Approach Paper
Systematic Review of Impact Evaluations in Maternal and Child Health

Background and Context

1. Improved outcomes for women and children—more education, lower fertility rates, higher nutritional status, and lower incidence of illness, among others—have broad individual, family, and societal benefits (World Bank 2011).

2. Though the evidence is thin on the causal relationship from maternal and child health to growth or poverty reduction,[1] it is robust in establishing the intrinsic importance of general health to the individual and its instrumental importance as an input into the accumulation of human capital—which in turn is a determining factor of economic growth (WHO 2002). Several studies point to a strong correlation between health and poverty (Strauss and Thomas 1998, Bloom and Canning 2000, WHO 2001, Gallup and Sachs 2001, Sachs and Malaney 2002). There is also evidence of a health-related poverty trap (Gallup and Sachs 2001, Bloom and others 2003, Bonds and others 2010). Despite the lack of good studies on the existence of a potential causal (instrumental) link between MCH and household or national wealth, maternal and child health is intrinsically valuable not only to mothers and children but also to the broader global community as is evident from the prominent placement of MCH in the Millennium Development Goals (MDGs).

3. Adopted in 2000, the MDGs aim to achieve specific goals of human welfare in developing countries by the year 2015. Women and children were given particular attention. MDG 4 calls for a reduction in the under-five mortality rate by two-thirds between 1990 and 2015. MDG 5 calls for a reduction in the maternal mortality ratio (MMR) by three-quarters between 1990 and 2015, and for universal access to reproductive health care by 2015. Progress on MDGs 4 and 5 is closely coupled: improving maternal health leads to reductions in deaths among newborns and young children.

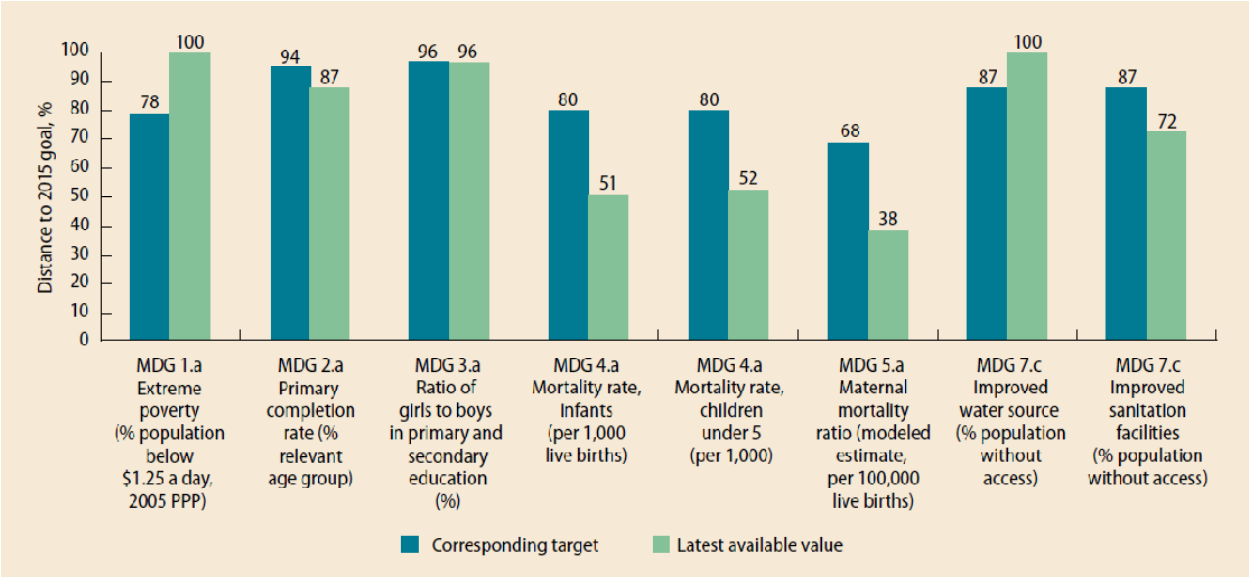
4. While improvement on some of the MDGs, such as poverty reduction (MDG 1) and expanding access to water and sanitation (MDG 7), has been significant, advances in the MDGs for maternal and child health (MCH) has been far more modest despite the increased efforts of developing countries and the international development community[2] (Figure 1). There are

[1] This lack of evidence does not establish that there is no link between economic growth or poverty reduction and maternal and child morbidity. Rather, there have been few reliable studies done with an evaluation strategy which could credibly establish or refute such a link (Greene and Merrick 2005).

[2] In comparison to the efforts made for combating communicable diseases, MCH received relatively less attention from the international community until the 2000 Millennium Summit where the MDGs were adopted. Since then, a number of global partnerships and initiatives have been established. Partnership for Maternal, Newborn, and Child Health aims to raise awareness and advocacy related to reproductive and child health. New initiatives, including the

challenges in improving health services across the continuum from pre-pregnancy through pregnancy, childbirth, the postnatal period, and into childhood (PMNCH 2010). Factors influencing maternal and child health are broad and complex, extending beyond the health sector to other sectors as well, including energy, water and sanitation, and education. Understanding areas of success, their determinants, and the constraints to more rapid progress is an important goal of the international development community and of the World Bank. To this end, IEG proposes a systematic review of impact evaluation evidence on what works in MCH.[3]

Figure 1. Global Progress toward the MDGs



Source: World Bank 2012.
Note: "Corresponding target" indicates progress currently needed to reach the goal by 2015. "Latest available value" indicates current progress as illustrated by the most recent available data.

MATERNAL HEALTH

5. A recently-released report from the WHO, UNICEF, UNFPA and the World Bank presents an updated look at global maternal mortality rates (MMR) from 1990 to 2010. Worldwide, maternal deaths have decreased by 47 percent over this period, from 543,000 in 1990 to 287,000 in 2010. While every MDG region has experienced a decline in maternal deaths (WHO and others 2012). the progress from 1990 to 2010 has been slight. MMR remained 15 times higher in developing regions than in developed regions, and many developing countries with high numbers

Global Campaign for the Health MDGs, focus on MCH. The World Bank has renewed its commitment to increase investments in gender through addressing adolescent motherhood as a priority area for the sixteenth replenishment of IDA resources. (World Bank 2010)

[3] A systematic review is an overview of primary research on a particular research question that tries to identify, select, synthesize and appraise all high quality research evidence relevant to that question in order to answer it. Systematic reviews may or may not contain meta-analyses, which is the use of statistical methods to summarize the results of independent studies. See www.cochrane.org for more information.

of maternal deaths were struggling to make sufficient progress toward the MDG's target of 75 percent reduction in the MMR.

Despite substantial regional decreases over the past 20 years, in 2010 Sub-Saharan Africa still accounted for 56 percent of global maternal deaths and Southern Asia for 29 percent. Of the 40 countries classified as having a high MMR (≥300 maternal deaths per 100,000 live births), only four are outside of Sub-Saharan Africa. The region also experienced 91 percent of worldwide maternal deaths attributable to HIV/AIDs. While the expansion of antiretroviral therapy has contributed to a recent decline in MMR in several SSA countries, regional progress is still negligible (e.g. South Africa, Zimbabwe) or insufficient (e.g. Zambia, Kenya) to reach MDG targets. Worldwide, among countries with 1990 maternal mortality rates labeled as moderate or worse (≥100 maternal deaths per 100,000 live births), only 9 countries are "on track" to reach the MDGs while 50 countries are "making progress" and 25 countries have made "insufficient" or "no progress" (WHO and others 2012).

