



Annotated Bibliography on Child Survival

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This bibliography expresses the research of Margaret Reilly McDonnell, who served as a consultant to the U.S. Coalition for Child Survival from February 2007 to May 2007. The bibliography was developed to help inform the Coalition's advocacy and communications campaigns to support the U.S. Global Commitment to Child Survival Act of 2007. Please send all comments or queries to Margaret at Margaret_mcdonnell@yahoo.com

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CONTENTS

I.	Advocacy, Policy, and Communication.....	1
	Messaging and Communication.....	1
	Call for Increased U.S. Support	2
	Aid Effectiveness	3
	Country-Specific Approach	6
	Behavior Change Communication.....	6
II.	Millennium Development Goals.....	8
III.	Child Health and Survival.....	10
	Overview of Child Health and Survival.....	10
	The Lancet Child Survival Series	11
	UNICEF’s State of the World’s Children Reports	15
IV.	Newborn Health and Neonatal Survival	18
	Overview of Newborn Health and Neonatal Survival	18
	The Lancet Neonatal Survival Series.....	20
V.	Maternal Health and Survival	25
	Overview of Maternal Health and Survival	25
	The Lancet Maternal Survival Series.....	25
	Maternal Health Interventions	28
VI.	Epidemiology, Causes of Death, and Treatment	32
	Nutrition.....	32
	Respiratory Illnesses	34
	Pneumonia.....	34
	Measles	34
	Water and Sanitation.....	35
	Diarrheal Disease	35
	Immunizations and Vaccines	36
	HIV/AIDS	38
	Malaria	39

I. ADVOCACY, POLICY, AND COMMUNICATION

Messaging and Communication

Strengthening the Message: Building Support for Maternal, Newborn and Child Health.

A joint publication of US Coalition for Child Survival, USAID, Global Health Council, Pan American Health Organization, Save the Children/ Saving Newborn Lives, Academy for Educational Development, GMMB, Student Campaign for Child Survival, White Ribbon Alliance, and the Health Communications Partnership (Fall 2005).

This document provides an integrated message platform for the maternal, newborn, and child health community to use when communicating with the American public about the need for greater commitment and action. It identifies five components of the most effective message platforms: (1) description of the problem using credible facts; (2) solution to the problem; (3) action steps to help solve the problem; (4) moral appeal to action; and (5) call to action.

It provides various message statements for each of the five components, which individuals and organizations can pull from to construct a complete message platform. At the end of the document, examples of fully constructed message platforms are provided as a guide.

Silvio Waisbord and Heidi J. Larson, *Why Invest in Communication for Immunization? Evidence and Lessons Learned.* A joint publication of the Health Communication Partnership based at Johns Hopkins Bloomberg School of Public Health/ Center for Communication Programs (Baltimore) and the United Nations Children's Fund (New York) (June 2005).

This report makes a case for revitalizing investments in communication for immunization. The authors consider communication in a broad sense, to include advocacy, social and community mobilization, and information, education, and communication (IEC) activities. As they argue, without well-planned, adequately funded strategic communication, immunization programs fall short of meeting and sustaining coverage goals. Communication is particularly needed to achieve vaccination coverage in hard-to-reach populations and to build trust in vaccines among those who question them.

The authors identify four major communication challenges that affect the success of immunization services; offer evidence of the contributions of communication activities; identify lessons learned; and suggest ways in which communication can continue to strengthen immunization programs. Specifically, stakeholders at the global, national and state levels need to advocate for immunization programs and persuade governments, donors and other actors to support vaccine programs vis-à-vis other health programs and priorities. In summary, the report concludes that communication is crucial to strengthening vaccine demand and supply and that the success of communication interventions depends on the resources allocated.

Tina G. Sanghvi, Deputy Director of Technical Division for BASICS II Project, “Reaching Every Child Now,” *Global HealthLink, The News Magazine of Global Health Council*, May-June 2004. <http://www.globalhealth.org>.

This article addresses many of the fundamental questions facing child survival, in a format that could be helpful while conducting advocacy. The author maintains that we know how to prevent six of the 10 million childhood deaths that occur every year and that new ways of reaching children are beginning to work in a growing number of countries. She reviews lessons learned as to what works (leadership and political commitment, sustained infusion of donor money and technical support, mobilizing communities to utilize critical health services) and how to overcome barriers (charismatic leadership and motivated front-line workers, streamlined regulations and guidelines, close monitoring and evaluation, incorporating community-oriented institutions).

The author also reviews the essential components of implementing and scaling up large-scale child health programs, but cautions that the approach needs to be adapted to each country’s unique context. As she concludes, “the return on every dollar spent on basic child health and nutrition interventions surpasses almost any other possible action we can take for saving lives.”

Call for Increased U.S. Support

Save the Children, “U.S. Leadership Needed to Finish the Child Survival Agenda: Sharper Focus and Further Funding Can Save Children’s Lives,” *Save the Children*, Issue Brief, September 2005. http://www.savethechildren.org/publications/issue-briefs/Issue_Brief_update_9-05.pdf

This issue brief argues that while significant progress has been made in child survival, the international community’s “Child Survival Agenda” remains unfinished and in some cases hard-won successes in saving children’s lives are being reversed. The brief highlights that we already know what works and emphasizes that we need a global renewal of commitment and greater focus on reaching those most at risk, which means: increased funding for services, saving newborn lives, protecting the health of mothers, and reaching the poorest. While U.S. leadership has played a critical role in providing funding and expertise for child survival thus far, funding levels have fallen far short of what is needed, which threatens to undermine the success achieved to date.

Save the Children concludes that the U.S. can maintain its position as a world leader by increasing funding and working with the international community to reach the poorest children, especially newborns and their mothers. “An increased commitment to saving these lives would send a clear message of U.S. concern for the health and well-being of mothers and children around the world.”

Global Health Council, “Getting Back to Global Child Health,” *Global Health Council*, Policy Brief, April 2006. http://www.globalhealth.org/images/pdf/publications/global_child_health.pdf

This policy brief provides a comprehensive overview of global child health: the state of children’s health today (cause of child deaths worldwide), what works (examples of cost-effective child health interventions), what it will take (in terms of donor funding and U.S. investment) and a call to action (recommendations for policies and actions for children under-five and for the early and teenage years).

Key messages: If children are “to contribute to the security, economic growth and civil stability of nations, they must be healthy, well-educated and survive to adulthood.” Malnutrition is an underlying cause of over half of all child deaths.

What works: Proven, low-cost health solutions could readily save two-thirds of the children who die each year, including three million newborns. Expansion of basic interventions such as vaccines, antibiotics, insecticide-treated bed nets, oral rehydration therapy, and vitamins could save six million lives each year;

What it will take: Full coverage of priority child health interventions could be achieved in low- and middle-income countries for an additional \$5.1 billion annually. U.S. government contribution to child health has been relatively stagnant over time, despite the tremendous growth in the under-five population. An increased investment in the health of children across the globe will be a cost-effective investment in the world’s future.

Call to action: Donors and international agencies should meet the challenge of providing \$5.1 billion annually for child health programs and maximize the impact of funds by prioritizing countries and regions where child death rates are the highest, utilizing evidence-based high-impact programs, focusing on newborn and maternal health interventions, and promoting and stimulating cognitive development.

Graphics: Pie graph of causes of child deaths (malnutrition in center); charts of cost-effective child health interventions; bar graph reflecting how “a little goes a long way” with vitamin A, ORS, and immunizations; a graph reflecting U.S. government funding, with separate lines for family planning, child and maternal health, infectious diseases, and HIV/AIDS (1997- 2006).

Aid Effectiveness

John Ricca, ORC Macro and Saul Morris, London School of Hygiene and Tropical Medicine. “13 USAID-Supported NGO Projects Saved 10,000 Lives in 4 Years: Applying the Bellagio Study Group Methodology to Real Project Data.” Study and PowerPoint presentation presented at Rolling Conference on Child Survival, December 13-14, 2005, London.

The objective of this study was to quantify the impact, in terms of child lives saved, of 13 recently completed USAID’s Child Survival and Health Grants Program-supported NGO projects. The researchers, who utilized the Bellagio Study

Methodology, found that 13 recently completed projects saved approximately 9,688 lives and reduced child mortality by an average of over 13 percent, with many achieving more than a 25 percent reduction. Each of the projects in the top quartile of this group saved over 1,000 lives, and the top half of these projects reduced under-five mortality rates by 16 to 34 percent. The top three projects cost only \$1.43, \$3.95, and \$4.84 per beneficiary; and \$217, \$486, and \$935 per life saved.

Through extrapolation, it is projected that the current portfolio of 67 projects will collectively prevent 74,000 to 97,000 child deaths and millions of serious illnesses during their four-to-five year project life cycles. The researchers conclude that USAID-supported NGOs have high impact at low cost, particularly as they are implemented through integrated community-based delivery mechanisms that have been proven to increase equity and have sustainable impact.

Prachi Mishra and David Newhouse, “Health Aid and Infant Mortality,” *IMF Working Paper* (April 2007). <http://www.imf.org/external/pubs/ft/wp/2007/wp07100.pdf>

This paper examines the relationship between health aid and infant mortality, using data from 118 countries between 1973 and 2004. The study determined that health aid has a statistically significant effect on infant mortality. More specifically, doubling per-capita health aid is associated with a two percent reduction in the infant mortality rate. For the average country, this implies that increasing per capita health aid by USD \$1.60 per year is associated with 1.5 fewer infant deaths per thousand births. The estimated effect is small, relative to the targets envisioned by the Millennium Development Goals.

Ruth Levine and the What Works Working Group with Molly Kinder, “Millions Saved: Proven Successes in Global Health,” *Center for Global Development*, Policy Brief, March 2007. http://www.cgdev.org/doc/millions/Millions_Saved_07.pdf

This policy brief introduces the book *Millions Saved: Proven Successes in Global Health* (<http://www.cgdev.org/section/initiatives/active/millionssaved>) and the updated edition, *Case Studies in Global Health: Millions Saved* (<http://www.jbpub.com/catalog/0763746207/>), which now documents 20 global public health initiatives that have saved millions of lives, improved millions more, and achieved both at relatively low cost. These case studies are offered as evidence that large-scale success in health is possible- countering the common view that health problems of the developing world are intractable, and that development assistance in health yields few benefits. These cases were selected based on five rigorous criteria: scale, importance, impact, duration and cost-effectiveness. For example, it highlights the eradication of polio in Latin America, the suppression of river blindness in Africa, the reduction of maternal mortality in Sri Lanka and the heading off of the AIDS epidemic in Thailand.

The authors offer seven lessons learned: 1) major health interventions have worked even in the poorest countries; 2) donor funding has saved lives; 3) saving lives saves

money; 4) powerful international coalitions have worked; 5) national governments can get the job done; 6) health behaviors can change; and 7) successful programs take many forms.

