interoperability of social sector information systems in Rwanda are based on knowledge sharing with Peru. In Madagascar, the World Bank organized a large cross-country learning event to support the development of the social protection policy and program and to demonstrate its feasibility in a low-income, low-capacity environment.

Trust funds and partnerships support innovation. Trust funds from Japan have been important in Ethiopia, Malawi, and Niger to pilot interventions for adolescents and nutrition-sensitive agriculture. Financing from the Global Financing Facility is developing health and nutrition services in Ethiopia, Mozambique, and Rwanda, including fiduciary management, information systems, and intervention packages. HarvestPlus has supported nutritional biofortification in Mozambique and Rwanda, and the World Bank has played a role in food fortification strategies and engaging farmers. In Rwanda, the Health Results Innovation Trust Fund has been important in supporting the development of performance-based financing. Also in Rwanda, Global Agriculture and Food Security Program financing has supported the village kitchen program, and the Bill and Melinda Gates Foundation is currently supporting the Mind, Behavior, and Development Unit, evidence-based learning on the national behavior change strategy, which could help in rethinking behavior change interventions for nutrition. In Madagascar, the Knowledge for Change program and the Health Results Innovation Trust Fund have provided critical support for the continuity of IE and other operational learning activities to adaptively improve the CBN program, including for humancentered design learning to improve the effectiveness of interventions.

# **Project Contributions**

### **Contribution to Results**

The World Bank has contributed to improving nutrition determinants in all of the countries. Over the evaluation period, indicators of wasting and underweight have decreased in most of the countries, likely because of investments in growth monitoring

and promotion and treatment of malnutrition. In Malawi and Mozambique, repeat crises likely limited improvements in nutrition indicators. Indicators of stunted growth, low birthweight, and anemia may have decreased, but levels remain high in most of the countries. The pathway to improve outcomes has been through support to nutrition determinants by the World Bank and other donors. The results supported by the World Bank are described and summarized across countries (table G.2). A key challenge has been the weak consistency of support to address needs relevant to low or disadvantaged nutrition determinants in particular country contexts. Moreover, results are yet to be seen in more recent investment areas, such as for parenting behaviors and diet diversity.

- Breastfeeding, child feeding, and caregiving. The World Bank contributed to improvements in these areas through support to CBN programs in Ethiopia, Madagascar, Malawi, Mozambique, Nicaragua, and Rwanda. Success factors have included consistent support to improve a package of well-designed interventions over time along with strong support to community volunteers from government at all levels. In Malawi, care groups in communities likely have helped improve the early initiation of breastfeeding, but child feeding did not improve. This is likely due to the duration of the World Bank's support, which was not adequate to strengthen the care groups. Moreover, the World Bank's support in Malawi has overlapped with periods of crisis and worsening food insecurity. In Madagascar, community-based programs likely have contributed to the improved quality and quantity of food provided to children under three. In Mozambique, Niger, and Rwanda, evidence of dietary and feeding improvements remain limited, but breastfeeding has increased. Social protection support for families also have supported improvements in the minimum diet diversity of children in Madagascar, but national levels remain low.
- Child health and disease. Contributions to child health have been through the
  expansion of CBN programs, specifically by expanding growth monitoring and
  promotion, screening, and treatment of malnourished children (for example, in
  Ethiopia, Madagascar, Niger, and Rwanda). There are also gains in the
  prevention and treatment of childhood diseases, including diarrhea, deworming,
  and malaria, supported by health services.
- Maternal health. Contributions to maternal health are through support to
  micronutrient supplementation during pregnancy (for example, in Ethiopia and
  Madagascar), particularly through the provision of iron–folic acid to pregnant
  women as part of the minimum package of health services.
- Access to health services. Ethiopia, Mozambique, Nicaragua, Niger, and other countries have improved access to health services, such as immunizations, family

planning, institutional delivery, and antenatal and postnatal care, but the quality and coverage of services remains a challenge. In Mozambique, success factors have been mobilizing pregnant women in communities and skill building of health professionals. Similarly, in Nicaragua, success factors have been the use of volunteers (reaching 20,000 families) to identify pregnant women in rural areas and the coordination of interventions across social services (health, social protection, and education). Success factors in Madagascar include fee exemptions and drug vouchers, which made services and medicines available to women and children free of charge.

- Access to nutrient-rich food. In some countries (such as Ethiopia) the World Bank contributed through agriculture services that have improved the seasonal availability and access to food. For example, fortified crops are an important contribution of the World Bank in Mozambique, Nicaragua, and Rwanda. A success factor to supporting fortified foods in Mozambique was creating synergies with the health project. In Malawi, the World Bank's contribution has improved agriculture yields and diversified crops. A success factor has been the use of model villages to promote practices among a cluster of villages. In Rwanda, a success factor has been the extensive and consistent support to farmers groups over many years. However, access to diverse foods and dietary intake remains a key challenge across all the countries, overshadowing the need to increase food availability through productivity of staple food. Safety net interventions and community-based food preservation activities in countries, such as Madagascar, also have supported food security among lower-income households.
- Access to WASH. In Ethiopia, Malawi, Mozambique, Nicaragua, and Rwanda, the World Bank has increased access to water and sanitation, such as piped water and latrines. The main success factor has been collaboration with the community to strengthen water management. However, in Madagascar and Niger, the World Bank's contribution to WASH is modest. In Niger, there have been some improvements in WASH supported through social protection and education projects. The World Bank also has contributed to improved WASH behaviors of households with children through CBN programs implemented by care groups in Malawi.
- Maternal and childcare resources. In Madagascar, Malawi, Mozambique, Nicaragua, and Niger, safety nets have contributed to improvements in areas such as income, food consumption, and school enrollment and retention among households (many headed by females). Challenges are the limited coverage of

safety net support and the sustainability of supporting households in graduating and sustaining nutrition and livelihood improvements. Results of ECD interventions are not available in most countries. In Nicaragua, safety net support has helped improve parenting skills, including time that parents spend with children on nutrition.

• Social norms. Across countries, projects likely have had some contribution to improve sexual and reproductive health rights and knowledge to delay pregnancy (Ethiopia, Nicaragua, and Niger), gender roles in agriculture (Madagascar, and Rwanda), girls' enrollment in school (Niger), and family planning usage (Ethiopia, Niger, and Rwanda). Nicaragua's support to sexual and reproductive health rights likely helped increase contraceptive usage and reduce teen pregnancy and gender-based violence. Agriculture support to engage women has likely been important in improving women's participation in farming and decisions in households, and resources to care for children, including income, livestock, and other assets. Community-based family planning has likely been important in Rwanda to support contraceptive use. However, across countries, results in social norms are limited.

# **Contributions to Behavior Change**

Community-based programs have contributed to behavior changes to improve nutrition determinants. The evaluation applied a behavior change model to assess how behavior changes (appendix C) have been supported in countries by frontline workers, community groups, and nongovernmental organizations, among other stakeholders. This model has traced incremental behavior changes along a results chain, leading from initial inputs and outputs all the way to sustained behavior change that could be expected to persist after interventions are completed. Although such processes are rarely linear and require interactions across actors and among different types of outputs and outcomes, the model clarifies how progress must traverse four levels. First, the designated actors (caregivers, health providers, and so on) will gain the awareness and motivation to *engage* in the change process. In the second level, they will *learn* what is needed for behavior change and then they will draw on available resources and programs to *apply* new knowledge and skills in the third level. The final level reflects a *sustained change* in behavior for improving determinants.

Examples of behavior change maps are provided for selected countries (table G.3). The main challenges to mapping of behavior change has been the fragmentation of interventions implemented in communities by different projects and the limited measurement of results related to behavior change. Hence, a limitation of this mapping is the reliance on available evidence from project indicators, studies, and stakeholder

interviews. Evidence suggests that the World Bank has contributed to engaging actors and learning (although not often measured), and in some cases new practices by caregivers, farmers, and health workers, among others, but there is limited evidence that the World Bank has contributed to longer-term sustained changes in the behaviors of actors. In most of the countries, CBN programs are still being strengthened, providing an opportunity to improve evidence and learning regarding behavior change.

- Maternal and child caregiving and nutrient-rich food. In countries with CBN intervention packages (including Ethiopia, Madagascar, and Malawi), these programs have supported households with young children in adopting maternal and child caregiving behaviors. For example, caregivers participate in community demonstrations and receive counseling and education through home visits by CHWs and care groups. These activities have improved knowledge to prepare food, maintain home gardens, and practice breastfeeding and complementary feeding of children. ECD programs in communities have supported parents' adoption of new practices, such as child stimulation. Agriculture extension workers also communicate messages on diversifying crops and home gardens, and farmers increased production of micronutrient-rich crops and the practice of home subsistence gardens. Among countries, Madagascar provides evidence that suggests consistent attention to community programs has supported continued improvements in dietary intake in children in areas where the World Bank worked.
- Access to health. Behavior change has been through support to frontline workers to promote and deliver services. For example, in Rwanda, there has been an increase in preventive care visits for children and the use of family planning through community-based visits of CHWs. In Madagascar, there has been improved adherence of frontline workers to guidelines for child growth monitoring and promotion activities. In Ethiopia, health extension workers have delivered health messages, and communities have organized child health days. This has supported the increased use of antenatal care, birth registration, contraceptive services, and vitamin A delivery through routine child health services. In Mozambique, promotion activities by CHWs and community leaders have supported the increased use of pregnancy services and vaccination. In Malawi, care groups have promoted health service use (such as antenatal care and child disease management). The treatment of malnourished children and diarrhea has also increased. Nicaragua and Rwanda provide evidence that suggests sustained improvement in the use of a range of maternal and reproductive health services to contribute to nutrition improvements.

- **Access to WASH.** In Ethiopia, Madagascar, and Nicaragua, caregivers participate in community conversations and or receive messages on WASH practices delivered by extension workers, community groups, or nongovernmental organizations. In Niger, WASH messages are also delivered to social protection beneficiaries. The World Bank has supported training in WASH communication and demonstration skills. In Ethiopia, the World Bank's support also has facilitated adoption of improved toilet facilities and water sources among households, and monitoring of water quality among communities who then declare themselves free of open defecation. The involvement of local leaders to mobilize communities to address WASH has also been seen in Malawi and Rwanda. In Rwanda, WASH is being integrated in ECD programs in communities, and this is resulting in the adoption of improved WASH practices among participating households. In addition, there was support to households and communities to adopt improved water treatment and management in both Niger and Rwanda. There is some evidence that the World Bank has supported sustained use of improved drinking water and sanitation in communities in Malawi and Rwanda.
- Social norms. Agriculture, health, and livelihood interventions in communities
  have engaged women and promoted gender roles, but evidence regarding these
  interventions is limited.

Table G.1. Summary of Findings from the Case Study Countries

Multidimensionality	Alignment with Country Situation	Policy Dialogue, Knowledge Generation, and Convening	Contributions to Nutrition Outcomes
Ethiopia	Anginnent with Country Situation	Generation, and Convening	Outcomes
The World Bank's portfolio in Ethiopia has increasingly transitioned from a focus on food security to support a national multisectoral nutrition program focused on building comprehensive nutrition services including nutrition-sensitive and nutrition-specific interventions.  The World Bank, together with other donors, has developed CBN services across the country by strengthening frontline workers. Support includes nutrition messages; growth monitoring and management of malnutrition; agriculture development agents to promote nutritious food intake and farming techniques; and support in schools for adolescent nutrition and WASH facilities.  Examples of World Bank support include block grants to local government, salaries, and training.  Support has also included nutrition-sensitive interventions in health, social safety nets, women's empowerment, agriculture, and WASH. The World Bank has provided support to the development of basic health service coverage and policies, such as the	The World Bank's support has aligned with the global nutrition movement. Knowledge from this movement has provided a critical push to the country program.  World Bank country strategies have evolved to sharpen attention toward nutrition. The CPS for FY08–11 acknowledges the economic costs of malnutrition. The CPS for FY13–16 recognizes nutrition determinants and donor partnerships on nutrition. The CPF for FY18–22 articulates a multisectoral approach to nutrition, which is seen in the World Bank's internal coordination of project teams and multidimensional design of projects.  The World Bank's support has aligned with challenges to improving nutrition outcomes. However, many challenges remain, including to improve care seeking for diarrhea, disparities in access to health, quality of health care services, access to safe water and sanitation, access to and demand for dietary diversity, and low maternal knowledge and autonomy.  The World Bank's support has aligned	The convening of donors has harmonized nutrition support. This includes the division of work programming and pooled financing modalities, mobilization of resources (such as trust funds), and nutrition monitoring and surveillance. Diagnostics and evidence on effectiveness have informed the nutrition program and policy. For example, the study analytical work on malnutrition in Ethiopia has generated evidence on cost-effectiveness of interventions, and analytical work on family planning has provided qualitative research to improve the CBN program. Analytical work on maternal and child health inequalities has provided diagnostic evidence to inform policy. Between 2015 and 2018, several studies have provided evidence on institutional capacities to improve WASH programs, policy, and M&E. In 2017, research on the small-area estimation of child undernutrition has provided evidence for the subnational nutrition program. Analytical work on investing in the early years in 2018 has informed programming to integrate nutrition into non–health sector operations. Policy dialogue and operations have	factor has been the scale-up of CBN services (55.8 million people gained access to the CBN services). Moreover, the scale-up through the existing government system ensures reach and sustainability, and the use of community conversation promote behavior change.  The World Bank has contributed to

with the government's strategy to expand supported the development of the national

registration of zinc as an essential

drug. There has also been support to CCTs for food-insecure families. The World Bank provides grants for support for ECD. It has supported life skills and schooling for girls. In access to food, the World Bank has supported irrigation infrastructure and the local government level and in improved inputs for farmers, among other areas. In WASH, the key support as pastoralists. has been to rural water supply and sanitation development.

service delivery coverage, with a focus on nutrition program and coordination rural areas. Early nutrition support has been piloted in a limited number of community-driven IGSs and is piloting regions and then expanded nationally, targeting women and children in the 1,000-day window. More precise intervention targeting has occurred at agriculture for population groups such

structures. The challenge remains inadequate leadership and accountability to implement multisectoral actions for coordination at the local government and community level.

Trust funds have supported innovation, attention to needs, and coordination. Japan trust fund support has piloted community-level interventions for adolescents. Financing from the GFF is supporting RMNCH and nutrition services, including by bringing coordinated donor attention and resources to challenges, such as fiduciary management, information systems, and vital registries.

pregnancy care with an emphasis on nutrition.

The World Bank has contributed to improving access to food and care through agricultural support services and nutrition-sensitive safety net support, including increasing access to financing through IGS. However, food security, inadequate diet, and food diversity remain challenges. Newer support in ECD promises to add results in this area.

The World Bank has contributed to increasing access to safe water in rural areas. Improvements also have occurred in the time and distance required to access water. The main success factor has been collaboration at the community level, reaching more than 6 million people.

#### Indonesia

The World Bank has supported CDD approaches in social, WASH, and ECD sectors. This support includes community block grants to incentivize implementation) have supported the the use of health care services and for hygiene promotion and construction of water and sanitation facilities in the social and water sectors, respectively. In ECD, support has been to integrated ECD services for lower-

The World Bank's support has aligned water projects (still under achievement of WASH MDG targets through programmatic mainstreaming and expansion of a nationwide CDD approach. Addressing the low use of ECD services by lower-income investments to improve lower-income children's overall development and

Engagement in South-South learning has with the country's challenges. A series of facilitated the high-level adoption of new approaches. The World Bank supported a visit of a high-level government delegation to Peru for the new stunted growth strategy to draw on lessons from their experience in stunted growth reduction.

The engagement of government actors at communities, the World Bank supports all levels in nutrition strategy and planning has been important for leadership building. The GFF supports "Stunting Summits"

Nutrition outcomes have improved overall. Between 2018 and 2019, across the country, the stunted growth rate for children under five declined from 30.8 to 27.7 percent, and wasting decreased from 10.2 to 7.4 percent. The World Bank has had a big role in supporting stunted growth reduction acceleration and convergence. The Generasi program is ensuring monthly weight increases for infants and improved

income communities, teacher training, and SBCC and parent counseling. Agriculture support has been marginal during the evaluation period. It includes communities in lower-income rural a pilot supporting credit to women for areas to increase use of health and staple food purchases during the dry season, food savings accounts for harvest surpluses, and training on use and provision of food storage media. More recently, a series of PforR in SPJ and health have focused on strengthening the delivery of national sector programs key to reducing stunted growth (ECD, food assistance, and interpersonal communication). It includes support to the adaptation of nutrition-sensitive food assistance program, the consolidation of cast transfer delivery systems focused on family planning for reproductive health, provision of universal ECD, the strengthening of the conditional cash transfer program delivery system, and converging village service delivery on all 1,000-day households of priority nutrition-specific and nutritionsensitive interventions.

readiness for further education. In the social rural sector, support has included the empowerment of local education services through a CDD approach. More recently, the World Bank has supported the strengthening of delivery systems in social protection, health, and nutrition through a series of PforR instruments. In agriculture, a trust-funded project tested the costeffectiveness of a pilot program of food credits and a storage system in lower-income communities. However, there is still a need to strengthen aspects of agricultural policy to promote vegetable and fruit production through small-scale local farmers and improve quality of food availability and incomes among rural lower-income people.

The World Bank's support has aligned with the country's priorities. This is by supporting the government's National Strategy to Accelerate Stunting Reduction 2018–22 (StraNas) coordinated by the Office of the Vice President to accelerate stunted growth analytics (IMN-PASA) to support the reduction by addressing the convergence of national, regional, and community programs involving 22 ministries in 33 priority nutrition interventions across health, water and sanitation, ECD, social protection, and

aiming to secure political commitment from district leaders regarding priorities and finances catalytic technical assistance expanded access to communityto the Office of Vice President and selected line ministries.

IEs have supported evidence-based learning lower-income children's social to design and adaptively improve nutrition interventions in operations. This includes the Generasi program and its impact on use of basic health services and on children's nutrition status; the CLTS project that improved sanitation practices and reduced parasitic infestations; and the ECD project with positive results on children's cognitive development.

Technical assistance and diagnostic work are strengthening nutrition policies. This includes an assessment of the double burden of the malnutrition problem; analytic and advisory services to strengthen World Bank support in monitoring, evaluation, and information system development to enhance design and implementation of the PAMSIMAS Community-Based Drinking Water Supply and Sanitation program; a programmatic advisory services and implementation of the multisectoral convergence approach to addressing malnutrition and child development in the early years, including a recent PER to assess the level and allocation of stunted growth -related expenditures.

underweight and stunted growth of target children. The ECD project based ECD services in rural Indonesia, which has led to improvements in competence, language, cognitive development, and emotional maturity.

The World Bank has contributed to increasing the use of health services. The IE of the community-based Generasi program shows that community block grants to rural communities are an effective tool to boost the use of basic health care services. This includes increases in the number of children under age five treated for moderate or severe acute malnutrition, pregnant women taking iron tables, prenatal and postnatal visits, among others.

The World Bank has contributed to improving access to water and sanitation. The IE of the large-scale community sanitation program reports an increase in the rate of toilet construction and a decrease in open defecation, parasitic infestations, and diarrhea prevalence among young children, likely affected by differences in drinking water and hand washing behavior. Between 2017 and 2019, the percentage of households with children under two

food security for 48 million beneficiaries over 514 districts. PforRs are strategically aligned with national programs to help institutionalize interventions. The Investing in Nutrition and Early Years program supports the implementation and expansion of StraNas to increase simultaneous use of nutrition interventions by 1,000-day households in priority districts by incentivizing the government to strengthen management capacity and system across sectors and levels and to use existing resources more effectively. The World Bank's country strategy also aligned with the country's multisectoral nutrition coordination and the global agenda on nutrition. Coordination to converge the implementation of interventions of different sectors in the same geographical areas is emerging. The government has institutionalized a modified version of the project's village scorecard (from the Generasi program) used by an outreach network of HDWs to improve the convergence of nutrition interventions on priority households. In 2019 the scorecard was rolled out in 160 priority districts with high stunted growth rates.

with access to improved drinking water rose from 70 to 72 percent at the national level, and from 65.3 to 69.0 percent in the 100 priority districts. The percentage of households with access to improved sanitation rose from 62.4 to 66.6 percent at the national level, and from 54.3 percent to 58.0 percent in the 100 priority districts. The World Bank has contributed to maternal and childcare resources. The ECD project has helped increase enrollment in ECD services by lowerincome children, and improve early development scores of children entering kindergarten or the first grade of primary school. Community block grants also contributed to improved household expenditure

### Madagascar

The World Bank has transitioned from supporting a humanitarian response to

The World Bank's support has aligned with the country's challenges. Its

Evidence learning has supported the adaptive design and delivery of the

Nutrition outcomes have improved overall. The magnitude of stunted

rates and access to economic and

social services in more than 4,000

subdistricts.

support the comprehensive development of nutrition services. including nutrition-specific and nutrition-sensitive interventions in the national nutrition plan. This includes interventions in health, education, and social protection, and emergency interventions in coordination with partners such as the World Food Programme.

Key support has been to a CBN program through a phased approach. The CBM program provides a platform to integrate nutrition-specific and nutrition-sensitive interventions (such as home gardens, school-based services, women's empowerment, hand washing and hygiene, and counseling) in the same communities. It has strengthened the role of community groups in nutrition. More recent support includes interventions in social protection, health, and education. Social safety net interventions promote the use of basic to human development. services available in localities. Education interventions support school-based health and nutrition services and early child stimulation through parenting support and community childcare centers. Health interventions support access to RMNCH services.

investments in the social sectors, food security, women's empowerment, and income generation are all appropriate for addressing low social indicators, high levels of poverty, and inequitable access to basic information and services.

The World Bank's recent strategy focuses on nutrition. The CPF for FY17–21 aims to strengthen children's human development. Delivery of integrated health, nutrition, and social protection interventions in the regions with the highest stunted growth rates is expected. The previous interim strategy had focused on vulnerability and resilience, including preservation of health, education and nutrition, and disaster management.