6. The major causes of maternal mortality in developing countries are hypertension and heavy bleeding after childbirth, which are responsible for 18 and 35 percent and of obstetric deaths. In combination with infections, obstructed labor, and unsafe abortions, these five complications account for 80 percent of maternal deaths. Indirect causes, including malaria and HIV/AIDS, make up the remaining 20 percent (WHO 2012). The WHO asserts that most of these deaths can be prevented if the woman receives the appropriate interventions from a skilled health provider, and with adequate equipment, drugs, and medicines (PMNCH 2010).

7. Birth attendance by skilled health providers has been designated an intermediate MDG as it is believed to reduce maternal mortality. The share of pregnant women attending at least one antenatal visit (the World Health Organization recommends four visits) increased from 64 percent in 1990 to 81 percent in 2009 (UN 2011). However, progress is still insufficient to achieve MDG 5. The average annual decline in the MMR was 2.3 percent between 1990 and 2008, less than half of the 5.5 percent per year average required to meet the goal..

8. Fertility patterns also affect MCH outcomes. Pregnancies that carry a high risk (those that are closely spaced or occur at very young or older ages) can be averted through contraception (World Bank 2010). Across the developing world, women are having fewer children though adolescent fertility remains relatively high. Contraceptive use has increased, but its perpetuation will require a sustained effort as the number of women entering reproductive age continues to grow (PMNCH 2010).

CHILD HEALTH

9. In comparison to maternal deaths, steady progress is being made in reducing child deaths. Globally, the mortality rate for children under-five has declined by a third, from 89 deaths per 1,000 live births in 1990 to 60 in 2009 (UN 2011). The infant mortality rate dropped from 61

deaths per 1,000 live births in 1990 to 40 in 2010. The neonatal mortality rate also dropped from 32 deaths per 1,000 live births in 1990 to 23 (IGME 2011). However, under-five mortality continues to be high in Sub-Saharan Africa, where one child in eight dies before the age of five (129 deaths per 1,000 live births). South Asia has the second highest rate with 69 deaths per 1,000 live births (UN 2011). Similarly, neonatal mortality continues to be high in Sub-Saharan Africa (35 deaths per 1,000 live births) and in South Asia (32 deaths per 1,000 live births) (IGME 2011).

10. Increasing evidence suggests that the MDG target can be reached only if substantial and accelerated action is taken to eliminate the leading killers of children (UN 2011): pneumonia, diarrhea, and malaria, which accounted for 43 percent of under-five deaths in 2008. Malnutrition contributes to one-third of the under-five deaths. A third of stillborn deaths in developing countries occur during birth, mainly due to maternal conditions such as hypertension and obstructed labor but also partly reflecting poor quality of care / management (PMNCH 2010). Neonatal mortality is increasingly concerning: the proportion of under-five deaths occuring during the neonatal period is increasing even as under-five mortality declines (IGME 2011).

CONCEPTUAL MODEL

11. A simple model[4] of the intervention paths which can be taken by the public sector to improve MCH outcomes is shown below in Figure 2. MCH outcomes are the result of a dense set of interactions between providers and individuals/households that extend across different points in the lifecycle. There are also a number of barriers that exist on the intervention paths to improve MCH outcomes. These barriers include insufficient inputs (such as physical access, financial access, and socio-cultural access) on both the producer/provider and user sides, shocks at the macro and micro levels (such as economic crises and natural disasters), and poor health endowments. Consequently, efforts and interventions that address these barriers extend to sectors beyond the public health sector, with useful provision coming from the public, private, and non-profit sectors. Public policy may also be used to influence behaviors of households and individuals to induce decisions leading to improved outcomes, including their utilization of health services, and habits that affect the health of mothers and children such as sanitation.

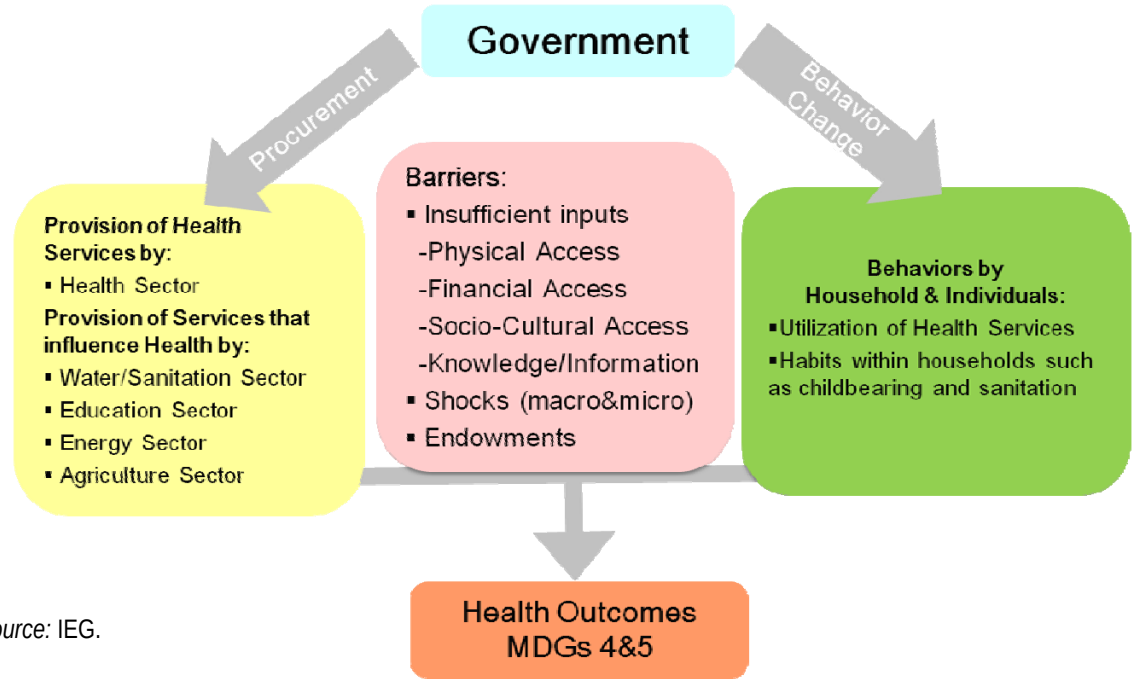
12. Table 1 is a taxonomy providing details on the classes of outcomes and interventions referred to in Figure 2; it also lists reference codes and summary counts for a preliminary set of impact evaluations collected by IEG to date in the MCH intervention/outcome space[5]. The taxonomy was developed from reviews of World Bank and WHO models and MCH-related impact evaluations, and consultations with HDN representatives and health economists. Rows are "interventions" which may affect MCH, while columns give the "outcomes" of the

[4] A more detailed logic model or results chain will be developed and integrated into the final report as time and resources allow.