While there is no “recipe” for success, the authors highlight the common elements of these successful scaled-up global health programs: predictable, adequate funding from both international and local sources; political leadership and champions; technological innovation within an effective delivery system at a sustainable price; technical consensus about the appropriate biomedical or public health approach; good management on the ground; and effective use of information. The brief identifies the remaining long-standing challenges to be: inequality, HIV/AIDS, high child mortality and cardiovascular and chronic diseases.

Shaping policy for maternal and newborn health: A compendium of case studies. A joint production of JHPIEGO, Maternal & Neonatal Health, Save the Children, and Family Care International (2003). <http://www.jhpiego.org/resources/pubs/mnh/MNHPolComp.pdf>.

This collection of case studies was developed to highlight the different strategies and processes involved in influencing national policies on maternal and newborn health. Each case study presents the strategy that was used to achieve or influence policy change in a country or region, the details of the implementation process, and the changes that have been made in maternal and newborn health and healthcare as a result. Together these case studies offer insights into policy processes on many levels: the contribution of individuals as powerful agents for change; the importance of partnerships at all levels; and how both national and international organizations can work with governments to achieve positive change for safe motherhood and newborn health.

The case studies are grouped into four sections, as follows. The “Global Initiatives: Inspiring National Implementation” section highlights three examples of when international initiatives and global alliances influenced maternal and newborn health policies and programs at the country level, such as the impact of the global breastfeeding movement in Bangladesh. The “Building Commitment: Action for Policy Change” section highlights four examples of how national commitment can be translated into action through stakeholder participation, targeted advocacy, and local ownership, such as when pediatricians in India mobilized government support for advancing newborn health nationally. The third section, “Program Learning: Informing Policy Dialogue,” demonstrates how programming can influence national-level policy, drawing from cases such as when research regarding malaria during pregnancy informed policy dialogue and change in Africa. “The Power of Partnerships: Moving the Agenda Forward” section emphasizes the centrality of partnerships in the safe motherhood movement, highlighting Mexico’s National Safe Motherhood Committee.

Country-Specific Approach

Davidson R. Gwatkin, Shea Rutstein, Kiersten Johnson, Eldaw Suliman, Adam Wagstaff, and Agbessi Amouzou. "Socioeconomic Differences in Health, Nutrition, and Population in (Name of Country)." *The World Bank*. Washington, D.C. (2007).

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXTPAH/0,,contentMDK:20219043~menuPK:400482~pagePK:148956~piPK:216618~theSitePK:400476,00.html>

These 56 individual country reports are designed to serve as a source for basic health data, which can be used to identify and target health inequalities within specific countries. The data is drawn from 95 household surveys undertaken in 56 low- and middle-income countries by the Demographic and Health Survey project between 1990 and 2005. Each country report features estimates for each economically-defined 20 percent (quintile) of the population, covering approximately 120 indicators of health status, service use, behavior and health-related social development. This country-focused approach is intended to complement the overview report- whose principal tables each present data for a single indicator from all countries- by providing data in a form more easily used by policy makers and analysts concerned primarily with a particular country.

Behavior Change Communication

Renata Seidel, *Behavior Change Perspectives and Communication Guidelines on Six Child Survival Interventions*. A joint publication of the Academy for Educational Development and the John Hopkins Bloomberg School of Public Health/ Center for Communication Programs with support from the United Nations Children's Fund (December 2005). Found though: <http://www.infoforhealth.org/>.

This publication is addressed to those who want to incorporate behavior change and communication strategies into their child survival programs, as well as those who already plan and carry out such activities. It focuses on six major interventions (newborn health, childhood immunizations, diarrheal disease, malaria, acute respiratory infections, and nutrition) and key practices. It examines the challenges associated with improving these practices in developing country contexts and provides insight into how to design effective strategies.

Academy for Educational Development, *Seven Innovations: Contributing to Long-term Improvements in Health in a World of Short-term Commitments and Shrinking Funds* (April 2006). http://www.aed.org/ToolsandPublications/upload/Seven_Innovations.pdf

This document highlights several examples of efforts by AED to contribute to long-term improvements in health, despite funding challenges and short-term commitments. AED focuses on how individuals change, how societies change and how community solutions can be applied at a scale that will improve the health of large populations. This document focuses on seven major innovations designed to significantly change the way we do development: infant feeding and the prevention of

HIV/AIDS; launching maternal and newborn programs; working with private providers to help sick children; improving access to affordable health products such as insecticide treated bed nets; building community strengths to provide care during emergencies and beyond; strategic approaches to addressing tuberculosis; and how to navigate family planning with respect to cultural norms. The case studies are accompanied by practical and advocacy tools as well as strategies for scaling up various initiatives.

Graphics: Bar graphs of simulated risk for each of three infant feeding strategies; bar graphs of maternal and neonatal mortality rates by region in 2000; bar graph of care-seeking for young child illness among the poor by public versus private sector sources of care; a diagram reflecting a path of ideal behaviors in TB control; many photos.

II. MILLENNIUM DEVELOPMENT GOALS

United Nations, *The Millennium Development Goals Report* (2006).

<http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDGReport2006.pdf>

This report provides an update as to where the world stands in achieving each of the eight MDGs. It provides data on progress worldwide and by region, revealing that progress has been made (particularly towards achieving universal primary education and lowering HIV infection rates in some sub-Saharan countries) but that “there is still a long way to go to keep our promises to current and future generations.” (Jose Antonio-Ocampo, Under-Secretary-General for Economic and Social Affairs)

Graphics: Bar graphs reflecting progress for every target measure per goal by region.

Adam Wagstaff and Mariam Claeson, “The Millennium Development Goals for Health: Rising to the Challenges.” *The World Bank*. (2004). http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/07/15/000009486_20040715130626/Rendered/PDF/296730PAPER0Mi1ent0goals0for0health.pdf.

This report focuses on the health and nutrition MDGs, assesses their progress to date, and analyzes the prospects of achieving these goals. The authors report that progress has been mixed: nearly 80 percent of the world’s population lives in a country on track to reach the malnutrition target, whereas progress in reducing child mortality is lagging in many regions, particularly Sub-Saharan Africa. They warn that progress in the second half of the 1990-2015 time frame will not necessarily be swifter, but they maintain that accelerating progress towards achieving the health MDGs is possible in all regions and countries.

However, additional resources, while necessary, will not alone be sufficient in reaching the MDGs. Policies and institutions need to be improved in many countries, and government health spending should be more targeted. Unfortunately, many governments lack credible and resource-backed strategies for the prevention, treatment, and control of communicable diseases, and some countries spend less than they can afford. Furthermore, donors can do a better job than they have in the past. This report identifies what developing country governments can do to accelerate the pace of progress while ensuring that benefits accrue for the poorest and most disadvantaged households. It also pulls together the lessons of development assistance and country initiative and innovations to improve the effectiveness of aid, based on a number of country case studies.

Finally, it highlights some of the principles of effective development assistance: country-driven coordination; strategic coherence expressed in comprehensive poverty reduction strategies, which fully address the issues of health, nutrition and population; financial coherence embodied in medium term expenditure framework; pooling of donor funds; and a common framework for reporting and assessing progress.

Jennifer Bryce, Nancy Terreri, Cesar G Victora, Elizabeth Mason, Bernadette Daelmans, Zulfiqar A Bhutta, Flavia Bustreo, Francisco Songane, Peter Salama and Tessa Wardlaw. "Countdown to 2015: tracking intervention coverage for child survival." 23 September 2006. *The Lancet*. Vol. 368: 1067-1076.

In this article, the authors present the first report of the "Child Survival Countdown," a worldwide effort to monitor coverage of key child survival interventions in the 60 countries that have the world's highest number or rates of child mortality. Each country was categorized by their progress (as measured by defined indicators of intervention coverage) into one of three groups: "on track," "watch and act," and "high alert." Their findings were that only seven countries are on track to meet MDG #4; 39 countries are making progress, although they need to accelerate the speed; and 14 countries are cause for serious concern. While some countries have made substantial improvements, coverage of the key child survival interventions remains critically low, and there are still significant health disparities among disparate socioeconomic groups. The authors conclude that tremendous efforts are urgently needed to achieve the MDG for child survival, and that the "Countdown to 2015" reports can help increase accountability worldwide for progress in child survival.

Graphics: Map of 60 countries with the highest numbers or rates worldwide of child mortality; tables of under-five mortality rates in the 60 countries in 1990 and 2004 and the progress needed to meet the 2015 target; table of the median coverage rates for essential interventions in the 60 countries; categorization of priority countries by levels of coverage of immunization, vitamin A supplementation, use of insecticide-treated bednets, skilled attendant at delivery, care-seeking for pneumonia, oral rehydration for diarrhea and antimalarial treatment

III. CHILD HEALTH AND SURVIVAL

Overview of Child Health and Survival

Jennifer Bryce, Cynthia Boschi-Pinto, Kenji Shibuya, and Professor Robert E Black, for the WHO Child Health Epidemiology Reference Group. “WHO estimates the causes of death in children.” *The Lancet*. 26 March- 1 April 2005. Vol. 365(9465): 1147-52.

This article reports on a four-year effort by the WHO Child Health Epidemiology Reference Group (CHERG) to improve the accuracy of information about global child health. The key findings are that between 2000 and 2003, six causes accounted for 73 percent of the 10.6 million yearly deaths in children younger than five years old: pneumonia (19 percent), diarrhea (18 percent), malaria (8 percent), neonatal pneumonia or sepsis (10 percent), preterm delivery (10 percent) and asphyxia at birth (8 percent). The four communicable disease killers are similar in all WHO regions with the exception of malaria: 94 percent of global deaths attributed to malaria occur in Africa. Undernutrition is an underlying cause of 53 percent of all deaths in children younger than five years old.

Therefore, the MDG of reducing child mortality by two-thirds will depend on renewed efforts to prevent and control pneumonia, diarrhea, and undernutrition in all WHO regions, and malaria in Africa. Neonatal deaths, primarily due to preterm delivery, sepsis or pneumonia and birth asphyxia should also be addressed. The report recommends that the estimates of these causes should be used to guide public health policies and programs.

Graphics: Map identifying number of deaths per children younger than five and their distribution by cause for the six WHO regions (yearly average for 2000-2003).

World Health Organization, *World Health Report 2005: Make every mother and child count* (7 April 2005). http://www.who.int/whr/2005/whr2005_en.pdf

This report provides a comprehensive overview of the state of the world’s mothers and children. While progress has been made on certain fronts and in a number of countries, disparities remain, some progress has been reversed and child and maternal mortality rates remain unnecessarily high: 3.3 million stillborns, 4 million neonatal deaths and a further 6.6 million children under-five die per year. The overall objective should be to achieve universal access to care for all women and children. There also needs to be a renewed emphasis on newborns, as they account for 40 percent of under-five deaths.