The World Bank's early support to a multisectoral approach aligns with country priorities. The postcrisis national development plan (2015–19) advocated for a multisectoral approach

Attention to agriculture and WASH, specifically rural water and sanitation, has been consistently weak. Although other donors have worked on these sectors. there is still a role for the World Bank to support WASH and agriculture activities, which are important for contributing to the nutrition agenda. Social sector projects have targeted vulnerable geographies and populations.

community-based programs. IEs (conducted between 1999 and 2016) were pivotal in generating new knowledge and evidence to enhance the impact of the CBN program. For example, a key pathway to contribute to IE evidence has called for more attention nutrition outcome improvements. to address chronic malnutrition (in its early years), on which the program had had little influence. The Mahay pilot has accordingly tested new communitybased approaches to reduce chronic malnutrition and improve early child stimulation, and used a human-centered design approach to understand constraints to address to improve interventions. Evaluation shows that intensive counseling works in changing behaviors and shows the effectiveness of lipid-based nutrient supplements in young children. This adaptive learning has been supported by trusts funds, which were critical in influencing the design of subsequent nutrition operations and the country's CBN

Analytical work has strengthened health and social protection programs. Together, a country health status report (2010), a health PER, and a report on health service Bank also has invested substantially in delivery indicators identified challenges to improving basic health services. Analytical work on social protection has helped promote and develop a viable social protection program and improve dialogue on effective links between cash

growth and anemia has decreased, but levels remain high. Wasting and underweight have more sharply declined. The CBN program has been

The World Bank has contributed to increasing breastfeeding and child feeding through consistent support of the health sector to of the CBN program under the leadership of the national nutrition coordination unit. which has improved the quality and quantity of food provided to children under three. Social protection projects also have supported improvements in the minimum diet diversity of children, but national levels remain low.

The World Bank has contributed to child health and health service improvements through the treatment of malnourished children. There are gains in the prevention and treatment of childhood diseases (including diarrhea, parasitic infestations, and malaria) supported by the CBN and school-based services. The World basic health services for mothers and children and their synergies with the CBN activities.

The World Bank has contributed to maternal health improvements through the provision of IFA to pregnant

Health projects target women and children in regions with high poverty and low health and nutrition indicators and limited access to services. Social safety net interventions, similar to health, reached mothers in geographies with high poverty and food insecurity but also have considered the complementarity of other interventions to foster synergies with available social services. The education project is national in its scope. Agriculture focused on geographies important for the food supply.

transfers and behavior "nudges" to finetune social safety net interventions. Pilot learning in projects has generated knowledge to expand interventions. For example, health projects piloted and demonstrated the positive impact of fee exemptions, which lifted financial constraints and boosted use of critical maternal and child health services.

Policy dialogue regarding operations has

supported the launch of the multisectoral approach to nutrition. The long-running Community Nutrition II project (P001568) term agriculture productivity and has been important in establishing and rendering functional the national nutrition coordination structures and the modestly to WASH. Knowledge on decentralized branches. But subsequent investments in nutrition have not further developed this coordination capacity.

women as a part of the minimum package of health services.

The World Bank has made some contributions to improving access to nutrient-rich foods mainly through safety net interventions for foodinsecure households, the CBN program's support of family gardens, livestock and cooking demonstrations, and emergency interventions. There has been limited World Bank support to improve longdiversity.

The World Bank has contributed WASH likely has improved since promotional activities on WASH were supported by all health and nutrition projects in the portfolio. However, there are no supply-side investments in WASH during the period under review.

The World Bank has contributed to improvements in maternal and childcare resources. These include improvements in incomes, consumption, and school enrollment and retention through safety net support to vulnerable households (many headed by females).

### Malawi

The World Bank has supported the rollout and development of community- related to social protection, agriculture, based care groups. The nutrition

The World Bank has aligned with needs WASH, and social mobilization and

The World Bank's policy dialogue has supported the government to develop its nutrition coordination structures and

The magnitude of most nutrition outcomes has improved through support of multiple donors, particularly project (P125237) has supported the CBN interventions, such as IYCF counseling, WASH promotion, cooking demonstrations, home gardens, promotion of care seeking for childhood diseases, and promotion households and areas hit by natural of health services. The new early years project (P164771) adds a focus on community-based childcare and parenting. Other support has been to emergency food support.

In social protection, the World Bank supported the social CCT program for families with children. Elements include nutrition promotion and livelihood skills support through village savings and loans.

In agriculture, support has been to

agriculture extension services to engage in nutrition-sensitive activities. This includes promotion of droughtresistant crops, livestock, poultry and fisheries, crop diversification, improved seeds, legume farming, fortified crops, integrated homestead farming (including home gardens), appropriate technologies, and safe food preparation and storage. In WASH, there has been support to water management and supply. This includes strengthening services at all levels to manage water and some

behavior change; there are gaps in development of care groups to deliver support to health and WASH support for rural lower-income people. In social protection and agriculture, interventions have targeted the lowest- nutrition. The World Bank's nutrition income and most vulnerable disasters, with an emphasis on rural poverty reduction. The main nutrition project (P12523) in the portfolio has supported care groups to reach households in 50 percent of Malawi's districts. In WASH, most interventions have been in urban areas, despite the need to reach rural areas. The lack of investment in health services is based on a desire to limit the number of sectors in the country portfolio. Maternal health especially has lacked support. Although other donors do support health, there is a role for the World Bank to improve support. The World Bank strategy has prioritized nutrition to reduce vulnerabilities. The FY07–10 CAS had a focus on

vulnerability at the household level to HIV/AIDS and malnutrition. The FY13-17 CAS aimed to improve nutrition to enhance human capital and reduce vulnerabilities. The focus has been one nutrition project, which is now closed (P125237).

The coordination of interventions across rural infrastructure (piped water, water World Bank projects and sectors to address nutrition has been lacking. For

strategies. This includes the national nutrition policy and communication strategy, and the organization of multilevel structures to coordinate project (P125237) supported the National child health, but diet diversity remains a Nutrition Strategic Plan (2007-12) and the National Multi-Sector Nutrition Policy improved early initiation of (2018-22). Strengthening multisector coordination and decentralized coordination, including structures of care feeding. The duration of the support groups, village development committees, is likely too short to adequately and nutrition coordinating committees, have been key to improving access to services at the household level. The challenge has been continuity of this support to reinforce coordination structures and financing and planning that are needed to improve the interoperability of sector programs. Moreover, there has been limited effort to synergize nutrition support with other The World Bank has contributed sectoral investments, such as in health, WASH, and agriculture.

Convening of actors has supported learning funded about 25 percent of Malawi's to improve nutrition policy and programming. For example, the World Bank has helped develop the country's **Food and Nutrition Conferences** research-policy learning and the annual SUN Forum for district knowledge sharing.

Knowledge generation has provided some evidence to design the community-based program. In 2011, a national survey

the levels of wasting and underweight. Levels of stunted growth and anemia remain high. The World Bank has contributed to improvements in breastfeeding and key challenge. Care groups likely have breastfeeding, but there is no evidence of improvement in child strengthen the care groups and overlapped with periods of crisis. In terms of child health, emergency treatment and food support of the World Bank and UNICEF likely has helped reduce wasting. Care groups are also trained to promote growth monitoring and identify malnourished children.

substantially to improve access to nutrient-rich foods. The World Bank agriculture budget, supporting increased crop yields and, in more recent years, diversified crops for nutrition and climate risk management. A success factor has been the use of model villages to promote practices among a cluster of villages.

The World Bank has contributed to improved access to water and

points, harvesting structures, and latrines).

example, the planting of home gardens, small livestock rearing, and nutrition promotion activities are supported by operational projects in social protection, agriculture, and health sectors without coordinated implementation or results learning.

conducted with USAID has provided evidence to improve IYCF activities of care groups in the CBN program. The World Bank also conducted an IE of the care group support.

Analytical work has generated evidence to improve social protection and agriculture interventions. For example, studies have provided evidence to enhance targeting of interventions and diversify agriculture crop support to improve its impact on nutrition.

Trust funds have supported learning on new approaches. For example, the adolescent nutrition-sensitive agriculture households to economic shocks. The pilot supported by Japan supports yearround production of micronutrient-rich crops at demonstration sites.

sanitation. Strengthening water management services, including in communities, has been a success factor to improve local water services. Care groups also have improved WASH behaviors of households with children.

The World Bank has contributed to maternal and childcare resources. The IE of CCTs found beneficiary households have increased food consumption by 23 percent. In addition, CCTs have helped build the resilience of female-headed challenge of safety nets remains the limited coverage. More recent support on ECD should also contribute results in this area.

# Mozambique

The World Bank has supported nutrition In social sectors, the World Bank's has interventions in health facilities and at the community level. This is through the progressive rollout of the Nutrition Intervention Package through health facilities and a network Program (P163541). Health support of CHWs that coordinate care groups and CBN sites. Relevant interventions include the promotion of breastfeeding and IYCF, cooking demonstrations, distribution of micronutrient powder and zinc and iron tablets, treatment of diarrhea, growth monitoring and promotion, promotion of pregnancy care,

support increasingly aligned with nutrition needs. Key are the Health Service Delivery Project (P099930) and the Primary Health Care Strengthening high rates of stunted growth and access to nutrition services. emphasizing the first 1,000 days. In social protection, the World Bank has increasingly targeted women in lowerincome households. In education, ECD support responds to needs related to child caregiving.

Analytical work is generating relevant evidence to enhance nutrition activities. In education, an evaluation of the ECD program informed the expansion of interventions and links between ECD and health services. A collaborative study also focuses on the northern provinces, with informed interventions to delay childbirth country. Diet diversity and among adolescents. In agriculture, an IE of extension networks to support farmers anemia) also remain a significant has provided evidence on the effectiveness of different delivery modalities in boosting farmers' adoption of sustainable practices, with a focus on increased productivity by smallholders. In 2014, an evaluation supported by

Limited changes in nutrition outcomes have occurred in Mozambique during the evaluation period. Levels of stunted growth, wasting, undernutrition, and LBW remain high, especially in the northern part of the micronutrient deficiencies (such as challenge. This is further challenged by repeated crises from natural disasters (frequent droughts and floods), which likely have had a detrimental influence on outcomes and limited observed improvement.

immunization, malaria prevention, and In WASH and agriculture, interventions community-based family planning. The World Bank's support to WASH is limited. It includes water points, desalination, rehabilitation of drinking water systems, and promotion of open Moreover, explicit links to improving defecation-free campaigns and latrine construction

In agriculture, there has been limited support to the productivity of crops, food fortification, and food distribution in emergencies. The World Bank has supported fortification of staple crops and providing improved and droughtresistant seeds for smallholder farmers. The World Bank also financed the distribution of food to populations nutrition support. Mainly though the affected by droughts.

In social protection and education, the World Bank has supported social CCTs and childcare. The ECD program has thus far been rolled out to reach children between ages three and five in 350 rural communities. It is intended to influence social norms and the behaviors of parents and children in five provinces.

and needs are less aligned. In WASH, the nutritional biofortification. The World World Bank has addressed challenges of water supply and sanitation, but most of the support is in towns. nutrition are lacking in the sector. In agriculture, the World Bank has a few examples of successful support, such as recommendations could support the for crop fortification, but the support has focused on emergency food distribution, with a need for more emphasis on sustained access to food and food diversification.

There has been limited coordination across World Bank projects to implement health sector, the World Bank has supported the government's nutrition policies and strategies, such as the Multisectoral Action Plan for Reduction of Chronic Undernutrition 2011-. Agriculture support is aligned with government production and emergency strategies.

The FY17-21 CPF has a focus on ECD and challenges. nutrition to build human capital and on addressing nutrition in value chains for food. However, the recent national development plan (2020–24) does not make explicit reference to prioritizing the nutrition agenda. The FY12–15 CPS had aimed to mainstream nutrition in the portfolio to address challenges of

HarvestPlus has provided evidence on Bank has played a role in designing the National Food Fortification Strategy 2016–21. Moreover, the World Bank has recently conducted a study on nutritionsmart agriculture (including a country profile for Mozambique [June 2020]). The results will need to be assessed, agricultural portfolio from FY21 onward. In social protection, a social assistance PER (2012) identified options to improve social programs. In WASH, a recent diagnostic has been conducted to develop policy options for improvement. Technical support in the health sector has strengthened nutrition services. Recent support is to the nutrition department in the health sector, in partnership with the GFF to develop nutrition services and primary care RMNCH services, including strengthening CHWs. This is core to the national program to expand health services, with increasing support to addressing the nutrition agenda and

Policy dialogue has supported nutrition coordination. Early support had focused beyond health, facilitating the establishment of multisectoral coordination at the national and subnational levels. These coordination structures are taking an increasing role to contributions to access to drinking promote the nutrition agenda and strengthen interagency coordination.

The World Bank likely has contributed to improvements in breastfeeding and child feeding. This is through engagement with other donors to strengthen the rollout of communitylevel services, which have likely helped improve outcomes. However, including evidence of dietary and feeding improvement.

The World Bank has contributed to improving in health service use by mobilizing pregnant women in communities, supporting immunization, and building the skills of health professionals. Improvements are seen in institutional delivery and immunization, but the quality of services remains a challenge. It also has contributed to maternal increased IFA supplementation and deworming.

The World Bank has made some contribution to access to food. In agriculture, this is through improved inputs (for fortified crops), improved technologies to enhance smallholder productivity, and food assistance to vulnerable groups during emergencies.

The World Bank has made some water and reduced open defecation. This is through desalination,

chronic malnutrition, focusing on the CBN program and health.

Their challenge is to strengthen the institutional capacities and effectiveness of these structures at both national and subnational levels.

expanding piped water among the lowest-income households, and sanitation promotion. The challenge remains the coverage of rural areas. The World Bank is contributing to maternal and childcare resources. In social protection, the World Bank has coordinated with other donors to increase the coverage of social safety nets to support households at risk of food shocks, and increase female beneficiaries of safety nets. The newer ECD program includes support for parenting education to contribute to the knowledge and feeding practices of caregivers.

#### Nicaragua

The World Bank portfolio has included a Diet diversity is first identified as a need mix of nutrition-specific and nutritionsensitive interventions. In social sectors government's request for support from (health, education, social protection), these interventions have been coordinated by local government and through the community-based program, but there has been limited coordination of nutrition at the national level.

The World Bank has supported an integrated package of nutrition-specific and nutrition-sensitive interventions for health, safety net support, and education children in geographies that have the for lower-income families with children. This is through the Family and Community-based Social Welfare Model (MAIFC), and the Family and

in the FY13–17 CPS, in response to the GAFSP. In the FY18–22 CPF, nutrition is addressed by improving health and ECD and providing water supply and Dry Corridor and Caribbean regions). The World Bank support in health, social protection, water, and agriculture has aligned with nutrition needs. In health and social protection sectors, the support has been to mothers and lowest health indicators and to indigenous and lower-income populations. In the water sector, the focus has been on access to WASH in

IEs have helped improve social programs. For example, the Women's Power, Conditional Cash Transfers, and Schooling in Nicaragua (2008) have provided evidence to improve measures for women and children. Similarly, a 2009 sanitation in rural communities (that is, IE of a Conditional Cash Transfer Pilot in Nicaragua has provided evidence for CCTs on child health and education. Analytical work has prioritized community investments. In Social Protection in 2008 a with strong support from government public expenditure review recommended at all levels. Improvements in diet the extension of the package of basic health services to communities. It also emphasized ECD and nutrition programs for lower-income children. These priorities are reflected in the government of diseases since these interventions and World Bank strategies. Analytical

Nutrition outcomes have improved overall—the magnitude of stunted growth, wasting, and LBW decreased, but levels of stunted growth remain above the regional average. The World Bank has contributed to improving breastfeeding and child feeding. Success factors have been consistent support to a package of services and community volunteers diversity are limited since interventions started in FY15 and concentrated in two regions. There is limited evidence on home-based care are still active.

Community Health Model (MOSAFC). This support has helped local services, including health and nutrition so far no continuity of this support. promotion, prevention and care services, family grants, and a network of volunteer counselors to provide home-based support and parental education. Emphasis is on access to services for vulnerable populations and involving the community as a partner.

and agriculture sectors. In water, support has developed supply chains for rural water and sanitation services, including community-based committees, latrines, and piped water. In agriculture, support has strengthened farmers' solidarity groups, agriculture inputs, biofortification, and community volunteers to promote nutritionsensitive agriculture, but this support has been limited to two regions and one project.

rural areas. In agriculture, key support has been provided in coastal areas authorities to coordinate a package of based on the food supply, but there is Most of the World Bank support across sectors has not been coordinated to address nutrition needs in the same communities. However, there has been simultaneous support to needs in health, social protection, water, and agriculture in Jinotega during FY11-17. strategy on adolescents' SRHR. Trust Madriz, Leon, and Chinandega have Other support has extended to the water received health, social protection, and water support during FY11-17, and Boaco, Chontales, RACCN, and RACCS have received support in the health, agriculture, and water sectors. Moreover, the GAFSP support led to the Caribbean Coast Food Security project (P148809) in FY15. The project provides a unique example of agriculture leading the coordination of interventions in two regions with other World Bank projects to reach beneficiaries in lower-income and hard-to-reach communities.

work on agriculture performance and challenges has prioritized support to the Dry Corridor with high nutrition needs and has provided evidence to expand support to smallholder famers.

Trust funds have generated knowledge for collaborative approaches. The Nordic trust included the use of volunteers fund support to SRHR has supported analyses by the health sector, PAHO, and UNFPA and informed a multisectoral funds and partner collaboration are important in supporting evidence gathering.

The World Bank has made strong contributions to improving access to health. There are increases in institutional deliveries, antenatal care, postnatal care, family planning, and immunization. Success factors have (reaching 20,000 families) to identify pregnant women in rural areas and the coordination among social services.

Agricultural support has contributed to increased productivity and food security in two regions. Interventions have helped improve biofortification and diversification of crops. A success factor has been promoting synergies with other projects.

The World Bank has contributed strongly to improving sanitation, access to water, and reduced open defecation. The Rural Water Supply and Sanitation (P106283) project improved access to water for over 69,000 people and sanitation for over 44,000 people.

The World Bank has contributed to parenting improvements. About 18,000 lower-income families have been reached by social safety nets, to improve schooling and parenting skills, including time that parents spend with children and nutrition.

The World Bank has contributed to improvements in sexual and

reproductive health for girls. This has been through its support the multisectoral strategy on SRHR.

#### Niger

In health, the World Bank has supported The CPF (FY18–22) has prioritized the expansion of the basic package of services. This has included growth monitoring and promotion, nutrition counseling on IYCF, the referral of malnourished children for treatment. and home-based care for childhood illness. It has also supported pregnancy care, immunization, and family planning services in remote areas.

In social protection, the World Bank has provided extensive support through cash transfers. Cash transfers have included accompanying measures, such as SBCC on breastfeeding, child feeding and essential family practices, life skills, promotion of delayed pregnancy, promotion of water treatment, IGS activities, skills building, creation of community savings groups, and home visits and workshops on ECD and healthy parenting and family relationships. The World Bank has supported girls' education and WASH in schools. Collaborative support between social protection, health, and education has also supported grants for girls to attend school. Education has also supported SBCC promotion on WASH, communities.

nutrition to improve human capital. This includes an emphasis on nutrition in early childhood, diet diversity in agriculture, maternal health, and women's and girls' empowerment. In the FY13-18 CPS, nutrition was addressed in a more limited way through rural health and food security. The World Bank has provided support to nutrition interventions through health, social protection, education, agriculture, and urban sectors. Support to child feeding and parenting is in early phases and will need to be expanded to meet needs. Overall, needs related to maternal knowledge and resources are being addressed by social protection projects. Support to manage childhood illnesses has responded to critical needs to reduce the burden of malnutrition, malaria, diarrhea, and other illnesses. There has also been a consistent addressing of needs to improve access to health services. Key challenges remain the inadequate coverage of remote rural populations, improving the quality of services, and addressing vulnerable communities such as refugee

Diagnostics evidence has informed policies. There were limited improvements in This includes a 2019 assessment of food security policies and programs. In social protection especially, the World Bank has some outcomes such as stunted provided consistent support to policies and a framework to better target and coordinate social protection services. A diagnostic on land management has provided an analytical basis for the preparation of programs, given that this is a critical challenge in communities, and may have important links to addressing nutrition in Niger.

This is particularly the case in the use of IE evidence to develop safety net programs and school grant programs to benefit lower-income families and women and girls. The SWEDD regional project also has supported an IE to learn how to address social norms related to girls' empowerment.

Leadership building has improved health and nutrition services. The World Bank has provided technical assistance in a collaborative leadership program in the health sector to improve reproductive health and nutrition service in districts and communities. This included a stakeholder mapping of actors involved

nutrition outcomes during the evaluation period. The magnitude of growth and anemia have decreased. but levels of stunted growth, wasting, and undernourishment remain unacceptably high, above the regional average.

The World Bank has made some contribution to improve breastfeeding and complementary feeding. This is through support in social protection Evaluation evidence has supported learning. to lower-income households with children and improvements in nutrition counseling in the health sector. The challenge remains the scale of this support, given the extent of undernutrition. Moreover, the benefits to improve diet diversity are yet to be seen.

> The World Bank has contributed to child and maternal health. This has mainly been through improved treatment of malnutrition, promotion of bed net use, and improvements in pregnancy care, including malaria prevention and treatment. However, needs in this area remain vast. The World Bank has contributed to improved access to health services. This

latrines, school-based deworming, vegetable gardens at schools, and literacy training.

In agriculture, there has been limited milk, livestock, and poultry production. This has included improved seeds, promotion of cowpeas and moringa, and demonstrations on the transformation of foods in flour and oils.

Support to WASH and access to nutrient- in nutrition to identify disaggregated rich food could be strengthened. WASH has been integrated in social protection, education, and urban support to intensify nutritional crops and projects, but significant needs remain. Access to nutrient-rich food is addressed through the PHRD fund, but municipalities of Niger (Kao, Bambey, interventions are not yet mainstreamed in agriculture programs. Support to diet diversity is a newer priority in the CPF.

> Coordination on nutrition across projects and sectors is lacking. Support to nutrition has been through individual sector programs. There was no evidence of coordinated or strong country leadership. However, the portfolio is increasingly aligned to coordinate efforts on reproductive health and women and girls' empowerment. There have also been some efforts by projects to coordinate community-based interventions, which could provide an entry point for nutrition coordination.

needs in communities.

Trust funds have supported nutritionsensitive activities. The PHRD fund has supported the development of crops with immunization. However, the high nutritional value in five rural Bangui, Hawandawaki, and Korgom) most affected by malnutrition, especially among women and children.

Reginal support has been critical to develop women's and girls' empowerment activities and to build productive assets of women. The Sahel Women's Empowerment and Demographic Dividend project (P150080) The World Bank has made some has supported policy, SBCC (husbands' schools), girls' empowerment (safe spaces), and health service improvements the promotion of hygiene and related to SRHR and nutrition across communities to increase demand for services. This support has addressed critical issues such as early marriage. The 
The World Bank is contributing to food knowledge support of the Sahel Adaptive security and parental knowledge and Social Protection Program (P173603) has provided a package of productive activities to cash transfer beneficiaries to build household assets and skills so they may move out of poverty and become more resilient to shocks.

has been by expanding the basic service package. Key improvements are in assisted birth, antenatal care, nutrition counseling, and challenge remains the lack of services in rural and remote areas. The World Bank has made some contributions to improve access to nutrient-rich food. This is mainly through improved inputs for productivity of staples and livestock. However, improvement is limited given the pilot scale of the support. contribution to improve access to WASH. This has been mainly through sanitation practices in communities, and support to develop latrines and water points.

assets in households. This has been through social protection support and improvements in household productive assets (livestock, and so on). IEs found that productive measures boosted incomegenerating activities. Beneficiaries displayed higher levels of total consumption and food security. Beneficiaries also experienced improved mental health and social

well-being. A success factor was peer learning support.