[5] Letters indicate a World Bank-related IE; Greek letters are for IEs from other IEs; Numbers are other external IEs.

interventions. These outcomes in the columns include both final and intermediate outcomes as well as indicators for interventions found as part of the MDGs (as with the "percentage of births attended by skilled health personnel") as well as major causes of morbidity and mortality.

Figure 2. Paths to MCH Outcomes



Source: IEG.

OUTCOMES

13. Outcomes (columns) with triple asterisks in Table 1 are goals or sub-goals of the MDGs. The columns are arranged according to the "continuum of care" from the health literature. Tracing out the lifecycle in relation to the outcomes in Table 1 begins with family planning (the first element in the MDG5 section), which has the potential to reduce maternal, newborn, infant, and child deaths and the frequency of unsafe abortions by reducing pregnancies. For the duration of the pregnancy, antenatal care by skilled health personnel can improve healthy practices and prevent maternal malnutrition, anemia, and malaria and can reduce the risk of mother-to-child transmission of HIV. Tetanus immunization of pregnant women can potentially reduce the risk of neonatal deaths from infection. Appropriate care by skilled health personnel at birth can detect and manage complications to reduce maternal and perinatal morbidity and mortality. Following birth, appropriate postpartum care can reduce frequency of complications for the mother, such as hemorrhage and infection, and ultimately reduce maternal mortality and morbidity. Postnatal care can also halve neonatal mortality (WHO 2010). Over the course of infancy and childhood, interventions promoting nutrition, micronutrients, and breastfeeding can improve anthropometric and cognition outcomes. Provision of integrated management of childhood illnesses along with immunization and insecticide-treated bed nets can reduce a range of health risks, such as measles, meningitis, pneumonia, water-borne diseases, helminthes, and malaria.

Table 1. Impact Evaluations Categorized by Intervention, Outcome

Interventions			Outcomes and Indicators	MDG5: Improve maternal health												MDG4: Reduce child mortality															
				Sexual and reproductive health				Pregnancy			Birth		Postpartum			Pregnancy		Newborn		Infancy and childhood											
				Family planning: coverage and usage	Contraceptive prevalent rates	Frequency of unsafe abortion	Fertility & Birth Rate: Adolescent & Total	Antenatal care visit by skilled health personnels: coverage and frequency of usage during	Malaria: incidence, prevention (bednets) and treatment	Maternal nutrition & anemia	**Percentage of births attended by skilled health personnel*** **	Percentage of obstructed complication receiving care	Postpartum care visit: coverage and usage	Frequency of postpartum complications (hemorrhage, infection/sepsis, high blood	**Maternal mortality ratio*** **	Percentage of PMTCT diseases incl. HIV	Percentage of pregnant women who are fully immunized against tetanus	Postnatal care visit: coverage and frequency	**Neonatal mortality rates*** **	Percentage of children (<1yr, <5yrs) immunized against measles, meningococcal,	Malaria: incidence, prevention (bednets) and treatment	Water-borne diseases**: incidence and treatment	Acute Respiratory Infection	General /Other sickness: incidence and treatment	Anthropometrics (birth weight, Z-sc	Percentage of infants under 6 months breastfed	Diet: Nutrition and caloric intake	Micronutrients (hemoglobin, vitamins, etc.)	Helminth infections: incidence & treatment	Cognition	**Infant mortality rate*** **	**Under-5 mortality rate*** **
Governance	Government/ Governance	Strategy planning, policy					58	19 R		R	19 R				58,68				19,58	R				U	R	R		R			58	58
		Public financial management																													67	67
		Regulation/Licensing																														
		M&E/Accountability	29,41 N					29,41 N			N	29,41								N					29 N						29 N
		Multi-sector coordination						R		R	R									R,S		S,W		S	R,W	R		R,W	W	W		
		Public Private Partnership	AO,AX					AO,AX			AX									9 AO,AX	65	AX				AX		AX			AX	
Provision	Donor support	Coordination													β	β									β					β	β
		Integration																														
	Health Sector	Service delivery* Delivery modality	29, 63,69	22,23,34,35,36,44,53,		22,23,63,69	7,8,14,15,29,34,35,36,	44	7,8,44,46R	14,15,29,34,35,36,44,		53,54Y		46,47,77,78,79			44,50,51Y	44,50,51,53,54	14,15,45,46,50,51,77,8	10,11,44,69R	44,65	37,44,48,49M,W,Y,AI		44,46,50,51AI	37,38H,M,O,R,T,W	7,8.48.49,52,53,54	H,Y,AI	37,38,44H,M,R,W,Y,A	38W,AU	H,W	45,56,69,78,79,81	29,56,
		Service packages	70	70		70	50,51			50,51Y		Y					50,51Y	50,51	50,51	70S		M,S,W,Y,AI		50,51S,AI	H,M,T,W,Y,AH,AI	H,Y	H,Y,AI	H,M,W,Y,AI	W	H,W	70	α
		Health infrastructure					E,F			E,F										B,F,S		F,S	F	S	F,S							E
		Service management	AX				AW,AX			AW,AX				68			AW	AW		AW,AX		AX		AW		AX		AX				
		Health Workforce	55			55,58	47,66			12,47,52,55,66,77			12	47,58,77,78,79				66	58,77,80,81,82							52					55,58,78,79,80,81	55,58,80
		Health Information System																														
		Medical Products & Technologies					51			51							51	51	51		65			51	64 V,AJ				AU			
		Health Financing	AO				19,30,31,32		30,31	19,30,31,32							32 AW	30,31 AW	19	30,31,32 B,F,AO,AW		D,E,F,Z,AM	F	C,Z,AW	30,31,43 F			30,31			43 Z	E,AM
	Other Sector	Water/Sanitation																				1,3,6,20,27,60		C	61 F,P		α		AU			17, 21,42 E, AK,AM
		Education/Training		AD		AD,AE						ξ								AL		W			2 G,O,W,AA,AL			W,AL	W	2,28 G,W,AL		
		Income generation / Labor mkt / Personal or business		24,72,73,74		24 I																			62,75,76						71	71
		Energy																									α				85	
		Agriculture/Food Security																		AL					18 A,G,O,AA,AL,			AL		G,AL		
		Transportation infrastructure																														
Using	Household/ Individual	Ability to pay Income increasing	AF	AD,AF		K,AC,AD,AE,AT	19 AF	4	X	19								X	19	11 K,L,AC,AF	4	K,L	L	X,AB,AC,AF,AQ,AY	L,X,AB,AF,AG,AQ		L,AB	X,AB,AF,AQ		X,AB,AQ		
		Household health spending	39,40	34,35,39,40		58	34,35,57,59	4,83		34,35,57,59				58				57	58	57	4			J	64 J,AS						58	58
		Knowledge/Information	39,40,55	33,34,35,39,40,53,54		55 AP	7,8,14,15,33,34,35,46	4	7,8,46R	14,15,33,34,35,46,52,		53,54Y		46			7,8Y	53,54	14,15,46,80,82	R	4,26	37,60M,W,Y,AI		46AI	37H,M,R,T,W,Y	7,8,52,53,54	H,Y,AI	37H,M,R,W,Y,A	W,AU	H,W	55,80	55,80
		Household environment & infrastructure																				25,84	84		25,84 η		θ	25	84	25	84	
		Transportation					16			16									16													
Unique World Bank Impact Evaluations				4	3	0	7	8	0	2	7	0	1	0	0	0	2	2	0	14	0	18	2	14	26	5	5	12	2	7	2	4
Unique Impact Evaluations				13	20	0	15	34	3	8	30	2	4	1	8	1	8	11	14	22	4	31	3	20	44	11	7	18	4	10	20	19
Total Impact Evaluations				18	29	0	20	57	4	14	57	2	8	1	16	1	14	17	27	34	8	51	4	30	75	25	14	37	11	16	26	24
Total Intervention Types				10	7	0	9	15	4	6	15	1	4	1	7	1	6	9	10	12	6	11	4	12	17	8	7	11	8	8	13	13