In order to improve maternal, newborn, and child health (MNCH), technical strategies need to be implemented across a continuum of care and focused to extend and strengthen sustainable health systems. While programs to tackle vaccine-preventable diseases, malnutrition, diarrhea, or respiratory infections have made significant inroads, they have “an unfinished agenda.” Integrated approaches are urgently needed: first, to deal efficiently with the changing spectrum of problems that need attention; and second,

to broaden the focus of care from the child's survival to its growth and development. Along these lines, the Integrated Management of Childhood Illness combines a set of effective interventions for preventing death and for improving healthy growth and development. The report estimates that it will cost an additional USD \$52.4 billion, on top of current expenditures, to provide a package of essential child health interventions to all children in the 75 countries with the highest mortality rates. For maternal and newborn care, universal access is further away — providing a comprehensive package of care for mothers and newborns in these 75 countries will cost an additional \$39 billion.

Graphics: Graph of how neonatal and maternal mortality are related to the absence of a skilled birth attendant; graphs and maps reflecting neonatal and maternal mortality rates as well as the pattern of reduction of under-five mortality rates; graph of leveling off of DTP3 vaccine coverage since 1980; bar graph of increasing coverage of antenatal coverage; pie graph of causes of maternal mortality; bar graphs of the rising proportions of births in health facilities and attended by doctors; tables of basic indicators, rates and causes of under five mortality rates, national health account indicators, immunization indicators and indicators related to reproductive health, maternal and newborn health for all WHO members.

The Lancet Child Survival Series

BASICS II, "The Second Child Survival Revolution: Summary of *The Lancet* Child Survival Series," September 2003.

http://www.basics.org/publications/Lancet_series_summary_BASICS_II_Sept_2003.pdf

BASICS II's synthesis of the five articles in *The Lancet's* Child Survival Series is that six million children can be saved at approximately USD \$75 billion per year for vaccinations, treatment of childhood illnesses, and malaria prevention and treatment. In order to overcome the obstacles to preventing these deaths, we need the commitment to scale-up proven interventions with adequate resources and to mobilize the political will globally and at the national level. As *The Lancet* authors suggested, the tools needed to achieve the MDG of reducing child death by two-thirds by 2015 are "within our grasp, but only if the necessary commitment and resources are made available."

Robert E Black, Saul S Morris and Jennifer Bryce. "Where and why are 10 million children dying every year?" *The Lancet*. 28 June 2003. Vol. 361 (9376): 2226-34.

This article reviews where most child deaths occur, the risk factors, and the underlying causes of death. The key messages are that 10.8 million children die unnecessarily each year: approximately 41 percent in sub-Saharan Africa and 34 percent in south Asia. Ingestion of unsafe water, inadequate availability of water for hygiene, and lack of access to sanitation contributes to about 1.5 million child deaths, and is a risk factor for 88 percent of diarrhea mortality. Other health-related behaviors such as birth spacing and poor breastfeeding practices are also important risk factors. In low- and middle-income countries, serious illnesses commonly occur sequentially or concurrently before death. Both child and neonatal mortality can often be attributed to

underweight status and micronutrient deficiencies, as they decrease immune and non-immune host defenses. In children with vitamin A deficiency, the risk of dying from diarrhea, measles, and malaria is increased by 20 to 24 percent. Of the 10.8 million child deaths every year, 3.9 million occur in the neonatal period (first 28 days of life): 24 percent from severe infections, 29 percent by birth asphyxia, 24 percent by complications of prematurity, and 7 percent by tetanus. Malaria is more of a risk factor in sub-Saharan Africa than AIDS, which accounts for more than 10 percent of deaths in only three of the 42 countries. The authors maintain that the identification of risk factors, the detection of the underlying and associated causes of death and the recognition of co-morbidity can lead to a selection of effective and affordable interventions that are appropriate for a given national delivery system.

Graphics: Table of countries ranked by total child deaths or by under-five-year mortality rates (2000); map representing the world distribution of child deaths (each dot represents 5,000 deaths); histogram of distribution of global child deaths by cause; pie graphs and maps representing the distribution of child deaths by cause in five profiles for the 42 countries with 90 percent of global child deaths in 2000.

Gareth Jones, Richard W. Steketee, Robert E Black, Zulfiqar A Bhutta, Saul S Morris, and the Bellagio Child Survival Study Group. "How many child deaths can we prevent this year?" *The Lancet*, 5 July 2003. Vol. 362 (9377): 65-71.

This article focuses on "proven" interventions — preventative approaches that reduce exposure to the infection, and treatment approaches that reduce the likelihood that the disease or condition will lead to death. According to this article, in the 42 countries with 90 percent of global child deaths, 9.7 million children under age five died in 2000. It is estimated that 6.4 million of these deaths could have been prevented through full implementation of selected interventions. Breastfeeding and oral rehydration therapy (ORT) alone are estimated to be able to prevent 13 and 15 percent of all under-five deaths, respectively. Six other interventions could each further prevent a significant percentage of under-five deaths: insecticide-treated materials (seven percent), complementary feeding (six percent), antibiotics for sepsis (six percent), antibiotics for pneumonia (six percent), antimalarials (five percent) and zinc to reduce diarrhea and pneumonia deaths (five percent). Unfortunately, existing coverage of these interventions is low in most of these 42 countries, ranging from a high of 90 percent for breastfeeding to a low of one percent for antimalarial intermittent preventative treatment during pregnancy.

The authors warn that there are signs that the child survival effort has lost its focus, amid the plethora of new and newly validated interventions. As the authors maintain, more deaths would be prevented by focusing on what we know works rather than being sidetracked by new interventions and programs. This being said, new vaccines, drugs and technology should remain on the agenda as a basis for improving our efficiency and effectiveness in the future. They also note that some of the most promising interventions may be delivered at the household level, with limited need for external material inputs, including breastfeeding, ORT, education about complementary feeding,

and insecticide-treated materials. These interventions could prevent over one-third of all deaths.

Graphics: Table of child survival interventions with sufficient or limited evidence of effect on reducing mortality from the major causes of under-five deaths; histogram of actual and preventable under-five deaths by country profiles for the 42 countries with 90 percent of under-five deaths in 2000.

Jennifer Bryce, Shams el Arifeen, George Pariyo, Claudio F Lanata, Davidson Gwatkin, Jean-Pierre Habicht and the Multi-Country Evaluation of IMCI Study Group. "Reducing child mortality: can public health deliver?" 12 July 2003. *The Lancet*. Vol. 362 (9378): 159-164.

This article laments that despite improved interventions, increased overall resources, and a history of success, the gap is growing between what can be done to reduce child mortality and what is actually being done. Poor coverage is the result of weaknesses both in the provision of and the demand for services, and is a consequence of malfunctioning health systems. Understanding the reasons for the inability to increase coverage, especially among the poorest people, is a first step towards achieving universal coverage. The Integrated Management of Childhood Illnesses multi-country evaluation provides evidence of barriers to implementation and provides insight into why efforts to improve child mortality have achieved lower coverage than anticipated. Countries such as Brazil, Tanzania, Uganda, and Guatemala have experienced success, but these examples demonstrate that there is no one way to achieve high coverage and reduce child mortality.

These case studies present five fundamental findings regarding improvement of service delivery.

- 1) Planning requires relevant data at sub-national level to assess local epidemiological profiles, health system capacity, and community preferences. Monitoring of provision and quality of services is also essential.
- 2) Interventions should be selected on the local epidemiological data and other locally defined key criteria. Improved integration of child survival and reproductive health will probably help effectiveness.
- 3) Alternative delivery strategies must be assessed.
- 4) Supply must be tailored to meet demand and respond to needs.
- 5) Strengthening national health systems is a medium- to long-term goal. Community-based and private-sector strategies must be linked within health systems.

Graphics: Histogram of estimated proportion of children younger than five who received survival interventions in 42 countries accounting for 90 percent of under-five

deaths (2000); bar graph of estimated proportion of the world's children aged 12-23 months who received three doses of diphtheria-pertussis-tetanus (DPT) vaccine.

Cesar G Victora, Adam Wagstaff, Joanna Armstrong Schellenberg, Davidson Gwatkin, Mariam Claeson and Jean-Pierre Habicht. "Applying an equity lens to child health and mortality: More of the same is not enough." 19 July 2003. *The Lancet*. Vol. 362 (9739): 233-241.

This article reiterates that the gaps in child mortality rates are increasing between the rich and poor — within countries as well as between countries. The life-saving potential of improving equity is far greater than that of any new technology or combination of treatments. A policy intervention that eliminated inequalities in child health - by bringing rates among the poorest 80 percent down to those prevailing among the richest 20 percent - would prevent about 2.28 million under-five deaths. The authors argue that the damaging efforts of poverty on child health can be reduced by well-designed policies, including improving knowledge and behavior among mothers, social marketing approaches, micro-credit programs, increased affordability of health care, and improved access to clean water and sanitation.

According to the authors, we know enough to move ahead in reducing health inequities among children. The challenge will be how to scale-up these approaches on a large scale, which will require the adoption of suitable health strategies, the creation of an appropriate policy environment, and more equitable targeting of interventions.

There are two basic approaches to increasing coverage among poor populations: targeting (both direct and indirect) and universal coverage. Another challenge is achieving accountability and commitment to equity among policymakers, program managers, health professionals, and communities. On the international level, multilateral and bilateral agencies must ensure that equity considerations are an essential part of the design of all new projects, address equity issues in dialogue with countries, and ensure that impact evaluations provide data on equity. Finally, the MDGs must address equity issues and aim to reach the poorest populations. Progress should be monitored according to socioeconomic strata.

Graphics: Bar graph of under-five mortality rates by income groups of countries; potential changes in under-five mortality rates that could be achieved by eliminating within-country inequalities; acute respiratory infections and diarrhea prevalence in under-five children by socioeconomic status in selected countries.

The Bellagio Study Group of Child Survival. "Knowledge into action for child survival." July 26, 2003. Vol. 362 (9380): 323-327.

In this article, this Bellagio Study Group maintains that translating current knowledge into effective action for child survival will require leadership, strong health systems and targeted human and financial resources to ensure that poor children and mothers benefit. The authors call for a second Child Survival Revolution (modeled after Jim Grant's revolution started in 1982) that works to end disparities and

significantly reduce child mortality. This article reviews the grounds for such renewed actions (as laid out in the previous four articles), such as: utilizing advanced research in epidemiology, to support child survival programming; more aggressively applying existing effective interventions and making progress on interventions not yet available (i.e.: vaccines for pneumonia, diarrhea and malaria); improving delivery strategies, to reach the mothers and children in greatest need; and documenting and addressing inequities.