The World Bank is contributing to improving social norms. This has been through support to girls' education and increased contraceptive usage.

#### Rwanda

The World Bank has supported health services. This included early support to develop PBF services. The current health project (P164845) is further strengthening CHWs and high-impact about 2012. Recent health support services. This includes PBF incentives to improve nutrition interventions (such as early antenatal care visits, postnatal care, IFA supplementation, nutrition counseling, and growth monitoring and promotion), and the distribution of fortified blended food. The World Bank supports safety nets and childcare. The World Bank is providing nutrition grants to families, including parenting education and incentives to use health services. This includes a program to employ community workers and roll out childcare in rural areas. Other support The World Bank has targeted relevant has been to a voluntary savings policy for lower-income households, grants to carry out IGS, and social funds for farmers.

The World Bank has provided extensive support in agriculture. This included support to improve seeds, biofortified crops (such as iron-fortified beans)

The World Bank portfolio is increasingly aligned with country challenges. In health and water, the World Bank had supported access to services until responds to the need to improve the quality of nutrition services and support has focused on challenges of productivity and food security, although the address of food diversification could be strengthened. Social protection addresses challenges among lower-income households to care for and feed children. Support in governance has addressed challenges in accountability of services and improved the social registry system for reaching lower-income households. populations. In health and social protection, mothers with young children are a special target group, as are districts with high nutrition needs. WASH support has focused on rural areas. Agriculture support has reached lower-income smallholder farmers in

Convening of leaders has demonstrated nutrition commitment and helped pivot the overall—the magnitude of stunted country to action. For example, a visit from growth, wasting, and LBW has the World Bank president helped catalyze decreased, but levels of stunted high-level leadership to act on nutrition. Engagement of actors at all levels (district, community, and so on), however, The World Bank has contributed to community-level outcomes. Agriculture have been critical to mobilize action on nutrition. The World Bank supports the monitoring of Imihigo, which is a contract between the president and local government leaders on achieving targets mainly though the expansion of PBF for key programs.

> Evaluation evidence is supporting learning. For example, IEs on PBF, nutritionsensitive social protection, and agriculture are guiding implementation learning. The current health project is using IE learning to strengthen highimpact health services and services of CHWs.

Analytical evidence has informed policy. For example, the Rwanda Nutrition Situation Analysis and Policy Options program (P162400) has supported the government in improving the nutrition response. Similarly, a recent nutrition expenditure marshlands and hillsides. A challenge is review (P169988) has identfied needs to

Nutrition outcomes have improved growth remain above the regional average. Anemia also remains high. improvements in child health, early breastfeeding, and access to health services, but child feeding and maternal nutrition remain challenges. This is at the health facility and community level, including nutrition services, pregnancy care, and family planning. Key achievements have included increased care seeking for children and institutional deliveries. Success factors have been the strengthening of CHWs and fit of the approach with the highly organized health system in Rwanda.

The World Bank is contributing to parental caregiving improvements through support to child grants and childcare. Initial evidence shows improved parenting behaviors of mother and father and improved

sustainable land management, water management, and postharvest infrastructure. The kitchen garden program is the main initiative to promote diverse foods.

The World Bank has supported WASH. This included access to piped water and sanitation through PPPs, water treatment, and WASH in health facilities and schools. WASH is also part of SBCC across sectors.

the weak overlap of agriculture support improve nutrition financing and with other support.

The World Bank strategy has consistently addressed nutrition, but political commitment has increased in recent years. The FY09–12 CAS has prioritized malnutrition and its determinants (water, health, food access). The FY14– 18 CPS has focused on nutrition in agriculture, given that donor division of data systems. labor shifted the portfolio from health. The FY21-26 CPF prioritizes child nutrition improvements to support the multisector government program. Projects in health, social protection, agriculture, and education are coordinating nutrition interventions.

DPLs have supported the expansion of interventions such as the PBF. A DPL on human capital supports interventions such as childcare.

accountability for multisectoral coordination.

Knowledge exchange is supporting innovation. For example, study visits to Peru and Indonesia and ongoing partnership across the countries have helped reform safety net interventions and the interoperability of social sector

Trusts funds have supported nutritionsensitive approaches and partnership. For example, the GAFSP financing (P124785) has supported the village kitchen demonstration program. Power of Nutrition and GFF are supporting learning to converge sectoral Policy operations have scaled up support. interventions across World Bank projects in a selection of districts. The GFF has supported multipartner nutrition planning, involving multiple sectors and levels of government. BMGF is supporting eMBeD (P169525) evidencebased learning on the national behavior change strategy.

coverage remains limited. The World Bank has contributed to improved access to food by increasing arable land and reducing seasonal vulnerability; improving financial access; increasing production of staple crops and milk, meat, fish, and eggs; and expanding kitchen garden practice across communities. A success factor has been the

strengthening of farmers' groups.

However, projects have not

diversity.

contributed to improved diet

child feeding, but intervention

The World Bank has contributed to improved access to water and sanitation. This is through the Rural Water Supply and Sanitation project (P045182) and later DPLs. There have been large improvements in access to drinking water and sanitation facilitates. Nevertheless, water access remains a challenge in rural areas.

Source: Independent Evaluation Group.

Note: BMGF = Bill and Melinda Gates Foundation; CAS = Country Assistance Strategy; CBN = community-based nutrition; CDD = community-driven development; CCT = conditional cash transfer; CHW = community health worker; CPF = Country Partnership Framework; CPS = Country Partnership Strategy; DPF = development policy financing; DPL = development policy loan; ECD = early childhood development; eMBeD = Mind, Behavior, and Development Unit; FY = fiscal year; GAFSP = Global Agricultural and Food Security Program; GFF = Global Financing Facility; HDW = human development worker; IE = impact evaluation; IFA = iron-folic acid; IGS = income generation support; IYCF = infant and young child feeding; LBW= low birthweight; M&E = monitoring and evaluation; MDG = Millennium Development Goal; PAHO = Pan American Health Organization; PBF = performance-based financing; PER = public expenditure review; PHRD = Japan Policy and Human Resources Development; PforR = Program-for-Results; PPP = public-private partnership; RACCN = North Caribbean Coast Autonomous Region; RACCS = South Caribbean Coast Autonomous Region; RMNCH = reproductive, maternal, newborn, and child health; SBCC = social and behavior change communication; SPJ = Social Protection and Jobs; SRHR = sexual and reproductive health rights; SUN = Scaling Up Nutrition; SWEDD = Sahel Women's Empowerment and Demographic Dividend; UNFPA = United Nations Population Fund; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene.

Table G.2. Observed Results of Nutrition Support in Case Study Countries

Outcome	Ethiopia	Indonesia	Madagascar	Malawi	Mozambique	Nicaragua	Niger	Rwanda
				Immediate Dete	erminants			
Child feeding and caregiving	+ dietary diversity + minimum acceptable diet + exclusive breastfeeding	n.a.	<ul> <li>+ breastfeeding</li> <li>+ diet of children</li> <li>+ child stimulation and feeding practices</li> <li>+ micronutrients</li> </ul>	+ breastfeeding + complementary feeding practices	+ food supplements to vulnerable + breastfeeding	+ breastfeeding + diet diversity for children < 5 + parenting behavior	+ parenting practices + breastfeeding + complementary feeding	+ early breastfeeding + parenting behaviors
Child health and disease	+ feeding and care of children with diarrhea + treatment of malnutrition	+ treatment of child malnutrition	+ treatment of malnutrition and diarrhea + health of child	<ul> <li>+ Children with ITNs who slept under them last night</li> <li>+ Children with diarrhea given increased fluids</li> </ul>	+ treatment of malnutrition + deworming	+ improved home-based care of vector- borne diseases	+ treatment of malnutrition + bed net use	+ treatment of child illness and diarrhea, malnutrition + bed net use
Maternal health and diet	+ reduced underweight pregnancy + IFA supplementation	+ intake IFA during pregnancy	+ micronutrients + health of mother	+ IFA	+ IFA during antenatal care	+ improved diet diversity for pregnant women	+ treatment for malaria during pregnancy	+ healthy pregnancy
				Underlying Dete	erminants			
Access to nutrient- rich food	+ access to agricultural support services  + improved agricultural practices  + irrigation support	+ food storage  – repayment rates of food credit	+ food enrichment knowledge on preparation of nutrient-rich meals using affordable local products + nutritious crops	+ Home or backyard gardens planted + increased food access + crop yields,	+ fortified food products + food supply	+ quality of food produced and consumed + productivity staples, fortified crops, livestock	+ improved inputs for productivity of staples and livestock (poultry, small ruminants) + production nutrient-rich crops	+ food consumption + productivity, fortified crops, livestock, milk
	+ iodized salt		+ home gardens	diversification + agriculture inputs and livestock		+ improved inputs, storage	(pilot)	+ improved inputs, arable land, storage

+	kitchen
С	ardens

		<ul><li>child monthly weighed</li></ul>						
	+ antenatal care coverage	+ vitamin A + Immunizations			+ nutrition services			postnatal care
	+ vitamin A	+ SBA	benefits of RMNCH services		deliveries	+ immunization	+ immunization	+ antenatal care and
	+ LLINs	+ ANC, PNC	+ knowledge of	+ antenatal care	+ institutional	women	+ antenatal care	birth
	+ immunization	+ provision IFA	+ immunization	care groups	+ antimalarials	+ use of services by pregnant	+ assisted birth	+ assisted
Access to health services	+ access to health and community nutrition services	+ basic nutrition services coverage	+ supply, affordability, uptake of RMNCH services	+ caregivers of children benefiting from services in	+ vitamin A + immunization	+ health services coverage	+ health services coverage	+ health service coverage
				+ coverage of safety nets				+ community insurance coverage
	transfers	+ household expenditures and access to social services	incomes  + household assets,     resilience  + community day     care	consumption  + household asset depletion prevented  + productive assets		+ school children receiving meals	+ household productive assets (livestock, and so on)	income people  + health- seeking behaviors
Maternal and childcare resources	+ food security  + access to income support and cash transfers	+ enrollment ECED services by lower-income people	+ food security of vulnerable + household	+ households with three meals a day + household food	+ beneficiaries of cash transfers	+ retention of children in preschool + school	+ food security  + access to income support or cash transfers	+ seasonal food security + safety nets for lower-

Access to WASH services	+ access to improved water	n.a.	+ knowledge of hygiene, sanitation	+ SBCC on WASH practices	+ access to clean water	+ water supply in rural areas	+ improved hygiene and sanitation practices	+ clean water + sanitation
	+ access to latrines			+ community	+ piped water	+ improved	р	facilities and
				sanitation projects		hygiene and	+ latrines and	latrines
	+ functional water				+ improved	sanitation in	water points	
	schemes				sanitation facilities	rural areas		+ piped water
								+ water
								management

Source: Independent Evaluation Group.

Note: Results evidence in the table are from project indicators in results frameworks and evidence from evaluations supported by projects in the country. ANC = antenatal care; ECED = early childhood education and development; IFA = iron-folic acid;; ITN = insecticide-treated net; IYCF = infant and young child feeding; LLIN = long-lasting insecticide-treated net; n.a. = not applicable; PNC = postnatal care; RMNCH = reproductive, maternal, newborn, and child health; SBA = skilled birth attendance; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

Table G.3. World Bank Support to Behavior Change in Select Case Study Countries

Level of Evidence	Maternal and Child Caregiving and Nutrient- Rich Food	Access to Health Madagascar	Access to WASH
Level 1— Engage	<ul> <li>Caregivers attended nutrition sessions in the community and received messages on breastfeeding, IYCF, and cooking demonstrations.</li> <li>Parents testified about their experiences and brought food for culinary demonstrations.</li> </ul>	Caregivers received sensitization on the benefits of accessing health and nutrition services.     Community nutrition agents provided health and nutrition education for the community on various vaccination themes.	Caregivers at nutrition sites and health centers received messages on hygiene, sanitation, and the use of drinking water (hand washing, latrines, environmental cleaning).
Level 2— Learn	<ul> <li>Caregivers acquired knowledge on breastfeeding, complementary feeding, foods rich in micronutrients, and having a diverse diet.</li> <li>Caregivers acquired knowledge to cultivate vegetable gardens.</li> <li>Households cultivated products with high</li> </ul>	<ul> <li>Mothers realized the benefits of monitoring the health and nutrition of their children.</li> <li>Providers improved their knowledge to promote nutrition.</li> <li>NGOs improved their skills to supervise community nutrition.</li> <li>Providers carried out nutrition services as per</li> </ul>	<ul> <li>Caregivers improved their knowledge of hygiene, hand washing, food hygiene, use of soap, and use of latrines.</li> </ul>
	nutritional value.  Mothers improved their breastfeeding.  Households used peanuts, beans, and other legume proteins for consumption and fortified food products, such as sweet potatoes and yams.	guidelines at supported sites as part of health services.  • Community nutrition agents ensured the approach of the 1,000 days, following the newborn baby into growth monitoring and counseling and continuing screening children 6 to 59 months.	
Level 4— Sustained behavior change	<ul> <li>Caregivers improved the quantity and quality of dietary intake of children on a sustained basis.</li> </ul>		

Related Interventions	Communication by radio, community meetings, and campaigns.  Education by community nutrition agents.  Training in village culinary demonstrations with local products.  Demonstration sites for vegetable gardens.  Fortification and biofortification of food products.  Capacity building of community actors and evaluation of the program by beneficiaries.	Operational support to community nutrition sites.  Training of caregivers on monitoring their children.  Training of health workers, NGOs, and community groups to provide health and nutrition education.  Support to improve the provision of nutrition services (training, guidelines, supervision, and evaluation).  Strengthening of collaboration of implementing actors.	Strengthening the technical capacities of community nutrition agents.  Provider training on nutrition WASH approaches.
		Malawi	
Level 1— Engage	<ul> <li>Communities organized nutrition days to engage adolescents.</li> </ul>	<ul> <li>District and subdistrict officials in nutrition committees participated in activities with care groups.</li> </ul>	<ul> <li>Local chiefs were involved in the oversight of their village WASH practices and facilities.</li> <li>SBCC messages sensitize households on what factors contribute to healthy home environment.</li> </ul>
Level 2— Learn	<ul> <li>Caregivers improved their knowledge of feeding practices.</li> </ul>		<ul> <li>Local leaders learn how to promote and support WASH practices.</li> </ul>
Level 3— Apply	<ul> <li>Care group delivered a minimum package of community nutrition services through SBCC and group education, individual counseling, and home visits.</li> <li>Caregivers improved their timely introductions of complementary foods to children.</li> </ul>	<ul> <li>Providers practice new guidelines on how to treat malnourished children and children with diarrhea.</li> </ul>	Households improved hand washing practices.
Level 4— sustained behavior change	Mothers adhere to practice of early breastfeeding.		<ul> <li>Households improved access to drinking water sources, latrines, and sanitation facilities.</li> </ul>
Related interventions	Support to care groups on SBCC messaging on breastfeeding and complementary feeding, cooking demonstrations, and promotion of production of fruits, vegetables, and small livestock.  Support to nutrition days.  Promotion of integrated homestead farming.	Care groups promoted maternal and nutrition services. Nutrition training for district and subdistrict-level officials on SBCC messaging for care groups.	Care groups organized and provided SBCC messaging on WASH.  Training of local leaders in WASH.  Support for healthy home environment (indoor air pollution, cook stoves, fly control).

Promotion of latrines and water treatment.

	_	Nicaragua	
Level 1— Engage	Parents connected to nutritionists or promoters in project communities to learn food preparation.	<ul> <li>Teens engaged in peer learning on sexual and reproductive health.</li> <li>Home visits to mothers from midwives and health promoters promoted prevention and primary care services.</li> </ul>	Community promoters and social facilitators implemented awareness campaigns to reinforce good sanitation and hygiene practices in communities.
Level 2— Learn	<ul> <li>Parents learned to prepare new foods in balanced meals.</li> <li>Mothers learn how to be better caregivers in terms of their child's health, after receiving support from community volunteers.</li> </ul>	Mothers learn how and when to access prevention and primary care services.	<ul> <li>Volunteer health promoters educated on proper latrine use (including hand washing).</li> </ul>
Level 3— Apply	<ul> <li>Families with children under five produced and consumed a greater variety of foods in remote communities.</li> <li>Women and children increased the number of food groups they consume, from &lt; = 4 groups to &gt; = 5 groups (36 percent baseline, 80 percent final).</li> </ul>	<ul> <li>Health unit staff monitored growth and development of children under six in the lowest- income municipalities, primarily in the Dry Corridor.</li> <li>Health care workers routinely evaluated women's prenatal nutritional status and provided pre-and postnatal nutritional supplements.</li> </ul>	
Level 4— sustained behavior change		Women increased their use of a package of maternal and reproductive health services (antenatal care, prenatal care, contraceptives), showing ongoing behavior change.	

Related interventions	Training of nutritionists and promoters to support families.  Counseling and workshops on parenting and family relationships in communities.  Breastfeeding support and complementary feeding counseling for parents.	Support to local networks of midwives and health promoters in vulnerable communities.  Support to maternal homes in municipalities.  Sexual and reproductive health training of youth.	Support to network of promoters and social facilitators in communities. Support to local NGOs and municipal sanitation campaigns.
		Rwanda	
Level 1— Engage	<ul> <li>Community actors (lead farmers, farm field schools, health workers, and self-help groups) promoted food and dietary practices, kitchen gardens, savings plans, social funds, and others.</li> </ul>	<ul> <li>CHW visited households for child disease management, nutrition counseling, family planning, and referrals of pregnant women to services.</li> </ul>	Local leaders promoted WASH initiatives.
	<ul> <li>ECD workers selected from the community were trained to provide caregiving in first-phase areas.</li> </ul>		
Level 2— Learn	<ul> <li>Households planted kitchen gardens.</li> <li>Communities constructed drying and storage facilities for lean season.</li> </ul>	<ul> <li>CHW diagnosed child undernutrition and reported undernutrition cases to the health facility.</li> </ul>	<ul> <li>Households in home- based ECD programs increased their WASH practices.</li> </ul>
Level 3— Apply	<ul> <li>Caregivers improved parenting practices in the community-based ECD program (child</li> </ul>	<ul> <li>Caregivers increased preventive care visits for children.</li> </ul>	<ul> <li>Households adopted water filtration and chlorination practices.</li> <li>Communities managed</li> </ul>
	<ul> <li>timulation and feeding).</li> <li>Households used fortified seeds and food products, such as beans and sweet potato rich in vitamin A.</li> </ul>		piped water through PPPs.
Level 4— sustained behavior change	<ul> <li>Communities continue savings plans and social funds to pay for health insurance and increased their food consumption.</li> <li>Women increased early initiation of breastfeeding, and</li> </ul>	<ul> <li>Women increased their use of family planning, antenatal care, and postnatal care on a continued basis.</li> </ul>	<ul> <li>Households improved access to clean drinking water sources.</li> </ul>

# breastfeeding continues to be high.

# Related interventions

Agriculture extension worker farmers were trained on nutrition-related content (such as food processing, diversification).

Promotion of the organization of village kitchens.

Community-based ECD in first-phase communities registering lower-income families.

Introduction of voluntary saving plans for food security shocks.

Support to self-help groups to set up social funds.

PBF incentives for CHW and providers in facilities.

Training provided to CHW in provision of a package of preventive and curative services for children and mothers.

Local leaders and CHW trained in WASH, including monitoring.

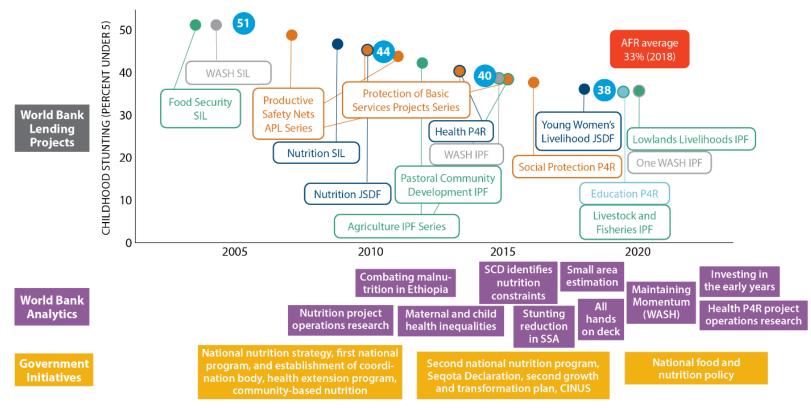
ECD workers supported clean toilets and organized WASH training for parents. CHW received incentives for household use of water treatment.

Community PPPs were formed under the rural water project.

Source: Independent Evaluation Group.

Note: The levels of the behavior change map are defined as level 1—engage: the actor gained awareness and motivation for changing behavior, 2—learn: the actor developed new knowledge or skills; 3—apply: the actor draws on available resources and programs as needed to use new knowledge and skills and adopt new practices; 4—sustained behavior change or institutional change: a consistent change in actors to improve a nutrition-related determinant. Institutional changes can be achieved for caregivers and households in terms of consistency or norms in practices to care for children, for community groups in terms of promoting and perpetuating social norms, and for service providers in terms of functioning more efficiently and effectively. ECD = early childhood development; IYCF = infant and young child feeding; NGO = nongovernmental organization; PBF = performance-based financing; PPP = public-private partnership; SBCC = social and behavior change communication; WASH = water, sanitation, and hygiene.

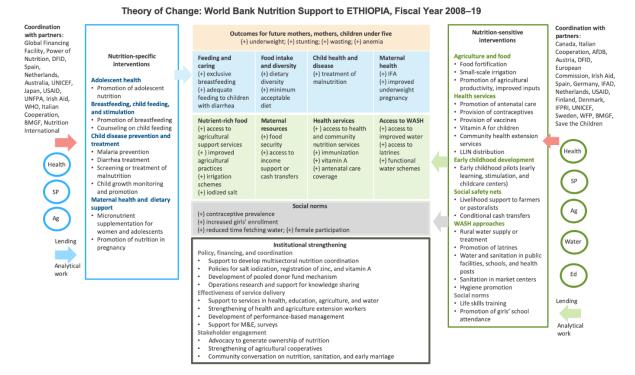
Figure G.1. Ethiopia Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Food and Security Project SIL (P050383); Water, Supply, and Sanitation SIL (P076735); Productive Safety Nets APL Series (P098093, P113220, P146883, P158770, P163350); Nutrition SIL (P106228); Protection of Basic Services Projects Series (P103022, P121727, P128891); Piloting Community-based Management of Acute Malnutrition; WASH (P133591); Pastoral Community Development III IPF (P130276); Agricultural Growth IPF Series (P148591, P113032); Health SDGs (P123531, P160108); Enhancing Shared Prosperity through Equitable Services (P151432, P161373); Young Women's Livelihood and Nutrition JSDF (P157716); General Education Quality Improvement for Equity P4R (P163050); Livestock and Fisheries Development IPF (P159382); Lowlands Livelihoods Resilience IPF (P164336); OneWASH IPF (P167794).