1-2 3-5 5-7 8-10 >10

*Incomplete; Categories for use in mapping existing impact evaluations **Including diarrhea, dysentery, cholera, etc.
*** MDG Target Indicators. Codes: Letters – WB IEs Greek – Other IFI IEs Numbers – Other External IEs

INTERVENTIONS

14. In their efforts to affect the MCH outcomes listed above, developing countries and the international community have invested in a wide variety of interventions, given in the vertical axis in Table 1. For this study, IEG categorized these interventions into three groups: government/governance (stewardship), provision (supply), and utilization (demand) as shown in Table 1. The government/governance category has six intervention types that address the stewardship roles of the government: strategy planning and policy, public financial management, regulation/licensing, monitoring and evaluation/accountability, multisector coordination, and public-private partnership. The provision category is further grouped into three sub-categories: donor support, the health sector, and other sectors. The health sector, as defined by the WHO (WHO 2007), consists of the health system's "building blocks": service delivery, health workforce, health information system, medical products and technologies, and health financing. The production of MCH outcomes is complex, and other sectors which may affect MCH include education, transportation, and water and sanitation. Finally, the utilization category has four intervention types (ability to pay, knowledge/information, household environment, and infrastructure and transportation) that address barriers to households' and individuals' healthy and health-seeking behaviors.

EXISTING LITERATURE

15. The many actors working in MCH generally share a conventional wisdom that relatively low-cost interventions are available to improve maternal and child health. These include skilled attendance at birth, emergency obstetric care, antenatal and postnatal care, safe abortion services, improved family planning services, and community-based services. Furthermore, these interventions are believed to be more effective when delivered as packages throughout the continuum of care (PMNCH 2010). Effectiveness of these interventions is thought to be constrained or enhanced by contextual factors including economic growth, local culture and practices, public policies, and the functionality of health systems such as service delivery, health workforce, adequate equipment, drugs and medicines (PMNCH 2010).

16. MCH interventions are exceptionally cross cutting across sectors (as opposed to, say, interventions aimed at increasing agricultural water supply). Moreover, the related literature is quite dense and—at least for core health-sector interventions—includes a sizeable number of impact evaluations. Despite the richness of the literature, there are relatively few systematic reviews on MCH that cover rigorous impact evaluations.[6] One survey of 22 systematic reviews[7]

[6] Impact evaluation is valuable because it can capture the causal relationship between interventions and outcomes (for more details, see Box 1 on page 15) while other designs are less suitable to identify the causal relationship as they cannot fully eliminate confounders.

[7] Systematic reviews produced outside the World Bank were retrieved from the 3ie database of systematic reviews.

reveals that the majority of them include evidence of mixed reliability in establishing causality as they include both impact evaluations and other less rigorous assessments (case studies, before-after studies with no controls, qualitative evaluations, and observational studies), often without conveying the relative credibility of the evidence. While this yields a large set of studies, the internal validity of non-IE study designs is limited in the ability to firmly establish causal inference.[8] Additionally, among the few studies with impact evaluations, virtually all of them take an intervention-based approach (as opposed to an outcome-based approach),[9] and most of these focus on clinical interventions rather than interventions addressing social or systemic issues of delivery and use.

17. In the proposed study, rather than examining the effectiveness of particular medical products or technologies, IEG will choose strategic outcomes and synthesize the evidence from impact evaluations across interventions aimed at improving those outcomes, be they through increasing provision or use of health-improving services and behaviors.[10] IEG has begun collecting impact evaluations for this study, including the 144 IEs coded in Table 1; we intend to engage in a far more detailed literature search and will make the resulting bibliographical and coding data available at the time of the final report. Data permitting, this approach may allow comparison of relative magnitudes of effectiveness across interventions to help understand which interventions have the largest impacts on the desired MCH outcomes.

Purpose, Objectives, and Audience

18. The World Bank's involvement in efforts to improve MCH outcomes is part of a renewed global consensus surrounding maternal and child health. This collective push provides an opportune moment to take stock of current knowledge on the effectiveness of MCH interventions and the constraints to progress.

19. The Bank is one of 41 bilateral and multilateral development agencies that signed the 2009 Global Consensus on Maternal and Neonatal Health (MNH), which provides a checklist of policies and prioritized interventions to improve MNH outcomes. The Bank is on the board of

[8] In particular, the number of rigorous IEs included in these systematic reviews has been low (the only exception being systematic reviews of water, sanitation, and hygiene; conditional cash transfers; and community-based health and nutrition programs—the latter two already included in past systematic reviews by IEG (IEG 2010, 2011). Of the systematic reviews surveyed (and with the three exceptions noted above, interventions with a relatively large number of IEs (>10) included a disproportionately high number of IEs evaluating medical interventions and/or done in developed country contexts.

[9] The two studies that required all included studies to have measured an outcome only looked at specific intervention categories. One of these focused on impact of water, sanitation, and hygiene interventions on diarrhea morbidity (71 IEs) and the other study was on impact of community-level interventions on maternal mortality (14 IEs). The quality of IEs in the latter study was highly variable.

[10] The focus will be on interventions with both clinical and non-clinical aspects, or those having only non-clinical content. On the other hand, interventions with an exclusive medical or clinical focus will not be emphasized.

the Partnership for Maternal, Newborn, and Child Health (PMNCH), aimed at raising awareness and advocacy related to reproductive and child health. It also participates in several recent initiatives, among them the Global Campaign for the Health MDGs, focused specifically on maternal and child health, and the High-Level Task Force on Innovative Financing, which generates awareness and options to bridge national financing gaps for MDGs 4 and 5. Internally, the World Bank introduced the Reproductive Health Action Plan (2010-2015) to operationalize the reproductive health components of the Bank's 2007 Health, Nutrition, and Population (HNP) Strategy and bring these components to the forefront of the socioeconomic development agenda.

20. During FY2005-10, the World Bank approved 399 operations (21 percent of all operations)[11] coded as having any HNP thematic content; HNP-specific commitments in these projects amounted to $14 billion (7 percent). These operations were mapped to 13 sector boards—evidence of the extent to which HNP themes cut across sectoral lines. The HNP and Social Protection sector boards accounted for 36 percent and 12 percent of total projects.[12] Around half of the Bank's approved HNP-related investments in FY2005-10 were concentrated in health systems strengthening, while less than one-fifth were in the reproductive and child health areas corresponding to MDGs 4 and 5 (Figure 3).[13] However, existing classification systems do not adequately capture the Bank's investment and effort in MCH to allow for disaggregation. For instance, health systems interventions (financing, organization and management of service delivery, and health workforce) address issues such as affordability, quality, and accessibility of health care, which affect both maternal and child health outcomes. As part of its broader MCH work plan, IEG will undertake a review of relevant elements of the World Bank's portfolio to identify MCH interventions with explicit or implicit MCH objectives using the MCH intervention classification shown in Table 1.