The authors suggest that in order to transform knowledge into effective action to reduce child mortality, four prerequisites are required: 1) leadership; 2) strong health systems; 3) adequate and targeted resources (estimated yearly costs of scaling up interventions: USD \$1 billion for vaccinations, \$4 billion for treatment of childhood illnesses, and \$2.5 billion for malaria prevention and treatment for all age groups); and 4) awareness and a commitment to action among all stakeholders on the international, national and local level. The Bellagio Study Group calls on multilateral institutions, UN agencies, worldwide initiatives, governments, ministries of health, technical assistance partners, academics, and research institutes to make children survival a top priority.

Graphics: Graphs reflecting USAID decreasing funding for child survival (1995-2003).

UNICEF's State of the World's Children Reports

UNICEF, *State of the World's Children 2005: Childhood Under Threat* (2004).

[http://www.unicef.org/publications/files/SOWC_2005_\(English\).pdf](http://www.unicef.org/publications/files/SOWC_2005_(English).pdf)

Poverty, armed conflict, and HIV/AIDS threaten the survival and development of hundreds of millions of children. This report examines these three key threats in detail, and offers a comprehensive agenda of action to combat them. The report focuses on childhood, defined as the state and condition of a child's life. The Convention of the Rights of the Child, adopted in 1989, offers a new definition of childhood based on human rights. The report concludes by calling on all stakeholders – governments, donors, international agencies, as well as communities, families, business and individuals – to reaffirm and recommit to their moral and legal responsibilities to children.

Key Messages: The rights of over 1 billion children are violated because they are severely underserved with regard to at least one or more of the basic goods and services required to survive, grow, and develop. Millions of children are growing up in families and communities torn apart by armed conflict.

Graphics: Series of valuable maps, charts and graphs that reflect the prevalence of poverty, armed conflict, and HIV/AIDS, depicted by country, regionally, and globally; tables providing country-specific breakdowns for basic indicators (mortality rates, life expectancy, literacy, school enrollment), demographic indicators (population growth rate, birth rate, fertility), and indicators in nutrition, health, HIV/AIDS, education, and woman and child protection.

UNICEF, *State of the World's Children 2006: Excluded and Invisible* (2005).
[http://www.unicef.org/publications/files/SOWC_2006_English_Report_rev\(1\).pdf](http://www.unicef.org/publications/files/SOWC_2006_English_Report_rev(1).pdf)

This report highlights the millions of children who are excluded or “invisible” and focuses on poverty, armed conflict, and HIV/AIDS as the major macro level causes of exclusion. The report also highlights discrimination, children with disabilities, marginalized populations, and the poorest of the poor. Despite enormous efforts to reach children with needed services, millions continue to die every year and even more live without adequate access to education, life-saving vaccines or protection. The report presents the Millennium Development Goals as a catalyst for improved access to essential services, protection, and participation. If the MDGs are met, an estimated 500 million people will escape poverty by 2015; 250 million will be spared from hunger; and 30 million children, who would not have lived past their fifth birthday, will survive.

However, the MDGs are not an end in themselves. The children that will be left behind are often those in greatest need: the poorest, the most vulnerable, the exploited, and the abused. Reaching these children — many of whom are currently beyond the reach of laws, programs, research, and budgets — is a challenge that needs to be addressed head-on. Children around the globe deserve our commitment and dedication to helping provide them with a better world in which to live.

Graphics: Numerous graphs, tables, and maps that reflect the current status of children, what could be achieved through the MDGs, and who will be left behind; graphs highlighting the disparity between children in the developing and developed world regarding vaccinations, underweight prevalence rates, birth registration, education, etc.

UNICEF, *State of the World's Children 2007: Women and Children, The Double Dividend of Gender Equality* (2006).
http://www.unicef.org/publications/files/The_State_of_the_Worlds_Children_2007_e.pdf

This year's edition of UNICEF's flagship publication examines the status of women around the world. It concludes that an end to gender discrimination (MDG 3) produces the double dividend of benefiting women and children. In turn, societies everywhere will feel a positive impact on health and development, from reduction of poverty and hunger to global health and environmental sustainability (all MDGs). This report emphasizes that gender equality (in the household, employment, and politics and government) is critical to child survival and development.

The report outlines seven key interventions for gender equality: 1) Abolish school fees and invest in girls' education; 2) Invest government funding in gender equality; 3) Enact legislation to create a level playing field for women, and to prevent and respond to domestic violence as well as gender-based violence in conflict; 4) Ensure women's participation in politics; 5) Involve women's grassroots organizations early on in policy development; 6) Engage men and boys, so the importance of gender equality can be understood by all; and 7) Improve research and data on gender issues, which are

critical if progress is to be made. As UNICEF Executive Director Ann M. Veneman states, “If they [women] are not educated, if they are not healthy, if they are not empowered, the children are the ones who suffer.”

Graphics: Numerous bar graphs illustrating gender disparity and discrimination in school enrollment, societal attitudes, decision-making authority, literacy, wages, land ownership, etc; tables providing country-specific breakdown for basic indicators (mortality rates, life expectancy, literacy, school enrollment), demographic indicators (population growth rate, birth rate, fertility) and indicators for nutrition, health, HIV/AIDS, education, women and child protection.

IV. NEWBORN HEALTH AND NEONATAL SURVIVAL

Overview of Newborn Health and Neonatal Survival

Save the Children, *State of the World's Mothers 2006: Saving the Lives of Mothers and Newborns* (May 2006).

http://www.savethechildren.org/publications/mothers/2006/SOWM_2006_final.pdf

This report, the seventh annual edition commemorating Mother's Day, brings attention to the urgent need to reduce infant mortality around the world. It offers affordable, effective solutions and identifies countries that have been successful in improving the health and saving the lives of mothers and babies. It reviews the causes of newborn deaths, mortality rates by country and region, costs to society, and the link between maternal and newborn health (i.e. birth spacing, complications of childbirth, infections, low-birth weight). It outlines a continuum of care for mothers and newborns and the "building blocks" of newborn survival: critical newborn services, good maternal health, culturally appropriate solutions, effective use of health data and political will.

For each of the five building blocks, the Newborn Scorecard uses three indicators to analyze 53 low-income and 25 middle-income countries' capacity to improve survival rates and health status of mothers and newborns. The Mothers' Index documents conditions for mothers and children in 125 countries, showing where mothers fare best and where they face the greatest hardships.

Key Messages: Sixty million mothers in the developing world give birth without professional help every year and more than 500,000 women die from complications of pregnancy and childbirth. Four million newborns die in the first month of life and three million are stillborn. Ninety-nine percent of these deaths occur in developing countries. Three out of four newborn deaths could be avoided with simple, low-cost tools that already exist: antibiotics for pneumonia, sterile blades to cut umbilical cords, and knit caps to keep babies warm. A recommended package of low-cost, low-tech newborn and maternal health interventions for the 75 countries with the highest maternal and child mortality rates would cost \$4.1 billion per year, on top of current spending of \$2 billion.

Graphics: Pie chart of causes of newborn deaths; charts and maps of newborn mortality rates by country and region; tables for Newborn Scorecard; tables for Mothers' Index and country rankings

Erin Sines, Uzma Syed, Steve Wall, and Heidi Worley, "Postnatal Care: A Critical Opportunity to Save Mothers and Newborns," *Policy Perspectives on Newborn Health Series*, produced in a collaboration between the Population Reference Bureau and Save the Children's Saving Newborn Lives initiative (January 2007). http://www.prb.org/pdf07/SNL_PNCBriefFinal.pdf

This brief emphasizes that the early postnatal period (just after delivery and through the first six weeks of life) is the ideal time to deliver interventions to

improve the health and survival of newborns and mothers. It warns that policies and programs have largely overlooked this critical time, hindering efforts to meet the MDGs for maternal and child health. It suggests that these goals can be advanced by integrating postnatal care for newborns and mothers, and in turn that will reduce deaths and disabilities in newborns and women.

Key Messages: Four million infants die during the first month of life, representing 40 percent of all deaths of children under five years old. More than half a million women die each year as a result of complications from pregnancy and childbirth.

The Partnership for Maternal, Newborn & Child Health, *Opportunities for Africa's Newborns: Practical data, policy and programmatic support for newborn care in Africa* (November 2006).

This report brings together new data and analysis from a team of 60 authors and nine international organizations representing the Partnership for Maternal, Newborn and Child Health (PMNCH). It reports that Sub-Saharan Africa remains the most dangerous region in the world for a baby to be born, but highlights six low-income African countries (Burkina Faso, Eritrea, Madagascar, Malawi, Uganda, and the United Republic of Tanzania) that have made significant progress in reducing deaths among newborn babies.

Section I provides a basic situational analysis of MNCH for 46 African countries, in an effort to guide decision making for policy and program priority setting. Section II outlines the continuum of care through pre-pregnancy, childbirth, and the postnatal period, highlighting current gaps in coverage of care and opportunities to address these gaps at all levels- family and community care, outreach services, and primary and referral facilities. Section III provides an overview of 9 key programs related to newborn health, which examine the opportunities, challenges and case studies related to strengthening and integrating newborn health along the continuum of care. Section IV examines what we can learn from the aforementioned six countries that are making progress. It highlights the remaining gap between policy and action, especially for the poorest, and provides practical steps for strengthening and integrating service provision to provide newborn care. Section V summarizes relevant data for decision making for 46 countries in sub-Saharan Africa regarding maternal, newborn and child health status and policy.

Key Messages: 1.6 million babies die in the first month of life every year in sub-Saharan Africa, and another million babies are stillborn; up to 800,000 newborn lives could be saved every year if essential interventions already in policy reached 90 percent of African mothers and newborns; investment to save newborn lives also saves mothers and children- and the cost is affordable (an additional \$1.39 per capita is required- two-thirds of which goes towards the health and survival of mothers and older children); six poor African countries have made progress, achieving neonatal mortality rates between 24 and 32 per 1,000 live births.

Graphics: Chart of evidence-based interventions and key opportunities to save newborn lives; graphs of progress towards MDGs by region and for specific countries; graphs and charts of epidemiology of neonatal mortality in Africa (who, where, when, why and potential solutions); graph of interventions that reduce newborn deaths within the continuum of care; statistics, tables, and graphs (birth, deaths and inequity; policy and implementation; financing; estimated causes of neonatal deaths; coverage along the continuum of care; missed opportunities) for each of 46 African countries.

The Lancet Neonatal Survival Series

Lancet Neonatal Survival Steering Team, *Compilation Booklet of Lancet Series Articles on Newborn Survival* (March 2005). Contains the following articles:

Richard Horton. "Newborn survival: putting children at the centre." *The Lancet*. 5 March 2005. Vol. 365 (9462): 821-822.

This article introduces the series and serves as a call to action for renewed attention towards the newborn period, as eight million children are either stillborn or die within the first month of life every year.

Anne Tinker, Petra ten Hoope-Bender, Shahida Azfar, Flavia Bustreo and Robin Bell. "A continuum of care to save newborn lives." *The Lancet*. 5 March 2005. Vol. 365 (9462): 822-825.