STUNTING DATA SOURCE: UNICEF. WHO, and World Bank 2019.

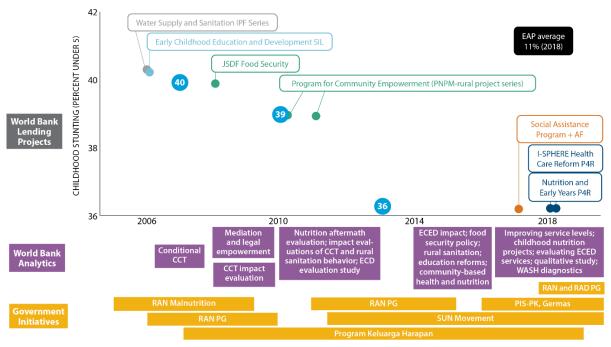
#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank Global Practice responsible for the lending: brown = Social Protection; gray = Water; green = Agriculture; dark blue = Health; light blue = Education; shaded = active or new; nonshaded = closed. (+) = improvement; (-) = decline; (n/c) = no change; AfDB = African Development Bank; AFR = Africa; Ag = agriculture; APL = adaptable program loan; BMGF = Bill and Melinda Gates Foundation; CINUS = Comprehensive Integrated Nutrition Services; DFID = Department for International Development (UK); Ed = education; IFA = iron-folic acid; IFAD = International Fund for Agricultural Development; IFPRI = International Food Policy Research Institute; IPF = investment project financing; JSDF = Japan Social Development Fund; LLIN = long-lasting insecticidal net; M&E = monitoring and evaluation; P4R = Program-for-Results; SCD = Systematic Country Diagnostic; SDG = Sustainable Development Goal; SIL = sector investment loan; SP = Social Protection; SSA = Sub-Saharan Africa; UNFPA = United Nations Population Fund; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene; WFP = World Food Programme; WHO = World Health Organization.

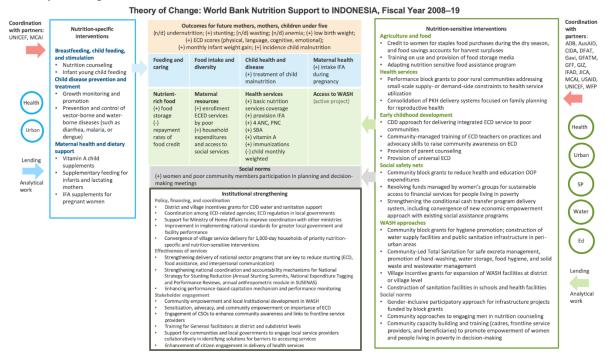
Figure G.2. Indonesia Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Water, Supply, and Sanitation (PAMSIMAS) IPF (P085375); Early Childhood Education and Development SIL P089479; Program for Community Empowerment (PNPM-Rural III) SIL (P115052); JSDF-Improving Food Security (P126110); GENERASI Program (P132585); Social Assistance Reform Program P4R + Additional Financing (P160665, P172381); I-SPHERE Health Care Reform P4R (P164277); Investing in Nutrition and Early Years P4R (P164686).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

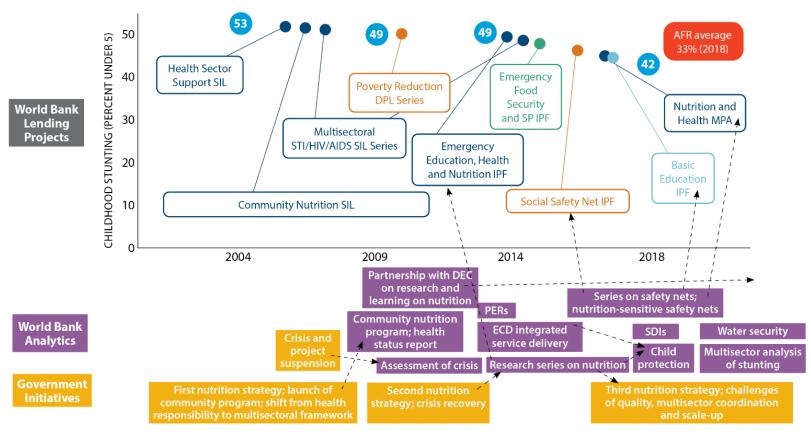
#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank Global Practice responsible for the lending: brown = Social Protection; gray = Water; green = Agriculture; dark blue = Health; light blue = Education. (+) = improvement; (-) = decline; (n/c) = no or minimum change; ADB = Asian Development Bank; AF = additional financing; ANC = antenatal care; AusAID = Australia Agency for International Development; CCT = conditional cash transfer; CDD = community-driven development; CIDA = Canadian International Development Association; CSO = civil society organization; DFAT = Australian Department of Foreign Affairs and Trade; EAP = East Asia and Pacific; ECD = early childhood development; ECED = early childhood education and development; Ed = Education; Germas = Healthy Living Community Movement; GFATM = Global Fund to Fight AIDS, Tuberculosis and Malaria; GFF = Global Financing Facility; GIZ = German Development Agency; HH = household; IFA = iron-folic acid; IFAD = International Fund for Agricultural Development; I out-of-pocket; PF = investment project financing; JICA = Japan International Cooperation Agency; JSDF = Japan Social Development Fund; MCAI = Millennium Challenge Account Indonesia; OOP = P4R = Program-for-Results; PIS-PK = Program of Healthy Indonesia with Family Approach; PKH = Family Hope Program; PNC = postnatal care; PNPM = National Program for Community Empowerment in Rural Areas; RAD PG = Regional Action Plan of Food and Nutrition; RAN = National Action Plan for the Prevention and Management of Malnutrition; RAN PG = National Action Plan for Food and Nutrition; SBA = skilled birth attendance; SIL = sector investment loan; SP = Social Protection; SUN = Scaling Up Nutrition; SUSENAS = National Socioeconomic Survey; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene; WFP = World Food Programme.

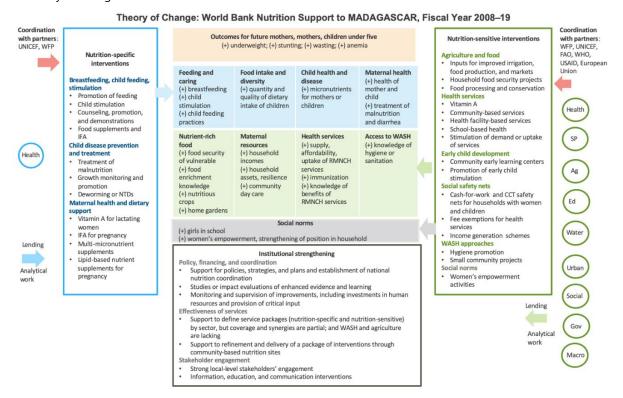
Figure G.3. Madagascar Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Community Nutrition II SIL (P001568); Health Sector Support II SIL (P051741); Multisectoral STI/HIV/AIDS Prevention II (P090615); Poverty Reduction DPL Series (P083326, P096102, P099420, P105135); Emergency Support to Critical Education, Health, Nutrition Service Delivery IPF (P131945); Emergency Food Security & Social Protection IPF (P147514); Social Safety Net IPF (P149323); Basic Education IPF (P160442); Improving Nutrition Outcomes Using the MPA (P160848).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

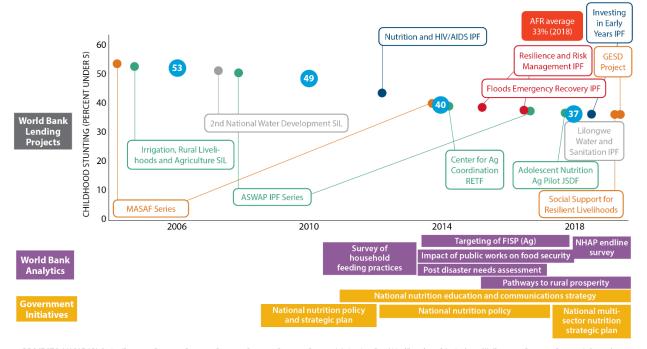
#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank Global Practice responsible for the lending: brown = Social Protection; gray = Water; green = Agriculture; dark blue = Health; light blue = Education. (+) = improvement; (-) = decline; (n/c) = no change; AFR = Africa; Ag = agriculture; CCT = conditional cash transfer; DEC = Development Economics Vice Presidency; DPL = development policy loan; ECD = early childhood development; Ed = education; FAO = Food and Agriculture Organization; GOV = Governance; IFA = iron-folic acid; IPF = investment project financing; Macro = Macroeconomics; MPA = multiphase programmatic approach; NTD = neglected tropical disease; PER = Public Expenditure Review; RMNCH = reproductive, maternal, newborn, and child health; SDI = service delivery indicators; SIL = sector investment loan; Social = Social Development; SP = Social Protection; STI = sexually transmitted infection; UNICEF = United Nations Children's Fund; Urban = Urban Development; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene; WFP = World Food Programme; WHO = World Health Organization.

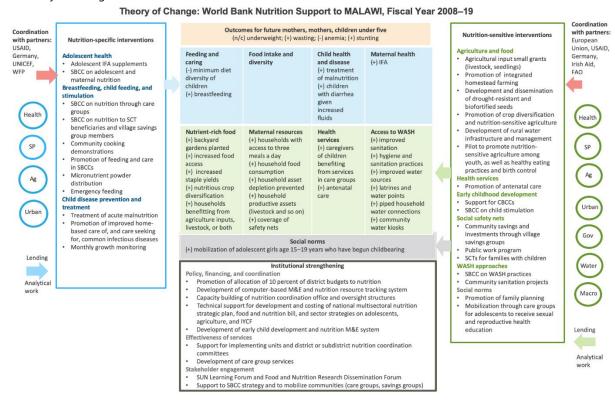
Figure G.4. Malawi Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: MASAF APL Series (P075911, P110446, P121055, P131648, P123620, P148617, P160519); Irrigation, Rural Livelihoods and Agriculture SIL (P084148, P121120, P131760); Second National Water Development Project SIL (P096336, P110157, P124486); Agricultural Sector Wide Approach Project SIL Series (P105256, P128576, P148964, P146445); Nutrition and HIV/AIDS IPF (P125237, P156129); Center for Coordination of Agricultural Research and Development For Southern Africa RETF (P113629); Resilience and Disaster Risk Management IPF (P161392, P171877); Floods Emergency Recovery IPF (P154803); Adolescent Nutrition Sensitive Agriculture Pilot IPF (p163923); Lilongwe Water and Sanitation Project IPF (P163794); Investing in Early Years for Growth and Productivity (P164771); Governance to Enable Service Delivery Project (P164961); Social Support for Resilient Livelihoods (P169198).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

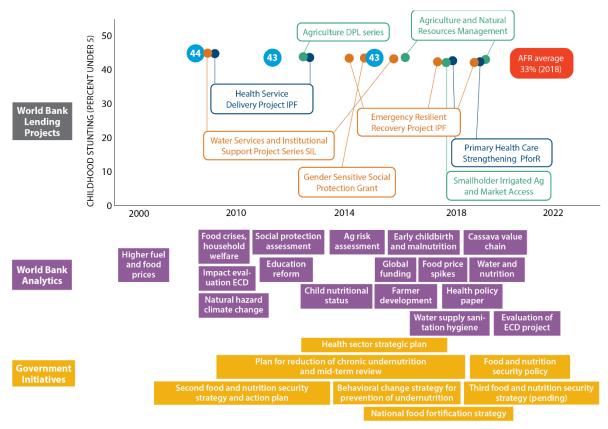
#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank practice responsible for the lending: brown = Social Protection; gray = Water; red = Social, Urban, Rural, and Resilience; green = Agriculture; dark blue = Health. (+) = improvement; (-) = decline; (n/c) = no change; AFR = Africa; Ag = Agriculture; ASWAP = Agricultural Sectorwide Approach Project; FAO = Food and Agriculture Organization; FISP = Farm Input Subsidy Program; GESD = Governance to Enable Service Delivery; GOV = Governance; IFA = iron-folic acid; IPF = investment project financing; JSDF = Japan Social Development Fund; M&E = monitoring and evaluation; Macro = Macroeconomics; MASAF = Malawi Social Action Fund; NHAP = Nutrition and HIV/AIDS Project; RETF = recipient-executed trust fund; SBCC = social and behavior change communication; SCT = social cash transfer; SIL = specific investment loan; SP = Social Protection; SUN = Scaling Up Nutrition; UNICEF = United Nations Children's Fund; Urban = Urban Development; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene; WFP = World Food Programme.

Figure G.5. Mozambique Project Timeline and Theory of Change for World Bank Nutrition Support

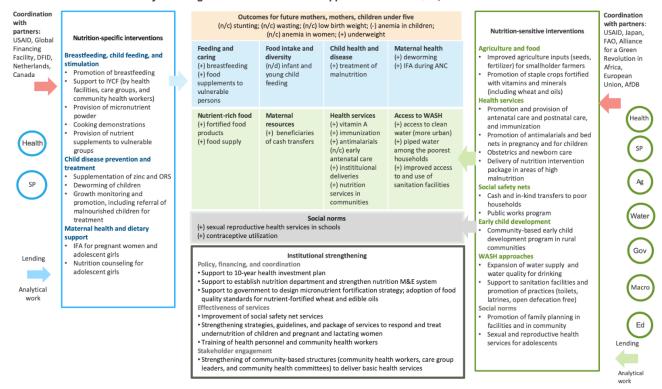


PROJECTS: Education Sector Strategic Program Project (P001786); Water Services and Institutional Support Project SIL Series (P104566, P149377, P165463); Health Service Delivery Project + Additional Financing (P099930, P125477); Agriculture DPL Series (P129489, P146930); Building Gender Sensitive Social Protection and Labor Practices Project (P149536); Emergency Resilient Recovery Project IPF + Additional Financing (P156559, P161559, P166063); Primary Health Care Strengthening PforR + Additional Financing (P163541, P168314); Agriculture and Natural Resources Management Landscape Project + Additional Financing (P149620, P168940).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

#### b. Theory of change

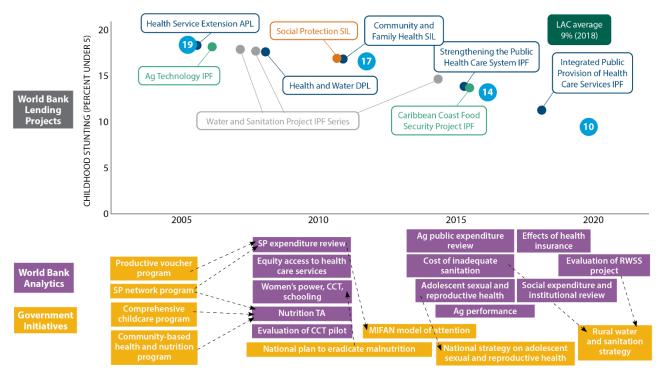
Theory of Change: World Bank Nutrition Support to MOZAMBIQUE, Fiscal Year 2008-19



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank practice responsible for the lending: brown = Social Protection; green = Agriculture; dark blue = Health. (+) = improvement; (-) = decline; (n/c) = no change; (n/d) = no data; AfDB = African Development Bank; AFR = Africa; Ag = Agriculture; ANC = antenatal care; DFID = Department for International Development (UK); DPL = development policy loan; ECD = early childhood development; Ed = Education; FAO = Food and Agriculture Organization; GOV = governance; IFA = ironfolic acid; IPF = investment project financing; M&E = monitoring and evaluation; Macro = Macroeconomics; ORS = oral rehydration salts; PforR = Program-for-Results; SIL = sector investment loan; SP = Social Protection; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene.

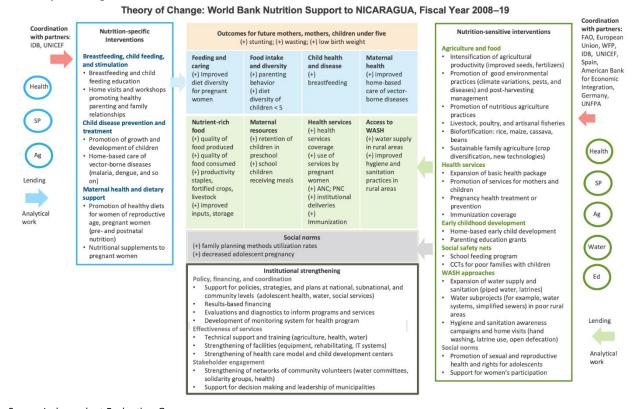
Figure G.6. Nicaragua Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Health Service Extension and Modernization Project APL (P078991); Second Agricultural Technology Project (P087046); Water and Sanitation Project IPF Series (P106283); Greater Managua Water and Sanitation (P110092); Development Policy Credit DPL (P106747) [Health Care Services and Water Supply and Sanitation]; Social Protection Project SIL (P10779); Improving Community and Family Health Care Services Project SIL (P106870); Sustainable Water Supply and Sanitation Project (P147006); Caribbean Coast Food Security Project IPF (P148809); Strengthening the Public Health Care System IPF (P152136); Integrated Public Provision of Health Care Services IPF (P164452).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

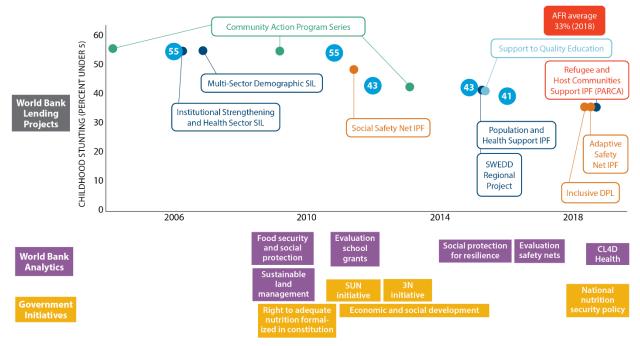
#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank practice responsible for the lending: brown = Social Protection; gray = Water; green = Agriculture; dark blue = Health. (+) = improvement; (-) = decline; (n/c) = no change; Ag = Agriculture; ANC = antenatal care; APL = adaptable program loan; CCT = conditional cash transfer; DPL = development policy loan; Ed = Education; FAO = Food and Agriculture Organization; IDB = Inter-American Development Bank; IPF = investment program financing; IT = information technology; LAC = Latin America and the Caribbean; MIFAN = Ministry of Family; PNC = postnatal care; RWSS = rural water supply and sanitation; SIL = specific investment loan; SP = Social Protection; TA = technical assistance; UNFPA = United Nations Population Fund; UNICEF = United Nations Children's Fund; WASH = water, sanitation, and hygiene; WFP = World Food Programme.

Figure G.7. Niger Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Niger Community Action Program APL Series (P065991, P102354); Niger Community Action Program + Additional Financing (P132306, P163144); Institutional Strengthening and Health Sector SIL (P083350); Multi-Sector Demographic SIL (P096198); Niger Safety Net IPF + Adaptive Social Safety Nets Project Additional Finance (P123399, P155846); Second Emergency Food Security Project (P123567); Population and Health Support IPF (P147638); Sahel Women's Empowerment and Demographics Regional Project (P166602); Support to Quality Education Project (P132405); Niger Refugees and Host Communities Support IPF (PARCA) (P164563); Niger Second Adaptive Safety Nets IPF (P166602); First Laying the Foundation for Inclusive DPL (P169830).

STUNTING DATA SOURCE: UNICEF, WHO, and World Bank 2019.

Coordination with

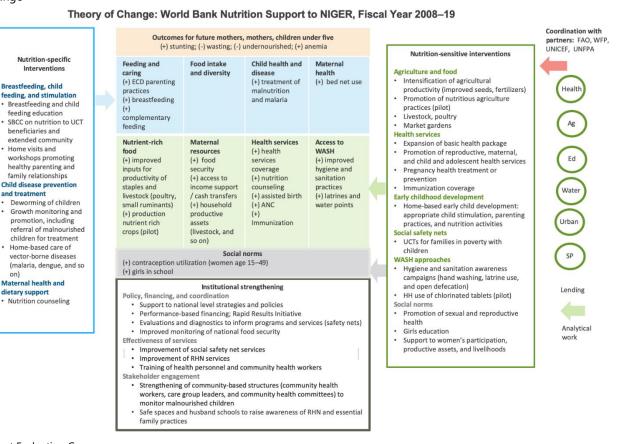
partners: UNICEF

Health

Lending

Analytical

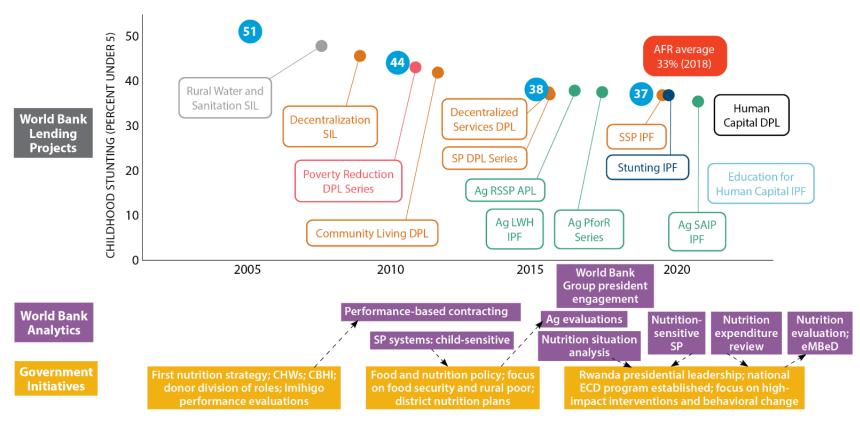
#### b. Theory of change



Source: Independent Evaluation Group.