21. The purpose of the systematic review proposed in this approach paper is to provide a thorough assessment of the changes in selected MCH outcomes attributable to the array of potential interventions, using evidence from rigorous impact evaluations. Likewise, the review will seek a deeper understanding of the barriers to progress as well as the effectiveness of

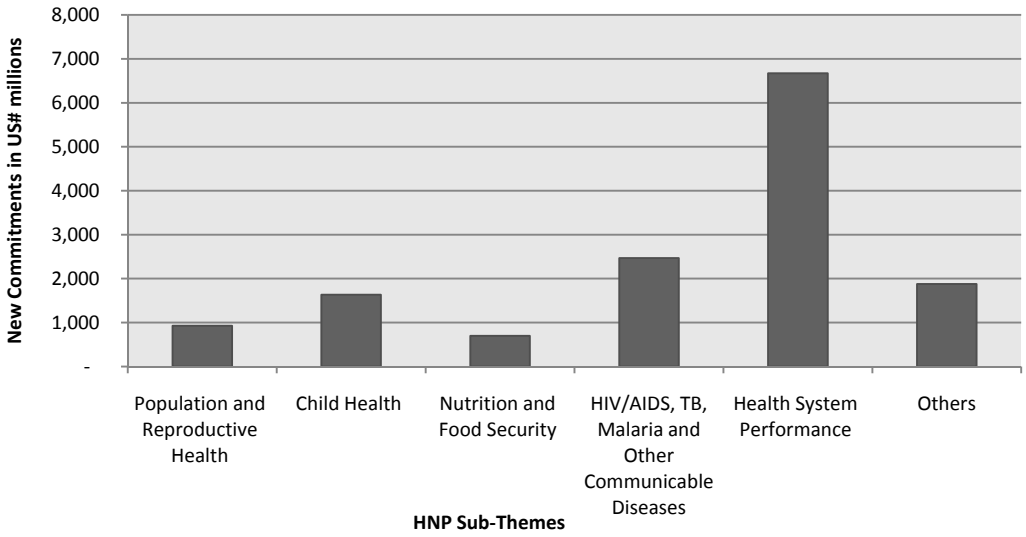
[11] Weighting number of projects by share of HNP theme shows that nine percent of Bank projects had HNP content.

[12] Fifty-seven percent and twelve percent of HNP commitments (weighted) were in projects mapped to the HNP and Social Protection sector boards respectively.

[13] Sub-theme Population and Reproductive Health is for activities that reduce maternal morbidity and mortality and improve reproductive health (such as providing access to family planning services and contraceptives, caring for women during and after pregnancy, providing essential and comprehensive obstetric care, and promoting the reproductive health of adolescents). Sub-theme Child Health is for activities that improve the health status of children, and reduce child morbidity and mortality (such as specific disease programs, integrated management of childhood illness, immunization/vaccination programs, neonatal and newborn care, and school- or other community-based child health programs). Interventions related to improving children's nutritional status (such as breastfeeding, micronutrients, and food aid) are assigned to sub-theme Nutrition and Food Security. Source: http://intranet.worldbank.org/WBSITE/INTRANET/UNITS/INTOPCS/0,,contentMDK:21872591~pagePK:51455324~piPK:51455326~theSitePK:380832,00.html#63

different interventions, to help identify and narrow key knowledge gaps to produce better health outcomes. The review process will classify and evaluate existing knowledge, providing comparisons across interventions and contextual understanding of both successful and unsuccessful interventions, where available, to generate key lessons, guide policy decisions, and orient future research. The synthesis of research-derived evidence in MCH will be a valuable exercise and an important tool to advance progress in these critical areas.

Figure 3. Distribution of World Bank Commitments by HNP Sub-Themes (FY2005-10)



Source: Business Warehouse.
Note: Based on World Bank commitments for IBRD/IDA projects approved between FY2005-10. "Others" represent HNP sub-themes Other Human Development, and Non-Communicable Diseases and Injuries.

22. The results of the systematic review will have use both inside and outside of the World Bank. Practitioners within the Bank, members of the aid community, and governments and organizations in developing countries will benefit from additional knowledge of effective interventions to advance MCH outcomes. Identification of areas with a thin evidence base may guide the future work of researchers. Further, the focus on impact evaluations and inclusion of studies both internal and external to the Bank create a natural audience among bilateral and multilateral aid organizations and nongovernmental organizations engaged in improving maternal and child health. Among these, the Japan International Cooperation Agency (JICA) has demonstrated particular interest in IEG's MCH research and has arranged funding for elements of this evaluation.

23. IEG is well positioned to undertake this exercise as part of its mission to distill lessons from development interventions at the country and global levels. Taking rigorous reviews of evidence from impact evaluations is an emerging area of practice for IEG, which has recently produced systematic reviews in social safety nets and nutrition. In addition, IEG undertakes objectives-based evaluations, and three such evaluations complementing MCH are planned for

the next fiscal year on health systems, water and sanitation, and a review of the Bank partnership with GAVI.

24. The indicators to assess if the study objective has been achieved include: (i) number of page views and downloads of the report from IEG's online presence (ii) use of study findings in other IEG evaluations of topics that affect MCH outcomes, e.g. health systems; (iii) use of study findings to inform broader MCH work at IEG; and (iv) incidence and range of outreach efforts to disseminate results of the systematic review. For additional details, please refer to the section on Expected Outputs and Dissemination (page 17).

Evaluation Questions and Coverage/Scope

25. This evaluation will conduct a systematic review on select topics in maternal and child health. As the universe of the MCH intervention/outcome is complex and dense, IEG will limit the scope of the review to topics of greatest relevance— those that could contribute to achieving MDGs 4 and 5 more effectively and for which sufficient evidence exists. The aim is to review a narrow set of topics in sufficient detail to make the report useful for operations. IEG proposes a "vertical cut" investigation of one child health outcome and one maternal health outcome. This will enable IEG to provide an innovative and tractable entre to the impact evaluation evidence of the many multisectoral interventions on MCH, and to precipitate a comparison of relative effectiveness of and, potentially, the tradeoffs between this array of interventions.

26. Specifically, IEG proposes assessing the portfolio of interventions leading to improvements in (1) child mortality rates (neonatal, infant, and under five) and (2) maternal mortality rates[14]. In part because MMR measurement can be unreliable, IEG also proposes a vertical and horizontal evaluation of (3) births attended by skilled health personnel—that is, examining interventions which affect skilled birth attendance (SBA) as well as outcomes affected by skilled birth attendance.