This article introduces the continuum-of-care approach, which provides care for mothers and children from pregnancy to delivery, the immediate postnatal period, and childhood. It also reviews three critical partnerships: the Healthy Newborn Partnership, the Partnership for Safe Motherhood and Newborn Health, and the Child Survival Partnership. It discussed what these partnerships are doing to mobilize their resources and coordinate advocacy efforts on both the national and international level.

Joy E Lawn, Simon Cousens, Zulfiqar A Bhutta, Gary L Darmstadt, Jose Martines, Vinod Paul, Rudolf Knippenberg, Helga Fogstadt, Priya Shetty, Richard Horton. "Why are 4 million newborn babies dying every year?" *The Lancet*. 2004: 364: 399-401.

This article argues that while the Belagio series on child survival was critical, it left a major gap in the information and action regarding the first four weeks of life, or the neonatal period. There has been little reduction in the risk of death during the neonatal period, which now accounts for 36 percent of deaths worldwide in children less than five years old. A substantial reduction of neonatal deaths will be required to meet MDG #4 and therefore should become a major public-health priority. The article suggests that the health of newborns has been neglected primarily because most neonatal deaths are unseen and undocumented, and preventing newborn deaths is perceived as complex. In order to address neonatal mortality, there needs to be a continuum of care, particularly during the critical first week of life. Health systems also need to be strengthened and approaches need to be implemented to promote demand for care.

Joy E. Lawn, Simon Cousens, Jelka Zupan, for the Lancet Neonatal Survival Steering Team. “4 million neonatal deaths: When? Where? Why?” *The Lancet*. 5 March 2005. Vol. 365 (9462): 891-900.

This report, the first in *The Lancet Neonatal Survival Series*, provides a comprehensive epidemiological data to guide efforts to reduce newborn deaths. It frames the key messages in terms of when (38 percent of deaths in children under-five occur in the first month, three-quarters within the first week and 25-45 percent within the first 24 hours after birth); where (99 percent of individuals die in low-income and middle-income countries, particularly in south-central Asia and sub-Saharan Africa); and why (major direct causes are infections [36 percent], preterm birth [28 percent] and asphyxia [23 percent]), while other important risks and indirect causes are low birth weight, maternal complications in labor, and poverty.

The article argues that child survival and safe motherhood strategies have yet to adequately address neonatal mortality. Increasing the availability and use of relevant information and data in programs and policy will be essential to success. Real progress in reducing neonatal mortality rates will depend on higher coverage of services in the highest-mortality countries, for the poorest people, and at the time of greatest risk-birth and the first days of life. The elimination of the mortality gap between the richest and poorest countries in sub-Saharan Africa and within three south Asian countries could avert almost 75 million deaths. In the meantime, 450 newborn babies will continue dying every hour, mostly from preventable diseases, which is unconscionable in the 21st century.

Graphics: Map reflecting neonatal mortality rates by country; pie graph of causes of neonatal mortality; bar graph of relative importance of different causes of death, according to neonatal mortality rates; panel of key messages for neonatal health in terms of when, where, and why.

Gary L Darmstadt, Zulfiqar A Bhutta, Simon Cousens, Taghreed Adam, Neff Walker, Luc de Bernis, for the Lancet Neonatal Survival Steering Team. “Evidence-based, cost-effective interventions: how many newborn babies can we save?” *The Lancet*. 12 March 2005. Vol. 365(9463): 977-988.

This fairly technical report, the second in the Neonatal Survival Series, identifies 16 interventions with proven efficacy and effectiveness in reducing perinatal and neonatal mortality. The authors propose combining interventions in packages with a common service delivery modes (outreach, family-community, and facility-based clinical care), which is more cost-effective than providing single interventions in a vertical manner. They suggest that universal coverage of these interventions could avert 41 to 72 percent of neonatal deaths. They estimate annual running costs for current degrees of coverage (US \$1.97 billion) with evidence-based interventions, and the additional costs for expansion of coverage from current levels to 90 percent (\$4.11 billion) for the 75 countries included in the analyses.

They report that early success in averting neonatal death is possible in settings with high mortality and weak health systems through outreach and family-community care, including health education to improve home-care practices, to create demand for skilled care and to improve care seeking. Furthermore, the simultaneous expansion of clinical care for babies and mothers is essential to achieve the reduction in neonatal deaths needed to meet the MDG for child survival. The report concludes that “generating this political will and leadership is the real challenge that policy makers and health systems face to translate our estimates into reality.”

Graphics: Chart of estimated number of neonatal deaths in 75 countries by region that could be averted by universal delivery of all evidence-based interventions; panel of key messages.

Rudolf Knippenberg, Joy E. Lawn, Gary L. Darmstadt, Genevieve Begkoyian, Helga Fogstad, Netsanet Walelign, Vinod K. Paul, for the Lancet Neonatal Survival Steering Team. “Systematic scaling up of neonatal care in countries.” *The Lancet*. 19 March 2005. Vol. 365(9464): 1087-1098.

This fairly technical report, the third in the Neonatal Survival Series, maintains that nearly 70 percent of neonatal deaths (almost three million) every year could be prevented if proven interventions were implemented effectively with high coverage where they are needed the most. Within poor countries, the richest women have two to three times higher antenatal care coverage than the poorest women, and six times higher skilled attendance. Thus, coverage is low, progress is slow, and inequity is high, especially for skilled clinical interventions. Systematic scaling up of clinical care is a necessary challenge if maximum effect and equity are to be achieved in neonatal and maternal health. However, the delivery strategy for a particular intervention varies across sections and should be adapted to local reality.

As a guide for scaling up care for newborn babies in different settings, this report proposes an adaptation of the four-step management cycle: 1) assess situation and create good policy environment; 2) achieve optimum neonatal care within the constraints of the situation; 3) systematically scale up neonatal care; and 4) monitor coverage and measure effect and cost. Two parallel, interdependent processes are needed: a systematic, data-driven decision-making process and a participatory, rights-based policy process.

The report maintains that measurable mortality reduction can be achieved within a weak health system by starting with outreach at the family-community level. For instance, governments in poor areas such as Ethiopia, Madagascar, and the Gujarat State in India have successfully committed themselves to strengthening maternal and neonatal health systems. The analysis determines that the health budget of many of the world’s poorest countries needs to double or even quadruple, while increasing accountability for use of these resources. As it concludes, “action in countries, driven by countries, is essential.”

Graphics: Graph reflecting the variation across quintiles of socioeconomic status in regional average coverage for antenatal care (>3 visits) and skilled attendance at birth; analysis of four-step process for Ethiopia, Madagascar, and Gujarat State in India.

Jose Martinez, Vinod K. Paul, Zulfiqar A. Bhutta, Marjorie Koblinsky, Agnes Soucat, Neff Walker, Rajiv Bahl, Helga Fogstad, Anthony Costello, for the Lancet Neonatal Survival Steering Team. "Neonatal survival: a call for action." *The Lancet*. 26 March 2005. Vol. 365(9464): 1189-1197.

This report, the fourth and final article in the Neonatal Survival Series, focuses on how national and global action is required to improve neonatal survival. The report addresses common myths and misperceptions that have restricted the implementation of neonatal health interventions, offering examples of low-income countries (Honduras, Indonesia, Moldova, Nicaragua, Sri Lanka and Vietnam) that have achieved low NMRs despite limited resources.

The authors call on development partners and national governments to increase funding, citing the high number of deaths, the human rights imperative, and the fact that extremely cost-effective interventions exist. According to the report's analysis, the running cost for providing the neonatal health package at 90 percent coverage in the 75 countries with the highest mortality rates would be US \$4.1 billion a year, in addition to the current expenditures of \$2 billion. Thirty percent of this money would be for interventions that specifically benefit the newborn child and the remaining 70 percent would also benefit mothers and older children. The cost per neonatal death averted is estimated at \$2100 (range \$1700-3100).

The authors contend that if external resources were made available, adequate mechanisms and a policy framework would need to be in place to ensure accountability and evidence-based and participatory decision-making. It explores the three following options: to create a new global fund for maternal, neonatal, and child health, similar to the Global Fund for TB, HIV/AIDS, and Malaria and GAVI (high profile, vertical approach); to expand the mandate of these global funds and other vertical funding mechanisms, to include integrated programming approaches such as IMCI and IMPAC (country-specific needs, longer time-frame); or to instead make resources available at country-level through donor convergence, as does the Child Survival Partnership (greater flexibility and decision-making in country).

The article concludes that saving lives of newborns is affordable, but depends on political commitment and leadership at national and international levels. They argue that now is the time to "translate these policy imperatives into programmatic endeavors, to turn statements of intent into actions, and to generate the political will to address the problem." The authors outline a series of actions that need to be taken on both the national and international level, which includes financing, implementing, and monitoring national plans of action as well as including NMR as an indicator for MDG #4; leveraging resources to meet additional needs identified (\$.96 per person);

improving funding for the development and support of health systems; and promoting greater accountability among governments, NGOs, and international agencies.

Graphics: Panel of common myths and misperceptions; chart of correlation between GDP per person and NMR in poor countries, which highlights aberrations of low-income countries with low NMRs; bar graph of public health expenditure as proportion of general government expenditure in African countries in 1998, as compared to Abuja target of 15 percent.

V. MATERNAL HEALTH AND SURVIVAL

Overview of Maternal Health and Survival

Please refer to the Overview of Newborn Health and Survival section for a review of: Save the Children, *State of the World's Mothers 2006: Saving the Lives of Mothers and Newborns* (May 2006). http://www.savethechildren.org/publications/mothers/2006/SOWM_2006_final.pdf

Please refer to the Overview of Newborn Health and Survival section for a review of: Erin Sines, Uzma Syed, Steve Wall, and Heidi Worley, *Postnatal Care: A Critical Opportunity to Save Mothers and Newborns*, the seventh brief in the "Policy Perspectives on Newborn Health" series, produced through a collaboration between the Population Reference Bureau and Save the Children's Saving Newborn Lives initiative, January 2007. http://www.prb.org/pdf07/SNL_PNCBriefFinal.pdf

Vincent de Brouwere and Wire van Lerberghe. "Safe Motherhood Strategies: a Review of the Evidence." *Studies in Health Services Organisation & Policy*. No. 17. Antwerp: ITG Press (2001). A CD-Rom of these articles was created in August 2003 by DFID, the European Commission, the Institute of Tropical Medicine, Antwerp University and John Snow International-UK.

This book reviews the evidence on various aspects of safe motherhood programs and was designed to define a clear European Union (EU) strategy for the reduction of avoidable maternal deaths. The authors argue that the various activities undertaken over the last 20 years to tackle maternal mortality have failed to produce dramatic results, and that the international community now needs to reassess what are the most appropriate measures for making childbirth safer. One of the book's major findings is that professionalizing obstetric care is critical to reducing maternal mortality. Other essential elements are the commitment of decision-makers, providing universal quality health care and the accountability of health professionals. The authors key recommendations are as follows: improve existing primary care health facilities; upgrade training of medical and non-academic staff; modify legislation on abortion; and improve health systems to better account for women's health rights. Most importantly, real progress in improving maternal health requires strong commitment from both the medical community and policy makers and substantial long-term funding.