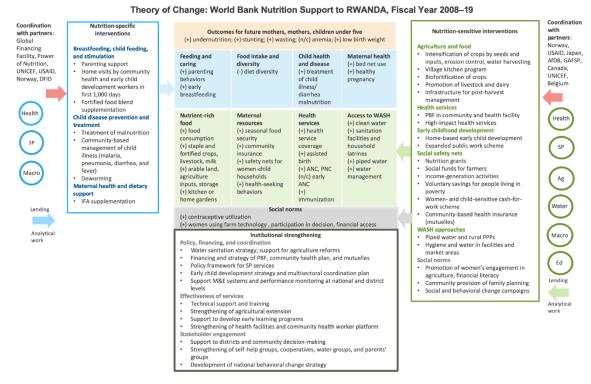
Note: The box colors in panel a indicate the World Bank practice responsible for the lending: brown = Social Protection; green = Agriculture; dark blue = Health; light blue = Education. (+) = improvement; (-) = decline; (n/c) = no change; 3N = Nigerians Nourishing Nigerians; AFR = Africa; Ag = Agriculture; ANC = antenatal care; CL4D = Collaborative Leadership for Development; DPL = development policy loan; ECD = early childhood development; Ed = Education; FAO = Food and Agriculture Organization; HH = household; IPF = investment project financing; PARCA = Refugees and Host Communities Support Project; SBCC = social and behavior change communication; SIL = specific investment loan; SP = Social Protection; SUN = Scaling Up Nutrition; SWEDD = Sahel Women's Empowerment and Demographics; UCT = unconditional cash transfer; UNFPA = United Nations Population Fund; UNICEF = United Nations Children's Fund; WASH = water, sanitation, and hygiene; WFP = World Food Programme.

Figure G.8. Rwanda Project Timeline and Theory of Change for World Bank Nutrition Support



PROJECTS: Rural Water Supply and Sanitation Project SIL (P045182); Decentralization and Community Development Project SIL (P130822); Poverty Reduction Strategy Grants DPL (P104990, P106083, P113241, P117495); Rural Water Community Living Standards Grant DPL (P106834, P117758, P122157); Quality of Decentralized Service Delivery Support DPL; Social Protection Support Series DPL (P126877, P131666, P146452); Rural Sector Support Project APL (P105176, P126440); Land Husbandry, Water Irrigation, and Hillside Irrigation (LWH) Project IPF (P114931, P124785, P147543; Transformation of Agriculture Sector Program PforR Series (P148927, P161000, P161876, P169514); Strengthening Social Protection Project IPF (P162646, P166720); Rwanda Stunting Prevention and Reduction (P164845); Sustainable Agricultural Intensification Project (SAIP) IPF (P164520); Human Capital for Inclusive Growth (P171554); Quality Basic Education for Human Capital Development Project IPF (P168551, P174046).

#### b. Theory of change



Source: Independent Evaluation Group.

Note: The box colors in panel a indicate the World Bank practice responsible for the lending: brown = Social Protection; gray = Water; pink = Macroeconomics; green = Agriculture; dark blue = Health; light blue = Education; black = multisector. (+) = improvement; (-) = decline; (n/c) = no or minimum change; AfDB = African Development Bank; AFR = Africa; Ag = Agriculture; ANC = antenatal care; APL = adaptable program loan; CBHI = community-based health insurance; CHW = community health worker; DFID = Department for International Development (UK); DPL = development policy loan; ECD = early childhood development; Ed = Education; eMBeD = Mind, Behavior, and Development; GAFSP = Global Agriculture and Food Security Program; IFA = iron-folic acid; IPF = investment project financing; LWH = land husbandry, water irrigation, hillside irrigation; M&E = monitoring and evaluation; Macro = Macroeconomics; PBF = performance-based financing; PforR = Program-for-Results; PNC = postnatal care; PPP = public-private partnership; RSSP = Rural Sector Support Project; SAIP = Sustainable Agricultural Intensification Project; SIL = sector investment loan; SP = Social Protection; SSP = Strengthening Social Protection; UNICEF = United Nations Children's Fund; USAID = United States Agency for International Development; WASH = water, sanitation, and hygiene.

# Reference

UNICEF (United Nations Children's Fund), WHO (World Health Organization), and World Bank. 2019. *Levels and Trends in Child Malnutrition: Key Findings of the 2019 Edition of the Joint Child Malnutrition Estimates*. Geneva: WHO.

# Appendix H. Stocktaking of Multidimensional Approaches

# **Objective and Methodology**

A stocktaking exercise was conducted to (i) develop a qualitative understanding of multisectoral approaches to nutrition in different country contexts, and (ii) understand how the World Bank helped enhance multisectoral coordination through institutional capacity building during the 10-year evaluation period.

# Box H.1. Selected Countries for Multisectoral Stocktaking

- Bangladesh
- Ethiopia
- Indonesia
- Madagascar
- Malawi
- Mozambique
- Nepal
- Nicaragua
- Niger
- Peru
- Rwanda
- Senegal

Source:

The stocktaking focuses on a purposeful sample of 12 countries (box H.1). The sample includes those countries selected for case studies in the evaluation, plus four others among the list of case study candidates from the 64 countries in the evaluation portfolio. These cases are of interest given that their country lending portfolios have a high degree of multidimensionality<sup>1</sup> in terms of covering nutrition-specific and nutrition-sensitive

<sup>&</sup>lt;sup>1</sup> The degree of country multidimensionality is defined as the sum of nutrition-specific or nutrition-sensitive intervention dimensions present in a country portfolio at any point during the

interventions during the evaluation period (71 percent coverage of intervention areas, compared with 52 percent in the overall portfolio).

A qualitative stocktaking template has been developed to capture descriptive details consistently across countries at the national and subnational levels. Data were collected for each country by reviewing government documents on nutrition (such as plans), the Scaling Up Nutrition (SUN) joint assessments, and published case studies and articles identified through PubMed and EconLit searches. The stocktaking reviews countries' institutional arrangements for the coordination of nutrition, delivery of interventions, and behavioral change communication (BCC). The portfolio review data and case study evidence are then used to understand how the World Bank has contributed to institutional strengthening of multisectoral arrangements in these countries (see appendix G on the country case studies). This appendix focuses on the World Bank's support to institutional strengthening of multisectoral coordination. These findings provide the basis for developing typologies for characterizing multisectoral approaches to nutrition in different country contexts and for highlighting factors that help facilitate or hinder multisectoral coordination.

# **Multisectoral Nutrition Approaches**

Tables H.1 and H.2 summarize the institutional arrangements for multisectoral nutrition in the 12 countries. Countries adopt different institutional arrangements for coordination of nutrition policies, strategies, and plans at the national and subnational levels; delivering nutrition-related interventions; and implementing BCC strategies. Some patterns of similarities arise in this sample. Countries that centralize nutrition planning at the presidential or prime minister level tend to also have a decentralized, multisectoral coordination at the subnational level. Having decentralized, multisector coordination at the subnational level appears to be consistent with providing more developed, coordinated support to services in communities. Furthermore, countries whose nutrition coordination remains under the health sector tend to have a BCC strategy embedded in various programs or sector strategies with limited overarching coordination of nutrition messages. In this sample, three pairs of countries share similar institutional arrangements across all dimensions: Indonesia and Senegal; Madagascar and Mozambique; and Ethiopia and Niger. However, the specific institutional

evaluation period divided by the total possible number of specific and sensitive dimensions, which is equal to eight: social safety nets, WASH approaches, health and nutrition services, agriculture and food approaches, ECD, diet and breastfeeding support, child disease prevention and treatment, and adolescent health.

arrangements across countries differ significantly in the extent that there has been investment in their functional development.

Table H.1 Institutional Arrangements for Multisectoral Nutrition Approaches in 12 Selected Countries

Institutional Arrangement	Typology of Nutrition Coordination	Countries
National coordination	Coordination by central government office (such as planning, prime minister's office)	<ul><li>Mozambique</li><li>Bangladesh</li><li>Madagascar</li><li>Senegal</li><li>Indonesia</li></ul>
	Coordination led by health sector, with roles of other sectors and in some cases strong links to the country's community health program	<ul><li>Ethiopia</li><li>Malawi</li><li>Niger</li><li>Nicaragua</li></ul>
	Coordination led by another social sector ministry or program (social development, early child development), with central government leadership	• Peru • Rwanda
Subnational coordination	Decentralized, multisectoral coordination of regions and district in planning, M&E and learning, financing, and implementation of interventions	<ul> <li>Peru</li> <li>Mozambique</li> <li>Madagascar</li> <li>Rwanda</li> <li>Bangladesh</li> <li>Malawi</li> <li>Nepal</li> <li>Indonesia</li> <li>Senegal</li> </ul>
	Nutrition activities mainly coordinated by health sector or other implementing sectors	<ul><li>Niger</li><li>Nicaragua</li><li>Ethiopia*</li></ul>
Delivery of services in communities and to households	Groups in communities and sectors (such as extension agents) developed coordinated support to households and community	<ul> <li>Rwanda</li> <li>Malawi</li> <li>Mozambique</li> <li>Nepal</li> <li>Peru</li> <li>Senegal</li> <li>Indonesia</li> <li>Nicaragua</li> </ul>
	Sector extension systems (health, agriculture, social protection) deliver planned services, with limited coordination	<ul><li>Niger</li><li>Bangladesh</li><li>Madagascar</li><li>Ethiopia</li></ul>
Behavior change communication	Multisector communication strategy with common messages	<ul> <li>Rwanda</li> <li>Senegal</li> <li>Malawi</li> <li>Indonesia</li> </ul>
	Targeted in programs for vulnerable groups	<ul><li>Peru</li><li>Nicaragua</li></ul>
	Embedded in various programs and interventions or in sector strategies; no clear coordination outside of sector	<ul><li>Niger</li><li>Madagascar</li><li>Mozambique</li><li>Ethiopia</li></ul>

Source: Independent Evaluation Group.

Note: \* In Ethiopia, the main coordinating sector is health, and there is a regional and local coordinating body chaired by local government. M&E = monitoring and evaluation.

Table H.2 Stocktaking of Multisectoral Approaches in 12 Selected Countries

_		Subnational		Behavior
Country	National Coordination	Coordination	Delivery of Services	Change
Bangladesh	National secretariat, chaired by prime minister, being revitalized to coordinate nutrition; previously under health	Multisector coordination by district and subdistrict nutrition coordination committees, chaired by district commissioner and Upajilla executive officer. All sectors and civil society are members	Health sector community clinics, CHWs, extension services to low- income farmers, and NGOs	National advocacy plan for nutrition
Ethiopia	National nutrition coordinating body, chaired by health sector	Multisectoral coordination by Zonal, Woreda, and Kebele administrative offices; anchored in health bureau at regional level	Community-level development groups are entry points, such as health extension workers, farmers field schools, and health development army	Health strategy includes behavior change promotion
Indonesia	Coordinated by Ministry of National Development Planning and Office of the Vice President	At province and district levels, planning offices coordinate across sectors to develop and monitor plan implementation	Health extension system, human development workers support convergence of priority interventions and volunteers and facilitators at village level	National social behavior change communication (SBCC) strategy developed by Ministry of Health
Madagascar	Anchored in prime minister's office in a national nutrition council and office responsible for coordination and implementation	Regional councils are the subnational extension of the national office; linked to communal committee for social development, chaired by the mayor, which integrates nutrition coordination into its agenda	Community nutrition program provides a platform for coordination across social sectors, and NGOs. Interventions in health, agriculture, WASH, education, social protection, among other areas	Projects include behavior change activities; nutrition plan prioritizes the development of a multisectoral behavior change strategy
Malawi	Coordinated by Department of Nutrition, HIV/AIDS under Ministry of Health	Multisector district nutrition coordination committees, chaired by principal nutrition HIV/AIDS officer; subdistrict committees comprising supervisors	Care groups provide platform for multisectoral learning BCC in cooperation with frontline workers that make up village	National education communication strategy outlines key actions for nutrition

		of extension works or frontline staff, village coordinators, and civil society	nutrition coordinating committee	
Mozambique	National platform chaired by Prime Minister; coordinated by technical secretariat	Establishing provincial- and district-level policy and technical consultation platforms	Agriculture extension workers, CHW, and community care groups, mother leaders, community leaders, NGOs	Program includes behavior change activities; a behavior change strategy is planned
Nepal	National Planning Commission leads overall nutrition coordination and facilitates strategy implementation	Nutrition coordination structures at the provincial, district, municipal, and ward levels	Village development councils link with the local coordination cascading structures	Behaviorchange activities for marginalized and lowest-income population segments
Nicaragua	Coordinated by health sector and other ministries	Coordinated by ministries of health, education, family affairs, agriculture, family and community economics, fishing and public works	Integrated network of health care providers, NGOs, community volunteers, midwives, social facilitators and specialists carry out community interventions; and ECD services	Integrated in health, education and social protection community programs, targeting vulnerable groups
Niger	National platform, coordinated mainly by health sector, despite multisector committee	Nutrition is part of regional and communal development plans in the same way as agriculture, health, or water	Extension services of sectors deliver interventions, with community groups	Projects include behavior change activities
Peru	Ministry of Development and Social Inclusion coordinates national strategy; sector ministries implement	Decentralized approach led by regional and local government, with district multisectoral committees for programs, such as social protection	Primary health services at community and household levels, social programs via cash transfers, and government's identity registry	Behavior change centered on vulnerable populations
Rwanda	Chaired by National Childhood Development Agency in Ministry of Gender and Family Protection, with support of president	Multisectoral nutrition committees for the District Plans to Eliminate Malnutrition, chaired by vice mayors, bring together relevant sectors (health, agriculture, social protection, hygiene, and sanitation) and other	Village committees organize support with household leaders and local service providers, CHWs, ECD caregivers, and agriculture promoters	National SBCC strategy aligned across sectors

		actors (NGOs, partners) in the district		
Senegal	National coordination platform chaired by prime minister	Governor is head of administration at regional level; at commune level, mayor coordinates nutrition services and interventions	Local management committees at village level, with NGOs and sectoral providers and leadership of mayor	National communication and advocacy strategy addresses social norms at community level

Source: Independent Evaluation Group.

Note: AIDS = acquired immunodeficiency syndrome; CCT = conditional cash transfer; CHW = community health worker; ECD = early childhood development; Med = medium; HIV = human immunodeficiency virus; NGO = nongovernmental organization; SBCC = social behavior change communication. Country multidimensionality is defined as the sum of nutrition-specific or nutrition-sensitive intervention dimensions present in a country, divided by the total possible number of nutrition-specific and nutrition-sensitive dimensions.

# Common Factors for Successes and Challenges in Multisectoral Approaches

While multisectoral approaches to address nutrition are in an emerging stage in most of the countries, the stocktaking exercise highlights how important common factors facilitate or hinder coordination efforts and results, including clarity of mandates and leadership, engagement of local governments, organization of local delivery systems, strengthened financing, planning, and M&E (box H.2).

#### Box H.2 Factors that Facilitated Multisectoral Coordination Efforts

- Consistency of national leadership in relation to a mandated program or framework to coordinate actors and roles of relevant sectoral ministries
- Developed role of subnational government to coordinate multisectoral actions
- Organization of sectoral extension services and community actors to deliver an integrated package of interventions tailored to local needs, with consistent messaging
- Strengthened financing and planning
- M&E, and knowledge sharing approaches that support multisectoral interoperability of decisions, actions, and learning (rather than single-sector systems) on nutrition interventions at different levels.

### Mandates and National Leadership

Among all countries, whether nutrition is coordinated by a central government office or by a specific sector (health or other social sector), key success factors include having consistent national leadership and a defined mandate or framework to integrate actions. Senegal offers one example of consistent national leadership. In 2001, the head of state created a national coordination unit to bring together all relevant sectors, including

education, family and social protection, health, livestock, agriculture, fisheries, trade, industry, higher education and research, decentralization, and environment. Actions of the coordination unit aligned with a nutrition policy and multisectoral strategic plan, under which the nutrition-related programs were harmonized. Rwanda offers another example of how the leadership of the president under the National Child Development Agency has increased attention, resources, and effectiveness of plans dedicated to nutrition across multiple sectors, with clear actions and ownership of districts. Where central leadership and or multisectoral mechanism for coordination are weaker (such as in Ethiopia, Niger, Madagascar, and Mozambique), a common challenge is ensuring the accountability of actions implemented among sectors.

In countries with health sector leadership, nutrition is part of the health program, but a common challenge is to integrate agricultural and WASH approaches with health and other social services support. For example, in Nicaragua, the health sector mainly coordinates nutrition at the subnational level, which coordinates with education and social protection based on the Community and Family Health Model (MOSAFC) program. Other ministries involved in nutrition-sensitive initiatives—such as agriculture, public works (sanitation and hygiene), and fishing and aquaculture—implement separate sector activities, and there remains a need to strengthen coordination between these interventions and the MOSAFC support to nutrition. In Ethiopia and Niger, nutrition is also delivered as part of the health service package, with limited coordination with other sectors.

### **Empowerment of Local Governments**

Another key factor among the countries is the empowerment of local government to facilitate and prioritize multisectoral actions on nutrition. In countries where local government roles are less developed, collaboration among sectors is often weak. In Bangladesh, Ethiopia, Indonesia, Madagascar, Malawi, Nepal, Rwanda, and Senegal, multisectoral committees at the district level have various levels of functionality. A strong coordination structure (such as in Senegal) often links to other levels of government, with clear lines of accountability of leaders to engage multiple sectors. For example, Peru offers a decentralized approach led by regional and local government, with multisectoral committees for programs, such as social protection. Without clarity of roles, even dedicated local leaders are limited to take actions to improve nutrition (such as in Ethiopia and Madagascar).

Effective coordination appears to require centralizing some functions to facilitate learning and policy guidance to expand actions while decentralizing others to empower local authorities to plan, monitor, and make decisions. In some countries, there has been a continuing process to build buy-in of local leaders and converge services to develop an

integrated multidimensional package that addresses health, agriculture, WASH, and other local needs. Indonesia demonstrates how such support can be designed and phased in over time. To build commitment across the levels of government, the vice president brought together officials from provinces and districts to align policy and actions on reducing stunted growth through the national strategy. Heads of districts signed a pledge to hold stunting summits, implement convergence actions for nutrition interventions, collect and publish data on stunted growth and intervention delivery, formulate a behavior change communication policy, and support village-level nutrition intervention convergence. The ministry responsible for local government also organized subdistrict-level and village-level leaders. Rwanda is similarly strengthening district governments to converge health, social protection, agriculture, and WASH services and integrated nutrition in district performance contracts.

### **Sectoral Extension Services**

Most countries have leveraged extension services (health, agriculture, social promoters, and early childhood development workers) and or community groups to deliver interventions. However, the organization of these actors to coordinate interventions in an integrated multidimensional package is often more advanced in countries that emphasize multisectoral coordination. Countries vary widely in the extent of capacity building that has been done to organize actors to deliver interventions, the multidimensionality of the package being delivered, and partnerships among local government, community groups, and sectors to coordinate and integrate interventions so they can benefit key groups in communities.

In some countries, community groups (such as CHWs, mother leaders, women development groups, and farmers groups) are being strengthened to deliver interventions. In Malawi, care groups provide a platform for multisectoral behavior change communication in cooperation with frontline workers that make up village nutrition coordinating committees. Thus, members of care groups can deliver a multidimensional package to households with young children through home visits and cluster meetings. Implementing agencies and partners use the care groups as community entry points and so do other actors with similar targets. Care groups were also developed in Mozambique through the health sector. In Senegal, the NGO or community executive agency facilitates the community programming and implementation. In many of the countries, such as Ethiopia, Madagascar, and Mozambique, the coordination of community actors needs further strengthening, particularly links between actors delivering health and agriculture interventions, such as the promotion of nutritious food production and preparation among families with young children.

Learning is still emerging on how to converge interventions to meet the needs of communities. Barriers to effectively integrate the delivery of interventions at the local level can include problems related to geographic conditions and inadequate targeting of needs to differentiate services across households or communities to converge support for specific beneficiary groups. In Indonesia, decentralized service delivery faces substantial geographic challenges with about 75,000 villages with target households across 6,000 islands. This has presented logistical difficulties with scaling up a community platform. Rwanda is similarly learning to converge interventions of health, social protection, and agriculture to benefit households in the same communities. Other challenges to integrate interventions across sectors include that targeted beneficiaries often differ based on the design of interventions focused on differing sectoral objectives. Also, quality concerns happen when interventions are brought to scale quickly or community groups are overloaded with responsibilities.

Another important factor is having consistent communication on nutrition in programs across different sectors or stakeholders, with a means of M&E and learning. In some countries, SBCC is a targeted part of the national action framework for nutrition (such as Bangladesh, Indonesia, Malawi, Rwanda, and Senegal). In Malawi and Senegal, SBCC was emphasized for years, whereas in other countries, such as Mozambique, having an SBCC strategy for nutrition is a recent or future plan. In Nepal and Peru, SBCC has been embedded in programs for vulnerable groups or more marginalized and low-income population segments. In Malawi, the National Education Communication Strategy outlines key actions for nutrition information and communication for effective behavior change, including key stakeholders and community delivery platforms and coordination. In 2018, Rwanda developed a national SBCC strategy to guide consistent messaging across sectors, as well as M&E and learning. Ethiopia does not have a stand-alone SBCC strategy for nutrition interventions rather it has been an integral part of the health program and outlined as a key element of the national nutrition program.

## Financing, Planning, and Monitoring and Evaluation

A common accountability challenge among the countries is the coordination across sectoral systems (national and decentralized) to track nutrition financing and planned interventions. For example, Bangladesh, Indonesia, and Rwanda conducted nutrition performance expenditure reviews and are improving budget tracking for nutrition. One challenge is alignment between the decentralized flow of financing and the coordination roles of nutrition services at the decentralized level. In Indonesia, the district health office that receives the funding differs from the district planning agency in charge of coordinating, planning, and budgeting of the nutrition interventions program. Another

challenge is to track the money that has been allocated to sector services in terms of whether it is being used for the right activities and for the right target groups and geographical locations. In Bangladesh, sectoral line offices receive funds from their respective central ministry for implementation of their annual plan. In Ethiopia and Madagascar, the limited, decentralized decision-making and financing of nutrition constrains local capacities to plan multisectoral nutrition interventions. In Malawi, even though central coordination is strong, collaboration across sectors remains challenging due to the limited interoperability of sectoral systems for financing, planning, and supporting services.

A related challenge is to facilitate M&E data collection, reporting, and performance measurements across multiple sectors and stakeholders and levels of implementation. For example, Mozambique establishes a national level M&E system to track nutrition-related indicators involving sectoral ministries and provincial and district departments, but the national coordination office lacks authority to enforce reporting across sectors and different levels of government. In Nicaragua, there is also a challenge related to limited data on the different dimensions of the nutrition situation, particularly at the local level that would allow for adequate decision-making and prioritization and targeting of interventions. In Ethiopia, the health sectors reporting system includes limited nutrition indicators, most of which monitor nutrition-specific programs. The agriculture sector is also improving its monitoring of nutrition, but there is limited M&E of integrated nutrition achievements and weak data systems at the decentralized level for data use and decision-making. Rwanda is in the process of improving its M&E system and has already successfully improved the interoperability of sectoral information systems for ECD, health, social protection, and birth registration.