27. This selection, while limited, provides balance between a maternal and child focus and between the outcome-based and intervention-based analysis. The outcomes selected carry the advantage of coming directly from the MDGs and capture the ultimate concern of the MDGs in this area: the incidence of death among mothers and children. Functionally, they capture both intermediate and final outcomes as they represent a "reduced form" or "net effect" of other outcomes including major causes of mortality and morbidity and all potential pathways from the intervention space to these final outcomes. As an explicit sub-goal of the MDGs, we also include skilled birth attendance rates as an indicator in our outcome-based (vertical) analysis to study interventions which may positively affect SBA. On the other hand, because birth attendance is

[14] IEG does not examine maternal mortality itself as a principle objective for the study because of concerns of reliability of MMR measurement.

itself an intervention—and one which affects both neonatal and maternal mortality—the study will also treat SBA at the intervention margin to examine the evidence between birth attendance and other biological outcomes, including neonatal and maternal mortality, postpartum complications, and low birth weight.

28. The selection of these outcomes followed a multistep process. First, the team examined the existing literature describing challenges in maternal and child health. From this, the taxonomy in Table1 was developed relating the range of potential interventions both inside and outside traditional health systems to maternal and child health-related outcomes. Next, the matrix was populated with impact evaluations internal to the World Bank, those from other multilateral organizations, and other external impact evaluations. The team then counted the number of interventions with at least one impact evaluation in each outcome category, as well as summing the total number of impact evaluations in each outcome. This was followed by a search for existing systematic reviews on MCH topics. We then identified areas with a high concentration of impact evaluation evidence as well as gaps in existing reviews. Throughout the process the team met with MCH and health experts in the HDN anchor, Development Economics department (DEC), and Development Impact Evaluation initiative (DIME) to solicit opinions on the most important challenges facing MCH and promising areas of focus. These consultations influenced the selection of the chosen topics and approach of the proposed evaluation and led to an eventual consensus to focus on how the array of interventions affects selected outcomes. To our knowledge, this approach is unique in the literature of reviews on MCH impact evaluations.

29. Tasked with reviewing the Bank and non-Bank impact evaluation literature, the IEG team will synthesize evidence on the impact of MCH-focused interventions in specific outcomes. To the extent the data allow, this study will address the following questions regarding interventions aimed to improve the selected MCH outcomes:

- **IE Incidence:** What types of impact evaluations have been performed and for which programs?
- **Average Impacts:** What does the evidence reveal about what works, and under which conditions? What types of interventions are associated with larger effects? Is there any evidence of complementarities across different intervention types? For birth attendance, what is the evidence that birth attendance affects maternal mortality, low birth weight, and other MCH-related outcomes? Are the magnitudes of effects meaningful in making absolute gains in the MDG objectives?
- **Heterogeneity of Impacts:** Are the benefits equally distributed across beneficiaries or are there heterogeneous effects across income, gender, and locality of recipients or in scale of implementation of the intervention?
- **Cost Effectiveness:** To the degree that credible cost data are available, what are the most cost-effective interventions?

- **External Validity:** What evidence is there for effects to be generalized to other settings? What are the important contextual factors which may influence success of the projects?

30. Data for the systematic review will come from completed (or nearly completed) impact evaluations on interventions with outcome data on the chosen MCH metrics. A screening process will be applied to identify studies eligible for inclusion in the systematic review[15]. Such studies must have an appropriate control or comparison group from which can be constructed a credible counterfactual. Study designs may include baseline and endline or only endline data, but both treatment and control data must be collected contemporaneously.

31. Studies to be included in forming the database for the systematic review will have one or more of the following empirical strategies to establish internal validity (see Box 1 for further detail).

- Use known allocation rules, including randomized control trials (RCTs) or assignment based on a cutoff (as in regression discontinuity designs).
- Use multivariate regression to control for confounding variables together with techniques to overcome potential selection bias and other unobserved biases, as with instrumental variables and differencing strategies.
- Use matching methods to match treatment cases with observably identical control cases as with propensity score techniques.

32. The team will assess the credibility of the results of each of the impact evaluations by using its professional judgment of how well the evaluation dealt with challenges to the internal validity of the study. The team will also code elements of the evaluation deemed critical for the external validity of the study, or the application of its findings to alternate settings. These elements will include place, locality, scale, time, program length, and social contextual elements.

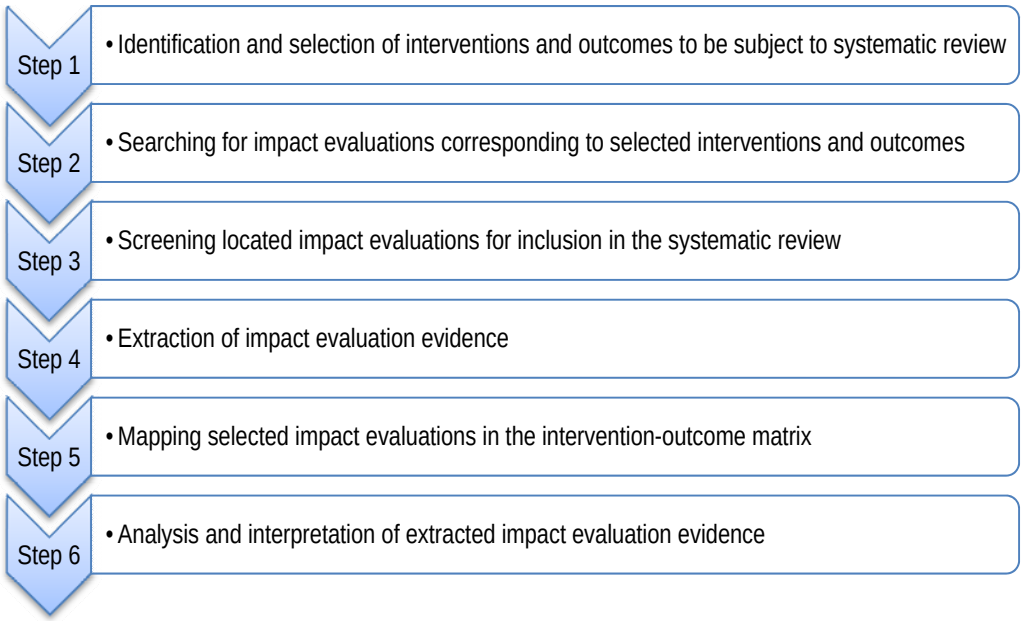
Evaluation Design and Evaluability Assessment

33. To credibly answer the aforementioned questions, the study will execute a structured methodology, which is based on a review of guidelines used in previous systematic reviews at the World Bank (IEG 2010, 2011) as well as protocols developed by the Cochrane Collaboration.[16] In the proposed study, impact evaluation evidence will be identified and synthesized by applying the (sequential) procedures shown in Figure 4 below.

[15] We acknowledge that some types of interventions are more amenable to IE evidence than others. Though this fact will limit comparisons, we do not believe it will bias them. Rather, when making comparisons across interventions the team will indicate that such comparisons are only relevant for interventions in which there is comparable evidence.

[16] http://www.cochrane.org/training/cochrane-handbook

Figure 4. Methodology for the Systematic Review



Source: IEG

34. **Step 1: Identification and selection of interventions and outcomes:** The interventions and outcomes to be included in the proposed review—including its conceptual underpinnings and the process by which these have been identified, classified, and selected—are discussed in detail in the preceding sections and illustrated in Table 1.