The Lancet Maternal Survival Series

Carine Ronsmans and Wendy J Graham, on behalf of The Lancet Maternal Survival Series Steering Group. "Maternal mortality: who, when, where and why." *The Lancet*. 30 September 2006. Vol. 368: 1189-2000.

This article, the first in the Maternal Survival Series, provides a comprehensive overview of maternal mortality. There are approximately 529,000 maternal deaths every year (as of 2000). The risk of a woman dying from pregnancy or childbirth is about one in six in the poorest parts of the world, compared to about one in 30,000 in Northern Europe. Such a discrepancy poses a major challenge to meeting the fifth MDG to reduce maternal mortality

by 75 percent between 1990 and 2015, although evidence suggests that this is achievable. Some developed and transitional countries were able to considerably reduce maternal mortality in a similar timeframe, but few of them faced challenges as severe as the worst faring countries do today, which include weak health systems, continued high fertility, and poor availability of data. Maternal deaths are clustered around labor, delivery and the immediate postpartum period, with obstetric hemorrhage being the main medical cause of death. Inequalities in the risk of maternal mortality exist between and within countries. Therefore, if substantial progress is to be achieved by 2015, it is essential to target interventions to the most vulnerable — rural populations and poor people — as well as to improve the measurements of their mortality burden.

Graphics: Histograms of maternal deaths and maternal mortality ratio by region; histograms of maternal mortality ratios in 2000 by medical cause and region; histograms of mortality rates during pregnancy and in weeks/ months following birth in Matlab, Bangladesh; histograms of mortality rates by poverty quintile in Tanzania (1996), Peru (2000) and Indonesia (2002).

Oona M. R. Campbell, Wendy J. Graham, on behalf of The Lancet Maternal Survival Series Steering Group. “Strategies for reducing maternal mortality: Getting on with what works.” *The Lancet*. 7 October 2006. Vol. 368: 1284-1299.

The second article in the Maternal Survival Series states that “what works” is complicated by a huge diversity of country contexts and maternal health determinants, but the authors argue that despite this complexity, only a few strategic choices need to be made to reduce maternal mortality. The article states that 88-98 percent of maternal deaths are preventable, and many developed and some developing countries have successfully reduced the risk of maternal death by 90-99 percent. While many single interventions are available, strategies will only work if the component packages are effective and distribution mechanisms achieve high coverage among the intended target groups. Specifically, the implementation of an effective intrapartum-care strategy is an overwhelming priority.

The authors discuss the alternative configurations of such a strategy and, using the best available evidence, prioritize one strategy based on delivery in primary-level institutions (health centers), backed up by access to referral-level facilities. They also discuss strategies that complement intrapartum care, such as antenatal care, postpartum care, family planning, and safe abortion. The authors conclude that the inexplicable hesitation in decision-making after nearly 20 years of safe motherhood programming is the biggest obstacle to achieving the fifth MDG.

Graphics: Table outlining the appropriate intervention packages for various target populations, the maternal outcome addressed, and the possible means of distribution.

Timothy Powell-Jackson, Josephine Borghi, Dirk H. Mueller, Edith Patouillard, and Professor Anne Mills, Ph.D. "Countdown to 2015: tracking donor assistance to maternal, newborn, and child health." *The Lancet*. 23 September 2006. Vol. 368 (9541): 1077-1087.

The third article in the Maternal Survival Series focuses on the importance of timely, reliable data measuring aid flows to maternal, newborn, and child health, particularly in assessing the adequacy of funding as well as in promoting accountability among donors for attainment of the 4th and 5th MDG. The authors provide global estimates of official development assistance (ODA) to MNCH in 2003 and 2004, based on data reported by high-income donor countries and aid agencies to OECD. As reported, donor spending on activities related to MNCH was estimated to be USD \$1990 million in 2004, representing only 2 percent of gross aid disbursements to developing countries. The 60 priority low-income countries, which account for most child and newborn deaths, only received \$1363 million or \$3.1 per child.

While there is a positive association between mortality and ODA per head, there is significant variation in the amount of ODA per person received among developing countries. The authors conclude that the current level of ODA for MNCH is inadequate to provide more than a small portion of the total resources needed to reach the MDGs for child and maternal health. Therefore, global aid flows will need to increase sharply over the next five years. The challenge will be to ensure that a sufficient share of these new funds will be channeled effectively towards scaling up key MNCH interventions in high priority countries.

Jo Borghi, Tim Ensor, Aparnaa Somanathan, Craig Lissner and Anne Mills, on behalf of The Lancet Maternal Survival Series Steering Group. "Mobilising financial resources for maternal health." *The Lancet*. 21 October 2006. Vol. 368 (9545): 1457-1465.

This article, the fourth in the Maternal Survival Series, argues that maternal mortality reduction interventions are cost-effective and have multiple health and social benefits. For instance, children whose mothers have died have a three to ten times greater risk of death than those with living parents. Unfortunately, coverage of maternal health services remains poor, due to insufficient supply and inadequate demand among the poorest groups. Households do not seek care because they pay too great a burden of the costs of maternal health services and/or cannot afford the costs.

Available evidence creates a strong case for eliminating user fees and providing universal coverage for pregnant women, particularly delivery care. Moreover, maternal health care should be included in insurance benefits packages; voucher schemes should be tested in low-income settings, and their costs and relative cost-effectiveness should be assessed; and further research should be conducted on methods to target financial assistance for transportation and time costs. The authors warn that current investment in maternal health is insufficient to meet the fifth MDG and much greater resources are needed to scale up coverage and to create demand for services through appropriate financing initiatives. They conclude that donors need to increase financial contributions for maternal health in low-income countries to help fill the resource gap. Resource

tracking at country and donor levels will help hold countries and donors accountable for their commitments towards achieving the maternal health MDG.

Veronique Filippi, Carine Ronsmans, Oona MR Campbell, Wendy J Graham, Anne Mills, Jo Borghi, Marjorie Koblinsky and David Osrin. “Maternal health in poor countries: the broader context and a call for action.” *The Lancet*. 28 October 2006. Vol. 368 (9546): 1535-1541.

The fifth and final article in the Maternal Survival Series takes a broad perspective on maternal health and places it in its wider context. The authors draw attention to the economic and social vulnerability of pregnant women, and stress the importance of concomitant broader strategies, including poverty reduction and women’s empowerment. They consider outcomes beyond mortality, in particular, near-misses and long-term sequelae, and the implications of the close association between the mother, the fetus, and the child. Beyond the 529,000 estimated maternal deaths a year, many more women are estimated to suffer pregnancy-related illnesses (9.5 million), near-miss events (1.4 million) and other potentially devastating consequences after birth. Moreover, maternal mortality has a radical effect on child survival, particularly during pregnancy and the neonatal period. The authors link maternal health to a range of global survival initiatives, particularly neonatal health, HIV, and malaria, and to reproductive health.

Overall, the Maternal Survival Series concludes that the best strategy for overcoming barriers and reducing maternal mortality is to scale-up coverage of delivery by skilled attendants, working in teams in health facilities. Finally, after examining the political and financial context, the authors call for action, emphasizing the need for donors and governments to develop a strategic vision, to invest significant and sustainable financial resources, to invest in training and deployment of required human resources, and to improve the monitoring and tracking of progress.

Graphics: Bar graph representing the extent of maternal mortality, morbidity and disabilities

Maternal Health Interventions

Fariyal F. Fikree, Heidi Worley and Erin Sines. “Delivering Safe Motherhood: Sharing the Evidence.” Published by the Population Reference Bureau, through a grant from Immpact, February 2007.

This brief introduces the current state of “safe motherhood” and reviews the innovative methods and lessons learned gained through four years of research by Immpact in Ghana, Burkina Faso, and Indonesia. Immpact’s evaluations first confirm the financial, physical and functional barriers to accessing skilled delivery care and reiterate the rich-poor gap in services. Immpact maintains that in order to reduce maternal mortality by 75 percent by 2015 (the target for MDG #5), we need to provide rigorous evidence of the effectiveness and cost-effectiveness of safe motherhood strategies and their implications for equity and sustainability. In this brief, Immpact introduces new and enhanced tools and methods for measuring maternal death and

other safe motherhood indicators; pioneers information to help design and implement safe motherhood strategies; and provides tools to strengthen capacity in developing countries for evaluation and evidence-based decision-making. They conclude that there is no “quick fix” for preventing maternal deaths and instead, multiple strategies must be undertaken, evaluated and adapted to specific countries and situations. The authors then outline research that should be conducted in the future.

WHO, “Making Pregnancy Safer: the Critical Role of the Skilled Attendant: A Joint Statement by WHO, ICM and FIGO.” WHO, Department of Reproductive Health and Research. Geneva: 2004.

In this statement, WHO, ICM, and FIGO advocate for skilled care during pregnancy, childbirth, and the immediate postnatal period. This statement is especially aimed at countries in which the coverage of skilled attendance at birth is below 85 percent. They clearly define who is a skilled attendant, what skills she/he should have, and how she/he should be trained and supported. As defined, a skilled attendant is an accredited health professional (such as a midwife, doctor, or nurse) who has been educated and trained to proficiency in the skills needed to manage normal, uncomplicated pregnancies; childbirth; and the immediate postnatal period, and in the identification, management, and referral of complications in women and newborns. The authors argue that skilled attendants are central in the continuum of care and are pivotal in reducing maternal and newborn mortality.

Achieving the MDG target of 90 percent of births attended by skilled attendants is a complex challenge with no “quick fixes.” In order to build consensus, dialogue must take place with all concerned stakeholders to convince them that the skilled attendant program should be a national and local priority.

PATH, “Clean-Delivery Kits: Guidelines for their use in programmatic settings,” Seattle: April 2006. http://www.path.org/files/RH_dk_fs.pdf

This fact sheet reports on research conducted by PATH in Nepal and Tanzania that suggests that many childbirth-related infections can be avoided when clean-delivery kits are used. More than 60 million women in developing countries give birth every year with only the help of an untrained attendant or family member or with no help at all. Approximately 1,600 women per day die from complications associated with pregnancy or childbirth, and infection is a leading cause. Moreover, around 950,000 newborns per year die from infection. Newborns of mothers who used a kit were 13 times less likely to develop cord infections than were newborns whose mothers did not use a kit, and the mothers were three times less likely to develop puerperal sepsis or genital tract infection after childbirth. This fact sheet provides guidelines for the use of clean-delivery kits in programmatic settings.

PATH, “Postpartum Hemorrhage,” <http://www.pphprevention.org/pph.php>.