The use of M&E for multisectoral decision. In Senegal, the use of nutrition performance data and inputs of various frontline agencies by regional and local authorities in Senegal has been instrumental in ensuring the identification of problems, collaboration, accountabilities of various sectors, and a common vision of shared goals. In Peru, the Ministry of Social Development and Inclusion uses the information from sectoral monitoring systems for a dashboard report at regional, departmental, and district levels. The dashboard was launched in 2016 to provide districts with quarterly progress reports, including general characteristics of the district, health, and education indicators, and housing conditions. Malawi has a national M&E system to track key indicators for the achievement of goals stipulated in the national policy and strategic plan for nutrition. The system relies on data from the district level, uploaded on quarterly basis. As of 2019, 75 percent of districts in Malawi have reported at least some nutrition data from the health, agriculture, gender, and education sectors, as well as data on coordination and monitoring.

# World Bank Support to Strengthen Institutions and Multisectoral Coordination

This section focuses on the support provided by the World Bank to strengthen nutrition multisectoral arrangements and institutional capacities in countries.

Some World Bank support focuses on the institutional strengthening of multisectoral approaches, and other support across the stocktaking countries focuses on capacities in specific sectors (health, agriculture, social protection). Across the countries, the main emphasis is on improving nutrition service delivery (figure H.1). This emphasis on service delivery is consistent with the overall nutrition portfolio (see appendix D). Box 3.1 provides examples of how the World Bank contributes to strengthening multisectoral approaches across the 12 stocktaking countries. This work takes place in diverse country contexts with other development partners and is often still at an emerging stage.

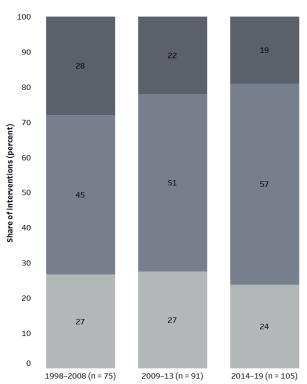


Figure H.1. Focus of World Bank Interventions for Strengthening Institutions, 1998–19

Intervention subcategory

Policy, financing, and coordination

■ Improving nutrition service delivery

Stakeholder engagement and ownership

Source: Independent Evaluation Group.

*Note*: Figure shows data on 271 institutional strengthening interventions from 79 projects in the 12 countries included in the stocktaking exercise (Bangladesh, Ethiopia, Indonesia, Madagascar, Malawi, Mozambique, Nepal, Nicaragua, Niger, Peru, Rwanda, and Senegal).

The intensity of institutional strengthening support varies across countries, as does the multidimensionality of the country's portfolio and success of project performance. Indonesia, Madagascar, Nicaragua, Rwanda, and Senegal, receive medium-to-high institutional strengthening support, which broadly covers nutrition-specific and nutrition-sensitive interventions and support relatively good achievement of project indicators (figure H.2). In Bangladesh, the World Bank has a low level of institutional strengthening support, a narrow intervention focus, relatively weaker project performance, and no evidence of institutional strengthening achievement in closed projects. In Niger, the diversity of interventions in the portfolio is high, and there is a low level of institutional strengthening support in the portfolio, which has been successful to develop capacities within sectors, such as health and social protection. Overall, the focus of institutional strengthening varies widely across countries. In most of the countries, the main attention of institutional strengthening is the development of community programs, whereas in some countries, such as Malawi and Senegal, there is a balance of support to develop policies and services in communities.

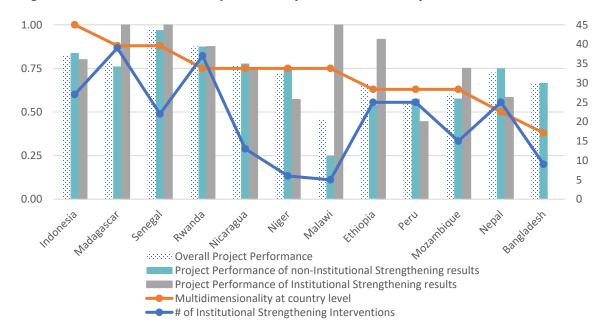


Figure H.2. Multidimensionality of Country Portfolio and Project Performance

Source: Independent Evaluation Group.

Note: Overall project performance refers to the achievement rate of all projects in the country portfolio; project performance of non-institutional strengthening results account for achievement rates of nutrition outcomes, determinants, and social norms.

Countries with highly multidimensional portfolios tend to have better project performance. This holds for all the results dimensions of the conceptual framework, including nutrition outcomes, nutrition determinants, social norms, and institutional strengthening contributions.

Global portfolio findings show that countries that are more successful at strengthening institutional capacities toward policy, service delivery, and stakeholder engagement also show better performance in nutrition results and its determinants. This suggests that the adequacy of the enabling environment underlies the countries' potential for improving the underlying determinants of undernutrition, and in turn, outcomes (see appendix D for portfolio review). For instance, in Senegal, the World Bank contributes to improving nutrition policies, strategies, and development plans, including the adoption of an efficient, child-focused social cash transfer scheme; integrating nutrition indicators in monitoring tools for decision-making; enhancing the coverage and quality of health care services; and improving the engagement of citizens and civil society organizations for better accountability. Better access to health care services and maternal and care resources follows, and projects also show better breastfeeding and child feeding practices and malnutrition screening and treatment, as well as for other common childhood illness. In terms of nutrition results, the Nutrition Enhancement project and the Rapid Response Child-Focused Social Cash Transfer and Nutrition Security project contribute to increase the share of children ages 0-24 months showing adequate monthly weight gain.

Country experiences suggest institutional strengthening requires consistent support to translate into improved performances. In Malawi, there are successful efforts to strengthen capacities for multisectoral coordination through the Nutrition and HIV/AIDS Project. The main challenge is the limited duration of this support to improve overall performance. Moreover, other institutional strengthening support in the portfolio is low. In Ethiopia, while investments in, and the performance of, institutional strengthening results are high, the portfolio is still young and does not yet see this support translate into high overall performance. One challenge is the need for better coordination of interventions at the subnational level.

In the case study countries, successful examples of institutional strengthening supported by the World Bank include policy dialogue, leadership building, South-South knowledge exchange, evidence-based learning, support to M&E systems, and support to districts to oversee nutrition, use M&E, and strengthen extension services and community groups (table H.3). A key variation across countries is the extent of support to policy and coordination, relative to service delivery. At the national level, the World Bank supports high-level leadership; coordination of nutrition, policies, financing, and strategies; and M&E systems, diagnostics, and research and evaluation. At the district level, the World Bank supports learning, M&E, and supervision to oversee nutrition services. At the community level, the World Bank supports strengthening the targeting of services, community groups, and extension workers.

Table H.3 World Bank Contributions to Institutional Strengthening in Case Study Countries

Country	National	Regions and Districts	Community
Ethiopia	<ul> <li>Support to nutrition coordination body and programs, including M&amp;E</li> </ul>	<ul> <li>Performance-based financing and block grants for health and nutrition services</li> </ul>	<ul> <li>Establishment of CBN approach, with health extension workers</li> </ul>
	<ul> <li>Dialogue on nutrition policies, such as on salt iodization</li> <li>Diagnosis and evaluation of nutrition situation and interventions to inform policy and cost-effective programs</li> <li>Mobilization of donor financing</li> <li>Support to strengthen productive safety nets program</li> </ul>	<ul> <li>Support to develop basic services, such as education, health, agriculture, WASH, and ECD</li> <li>Capacity building of regional and woreda nutrition units</li> <li>Support to water supply and sanitation schemes, including sanitation marketing</li> </ul>	<ul> <li>Support to farmer cooperatives, livestock extension workers, seed groups, model farmers, and nutrition-agriculture cooperatives for women to promote nutrition</li> <li>Formation of young women's clubs, mentors, and mother support groups</li> <li>Campaigns on nutrition and early marriage</li> <li>Cash transfers for farmers</li> </ul>
Indonesia	<ul> <li>Study tour to Peru to support National Strategy for Stunting Reduction (Stranas)</li> <li>Expansion of Stranas and strengthening of national leadership and coordination across sectors and levels of government</li> <li>Strengthening of M&amp;E</li> <li>Support to SBCC strategy</li> <li>Strengthening of nutrition financing</li> </ul>	<ul> <li>Support of multisectoral training programs for community facilitators</li> <li>District and village grants for water sanitation and supply good practices</li> <li>Support to implement standards for greater local government and facility performance of nutrition, maternal and child priority programs</li> </ul>	<ul> <li>Support to teacher training, quality standards, M&amp;E, and supervision for ECD programs</li> <li>Support to implement SBCC strategy and WASH promotion</li> <li>Community performance-based block grants to incentivize use of health and education services</li> <li>Leverage of community driven</li> </ul>
	<ul> <li>Diagnostics, policy dialogue, convening, programmatic knowledge work (on financing, multisectoral</li> </ul>	<ul> <li>Strengthening of convergence of district activities</li> <li>Strengthening management and</li> </ul>	community-driven development platform to pilot a frontline nutrition convergence approach

3	• • • • • • • • • • • • • • • • • • • •		
	nutrition, ECD, decentralization, social services)  Strengthening of social assistance delivery systems and cash transfers	implementation of nutrition activities at district level, district performance monitoring, local stunted growth surveillance, district diagnostics, facility accountability and human development worker mobilization	<ul> <li>Technical support for multisectoral coordination through subdistrict and village forums</li> <li>Training programs for community facilitators</li> </ul>
Madagascar	<ul> <li>Establishment of a multisectoral coordination body</li> <li>Consistent flow of evaluations and diagnostics to assess the impact of community interventions, refine program content and approaches, and improve implementation</li> <li>Enhancement of policy dialogue, and programs through analytic work, learning events, and study tours</li> <li>Strengthening of M&amp;E systems</li> <li>Monitoring and supervision of service delivery and quality improvements, including investments in human resources and provision of critical inputs</li> </ul>	<ul> <li>Establishment of regional multisectoral capacity for nutrition coordination, including technical and M&amp;E support</li> <li>Improved coordination and collaboration, especially across regional offices for health, education, and nutrition and social protection</li> <li>Support to regions and districts to supervise, oversee, and provide technical backstopping to frontline service delivery</li> </ul>	Establishment, refinement, and delivery of a package of CBN interventions linked to frontline services     Expansion of multisectoral content of minimum package to include key sectors, such as health, education, social protection, food security (family gardens, livestock projects), ECD, and women empowerment     Capacity building of frontline services for improved synergy and coordination     NGO support to strengthen community-based services and links to basic services     Engagement of the community leaders in nutrition activities     Improved emergency support to communities
Malawi	<ul> <li>Support to coordination platforms, financing, and M&amp;E</li> </ul>	<ul> <li>Learning forums to share lessons on the nutrition response across districts and build leadership</li> </ul>	<ul> <li>Development of care groups and village nutrition coordination committees</li> </ul>

- Leadership building activities in relation to policies and to coordinate sectors and stakeholders
  - Development of M&E and resource tracking framework for nutrition
  - Support to many nutrition policies and the national communication strategy
  - Diagnostics and evaluations to inform the nutrition strategy and community program

- Building of capacity to implement M&E practices to support the national framework
- (communication materials, supplies, training)
- Development of extension support through care groups, youth clubs, community savings and loans groups, and farmer groups
- Development of support for home gardens, micronutrient supplements, and promotion of WASH facilities
- Support to BCC among farmers on nutrition
- Strengthening of CHWs and care groups to deliver nutrition services to benefit targeted households
- Engagement of NGOs to coordinate and deliver nutrition interventions
  - Support to implement and improve communitybased health services
- Development of cash transfers to lowincome families with children
  - Development of community water committees
  - Strengthening of network of community volunteers to promote parenting practices; and in agriculture to promote biofortified

### Mozambique

- Strengthening of coordination body and its stakeholder engagement
- Support to nutrition policies, strategies, M&E, and financing (primarily though agriculture and health sector)
- health and other sectors, such as agriculture, food security, water supply, and ECD

Support to deliver

and improve

nutrition services in

- Support to child development centers, including feeding program, growth monitoring, and vaccinations
- Support to maternal services
  - Support to strengthen package of services integrating social protection, health, and education, focusing on lowerincome and vulnerable families and children (cash transfers, nutrition messages,

### Nicaragua

- Support to improve efficiency and accountability of social service delivery
- Dialogue on health and social policies
  - Evaluations and diagnostics to inform program design and services
    - Support to strengthen health care model and strategy to deliver community services integrating nutrition
    - Support to strengthen policy

	and model for social protection  • Support to develop and implement adolescent health strategies to prevent early pregnancy and gender-based violence	counseling, workshops)	crops, livelihoods enterprises, nutrition education, and gender behaviors
Niger	<ul> <li>Support to health plan and nutrition directorate in health</li> <li>Diagnostics and evaluations of social protection, nutrition coordination, and community programs</li> <li>Support to strengthen social protection systems</li> <li>Support to community health</li> <li>Support to M&amp;E</li> <li>Support to M&amp;E</li> <li>Support to coordinate sexual and reproductive health and women's empowerment, integrating nutrition</li> </ul>	<ul> <li>Strengthening of basic package of health services, with a focus on maternal, reproductive and child health</li> <li>Support to district health plans</li> <li>Leadership building to implement reproductive health and nutrition services</li> </ul>	<ul> <li>Support to mobilize community actors in relation to health centers to deliver nutrition services in health facilities and by CHWs</li> <li>Strengthening of safety nets and accompanying measures on nutrition, SBCC, and support on ECD for low-income households</li> <li>Training of midwives</li> <li>Support to school management committees to engage girls in school</li> </ul>
Rwanda	<ul> <li>Building of leadership at highest level</li> <li>Strengthening of coordination by National Child Development Agency (policy, strategy, financing, mapping stakeholder behavior change, and mapping nutritionsensitive and specific interventions across sectors)</li> <li>Diagnostics and IEs for evidence-based learning on interventions</li> </ul>	<ul> <li>Support to improve the assessment of nutrition in district performance frameworks and plans, and stakeholder mobilization</li> <li>Support to agricultural productivity approaches</li> <li>Support to improve high-impact health services</li> <li>Support to improve M&amp;E and supervision</li> </ul>	<ul> <li>Support to CHWs platform, including package of nutrition interventions</li> <li>Development of safety nets for low-income households</li> <li>Development of community-based family planning</li> <li>Support to agriculture extension agents, including farmers' organizations and women's groups, to promote nutrition, balanced diet demonstration</li> </ul>

- South-South knowledge exchange
- M&E systems interoperability
- Learning to measure behavior change approaches
- Community health strategy
- Support to improve child and gender sensitivity of social protection systems
- Performance-based financing strategy
- Strengthening of agriculture strategies

- Rural water supply public-private partnerships
- Support to districts to converge sectoral services
  - Engagement of leaders to support SBCC and WASH promotion
- sessions, fortified foods, and rollout kitchen gardens
- Learning to converge services based on needs in selected communities
  - Development of home-based ECD groups
    - Support to implement SBCC strategy

•

Source: Independent Evaluation Group.

Note: CCT = conditional cash transfer; CHW = community health workers; ECD = early childhood development; M&E = monitoring and evaluation; NGO = nongovernmental organization; PER = public expenditure review; SBCC = social behavior change communication. Country multidimensionality is defined as the sum of nutrition-specific or nutrition-sensitive intervention dimensions present in a country, divided by the total possible number of nutrition-specific and nutrition-sensitive dimensions, which is equal to eight (this excludes all institutional strengthening and social norms dimensions).

# **Appendix I. Multivariate Regression Analysis**

## **Approach**

IEG conducted an econometric analysis anchored in the conceptual framework to uncover predictors of project performance. Project performance is measured for closed projects as the share of achieved results framework indicators. The analysis provides additional evidence for answering the third evaluation question on the extent to which World Bank interventions contribute to reduce child undernutrition outcomes and improve nutrition determinants.

Based on the results of various exercises conducted in the evaluation, including country case studies and the portfolio review, seven hypotheses were tested:

- 1. Higher country multidimensionality is associated with better nutrition results.
- 1. Higher institutional strengthening (IS) achievements are associated with better project performance in improving nutrition outcomes and determinants. Moreover, the higher the intensity of IS achievement (more IS sublevels achieved within a project), the better the project's performance.
- 2. Project design, community-based implementation, country ownership and institutional arrangements, and monitoring and evaluation (M&E) are important factors associated with project performance.
- 3. Investing in effective interventions as documented in the global literature are positively associated with project performance.
- 4. A better match between World Bank supported nutrition interventions and country needs is associated with better project performance.
- 5. Core nutrition projects (those with "nutrition" or "stunted growth" in the title or PDO and a nutrition content share in the top 40 percent of the distribution) tend to perform better than sectoral projects (noncore projects) in improving nutrition determinants outside their area of expertise (cross-sector support).
- 6. Projects with analytical support perform better than projects without it.

The project-level analysis is based on the cross-section of 131 closed nutrition projects with available indicator achievement information and their characteristics identified in the portfolio review and analysis, including nutrition interventions, factors of success and failure, and indicators, among others. Appendix D describes these projects in detail.

# **Empirical Evidence on Project Performance**

Although much research has focused on predictors of World Bank project performance, to IEG's knowledge no previous work has investigated the drivers of nutrition-related project performance as measured by indicators. Nonetheless, the relevant empirical literature, in which performance is measured with project outcome ratings, reveals several project-level drivers of better performance that need to be considered to minimize omitted variable bias. These drivers include project design and the quality of M&E (Hussein, Kenyon, and Friedman 2018; Raimondo 2016)²; shorter project duration and the presence of additional financing (Bulman, Kolkma, and Kraay 2015); task team leader (TTL) record and predicted performance, TTL turnover, project preparation time and support from analytical work (Geli, Kraay, and Nobakht 2014; Hussein et al. 2018).

Some country-level characteristics are also important, including the ratings of Country Policy and Institutional Assessments (CPIA) (Hussein et al. 2018). However, evidence indicates that project-level drivers are more important than country-level ones. For example, Denizer, Kaufmann, and Kraay (2013) found that for 6,000 World Bank projects evaluated in PPARs, ICRs, or ICRRs between 1983 and 2011, 80 percent of the variation in project outcomes could be explained by within-country and across-project variations rather than by country characteristics. Similarly, Hussein et al. (2018) found that for IPFs approved between 2005 and 2009 and evaluated by IEG, 25 percent of the variation is explained by project M&E flags, 12 percent by other project characteristics, and only 6 percent and 5 percent by staffing characteristics and country characteristics, respectively.

The evaluation uses proxies for several of these project performance correlates, including a taxonomy of factors of success and failure from the portfolio review and analysis related to project design and M&E quality, among others (see appendix D). Other project-level controls are defined as they are in the literature, including project duration.

# Methodology

The basic model for investigating the project-level drivers of nutrition indicator achievement is based on the conceptual framework and the evidence on World Bank project performance described above. The model is as follows:

$$y_{ij} = \alpha + \gamma' X_{ij} + \delta' \Psi_i + \epsilon_{ij}$$
 (1)

where  $y_{ij}$  is project performance, that is, the share of indicators achieved in project i of country j, and used in one of its three versions (overall, nutrition outcomes and determinants, and cross-sector);  $X_{ij}$  is a vector of project-level characteristics, including

project multidimensionality, a noncore project dummy, the quantity of achieved institutional strengthening indicators or its three sublevels (policy, service delivery, and stakeholder engagement), selected factor topics as shares of total factors in a project (project design, community-based implementation, country ownership and institutional arrangements, M&E, country context, and World Bank systems and performance), the percent match of interventions to country needs, the share of effective intervention outcomes according to the literature, an analytical support dummy, an emergency project dummy, the share of nutrition outcome indicators in a project, the share of factors with positive direction, project duration time, and project approval period;  $\Psi_j$  is a vector of country characteristics, including the country portfolio multidimensionality score broken down by quartiles, region dummies, income level, fragile and conflict-affected situations (FCS) status, and the non-World Bank Group nutrition-relevant foreign aid per 1,000 population in \$, millions  $\alpha$  is an intercept and  $\epsilon_{ij}$  is the error term.

As a first step for testing the seven hypotheses, we use equation 1 to estimate bivariate regressions through ordinary least squares (OLS) between each of the relevant independent variables and the three measures of project performance. We then perform the multivariate regression analysis by estimating equation 1 through OLS with additional controls. Here, several model specifications are estimated for each of the three dependent variables, always including the variables of interest for testing the seven hypotheses. The choice of controls is based on the evidence in the literature and on an effort to ensure parsimony of the model given the small sample of projects. For example, three available proxies capture the enabling environment: the baseline composite score for five nutrition determinants, the CPIA rating, and the baseline government effectiveness ranking of the World Governance Indicators, yet only the latter is included as a control. Similarly, the log of nutrition commitments and a dummy on additional financing do not add explanatory power to the model across several specifications so they are excluded in the end. Results of preliminary estimations are available on request.

In addition, we estimate an augmented version of equation (1) to test the second part of hypothesis number 2 on the positive association between the intensity of institutional strengthening achievement and project performance:

$$\begin{aligned} y_{ij} &= \alpha + \beta_1 \text{ISachieved} + \beta_2 \text{broad} + \beta_3 \text{medium} + \beta_4 \text{narrow} + \beta_5 \text{broad} \times \text{ISachieved} + \\ &+ \beta_6 \text{medium} \times \text{ISachieved} + \beta_7 \text{narrow} \times \text{ISachieved} + \gamma' X_{ij} + \delta' \Psi_i + \epsilon_{ij} \ (1)' \end{aligned}$$

where *ISachieved* represents the quantity of IS indicators achieved in a project, and *broad*, *medium* and *narrow* represent dummy variables capturing the intensity of IS achievement. The *broad* dummy captures projects with three IS sublevels achieved (policy, financing and coordination; nutrition service delivery; and stakeholder engagement), irrespective of the number of IS indicators achieved within each sublevel.

Similarly, *medium* and *narrow* dummies capture projects with two IS sublevels achieved and one IS sublevel achieved, respectively. A fourth dummy that is used as the base category captures projects with no IS sublevels achieved. In the augmented model, we interact the *broad*, *medium*, and *narrow* dummies with the total quantity of IS indicators achieved as an additional element of intensity.

### Limitations

The econometric analysis attempts to reduce the risk of omitted variable bias by including relevant controls from the literature. However, there is still a risk that proxy variables for relevant controls do not fully capture such controls. For example, the World Bank systems and performance factor topic proxies for several relevant controls at once, like TTL record and predicted performance and TTL turnover, which are important in the literature, but it remains an imperfect measure. Also, omitted variable bias may remain a risk to the extent that there is reverse causality between project performance and factors of success or failure. For example, past project performance could influence current performance through improvements in project design and implementation that confound our factors of success and failure variables; and since the evaluation does not control for past performance this may bias the coefficients.

Another limitation is that the regressions are based on a small sample of projects. The evaluation team addresses this issue by imputing missing values with regional averages for all variables used, so that the number of observations is always maximized to 131 projects. In addition, it is assumed that the sample of closed projects is representative of the whole nutrition portfolio.