35. **Step 2: Searching for impact evaluations corresponding to selected interventions and outcomes:** Impact evaluations may be sourced from inside or outside of the World Bank. Various repositories that contain relevant studies will be searched to minimize publication and language bias. These include: (i) search of IE databases (such as DIME, 3ie, J-PAL, IPA,CENTRAL); (ii) keyword search in bibliographic databases (EconLit, MEDLINE/PubMed, ArticleFirst, Popline, ProQuest-ERIC, Dialog, ScienceDirect, Google Scholar, and Social Sciences Citation Index); (iii) review of World Bank project documents (PADs/ ICRs/latest ISR/aide-memoires) on the Operations Portal; (iv) review of reference lists in other systematic and/or narrative reviews[17] (as found on 3IE, World Bank intranet, Cochrane Library, and others); (v) search in conference abstracts and proceedings (e.g., in ProQuest-ERIC for select conferences such as those convened by the World Bank, IZA, BREAD, prominent professional economics/public health associations); (vi) search websites of donor organizations (multilateral and bilateral institutions) and other institutions involved in relevant research (such as Population

[17] The team will also take heed from the search strategies used by systematic reviews that have compiled a large body of IEs to ensure that as rich sources of IE information are not otherwise ignored.

Council, IFPRI, RAND, IZA, and others); (vii) contacting experts highly familiar with impact evaluation literature in selected topics to fill gaps.

36. A search strategy of search term categories, search terms within each category, and search fields will be developed and pilot tested in EconLit and ScienceDirect before starting the electronic search of the bibliographic databases outlined in paragraph 35. The search strategy will be revised as necessary to accommodate the unique functionality of each database.

37. **Step 3: Screening located impact evaluations for inclusion in the systematic review.** The universe of publications captured with the preceding search strategies will be screened for their relevance to the review according to clearly defined and objective inclusion/exclusion criteria:

- *Language:* The search will first focus on studies in English only. If time and resources permit, the search may be extended to include studies in Spanish, French, and Portuguese
- *Publication date:* Studies published since January 1, 1995, and after will be included.
- *Location:* Studies of interventions that occur in a low-income or middle-income country (based on World Bank classifications) will be selected.
- *Unit of analysis:* Only studies based on individual micro-data will be included. Conversely, studies that use regional or national time series data will be excluded. Survey articles will be mined for the source studies they survey but will not be included directly.
- *Interventions:* Studies that evaluate a general public policy intervention or a purposeful time-limited program (or a component of the program) and which fit with the interventions specified in Table 1 will be included. If the intervention is aligned with those given, and it targets a broad population, *but* the study does not report impacts separately for mothers/children, specifically for child mortality and birth assistance, it will be excluded.
- *Outcomes:* Studies that evaluate outcome indicators specified in Table 1 of child mortality (neonatal, infant, and under five) and birth attendance will be included.
- *Study design:* Studies that evaluate interventions based on quantitative experimental or quasi-experimental IE design with a well-defined counterfactual will be selected (Box 1).
- *Internal validity:* Studies that adequately test or discuss identification assumptions corresponding to the IE method used will be included. The assessment criteria will be the same as used in recent evaluation of the relevance and effectiveness of WBG IEs (IEG 2012).
- *Robustness of findings:* IEs demonstrating robust findings (by trying several specifications, try various models, use other datasets, sensitivity analysis, or similar approaches) will be included.
- *Peer Review:* IEs that have been subjected to peer review (for example, published in a quality journal or a book) or are in the process of eliciting feedback from the research community (such as working papers or papers presented in conferences) will be included.

38. The inclusion/exclusion criteria will be applied in the following sequence: title review, abstract review, full text review.[18]

Box 1. Impact Evaluation Design

The net impacts of a program are calculated by comparing post-program experiences of beneficiaries with what would have happened had they not participated in the program. Since the latter cannot be observed, the key to impact evaluation is constructing a credible counterfactual—a control group that is truly comparable to the treatment group. There are two main techniques for formulating a counterfactual: experimental and quasi-experimental. Experimental evaluations require selection of treatment and control groups prior to the intervention. Through randomization, observable and unobservable characteristics of the two groups should not differ on average, such that any difference in outcomes can be attributed to program participation. In quasi-experimental studies, treatment and control groups can be selected before, during, or after the intervention. In order to obtain unbiased estimates of program impact, any differences in the characteristics of the control and treatment groups that might affect the outcome of interest must be accounted for using econometric techniques. Quasi-experimental techniques include matching, difference-in-differences (DID), instrumental variables (IV), regression discontinuity (RD), and multivariate regression that control for observable differences where unobserved characteristics are believed to be immaterial.

Source: Betcherman and others 2004

39. **Step 4: Extraction of impact evaluation evidence:** The types of information to be extracted from these studies will pertain to: (i) program impacts (such as coefficients on the treatment indicators, statistical significance, and the like); (ii) intervention content, rationale, and duration; (iii) program design and delivery features of the intervention (e.g. where, by whom and to whom—age / gender / income / locality—is the program being delivered); (iv) distribution of program impacts across different beneficiary sub-groups (for example by socioeconomic status, gender, age, location, length of exposure); (v) cost effectiveness;[19] (vi) other contextual factors that have implications for program performance and external validity, including scale; (vii) IE methods and technical quality.[20] Additionally, if time and resources permit, the team will explore opportunities to collect information on other country-level contextual factors (not discussed in the IE reports) that have impeded progress on MCH outcomes to strengthen the review's discussion of external validity.

[18] Inclusion/exclusion criteria, internal validity and robustness of findings, will only be applied to full text review.

[19] An earlier IEG evaluation (IEG 2012) has shown that cost-benefit information in IE reports is usually sparse. For this exercise, IEG will not collect primary data nor retrospectively estimate resource costs. To the extent this information is available in the IE reports reviewed, IEG will document information on costs and benefits- including the method used to arrive at these estimations. Where this information is not mentioned, IEG may attempt (if time and resources permit) to identify cost information based on review of program documents and/or other data sources for a sub-set of cases.

[20] The assessment criteria will be the same as used in recent IEG study on the relevance and effectiveness of World Bank Group IEs.

40. **Step 5: Mapping selected impact evaluations in the intervention-outcome matrix:** The team will map completed and ongoing IEs across the intervention space for the selected outcomes to identify the prevalence, variations, and gaps in evidence. While the results of ongoing IEs obviously cannot be subject to a systematic review, their inclusion in the data collection effort is intended to identify areas of emerging evidence. Consequently, topics where there is little evidence of a completed or ongoing IE will be flagged as knowledge gaps requiring further attention.

41. **Step 6: Analysis and interpretation of extracted impact evaluation evidence:** The team will analyze extracted IE evidence and contextual information from the reviewed studies and other sources. The findings will be summarized using a narrative synthesis. This synthesis will be focused on identifying patterns and seeking to address the questions enumerated in paragraph 29. The findings will also be clustered by country groupings (such as fragile countries, IDA/IBRD countries etc.) to the extent the data allow, as the challenges and levels of performance vary across these groups. In addition, the team will selectively incorporate available qualitative studies, as appropriate, to illuminate the context of interventions assessed by the impact evaluations. Wherever there are interventions with a sufficient number of studies included and outcomes measured in comparable ways, meta-analysis techniques will be used to derive conclusions about the relevant effectiveness of the interventions.