The Prevention of Postpartum Hemorrhage Initiative website discusses postpartum hemorrhage (PPH), which is excessive bleeding of more than 500 ml after childbirth. Up to 60 percent of maternal deaths are due to PPH and the majority of the 14 million cases of obstetric hemorrhage every year occur postpartum. The primary intervention to reduce the incidence of PPH is the active management of the third stage of labor (AMSTL). Other preventative measures include reducing the incidence of prolonged labor, minimizing the trauma associated with instrumental delivery, and detecting and treating anemia during pregnancy.

ACCESS and USAID, “Preventing Postpartum Hemorrhage,” February 2007. http://www.accesstohealth.org/toolres/pdfs/ACCESStechbrief_PPH.pdf.

This brief suggests that most cases of postpartum hemorrhage (PPH) can be prevented using safe, low-cost, evidence-based practices, even in countries with high maternal mortality and limited resources. The knowledge of preventing PPH must be translated into action when implementing essential maternal and newborn health care and basic emergency obstetric and newborn care interventions. Action means: ensuring that national policies and clinical guidelines are in place; providing training on AMSTL; utilizing community health workers and skilled providers; and mobilizing the community along with a skilled provider that is ready for emergencies, in order to help women and families prepare for birth. One of the most important prevention measures is having a skilled attendant at birth, because they are able to perform AMSTL and can administer uterotonic drugs within one minute of birth. When a skilled attendant is not present, studies have established the safety of home- and community-based distribution of misoprostol for prevention of PPH.

Maternal Anemia: A Preventable Killer. This report was the product of a collaborative effort among USAID’s A2Z Micronutrient and Child Blindness Project, ACCESS Program, and Food and Nutrition Technical Assistance (FANTA) Project (August 2006).

This report addresses anemia and iron deficiency, which remain at epidemic levels among women and children in developing nations. It explores the consequences of anemia in terms of health, survival, and economic development and its risks in terms of global maternal and perinatal mortality. It also presents the major causes of anemia by region and offers several evidence-based interventions that have reduced prevalence rates among susceptible women. It suggests that maternal anemia programs are most effective when they address the multiple causes of anemia through integrated interventions. The report offers case studies of successful anemia prevention programs in Nicaragua and India.

Key Message: Anemia affects on average 45 percent of pregnant women and 49 percent of children under-five in developing regions. Iron deficiency is the 12th most important risk factor for all mortality globally, and the 9th most important risk factor for the global burden of disease. Anemia increases maternal and perinatal mortality,

increases numbers of preterm and/ or low birth weight, impairs cognitive development in children, and reduces adult work productivity.

Graphics: Venn diagram of causes and consequences of anemia and iron deficiency; pie graph of causes of maternal death and the contribution of iron deficiency anemia (IDA); chart of causes of anemia per region.

VI. EPIDEMIOLOGY, CAUSES OF DEATH, AND TREATMENT NUTRITION

World Bank, *Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action*, 2006.

<http://siteresources.worldbank.org/EXTABOUTUS/Resources/NutritionStrategy.pdf>.

The report argues that nutrition needs to be made central to development because a wide range of economic and social improvements, as reflected in the MDGs, depend on nutrition. The report states that nearly one-third of children in the developing world remain underweight or stunted, and 30 percent of the developing world's population continues to suffer from micronutrient deficiencies. While malnutrition is decreasing in some regions (Latin America and Asia), South Asia continues to have the highest rate and the largest number of malnourished children. Malnutrition, which accompanies HIV/AIDS, is on the rise in Sub-Saharan Africa. The report forecasts that many countries will achieve the MDG income poverty target (percentage of people living on less than \$1 per day), but less than 25 percent will achieve the non-income poverty target of halving the number of underweight persons.

As the Copenhagen Consensus concluded, nutrition interventions generated returns among the highest of 17 potential development investments, as it helps to stimulate economic growth and reduce poverty. Contrary to popular perceptions, undernutrition is not simply a result of food insecurity, but is often instead a result of inappropriate feeding and care practices, poor access to health services, or poor sanitation. Income and food production, as well as birth spacing and women's education, are important, but long-term routes to improving nutrition are ideal. Shorter routes are providing health and nutrition education and services and micronutrient supplementation and fortification.

The report concludes that development partners must use their combined resources of analysis, advocacy and capacity-building to encourage governments to move nutrition higher on the agenda, particularly when achievement of the MDGs is compromised. In order to do this, development partners need to convene around a common strategy in nutrition, focusing on scaled-up and more effective action for undernutrition and micronutrients in priority countries, and on action research on learning-by-doing for overweight, low birth weight, HIV/AIDS, and nutrition. The report proposes a global strategy for accelerated action in nutrition to the international development community and national governments.

Graphics: Graphs of prevalence and trends in malnutrition among children under five (1980-2005); graphs of projected trends in numbers of underweight children under five (1990-2015).

UNICEF, “Child Survival Fact Sheet: Nutrition,” <http://www.unicef.org/media>.

This fact sheet reviews the state of malnutrition among children in developing countries, describes a number of effective interventions, and calls on national partners, NGOs, and civil society to improve their commitment to end malnutrition by 2015, as outlined in the MDGs. Of the nearly 11 million children under five who die every year, malnutrition is responsible in over half the deaths. One third of young children in developing countries are malnourished — 150 million are underweight, while another 175 million are stunted from chronic malnourishment. Over two billion women and children worldwide suffer from micronutrient malnutrition deficiencies in vital vitamins (vitamin A and folate) and minerals (iron, iodine, and zinc). UNICEF reports that their interventions are working: vitamin A supplementation saved a million young lives between 1998 and 2000, and over 70 percent of the developing world’s households now use iodized salt and over 90 million children are protected from severe mental impairment. UNICEF argues that we have the expertise and tools to end malnutrition and related diseases — what we need now is political will and strategic funding.

Serigne Diene. “The Essential Nutrition Actions,” *BASIC Support for Institutional Child Survival (BASICS II) Project*. <http://www.basics.org>.

This report describes a set of evidence-based micronutrient and infant feeding interventions known as Essential Nutrition Actions (ENA). The BASICS II project utilizes ENA in developing countries to fight malnutrition, which contributes to 60 percent of childhood deaths. Even in its mildest forms, malnutrition weakens the immune system and increases the likelihood of mortality from other diseases such as malaria, diarrhea, and acute respiratory infection. ENA is a set of affordable and highly effective nutrition interventions delivered at health facilities and in communities to improve the growth and micronutrient status of children. ENA protects, promotes and supports the achievement of six priority nutrition behaviors: exclusive breastfeeding for six months; adequate complementary feeding starting at six months with continued breastfeeding for two years; appropriate nutritional care of sick and severely malnourished children; adequate intake of vitamin A for women and children; and adequate intake of iodine by all members of the household.

This report reviews the key delivery strategies, implementation steps and guiding principles of ENA. The author provides case studies of ENA implementation in Benin and India and reports on the early results, which suggest that coverage with micronutrients increased and infant feeding practices improved.

Respiratory Illnesses

Pneumonia

UNICEF and WHO, *Pneumonia: The Forgotten Killer of Children* (2006).

http://www.unicef.org/publications/files/Pneumonia_The_Forgotten_Killer_of_Children.pdf

This report examines the epidemiological evidence on the burden and distribution of pneumonia and assesses the current levels of treatment and prevention. As it reports, pneumonia causes almost one in five under-five deaths worldwide — more than two million children each year, more than any other disease, and more than AIDS (300,000 children deaths per year), malaria (800,000 children deaths per year), and measles combined. More than one million lives could be saved if prevention and treatment interventions for pneumonia were implemented universally. Around 600,000 children’s lives could be saved each year through universal treatment with antibiotics alone, which would cost around \$600 million. Yet, the lack of attention to the disease means too few children have access to available interventions. This joint UNICEF/ WHO publication is a call to action to raise awareness about this neglected disease and to reduce child deaths from pneumonia, which will contribute to achieving the MDG on child mortality.

Graphics and Summaries: Extensive background information and numerous useful graphics illustrating pneumonia’s epidemiology; detailed per-country tables of key pneumonia indicators (mortality, prevention and treatment); great photos of children.

Measles

WHO, “Fact Sheet: Measles,” revised January 2007.

<http://www.who.int/mediacentre/factsheets/fs286/en/>

This fact sheet provides a comprehensive overview of the epidemiology of measles, which remains a leading cause of death among young children, despite the availability of a safe and effective vaccine for the past 40 years. The measles vaccine is safe, effective, and inexpensive: it costs less than USD \$1 to immunize a child, making it one of the most cost-effective public health interventions available for preventable deaths.

Immunization coverage rates vary significantly by region. WHO estimates that the global immunization coverage for measles increased from 71 percent to 75 percent between 1999 and 2005. The largest gains occurred in Africa, where measles cases and deaths decreased by nearly 75 percent. The fact sheet reviews the components and 47 priority countries of WHO and UNICEF’s joint Global Plan for Reducing Measles Mortality. It introduces the Measles Initiative that was launched in 2001 and outlines the challenges of reducing measles mortality by 90 percent by 2010.

Water and Sanitation

UNICEF, *Progress for Children: A Report Card on Water and Sanitation*, No. 5 (September 2006). http://www.unicef.org/publications/files/Progress_for_Children_No._5_-_English.pdf.

This report card, the fifth in a UNICEF series that monitors progress for children towards the MDGs, measures the world's performance in water and sanitation.

The report maintains that unsafe water, lack of sanitation, and inadequate hygiene contribute to the leading killers of children under five. Those ailments include diarrheal diseases, pneumonia, and undernutrition. Achieving MDG #7, and its targets of reducing by half the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015, is of vital relevance for children and for improving nutrition, education, and women's status. As the report concludes, if current trends continue, the world is on track to meet the target for drinking water, although some countries and regions are lagging behind. The target for sanitation, however, appears distant universally.

Graphics: Numerous graphics reflecting access to improved drinking water and sanitation by region, further broken down by urban versus rural; maps and tables depicting progress towards MDGs by region; qualitative assessment by region and a section on the nine steps necessary to reach the MDG targets.

Diarrheal Disease

UNICEF and WHO, "Joint Statement: Clinical Management of Acute Diarrhoea." 2004. http://www.unicef.org/publications/files/ENAcute_Diarrhoea_reprint.pdf

In this joint statement, UNICEF and WHO (in collaboration with USAID) suggest that the mortality rate for children under five suffering from acute diarrhea can be dramatically reduced. According to this report, while the mortality has fallen significantly from 4.5 million deaths annually in 1979, more than 1.5 million children under five continue to die each year from acute diarrhea. The authors state that many children can be saved through critical therapies such as the prevention and treatment of dehydration with oral rehydration salts (ORS) and fluids available in the home, breastfeeding, continued feeding, selective use of antibiotics, and zinc supplementation for 10-14 days.