### Results

Table I.1 shows descriptive statistics of project-level variables that are used in the regression analysis. Table I.2 shows bivariate regression results of estimating equation 1 by OLS. The bivariate regression results provide preliminary evidence favoring most of the hypotheses. Country portfolio multidimensionality, institutional strengthening achievement (including all three of its subcategories and the *broad* and *medium* intensity measures), community-implementation and M&E factors, support from analytical work, and percent of interventions matching country nutrition needs, are all significantly associated with at least one measure of project performance without controlling for other variables and show the expected sign. For example, a higher country portfolio multidimensionality score is associated with better overall achievement; and the coefficients for community-based implementation and M&E factors are highly significant regardless of the dependent variable and have a positive and negative sign, respectively, consistent with their top ranking as success and failure factors. Project

Appendix I Multivariate Regression Analysis

design factors and the share of intervention outcomes with positive evidence in the literature, are not significantly associated with project performance in these bivariate regressions. A closer look at these results is offered next in the multivariate regression analysis.

Table I.3 shows the project-level multivariate regression results and shows suggestive evidence favoring most of the hypotheses.

**Hypothesis one:** In terms of country portfolio multidimensionality, the multivariate regressions suggest there is some evidence, although not robust across all model specifications that projects in countries in the top quartile of country portfolio multidimensionality perform better than projects in the bottom quartile. On average and all else equal, projects in the top quartile perform about 13 percentage points better compared with projects in the first quartile, both on overall performance and nutrition determinant and outcome performance (Panel A, column 1 and Panel B, columns 5 and 6).

Hypothesis two: Higher institutional strengthening achievements are associated with higher cross-sector achievement. This result is robust to changes in specification. On average one additional IS indicator achieved is associated with an increase of 15 percentage points in cross-sector achievement, other controls in the model constant. However, the magnitude of this positive association diminishes as the number of achieved IS indicators increases, as shown by the statistical significance of its squared term (Panel C, columns 25 and 26). The positive relationship is driven by the sublevel of policy, financing, and coordination, which is positively and significantly associated with cross-sector achievement and is again robust to changes in specification. A one unit increase in the number of achieved policy, financing and coordination indicators is associated with about a 10 percentage point increase in cross-sector achievement (Panel B, columns 18, 20, 22, and 24).

In terms of IS intensity, estimating equation (1)′ shows suggestive evidence that projects with *broad* IS achievement are associated with better performance in terms of both nutrition determinants and outcomes′ support, and cross-sector support, compared with projects with no IS achievement. However, for cross-sector support the significant negative coefficient of the interaction term shows that this positive association is reduced in magnitude as the quantity of achieved IS indicators increases. All other controls in the model constant, if the quantity of achieved IS indicators is equal to the mean (approximately two indicators), projects with *broad* IS achievement perform approximately 33 percentage points better compared with projects with no IS achievement³ (Panel C, column 28).

**Hypothesis three:** The results show evidence consistent with the literature. The clearest finding is that M&E matters for achievement rates and this is robust across specifications and choice of dependent variable. All else in the model being equal, a one standard deviation increase in the share of M&E factors in a project (16 percentage points) is associated with about a 6 percentage point reduction in overall achievement (Panel A, columns 1-4). This effect is a bit higher in magnitude for nutrition determinants and achievement of outcomes and in turn for cross-sector achievement (all columns in Panels B and C). Recall that M&E is one of the more frequent negative factors, so the results are also consistent with this fact. Project design matters for overall performance and nutrition determinant and outcome performance, showing robust results to changes in specification, though only with coefficients significant at the 10 percent level (Panel A, columns 1 and 2, and Panel B, columns 6-9, 11-12, and 14-15). All other controls in the model constant, a one standard deviation increase in the share of project design factors (21 percentage points) is associated with about a 4 percentage point increase in performance (coefficients are similar across performance measures). This result suggests that project design is important for better nutrition results.

Similarly, there is some evidence that community-based implementation is positively associated with the three measures of performance, but it is not robust to changes in specification. The strongest and more statistically significant association is seen for cross-sector support. A one standard deviation increase in the share of community-implementation factors (18 percentage points) is associated with about an 8 percentage point increase in cross-sector indicator achievement, all else in the model constant (Panel C, column 17). There is no evidence that country ownership and institutional arrangement factors matter for project performance when controlling for other factors and irrespective of the performance measure.

Interestingly, the share of World Bank systems and performance factors in a project is positively and significantly associated with cross-sector performance with results robust to changes in specification. In its largest estimated effect, a one standard deviation increase in the share of this factor (11 percentage points) is associated with an 8 percentage point increase in the cross-sector achievement rate (Panel C, column 24). Recall that this factor captures internal World Bank processes affecting project implementation, including adequacy of financing, timeliness of disbursements, procurement, quality of supervision, and quality of team composition. This finding is consistent with the literature on the importance of staffing for project performance. For example, Hussein et al. (2018) find that predicted practice manager and TTL performance during the second half of supervision has a strong influence.

**Hypothesis four:** There is no evidence supporting the hypothesis that investing in effective nutrition interventions as per the global literature is positively associated with project performance. This suggests that having the right interventions is not enough—implementation factors also matter.

**Hypothesis five**: Similarly, there is little evidence supporting a positive association between a higher percentage of nutrition interventions that match a country's needs and project performance. Although the associated coefficient is positive and significant in the bivariate analysis, the results do not hold in the multivariate regressions, not even in the more parsimonious specifications (Columns 1 and 2 in Panel A, 5 and 6 in Panel B, and 17 and 18 in Panel C). A higher percentage of nutrition interventions that match a country's needs is not significantly associated with better nutrition results once other controls are considered.

Hypothesis six: There is strong evidence in favor of hypothesis six: noncore projects are, on average, worse performers than core projects (those with "nutrition" or "stunted growth" in the title or PDO and a nutrition content share in the top 40 percent of the distribution) in terms of cross-sector performance. On average they perform 13 percentage points below core projects, all other controls kept constant (Panel C, columns 19–22, 24, 26, and 28). There is no evidence of a statistically significant difference in the effects of noncore and core projects on the achievement rates either overall or for nutrition determinants.

**Hypothesis seven:** There is strong and robust evidence that projects that are supported with analytical inputs perform better on all three measures of performance, especially cross-sector achievement, compared with those without analytical support. In its largest effect, on average and holding all other controls in the model constant, projects with analytical support perform about 17 percentage points higher in terms of cross-sector achievement than projects with no support (Panel C, column 26). Results of cross-sector achievement are robust across specifications.

Finally, there are other interesting findings in addition to the original hypotheses. First, the nature of indicators included in the results frameworks of projects matter for project performance. The higher the share of nutrition outcome indicators included, the lower the project performance. This is consistent with the finding that nutrition outcome indicators (such as anthropometric measures and micronutrient status) are more challenging to achieve during the project cycle, and hence with the predominance of project objectives focusing on nutrition determinants. Second, emergency projects perform better than nonemergency projects in terms of cross-sector achievement. Third, there are also some regional differences in performance, and non-FCS countries perform better than FCS countries in terms of overall and cross-sector support. Finally, better

World Bank systems and performance (disbursements, team composition, quality of supervision) matter for improved project performance in terms of cross-sector support, which is consistent with findings in the literature.

### References

- Bulman, D., W. Kolkman, A. Kraay, A. 2015. "Good Countries or Good Projects? Comparing Macro and Micro Correlates of World Bank and Asian Development Bank Project Performance." World Bank Policy Research Working Paper 7245.
- Denizer, C., D. Kaufmann, and A. Kraay. 2013. "Good countries or good projects? Macro and Micro correlates of World Bank Project Performance." *Journal of Development Economics* 105: 288-302.
- Geli, P., A. Kraay, and H. Nobakht. 2014. "Predicting World Bank Project Outcome Ratings." World Bank Policy Research Working Paper 7001.
- Hussein, M., T. Kenyon, and J. Friedman. 2018. "A New Look at Factors Driving Investment Project Performance," Development Economics (DEC) Policy Research Talk, September. Washington, DC: World Bank.
- Raimondo, E. 2016, "What Difference Does Good Monitoring & Evaluation Make to World Bank Project Performance?" World Bank Policy Research Working Paper 7726.

### **Notes**

<sup>1</sup> Project performance was measured in three versions, including (i) overall nutrition-related indicator achievement (nutrition outcomes, immediate determinants, underlying determinants, social norms, and institutional strengthening); (ii) nutrition determinant and outcomes indicator achievement (nutrition outcomes; immediate determinants, underlying determinants and social norms); and (iii) cross-sector indicator achievement (immediate and underlying determinants in sectors different from the project's leading GP, in addition to social norms. For example, in a project led by the Social Protection and Jobs GP, this measure would exclude achievement of social safety net indicators).

<sup>2</sup> Hussein et al. 2018 define good project design with higher quality of the results framework, lower number of components, and lower number of intermediate indicators in a project, while Raimondo 2016 shows several aspects of good quality of M&E, including the simplicity of the M&E framework and its degree of alignment with the client's M&E system, a clear institutional set-up in relation to M&E, and good integration with operational tasks.

$$^{3}\left(\frac{\partial y}{\partial broad_{ISachieved=2}}\right) = \beta_{2} + \beta_{5} \times 2 = 0.810 - 0.241 \times 2 = 0.328$$

Annex I.1

Table Al.1.1 Descriptive Statistics—Project-Level Variables

V + 11					
<u>Variable</u>	Mean	SD	Min	Max	Obs.
Share of all indicators achieved	0.671	0.287	0.000	1.000	131
Share of nutrition determinants and outcomes' indicators achieved	0.648	0.301	0.000	1.000	131
Share of cross-sector indicators achieved	0.657	0.347	0.000	1.000	131
No. of institutional strengthening (IS) indicators achieved-All	1.652	1.616	0.000	8.000	131
No. of IS indicators achieved – Stakeholder engagement and ownership	0.535	0.677	0.000	4.000	131
No. of IS indicators achieved – Policy, financing and coordination	0.423	0.554	0.000	3.000	131
No. of IS indicators achieved – Improving nutrition service delivery	0.887	1.016	0.000	6.000	131
Project multidimensionality score	0.230	0.139	0.000	0.625	131
Project w/ Broad IS achievement (3 IS sublevels achieved) (dummy 0-1)	0.053	0.226	0.000	1.000	131
Project w/ Medium IS achievement (2 IS sublevels achieved) (dummy 0-1)	0.183	0.388	0.000	1.000	131
Project w/ Narrow IS achievement (1 IS sublevel achieved) (dummy 0-1)	0.260	0.440	0.000	1.000	131
Project w/ No IS achievement (0 IS sublevels achieved) (dummy 0-1)	0.504	0.502	0.000	1.000	131
Country portfolio multidimensionality score	0.621	0.209	0.000	1.000	131
Country portfolio multidimensionality – first quartile (dummy 0–1)	0.359	0.481	0.000	1.000	131
Country portfolio multidimensionality – second quartile (dummy 0–1)	0.221	0.417	0.000	1.000	131
Country portfolio multidimensionality – third quartile (dummy 0–1)	0.237	0.427	0.000	1.000	131
Country portfolio multidimensionality – fourth quartile (dummy 0–1)	0.183	0.388	0.000	1.000	131
Non-core nutrition project (dummy 0–1)	0.710	0.456	0.000	1.000	131
Matching score between nutrition interventions and country needs	0.859	0.180	0.250	1.000	131
Emergency projects (dummy 0–1)	0.282	0.452	0.000	1.000	131
Analytical support (dummy 0–1)	0.450	0.499	0.000	1.000	131
Share of nutrition outcome indicators in project	0.039	0.095	0.000	0.500	131
Project duration (years)	5.762	2.434	0.512	13.285	131

Appendix I Multivariate Regression Analysis

Non-World Bank Group nutrition-relevant foreign aid per 1,000 population (US\$, millions)	0.047	0.074	0.001	0.567	131
Share of intervention outcomes with positive evidence in the literature	0.185	0.217	0.000	1.000	131
Share of factors with positive direction	0.618	0.316	0.000	1.000	131
Share of project design factors	0.183	0.209	0.000	1.000	131
Share of community-implementation factors	0.108	0.175	0.000	1.000	131
Share of country ownership and institutional arrangements factors	0.159	0.189	0.000	1.000	131
Share of World Bank systems and performance factors	0.064	0.105	0.000	0.500	131
Share of M&E factors	0.119	0.161	0.000	1.000	131
Share of country context factors	0.087	0.212	0.000	1.000	131
AFR	0.466	0.501	0.000	1.000	131
SAR	0.130	0.337	0.000	1.000	131
ECA	0.053	0.226	0.000	1.000	131
EAP	0.092	0.290	0.000	1.000	131
MENA	0.061	0.240	0.000	1.000	131
LCR	0.198	0.400	0.000	1.000	131
Low-Income country	0.656	0.477	0.000	1.000	131
Lower-Middle-Income country	0.266	0.443	0.000	1.000	131
Upper-Middle-Income country	0.063	0.243	0.000	1.000	131
Non-FCS country	0.740	0.440	0.000	1.000	131
Approval period 1998–08	0.366	0.484	0.000	1.000	131
Approval period 2009–13	0.504	0.502	0.000	1.000	131
Approval period 2014–19	0.130	0.337	0.000	1.000	131

Source: Independent Evaluation Group portfolio review and analysis.

Note: Three regional projects are excluded from income-level statistics.

Table AI.1.2 Nutrition Performance and its Predictors—Bivariate OLS Regressions

		Damandant Varia	hlaa
_		Dependent Varia Share Of Nutritio Determinants An	n
Independent Variables	Share Of All Indicators Achieved	Outcomes' Indicators Achieved	Share Of Cross-sector Indicators Achieved
Matching score between nutrition interventions	0.190	0.142	0.284**
and country needs	(0.151)	(0.159)	(0.140)
Non-core project (dummy 0–1)	-0.0504	-0.0418	-0.0898
	(0.0537)	(0.0566)	(0.0662)
Project multidimensionality score	0.189	0.145	0.141
	(0.165)	(0.189)	(0.221)
Country portfolio multidimensionality score	0.231*	0.203	0.0848
	(0.117)	(0.125)	(0.148)
Analytical support (dummy 0–1)	0.0615	0.0443	0.139**
	(0.0499)	(0.0527)	(0.0600)
Emergency projects (dummy 0–1)	0.0347	0.0360	0.123*
	(0.0544)	(0.0578)	(0.0640)
No. of IS indicators achieved-All	-	0.0353**	0.0337
	-	(0.0142)	(0.0227)
No. of IS indicators achieved – Policy, financing	-	0.0999**	0.170***
and coordination	-	(0.0474)	(0.0482)
No. of IS indicators achieved – Improving nutrition	-	0.167*	0.227
service delivery	-	(0.0953)	(0.148)
No. of IS indicators achieved – Stakeholder	-	0.0738**	0.0165
engagement and ownership	-	(0.0367)	(0.0454)
	-	0.204***	0.162

Project w/ Broad IS achievement (3 IS sublevels achieved) (dummy 0–1)	-	(0.0735)	(0.1369)
Project w/ Medium IS achievement (2 IS sublevels	-	0.113*	0.136*
achieved) (dummy 0–1)	-	(0.0632)	(0.0745)
Project w/ Narrow IS achievement (1 IS sublevel	-	0.003	0.008
achieved) (dummy 0–1)	-	(0.0584)	(0.0682)
Share of project design factors	0.111	0.136	0.0269
	(0.123)	(0.131)	(0.125)
Share of community-implementation factors	0.332***	0.327**	0.346**
	(0.126)	(0.145)	(0.146)
Share of M&E factors	-0.280**	-0.394***	-0.415**
	(0.115)	(0.126)	(0.180)
Share of country ownership and institutional	0.0333	-0.00354	0.150
arrangements factors	(0.136)	(0.146)	(0.144)
Share of intervention outcomes with positive	-0.0899	-0.0587	-0.0387
evidence in the literature	(0.134)	(0.140)	(0.0998)

Source: Independent Evaluation Group portfolio review and analysis.

Note: Table shows coefficients resulting from bivariate regressions between each of the dependent variables and each of the independent variables; no controls are included. Observations are always 131 projects. Robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table AI.1.3 Nutrition Project Performance and its Predictors—Multivariate OLS Regressions

a. Dependent variable is the share of all indicators achieved

Variables	(1)	(2)	(3)	(4)
Country portfolio multidimensionality – second quartile	0.0634	0.0295	-0.0305	-0.0535
(dummy 0–1)	(0.0742)	(0.0875)	(0.0912)	(0.0985)
Country portfolio multidimensionality – third quartile	0.106	0.102	0.0299	0.0154
(dummy 0–1)	(0.0717)	(0.0795)	(0.0826)	(0.0873)
Country portfolio multidimensionality – fourth quartile	0.136*	0.0826	0.0490	0.0352
(dummy 0–1)	(0.0734)	(0.0754)	(0.0767)	(0.0783)

Appendix I Multivariate Regression Analysis

Project multidimensionality score	-0.153	-0.187	-0.0791	-0.0488
	(0.188)	(0.192)	(0.185)	(0.187)
Non-core project (dummy 0–1)	-0.0359	-0.0479	-0.0311	-0.0369
	(0.0565)	(0.0579)	(0.0569)	(0.0586)
Matching score between nutrition interventions and country	-0.109	0.0564	0.0417	0.0583
needs	(0.162)	(0.206)	(0.195)	(0.207)
Share of intervention outcomes with positive evidence in the	-0.102	-0.129	-0.130	-0.127
literature	(0.148)	(0.160)	(0.164)	(0.168)
Share of project design factors	0.222*	0.205*	0.189	0.213
	(0.118)	(0.116)	(0.117)	(0.132)
Share of community-implementation factors	0.281*	0.234	0.198	0.188
	(0.150)	(0.157)	(0.150)	(0.159)
Share of country ownership and institutional arrangements	0.0496	0.0129	-0.00720	-0.00547
factors	(0.147)	(0.153)	(0.153)	(0.158)
Share of M&E factors	-0.415***	-0.462***	-0.434***	-0.444***
	(0.154)	(0.158)	(0.151)	(0.156)
Share of country context factors	-0.0688	-0.0630	0.0231	0.0263
	(0.166)	(0.160)	(0.167)	(0.169)
Share of World Bank systems and performance factors	0.216	0.218	0.280	0.355
	(0.227)	(0.223)	(0.223)	(0.253)
Analytical support (dummy 0–1)	0.116**	0.114**	0.103*	0.0912
	(0.0544)	(0.0558)	(0.0546)	(0.0566)
Emergency projects (dummy 0–1)	0.0293	0.00528	-0.00385	0.00962
	(0.0566)	(0.0591)	(0.0567)	(0.0625)
Share of nutrition outcome indicators in project	-0.627***	-0.568**	-0.638***	-0.635***
	(0.212)	(0.233)	(0.225)	(0.231)
Project duration (years)	-0.0118	-0.0104	-0.00936	-0.0123
	(0.0117)	(0.0128)	(0.0123)	(0.0128)

Appendix I Multivariate Regression Analysis

Non-World Bank Group nutrition-relevant foreign aid per	-0.542*	-0.642*	-0.403	-0.517
1,000 population (US\$, millions)	(0.306)	(0.328)	(0.344)	(0.368)
Share of factors with positive direction	0.133	0.136	0.134	0.149
	(0.0914)	(0.0935)	(0.0894)	(0.0903)
Approval period 2009–13	0.0108	0.0396	0.0582	0.0400
	(0.0608)	(0.0623)	(0.0646)	(0.0683)
Approval period 2014–19	0.160**	0.162**	0.185**	0.204**
	(0.0801)	(0.0799)	(0.0793)	(0.0961)
EAP		-0.0180	-0.0354	-0.0259
		(0.0871)	(0.0894)	(0.0979)
ECA		0.0647	0.0952	0.0987
		(0.155)	(0.143)	(0.151)
LCR		-0.140*	-0.144*	-0.142
		(0.0806)	(0.0797)	(0.128)
MENA		-0.110	-0.0594	-0.00920
		(0.130)	(0.137)	(0.154)
SAR		-0.126*	-0.103	-0.0996
		(0.0710)	(0.0680)	(0.0725)
Non-FCS country			0.162**	0.168**
			(0.0715)	(0.0832)
Lower-Middle-Income country				-0.0235
				(0.0953)
Upper-Middle-Income country				0.0340
				(0.159)
Constant	0.691***	0.642**	0.506**	0.507*
	(0.200)	(0.253)	(0.253)	(0.263)
Observations	131	131	131	128