42. The proposed methodology has certain limitations and faces some constraints[21]. There are challenges with comparing results across studies as the estimation assumptions required for a meta-analysis *per se* are unlikely to be met. Rather than give aggregate point estimates in such cases, the study will highlight observed trends. Second, the team's ability to compile a comprehensive inventory of IEs could be constrained by lack of access to non-subscribed databases as well as by limiting the search to studies published in select languages. This concern may be more serious if details of ongoing IEs are more available from some institutions than others. While not all of these potential biases can be addressed, the study will mitigate some of these concerns by searching for studies in many different types of databases and contacting experts. Since evidence from ongoing IEs is only used for mapping analysis and not synthesis of evidence, their relative unavailability is less of a concern.

Quality Assurance Process

43. The draft evaluation report will undergo a thorough peer review process. IEG has secured the services of peer reviewers from within and external to the World Bank to assess and make suggestions for improving the accuracy, credibility, and relevance of the report.

- Jere Behrman, Economist, University of Pennsylvania

[21] Further details on the search, selection, and coding criteria are available upon request.

- Monica Das Gupta, Senior Demographer, DEC
- Maureen Lewis, Adviser, PRMPS

Expected Outputs and Dissemination

44. The primary output of this exercise will be a report which will synthesize and summarize IE evidence in selected maternal and child health topics. Beyond the primary output, IEG will develop briefs, presentations, and other output formats as appropriate to reach key audiences for the evaluation. Beyond World Bank management and staff, key stakeholders include JICA, multilateral and other bilateral agencies, evaluation agencies, academia, and practitioners.

45. A secondary output of this study is the MCH intervention/outcome taxonomy with coding for relevant Bank and non-Bank impact evaluations. This will be useful for identifying knowledge gaps and guiding further research. As an example, this taxonomy will aid the IEG impact evaluation team to identify knowledge gaps in the MCH IE literature; this identification will contribute to the selection of topics in which to explore candidate projects for two original impact evaluations. The team has already fielded requests for the early version of this matrix from individuals in the Bank and the academy.

46. Outreach for this study will be conducted in two phases: (i) outreach during the study and (ii) outreach and dissemination after the study is complete. While the systematic review is in progress, the study team will engage with parallel IEG evaluations of health systems, water and sanitation, and the review of Bank partnership with Global Alliance for Vaccines and Immunization (GAVI), and seek opportunities to complement and coordinate with these efforts. In addition, the study team will engage with the anchor, DEC, and DIME from an early stage to solicit feedback, facilitate policy/operational relevance, promote complementarities, and cultivate interest in the work.

47. IEG will also implement an outreach plan once the evaluation is completed and publicly launched. IEG will publish and disseminate the main messages of the systematic review within the WBG and externally through face-to-face meetings, seminars, brown bag lunches, and conferences. The effort will target key stakeholders, particularly in the World Bank, JICA, and the donor and evaluation community. Dissemination will include presentations to staff at headquarters; presentations at relevant events organized by evaluation networks, donors, and think tanks; and presentations at professional conferences and other outreach activities to increase awareness and use of findings. In particular, the team will identify notable conferences or events relevant to this work and adjust the production timeline to allow for participation.

Resources

48. It is anticipated that the systematic review will take approximately 8 months to complete. IEG expects to submit the final report to CODE by February 2013.

49. Total costs of the report come to $373,000, including staff time, travel, and dissemination. Of this, approximately $144,000 will be chargeable to direct Bank Budget.

50. The team will be led by Jeffery Tanner and will consist of a health sector expert (consultant), a DEC researcher with health sector experience, a health expert seconded from JICA, a general economics researcher, a health economic researcher, and two interns.

Attachment 1

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Attachment 2

Evaluation Design Matrix

Key Questions	Information required	Information sources	Data collection methods	Data analysis methods	Strengths and limitations
IE Incidence: What types of impact evaluations have been performed and for which programs?	Number of IEs by type of intervention and outcomes; other IE characteristics (such as location, design, year, completed/ active)	Bibliographic/ non-bibliographic databases, project documents, institutional and conference websites, other systematic reviews, experts	Electronic search, desk reviews, contact with experts	Descriptive statistics, Narrative synthesis	Strengths: Systematic search strategy, Extensive search of a large number of databases of published and unpublished, Engagement with experts to fill gaps. Limitations: Search limited to studies in select languages, Access to some databases is limited because they require paid subscription, Information on ongoing IEs is more available for some institutions than others
Average Impacts: What does the evidence reveal about what works, and under which conditions? What types of interventions are associated with larger effects? Is there any evidence of complementarities across different intervention types?	Impact estimates; standard errors; statistical significance; intervention content, objective, scale, and delivery features	IE reports	Coding of IEs (which have been screened for inclusion in the review)	Descriptive statistics, Qualitative Analysis, Narrative synthesis and/or meta-analysis	Strengths: Extensive search strategy and objective screening criteria to ensure that as many relevant IEs with credible design and robust results are included. Limitations: Variable density of IEs across interventions and outcomes space to do meta-analysis for all categories.
Heterogeneity of Impacts: Are the benefits equally	Type of beneficiary sub-group;	IE reports	Coding of IEs (which have been	Descriptive statistics,	Strengths: Extensive search strategy and objective screening

distributed across beneficiaries or are there heterogeneous effects across length of exposure, income, gender, and locality?	heterogeneous impact estimates; standard errors; statistical significance		screened for inclusion in the review)	Narrative synthesis and/or meta-analysis	criteria to ensure that as many relevant IEs with credible design and robust results are included. Limitations: Not all studies measure heterogeneous impacts or heterogeneous impacts on the same characteristics. This also makes meta-analysis infeasible in case of many interventions/ outcomes.
Cost Effectiveness: What interventions provide the best value for money?	Cost and benefit information	IE reports, Program documents and other data sources (if time and resources permit)	Coding of IEs (which have been screened for inclusion in the review), Desk review of other sources (if time and resources permit)	Descriptive statistics, Qualitative analysis	Strengths: Effort to document various types of cost and benefit information that is available. Limitations: Not all studies contain cost information nor do they all measure it reliably or consistently. Review of external sources is time-consuming and cannot be undertaken for all studies with missing cost information. Even if such an exercise is undertaken, measurement error issues may still exist.
External Validity: What evidence is there for effects to be generalized to other settings? What are the important contextual factors which may influence success of the projects?	Sample size and representativeness; Contextual factors (such as baseline outcome and treatment levels, length of exposure,	IE reports, health sector reviews, other relevant literature	Coding of IEs (which have been screened for inclusion in the review), desk reviews	Descriptive statistics, Qualitative analysis	Strengths: Review of both IEs and relevant literature to document factors pertinent to external validity discussion. Limitations: Variable density of IEs across interventions and

	country characteristics, implementation context; IE design; health sector characteristics; key barriers to MCH outcomes for country and/or sample of beneficiaries, etc.)				outcomes space, external validity is a complex topic and the information captured will have to rely on the quality and availability of information on relevant factors.