They recall that these treatments may have averted more than 1 million deaths each year in the 1990s and lament that the knowledge and use of appropriate home therapies to successfully manage diarrhea appears to be declining. Their revised recommendations emphasize family and community understanding of managing diarrhea, outlining specific responsibilities for mothers and other caregivers, healthcare workers, governments and development partners.

PATH and UNICEF, Enhanced Diarrheal Disease Control Resource Center website:
<http://www.eddcontrol.org/>

This website provides a comprehensive overview of diarrheal diseases, which are responsible for an estimated 1.6 to 2.4 million deaths annually. It is the second largest killer of children under five. The website highlights new interventions for diarrheal disease control, which include a new, low-osmolarity formulation of oral rehydration solution, zinc treatment, and new vaccines against rotavirus, as well as the more traditional interventions such as breastfeeding and washing hands.

Immunizations and Vaccines

Mark Kane and Heidi Lasher, “The Case for Childhood Immunization,” *Children’s Vaccine Program at PATH*, Occasional Paper #5, March 2002.

http://www.path.org/vaccineresources/files/CVP_Occ_Paper5.pdf

This report suggests that childhood immunization may be the “most basic and cost-effective primary health intervention.” More specifically, immunization is safe, easy to administer, effective and cost-beneficial. Immunization against diseases such as polio, tetanus, diphtheria and pertussis saves the lives of approximately three million people each year, and prevents many more millions from suffering debilitating illness and lifelong disability.

Despite the widespread availability of vaccines, around three million people- mostly children under-five in developing countries- still die each year from vaccine-preventable diseases. Twenty-six percent of children (almost 34 million infants each year) still do not have access to basic immunization services, with lowest coverage in sub-Saharan Africa. Moreover, newer vaccines are slower to reach the children in greatest need. For instance, hepatitis B and Hib vaccines are only now becoming available to developing countries, decades after they were first introduced and they could prevent up to 1.5 million deaths per year. For these reasons, a child in the developing world is 10 times more likely to die of a vaccine-preventable disease than a child in the industrialized world.

However, as the authors maintain, there is hope. Together, the Children’s Vaccine Project at PATH and other GAVI partners are bringing newer vaccines and increased immunization safety to the 74 poorest countries of the world. Through this collaborative effort, they aim to protect an additional 34 million children and save approximately three million lives per year.

Graphics: Histogram of global mortality from vaccine preventable diseases (1999); pie chart of percentage and number of children not fully immunized by region (1999)

WHO-UNICEF Global Immunization Vision and Strategy (GIVS), “Saving 10 million more lives through immunization: the price tag, the shortfall,” 7 March 2006.
http://www.who.int/immunization/givs/GAVI_Imm_Forum_piece.pdf.

This brief addresses fundamental questions regarding the financial realities and challenges of global immunization. Currently, immunization coverage levels in 72 countries are around 70 percent, far lower than the 90 percent goal, and spending on immunization has risen over the last five years, from an average of US \$1.1 billion per year in 2000 to US \$2.5 billion in 2005. At under US \$1,000 per life saved, immunization remains one of the best public health “buys” available, especially when considering the additional economic benefits of an 18 percent return on investment that can accrue.

Based on the GAVI Alliance’s work in getting countries to complete financial sustainability plans, and recent advances in health economics forecasting by WHO-CHOICE (Choosing Interventions that are Cost-Effective), it is now possible to develop a model to forecast the future costs of achieving the immunization goals outlined in the GIVS. This costing study determined that an additional 10 million lives can be saved over the next decade by increasing spending on immunization from USD \$2.5 billion per year to USD \$3.5 billion per year by 2010 and to USD \$4 billion by 2015. One-third of this USD \$35 billion between 2006 and 2015 should be spent on vaccines, USD \$2.2 billion should go towards immunization campaigns, such as those for polio, measles and tetanus, and the remainder would be spent on immunization delivery systems. Currently, there is a USD \$11-15 billion funding shortfall. The poorest countries currently finance one-third of their immunization expenses.

Until those countries are able to take on a greater proportion of the expenses, it is in the interest of the high-income countries to cover some of the long-term costs. The GAVI Alliance is already filling part of the gap, but more funds are needed, and innovative concepts (such as Advanced Market Commitments and International Development Association [IDA] buydowns) need to be further explored to identify additional financial resources for immunization.

Graphics: Histogram of estimated spending (2000-2005) and forecasted expenditures (2010-2015) for immunization programs in 72 countries; histogram of funding gaps (2006-2015) by type of spending.

UNICEF, “Immunization Plus: the big picture,”
http://www.unicef.org/immunization/index_bigpicture.html

According to this update, “the ongoing story of the drive for full immunization is one of the many formidable challenges and spectacular successes.” Immunization has saved over 20 million lives in the last two decades and immunization rates for the six major vaccine-preventable diseases (pertussis, childhood tuberculosis, tetanus, polio, measles and diphtheria) have risen from under 10 percent in the 1970s to nearly 75 percent today. Polio is on the verge of eradication, deaths from measles have declined nearly

two-thirds over the last decade and immunization against tetanus has saved hundreds of thousands of mothers and newborns. Distribution of vitamin A capsules has averted at least one million deaths since 1998 and newer vaccines, such as those that protect against hepatitis B, have been introduced into routine health services in more than 40 of the world's poorest nations. However, the dramatic increase in global immunization coverage during the 1980s leveled off in the 1990s and gaps widened both between and within nations, dropping to less than 30 percent in some African nations. A quarter of the children born every year — about 34 million infants — are still not protected against diseases for which inexpensive vaccines are available. For instance, measles alone claimed over 770,000 lives in 2001 because children were not immunized with a vaccine costing less than USD \$1 per dose. The report lists many compelling reasons why the battle against infectious diseases must go on.

Owen Barder, "Vaccines for Development," *Center for Global Development*, Policy Brief. April 2006.

This brief promotes immunization as one of the best ways to improve health in developing countries. The author maintains that while the importance of vaccines is increasingly well understood, significant challenges inhibit increases in basic immunization coverage, the introduction of underused vaccines, and the development of new vaccines. He reviews five innovative measures that are being implemented to address these challenges: performance-based grants, a global vaccine purchasing fund, the new International Finance Facility for Immunization (IFFIm), public-private development partnership (PDPs) for development of new products, and advance market commitments (AMCs) to create incentives to develop and manufacture new vaccines. These policies have evolved separately but together constitute a broadly consistent package of measures benefiting from the institutional umbrella of the Global Alliance for Vaccines and Immunizations (GAVI). The brief suggests that the approaches adopted for vaccines may usefully be extended to other areas of development assistance.

HIV/AIDS

Center for Global Development, *Global HIV/AIDS and the Developing World*, Policy Brief, 15 June 2006.

This brief reviews the global human and economic impacts of HIV/AIDS (25 million have died, 40 million infected; disproportionate effects in Africa and among women; exacerbates poverty and drains health care budgets) and what can be done to fight the epidemic (prevention, treatment, care, better health systems). It also provides examples of programs that have successfully combated and even reversed the epidemic from the community to the national level: prevention of mother-to-child transmission (PMTCT) programs in Uganda, which have reduced transmission from mother to child by 50 percent; education and behavior-change programs in Thailand, which led to a 87 percent decrease in new infections; high level political commitment and bold leadership in Senegal, which has kept prevalence rates low; and pharmaceutical companies have responded to global activism by considerably reducing the annual cost

of HIV/AIDS drugs and altering patent laws so that poor countries can more easily produce and import generic drugs. The brief also reviews what the United States is doing to fight HIV/AIDS (bilateral assistance, contributions to the Global Fund, conceding to global agreements that allow poor countries to produce or import low-cost generic drugs) and highlights the continued funding gap (available funding: 9 billion, needed: \$14.9 billion).

Graphics: Pie charts of HIV/AIDS funding gap.

Indira Narayanan, Alakanada Bagchi, Mandy Rose, Carrie Hessler-Radelet and Christina Kramer, "Safeguarding Investment in PMTCT Programs by Incorporating Essential Newborn Care," *BASICS II Project*, Perinatal/ Neonatal Brief (March 2004).

This brief reports that it is essential that the investment in PMTCT be safeguarded not just by preventing transmission of HIV, but by ensuring that the baby lives. Every year, 600,000 infants are infected with HIV/AIDS, mostly through mother-to-child transmission; 3 percent of deaths in children under five years old is attributed to HIV/AIDS. Incorporating essential newborn care into PMTCT programs will ensure a reasonable chance of the baby surviving the critical newborn period (the first four weeks of life), when 50-60 percent of infant deaths take place. Linking newborn care to PMTCT is especially important because the newborn health component of maternal and child health (MCH) programs is often inadequate.

The authors review WHO's four-pronged approach to achieve the UNGASS goal to reduce MTCT by 20 percent by 2010, and suggest that this goal may not be reached unless the newborn components of MCH are strengthened. As they conclude, PMTCT programs should safeguard their investment by ensuring that babies not only avoid infection but also thrive. Integrating essential newborn care into PMTCT activities is logical and cost-effective.

Malaria

The Global Fund for AIDS, Tuberculosis and Malaria (GFATM), "Malaria," in *HIV/AIDS, Tuberculosis and Malaria: The Status and Impact of Three Diseases* (2005).
<http://www.theglobalfund.org>.

This report provides a comprehensive overview of malaria, which kills at least one million people every year (some reports indicate that it causes as many as three million deaths). Up to 90 percent of these deaths occur in Africa and 90 percent are children under five years old. While there have been considerable advances in both the prevention and cure of malaria over the last decade, life-saving measures have continued to fall out of reach of the majority of people who need them. In recent years, there has been a growing commitment to combating malaria on the part of donor governments and affected countries. In 1998, the Roll Back Malaria (RBM) was launched as a new partnership to tackle the disease, and consensus on core strategies and targets was achieved at the Malaria Summit in Abuja in April 2000.

Graphics: Histogram reflecting that the incidence of malaria is higher in poorer families; map demonstrating estimated incidence of falciparum malaria.

Heidi Worley, “Best buys and Challenges for Malaria Prevention in Sub-Saharan Africa,” *Population Reference Bureau*, June 2006.

The author reviews some of the most efficacious and cost-effective techniques to prevent malaria — the leading killer of African children under five, causing about 18 percent of deaths (803,000 per year), according to the article. The techniques of insecticide-treated bed nets, intermittent preventive therapy, and indoor residual spraying could improve the health profile of Africa’s children and pregnant women if made widely accessible. However, the rapid spread of resistance to antimalarial drugs, widespread poverty, and weak health infrastructure means that the burden from malaria in African countries continues to rise.

The author reviews some of the obstacles in obtaining universal coverage and sustainability and then offers successes that Malawi and Tanzania experienced with social-marketing for ITN distribution. She remarks that strong efforts are being made to boost ITN coverage, due in part to a surge in national and international funds. The Global Fund for AIDS, TB, and Malaria has provided another mechanism for increasing and leveraging resources for malaria prevention. This being said, challenges and policy issues remain.