Appendix I Multivariate Regression Analysis

R-squared					0.284		0.320		0.351		0.35	59
b. Dependent variable i	s the share	of nutrition	n determina	ants and ou	utcomes' in	dicators ac	hieved					
Variables	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Country portfolio multidimensionality – second quartile	0.0780 (0.0707)	0.0754 (0.0753)	0.0595 (0.0841)	0.0581 (0.0879)	0.0247 (0.0862)	0.0213 (0.0903)	-0.0179 (0.0900)	-0.0232 (0.0931)	0.0870 (0.0709)	0.0642 (0.0836)	0.0830 (0.0734)	0.0638 (0.0868)
(dummy 0–1)	, ,	, ,	,	,	, ,	, ,	,	,	,	,	,	,
Country portfolio	0.0881	0.0856	0.101	0.0985	0.0583	0.0531	0.0280	0.0212	0.0762	0.0848	0.0859	0.100
multidimensionality – third quartile (dummy 0–1)	(0.0753)	(0.0767)	(0.0814)	(0.0832)	(0.0826)	(0.0849)	(0.0849)	(0.0864)	(0.0759)	(0.0813)	(0.0809)	(0.0838)
Country portfolio	0.147**	0.140*	0.0868	0.0852	0.0669	0.0644	0.0437	0.0399	0.133*	0.0738	0.144*	0.0916
multidimensionality – fourth quartile (dummy 0–1)	(0.0740)	(0.0750)	(0.0795)	(0.0826)	(0.0805)	(0.0834)	(0.0826)	(0.0867)	(0.0745)	(0.0807)	(0.0765)	(0.0829)
Project	-0.192	-0.205	-0.253	-0.269	-0.187	-0.202	-0.179	-0.189	-0.194	-0.253	-0.246	-0.313
multidimensionality score	(0.214)	(0.221)	(0.219)	(0.223)	(0.217)	(0.221)	(0.209)	(0.214)	(0.213)	(0.219)	(0.212)	(0.225)
No. of IS indicators	0.0105		-0.00548		-0.00356		-0.00356		0.0764	0.0521	0.0160	-0.0343
achieved-All	(0.0158)		(0.0175)		(0.0178)		(0.0179)		(0.0513)	(0.0487)	(0.110)	(0.108)
No. of IS indicators									-0.00987	-0.00864		
achieved squared-All									(0.00659)	(0.00626)		
No. of IS indicators		0.0506		0.0329		0.0370		0.0404				
achieved – Policy, financing and coordination		(0.0389)		(0.0385)		(0.0381)		(0.0402)				
No. of IS indicators		0.00171		-0.0177		-0.0185		-0.0159				
achieved – Improving nutrition service delivery		(0.0270)		(0.0279)		(0.0283)		(0.0283)				
No. of IS indicators		0.0165		0.0101		0.0160		0.0118				
achieved – Stakeholder		(0.0444)		(0.0464)		(0.0454)		(0.0452)				

engagement and ownership												
Non-core project	-0.0200	-0.0212	-0.0494	-0.0521	-0.0375	-0.0407	-0.0474	-0.0484	-0.00765	-0.0384	-0.0139	-0.0370
(dummy 0–1)	(0.0631)	(0.0673)	(0.0659)	(0.0699)	(0.0657)	(0.0697)	(0.0680)	(0.0725)	(0.0649)	(0.0678)	(0.0663)	(0.0699)
Matching score	-0.126	-0.141	0.0429	0.0180	0.0296	0.000594	0.0725	0.0464	-0.109	0.0806	-0.145	0.0102
between nutrition interventions and country needs	(0.160)	(0.167)	(0.215)	(0.221)	(0.214)	(0.219)	(0.220)	(0.226)	(0.163)	(0.213)	(0.163)	(0.229)
Share of intervention	-0.0753	-0.0740	-0.127	-0.125	-0.124	-0.124	-0.117	-0.112	-0.0834	-0.133	-0.0961	-0.151
outcomes with positive evidence in the literature	(0.150)	(0.151)	(0.167)	(0.167)	(0.171)	(0.171)	(0.176)	(0.176)	(0.147)	(0.165)	(0.154)	(0.169)
Share of project	0.214*	0.203*	0.229*	0.215*	0.218*	0.202	0.264*	0.245*	0.204	0.217*	0.185	0.195
design factors	(0.122)	(0.121)	(0.122)	(0.121)	(0.123)	(0.123)	(0.135)	(0.137)	(0.124)	(0.122)	(0.124)	(0.122)
Share of community-	0.292*	0.260	0.267	0.229	0.242	0.196	0.257	0.215	0.268*	0.252	0.225	0.182
implementation factors	(0.161)	(0.180)	(0.171)	(0.190)	(0.169)	(0.188)	(0.173)	(0.192)	(0.161)	(0.170)	(0.181)	(0.193)
Share of country	0.0391	0.0173	0.00768	-0.00825	-0.00366	-0.0225	0.0188	-0.00109	0.0243	-0.000426	-0.0208	-0.0729
ownership and institutional arrangements factors	(0.154)	(0.154)	(0.165)	(0.168)	(0.165)	(0.168)	(0.170)	(0.172)	(0.150)	(0.163)	(0.154)	(0.173)
Share of M&E factors	-0.474***	-0.484***	-0.544***	-0.547***	-0.523***	-0.527***	-0.530***	-0.533***	-0.496***	-0.564***	-0.551***	-0.643***
	(0.171)	(0.175)	(0.184)	(0.190)	(0.184)	(0.191)	(0.185)	(0.192)	(0.169)	(0.183)	(0.185)	(0.200)
Share of country	0.0194	0.00741	0.0305	0.0135	0.0831	0.0663	0.105	0.0901	0.0191	0.0235	-0.0271	-0.0186
context factors	(0.184)	(0.184)	(0.182)	(0.182)	(0.196)	(0.196)	(0.201)	(0.201)	(0.181)	(0.181)	(0.186)	(0.183)
Share of World Bank	0.149	0.172	0.159	0.181	0.194	0.222	0.298	0.328	0.150	0.162	0.161	0.167
systems and performance factors	(0.242)	(0.251)	(0.246)	(0.255)	(0.251)	(0.259)	(0.273)	(0.280)	(0.245)	(0.250)	(0.263)	(0.264)
Analytical support	0.113**	0.111**	0.122**	0.120**	0.115**	0.113**	0.101*	0.0972	0.113**	0.123**	0.116**	0.121**
(dummy 0–1)	(0.0542)	(0.0555)	(0.0569)	(0.0575)	(0.0563)	(0.0567)	(0.0581)	(0.0586)	(0.0541)	(0.0571)	(0.0566)	(0.0587)
	0.0390	0.0373	0.0208	0.0180	0.0157	0.0123	0.0305	0.0271	0.0323	0.0149	0.0348	0.0172

Appendix I Multivariate Regression Analysis

Emergency projects (dummy 0–1)	(0.0594)	(0.0597)	(0.0619)	(0.0627)	(0.0606)	(0.0614)	(0.0656)	(0.0666)	(0.0603)	(0.0625)	(0.0601)	(0.0622)
Share of nutrition	-0.693***	-0.668***	-0.655***	-0.641**	-0.692***	-0.682**	-0.706***	-0.690**	-0.692***	-0.659***	-0.657***	-0.606**
outcome indicators in project	(0.220)	(0.224)	(0.249)	(0.256)	(0.260)	(0.269)	(0.259)	(0.270)	(0.220)	(0.248)	(0.233)	(0.275)
Project duration	-0.0205*	-0.0212*	-0.0169	-0.0178	-0.0165	-0.0173	-0.0194	-0.0204	-0.0217**	-0.0182	-0.0259**	-0.0223*
(years)	(0.0109)	(0.0111)	(0.0126)	(0.0128)	(0.0126)	(0.0128)	(0.0132)	(0.0134)	(0.0109)	(0.0126)	(0.0111)	(0.0130)
Non-World Bank	-0.336	-0.323	-0.514	-0.494	-0.367	-0.338	-0.422	-0.388	-0.253	-0.417	-0.251	-0.469
Group nutrition- relevant foreign aid per 1,000 population (US\$, millions)	(0.320)	(0.325)	(0.340)	(0.341)	(0.358)	(0.358)	(0.380)	(0.384)	(0.335)	(0.355)	(0.377)	(0.396)
Share of factors with	0.160	0.160*	0.159	0.155	0.159	0.152	0.184*	0.180*	0.162	0.165	0.135	0.132
positive direction	(0.0971)	(0.0961)	(0.100)	(0.0987)	(0.0987)	(0.0967)	(0.101)	(0.0996)	(0.0980)	(0.101)	(0.0996)	(0.102)
Approval period 2009–	-0.0145	-0.0144	0.0190	0.0163	0.0297	0.0271	0.00599	0.00357	-0.0190	0.0115	-0.0167	0.0221
13	(0.0624)	(0.0617)	(0.0652)	(0.0655)	(0.0682)	(0.0681)	(0.0721)	(0.0719)	(0.0625)	(0.0658)	(0.0647)	(0.0679)
Approval period 2014–	0.0897	0.0843	0.114	0.101	0.125	0.110	0.137	0.126	0.0692	0.0960	0.0831	0.118
19	(0.0919)	(0.0924)	(0.0920)	(0.0947)	(0.0924)	(0.0952)	(0.109)	(0.110)	(0.0956)	(0.0956)	(0.105)	(0.103)
EAP			0.0417	0.0305	0.0297	0.0146	0.0363	0.0242		0.0495		0.0195
			(0.0976)	(0.103)	(0.103)	(0.108)	(0.110)	(0.114)		(0.0987)		(0.0998)
ECA			0.0850	0.0861	0.0974	0.0993	0.112	0.115		0.109		0.0896
			(0.169)	(0.176)	(0.164)	(0.171)	(0.170)	(0.177)		(0.176)		(0.171)
LCR			-0.158*	-0.154*	-0.159*	-0.155*	-0.206	-0.199		-0.151*		-0.168*
			(0.0899)	(0.0882)	(0.0902)	(0.0884)	(0.147)	(0.151)		(0.0887)		(0.0922)
MENA			-0.151	-0.142	-0.120	-0.109	-0.0677	-0.0523		-0.126		-0.187
			(0.128)	(0.127)	(0.129)	(0.128)	(0.157)	(0.159)		(0.124)		(0.128)
SAR			-0.104	-0.107	-0.0891	-0.0930	-0.0928	-0.0926		-0.103		-0.120
			(0.0785)	(0.0811)	(0.0768)	(0.0792)	(0.0830)	(0.0846)		(0.0794)		(0.0800)
Non-FCS country					0.0965	0.103	0.106	0.113				
					(0.0734)	(0.0743)	(0.0862)	(0.0873)				

Appendix I Multivariate Regression Analysis

Lower-Middle-Income							-0.00944	-0.0112				
country							(0.107)	(0.112)				
Upper-Middle-Income							0.174	0.174				
country							(0.166)	(0.173)				
Project w/ Broad IS											0.411**	0.464**
achievement (3 IS sublevels achieved) (dummy 0–1)											(0.198)	(0.221)
Project w/ Medium IS											0.217	0.170
achievement (2 IS sublevels achieved) (dummy 0–1)											(0.194)	(0.189)
Project w/ Narrow IS											0.0425	0.0875
achievement (1 IS sublevel achieved) (dummy 0–1)											(0.144)	(0.150)
Project w/ Broad IS											-0.0608	-0.0380
achievement × No. of IS indicators achieved-All											(0.112)	(0.112)
Project w/ Medium IS											-0.0561	-0.0146
achievement × No. of IS indicators achieved-All											(0.120)	(0.117)
Project w/ Narrow IS											0.0344	0.0326
achievement × No. of IS indicators achieved-All											(0.130)	(0.130)
Constant	0.710***	0.729***	0.673**	0.709***	0.591**	0.630**	0.564**	0.593**	0.654***	0.600**	0.776***	0.782**
	(0.218)	(0.235)	(0.258)	(0.268)	(0.268)	(0.274)	(0.277)	(0.282)	(0.229)	(0.268)	(0.259)	(0.311)
Observations	131	131	131	131	131	131	128	128	131	131	131	131

Appendix I Multivariate Regression Analysis

R-squared	0.284	0.291	0.322	0.326	0.332	0.337	0.351	0.356	0.297	0.332	0.314	0.357
c. Dependent variable is	s the share	of cross-se	ctor indica	tors achieve	ed							
Variables	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Country portfolio multidimensionality – second quartile	0.0737	0.0481	0.0111	-0.00866	-0.0453	-0.0671	-0.0490	-0.0692	0.0919	0.0208	0.0727	-0.0106
(dummy 0–1)	(0.0855)	(0.0876)	(0.0905)	(0.0960)	(0.0966)	(0.103)	(0.104)	(0.107)	(0.0838)	(0.0865)	(0.0889)	(0.0907)
Country portfolio multidimensionality –	0.0546	0.0448	0.0950	0.0811	0.0266	0.00898	0.00173	-0.0148	0.0305	0.0619	0.0290	0.0496
third quartile (dummy 0–1)	(0.0831)	(0.0803)	(0.0880)	(0.0870)	(0.0922)	(0.0929)	(0.101)	(0.0996)	(0.0837)	(0.0825)	(0.0926)	(0.0895)
Country portfolio multidimensionality –	0.0678	0.0488	-0.0625	-0.0752	-0.0946	-0.108	-0.0958	-0.111	0.0383	-0.0895	0.0466	-0.0897
fourth quartile (dummy 0–1)	(0.0893)	(0.0852)	(0.0914)	(0.0901)	(0.0928)	(0.0919)	(0.0916)	(0.0898)	(0.0946)	(0.0919)	(0.102)	(0.0992)
Project multidimensionality	-0.351	-0.377	-0.441*	-0.473*	-0.333	-0.367	-0.308	-0.341	-0.356	-0.441*	-0.347	-0.455
score	(0.256)	(0.261)	(0.263)	(0.265)	(0.261)	(0.262)	(0.267)	(0.268)	(0.252)	(0.264)	(0.261)	(0.279)
No. of IS indicators achieved-All	0.0155		0.00181		0.00492		0.00681		0.149**	0.122**	0.0936	0.117
	(0.0252)		(0.0230)		(0.0222)		(0.0228)		(0.0651)	(0.0606)	(0.103)	(0.103)
No. of IS indicators									-0.0200**	-0.0181**		
achieved squared-All									(0.00886)	(0.00769)		
No. of IS indicators		0.125***		0.0964**		0.103**		0.104**				
achieved – Policy, financing and coordination		(0.0466)		(0.0431)		(0.0440)		(0.0451)				
No. of IS indicators		-0.00939		-0.0284		-0.0298		-0.0280				
achieved – Improving		(0.0333)		(0.0300)		(0.0288)		(0.0298)				

Appendix I Multivariate Regression Analysis

nutrition service delivery												
No. of IS indicators achieved – Stakeholder engagement and ownership		-0.0157 (0.0568)		-0.00738 (0.0502)		0.00198 (0.0463)		0.00517 (0.0478)				
Non-core project (dummy 0–1)	-0.0968	-0.106	-0.150**	-0.162**	-0.131*	-0.144*	-0.125	-0.137*	-0.0717	-0.127*	-0.0768	-0.138*
	(0.0739)	(0.0771)	(0.0724)	(0.0739)	(0.0708)	(0.0726)	(0.0755)	(0.0780)	(0.0728)	(0.0729)	(0.0755)	(0.0743)
Matching score between nutrition	0.0952	0.0486	0.147	0.141	0.126	0.113	0.124	0.110	0.131	0.226	0.127	0.234
interventions and country needs	(0.139)	(0.130)	(0.213)	(0.216)	(0.216)	(0.219)	(0.229)	(0.227)	(0.141)	(0.206)	(0.171)	(0.235)
Share of intervention outcomes with	0.0791	0.0766	0.0869	0.0784	0.0910	0.0799	0.105	0.0947	0.0627	0.0732	0.0560	0.0451
positive evidence in the literature	(0.134)	(0.133)	(0.131)	(0.129)	(0.139)	(0.137)	(0.146)	(0.144)	(0.132)	(0.128)	(0.144)	(0.136)
Share of project design factors	0.139	0.119	0.181	0.156	0.163	0.136	0.185	0.153	0.117	0.155	0.113	0.142
	(0.128)	(0.132)	(0.120)	(0.123)	(0.121)	(0.124)	(0.140)	(0.143)	(0.129)	(0.121)	(0.133)	(0.123)
Share of community-implementation	0.471***	0.433**	0.313*	0.275	0.272	0.223	0.292	0.239	0.422**	0.282	0.411**	0.253
factors	(0.168)	(0.171)	(0.182)	(0.193)	(0.178)	(0.190)	(0.191)	(0.201)	(0.164)	(0.183)	(0.175)	(0.196)
Share of country ownership and	0.169	0.0981	0.0803	0.0326	0.0619	0.00984	0.0589	0.00441	0.139	0.0633	0.144	0.0576
institutional arrangements factors	(0.166)	(0.174)	(0.162)	(0.169)	(0.162)	(0.170)	(0.172)	(0.181)	(0.164)	(0.165)	(0.172)	(0.175)

Appendix I Multivariate Regression Analysis

Share of M&E factors	-0.388*	-0.441**	-0.525**	-0.565**	-0.492**	-0.533**	-0.476**	-0.517**	-0.432*	-0.567**	-0.434*	-0.607**
	(0.222)	(0.219)	(0.225)	(0.226)	(0.215)	(0.218)	(0.222)	(0.226)	(0.219)	(0.227)	(0.230)	(0.236)
Share of country context factors	0.160	0.124	-0.0283	-0.0675	0.0567	0.0164	0.0833	0.0400	0.159	-0.0430	0.149	-0.0622
context factors	(0.202)	(0.203)	(0.199)	(0.195)	(0.202)	(0.197)	(0.205)	(0.201)	(0.195)	(0.196)	(0.201)	(0.199)
Share of World Bank systems and	0.505*	0.568*	0.552*	0.613**	0.610*	0.679**	0.693*	0.765**	0.506	0.560*	0.489	0.521
performance factors	(0.303)	(0.307)	(0.297)	(0.300)	(0.308)	(0.309)	(0.353)	(0.354)	(0.311)	(0.306)	(0.327)	(0.319)
Analytical support (dummy 0–1)	0.165***	0.153**	0.170***	0.163***	0.159***	0.152**	0.158**	0.150**	0.165***	0.171***	0.158**	0.164***
(aa) v .,	(0.0586)	(0.0608)	(0.0584)	(0.0586)	(0.0603)	(0.0600)	(0.0636)	(0.0631)	(0.0590)	(0.0590)	(0.0611)	(0.0604)
Emergency projects (dummy 0–1)	0.163**	0.154**	0.154**	0.145**	0.146**	0.136**	0.156**	0.147**	0.150**	0.142**	0.150**	0.136*
(ddilling 0 1)	(0.0658)	(0.0677)	(0.0669)	(0.0684)	(0.0664)	(0.0677)	(0.0719)	(0.0728)	(0.0673)	(0.0669)	(0.0710)	(0.0704)
Share of nutrition outcome indicators in	-0.824***	-0.772***	-0.632*	-0.607*	-0.692**	-0.671*	-0.726**	-0.705*	-0.822***	-0.639*	-0.810***	-0.637*
project	(0.248)	(0.262)	(0.330)	(0.338)	(0.334)	(0.343)	(0.354)	(0.364)	(0.249)	(0.323)	(0.263)	(0.346)
Project duration (years)	-0.00787	-0.00898	-0.0103	-0.0112	-0.00967	-0.0105	-0.0113	-0.0123	-0.0104	-0.0129	-0.0105	-0.0135
(years)	(0.0124)	(0.0124)	(0.0130)	(0.0130)	(0.0127)	(0.0127)	(0.0132)	(0.0132)	(0.0119)	(0.0127)	(0.0129)	(0.0132)
Non-World Bank Group nutrition-	-0.0709	-0.0965	-0.726**	-0.694**	-0.488	-0.445	-0.269	-0.244	0.0976	-0.522	0.0542	-0.577
relevant foreign aid	(0.351)	(0.344)	(0.329)	(0.333)	(0.358)	(0.359)	(0.514)	(0.509)	(0.375)	(0.345)	(0.407)	(0.375)

Appendix I Multivariate Regression Analysis

per 1,000 population (US\$, millions)												
Share of factors with positive direction	0.172	0.175	0.138	0.141	0.137	0.136	0.145	0.145	0.176	0.149	0.167	0.131
	(0.112)	(0.117)	(0.111)	(0.113)	(0.105)	(0.108)	(0.106)	(0.110)	(0.111)	(0.109)	(0.115)	(0.114)
Approval period 2009–	-0.0785	-0.0691	-0.0300	-0.0300	-0.0129	-0.0129	-0.0213	-0.0230	-0.0876	-0.0457	-0.0708	-0.0169
	(0.0713)	(0.0692)	(0.0666)	(0.0655)	(0.0682)	(0.0669)	(0.0731)	(0.0720)	(0.0709)	(0.0661)	(0.0750)	(0.0699)
Approval period 2014–	-0.0937	-0.0712	-0.0557	-0.0488	-0.0381	-0.0337	-0.0161	-0.0156	-0.135	-0.0930	-0.110	-0.0598
	(0.112)	(0.119)	(0.104)	(0.113)	(0.102)	(0.111)	(0.117)	(0.123)	(0.112)	(0.107)	(0.121)	(0.112)
EAP			0.0485	0.0552	0.0292	0.0300	0.0488	0.0448		0.0648		0.0561
			(0.110)	(0.112)	(0.102)	(0.102)	(0.109)	(0.107)		(0.107)		(0.110)
ECA			-0.250	-0.193	-0.230	-0.172	-0.214	-0.159		-0.200		-0.243
			(0.184)	(0.189)	(0.175)	(0.181)	(0.184)	(0.187)		(0.151)		(0.179)
LCR			-0.323***	-0.313***	-0.324***	-0.315***	-0.281**	-0.283**		-0.307***		-0.322***
			(0.0894)	(0.0883)	(0.0900)	(0.0890)	(0.136)	(0.138)		(0.0880)		(0.0949)
MENA			-0.0558	-0.0271	-0.00567	0.0248	0.0481	0.0717		-0.00267		-0.0237
			(0.121)	(0.123)	(0.127)	(0.129)	(0.159)	(0.160)		(0.114)		(0.122)
SAR			-0.221*	-0.220*	-0.196*	-0.198*	-0.178	-0.183*		-0.217*		-0.245**

Appendix I Multivariate Regression Analysis

_	(0.115)	(0.111)	(0.112)	(0.109)	(0.112)	(0.110)	(0.118)		(0.121)
Non-FCS country			0.156*	0.164*	0.194*	0.199*			
			(0.0935)	(0.0919)	(0.108)	(0.106)			
Lower-Middle-Income					-0.0522	-0.0422			
country					(0.106)	(0.113)			
Upper-Middle-Income					0.000773	0.0116			
country					(0.196)	(0.202)			
Project w/ Broad IS achievement (3 IS							0.7	'82**	0.810***
sublevels achieved) (dummy 0–1)							(0.	350)	(0.248)
Project w/ Medium IS achievement (2 IS							0.	207	0.201
sublevels achieved) (dummy 0–1)							(0.	205)	(0.182)
Project w/ Narrow IS achievement (1 IS							0.0	)723	0.132
sublevel achieved) (dummy 0–1)							(0.	170)	(0.183)
Project w/ Broad IS achievement × No. of							-0	.205	-0.241**
IS indicators achieved-							(0.	127)	(0.106)
Project w/ Medium IS							-0.	0993	-0.136
achievement × No. of									
IS indicators achieved- All							(0.	111)	(0.108)
							-0.	0443	-0.0935

Appendix I Multivariate Regression Analysis

Project w/ Narrow IS achievement × No. of IS indicators achieved- All											(0.137)	(0.141)
Constant	0.445*	0.527**	0.695**	0.738**	0.563**	0.612**	0.508*	0.563*	0.330	0.542*	0.369	0.580*
	(0.246)	(0.249)	(0.284)	(0.286)	(0.280)	(0.277)	(0.291)	(0.286)	(0.262)	(0.287)	(0.312)	(0.321)
Observations	131	131	131	131	131	131	128	128	131	131	131	131
R-squared	0.292	0.319	0.389	0.407	0.408	0.429	0.409	0.430	0.331	0.419	0.323	0.423

Source: Independent Evaluation Group portfolio review and analysis.

Note. In the table, the base region is AFR; the base approval period is 1998–2008; the base for the country portfolio multidimensionality quartiles is the first quartile; the base for the institutional strengthening (IS) achievement intensity levels (narrow, medium, broad) is projects with zero IS intensity (projects with no IS sublevels achieved); non-core projects are compared against core projects, defined as those with the words "nutri" or "stunt" in their title or PDO and having a share of nutrition content in the top 40 percent of the distribution. Table excludes 14 countries that had no closed nutrition projects (Nigeria, Haiti, Zimbabwe, Mali, Congo Rep., Côte d'Ivoire, Comoros, Philippines, Liberia, Bhutan, Armenia, Lesotho, Guinea-Bissau, and Marshall Islands). Three regional projects are excluded from columns that include income-level regressors. Robust standard errors in parentheses.

<sup>\*\*\*</sup> p<0.01 \*\* p<0.05 \* p<0.1.





