



H N P D I S C U S S I O N P A P E R

# The Family Health Cycle

## From Concept to Implementation

Jonathon Simon, Sydney Rosen, Marim Claeson, Anna Breman, and James Tulloch

October 2001





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James Tulloch**

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## Health, Nutrition and Population (HNP) Discussion Paper

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Jonathon Simon, Sydney Rosen, Mariam Claeson, Anna Breman, James Tulloch

## ACRONYMS

|        |  |
|--------|--|
| CDD    | Control of Diarrheal Diseases Programme      |
| DALYs  | Disability Adjusted Life Years               |
| ECD    | Early Child Development                      |
| ED     | Education                                    |
| EPI    | Expanded Programme on Immunization           |
| FRESH  | Focused Resources on Effective School Health |
| HDNSP  | Human Development Network Social Protection  |
| HNP    | Health, Nutrition, and Population project    |
| H-SIP  | Health Sector Investment Project             |
| IMCI   | Integrated Management of Childhood Illness   |
| IUGR   | Intrauterine Growth Retardation              |
| MCH    | Maternal and Child Health                    |
| NGO    | Nongovernmental Organizations                |
| NUT    | Nutrition                                    |
| RBM    | Roll Back Malaria                            |
| SRM    | Social Risk Management                       |
| SSN    | Social Safety Net                            |
| STD    | Sexually Transmitted Disease                 |
| UNICEF | United Nations Children's Fund               |
| WHO    | World Health Organization                    |

## ABSTRACT

For most people, but especially for children in developing countries, health outcomes are determined largely by decisions made within the household, by the family and the mother and father, in particular. From infancy to adulthood, parents provide (or fail to provide) everything from nutrition and shelter to education and health care. The family is also typically the source of care and support for older people, who in turn often contribute to care of children.

The authors develop a model for placing public health policies and programs in the context of the family and the outside forces that influence a family's decisions. This life-cycle model, which we call the "family health cycle," connects children, mothers, fathers, and grandparents in a system that, as a whole, shapes the health of individual family members. The family or household, in turn, interacts with various actors in the community, the formal and informal health services system, and is affected by a wide range of external conditions and inputs.

The model starts with the birth of a child, who passes through the first stage of the cycle as an infant boy or girl, becomes a child, and reaches adolescence. At this stage, the person is biologically "eligible" to pass through another stage of the cycle as a parent, and then, barring early adult mortality or childlessness of the offspring, can cycle through the system once again as a grandparent. Each stage carries with it age- and gender-specific health risks, and thus calls for different health interventions. Interventions at each stage can be viewed as inputs to help the individual survive (and benefit from lower morbidity) until the next stage, when new intervention inputs are required. This framework helps identify which kinds of interventions—biomedical, social, economic, environmental—are likely to be most effective at each stage of the cycle. It thus has the potential to improve understanding of the linkages among the many interventions available and help put scarce public health resources to better use.

Finally, the authors review how the family health cycle approach – or the "life-cycle" approach as it is more commonly called in World Bank analysis and operations – has been used for programming and policy development in different contexts beyond maternal and early childhood health: in developing poverty reduction strategies, in conducting risk assessments for social protection initiatives, in linking school health with health and nutrition interventions in other age groups, and in nutrition programming. We provide a few country-specific examples of the implementation of the approach in program policy and planning from Jamaica and Dominican Republic (social protection), China and the Philippines (health services), Senegal (nutrition), Brazil and India (health sector analysis), and sub-Saharan African countries (education).

## INTRODUCTION

Improving the health of mothers and children in the developing world has been the object of numerous public health programs during the past twenty years. The tools, technologies, and approaches developed to this end have led to increasingly effective health policies and programs. The results are evident in child survival rates in even the poorest regions. In South and Southeast Asia infant mortality fell by 44 percent, and in sub-Saharan Africa, it fell by more than a third, from 87 to 57 per thousand, between 1978 and 1998 (WHO 1999), although the trends in infant and child mortality rates have been uneven and are stalling in some countries and even increasing in others. Maternal health has lagged behind child health, but the reinvigoration of the women's health agenda after the 1994 International Conference on Population and Development has accelerated progress in this area. Even the disastrous impact of HIV/AIDS in Africa, reversing many of the gains of the past two decades, cannot overshadow the tremendous successes that better science, policies, and programs have achieved.

Maternal and child health (MCH) activities have typically involved tools and technology (e.g., disposable syringes, vaccine vial monitors, oral rehydration salts, insecticide treated nets) and strategies and approaches (e.g., Control of Diarrheal Disease [CDD] Programme, Expanded Programme on Immunizations [EPI], and Safe Motherhood Programme) that are directed at a single disease, like diarrhea or malaria, or a cluster of conditions, like vaccine-preventable diseases or obstetric complications. They are effective in part because they do target a single disease or set of conditions, but in so doing they neglect the wide range of inputs that enhance or diminish the health of an individual and determine overall health status. More recent approaches like the Integrated Management of Childhood Illness (IMCI) and Roll Back Malaria (RBM) have had some success in improving case management of common childhood diseases through improved use of life-saving health technologies, but their impact on community and household contributions to health promotion and disease prevention remains limited.

As a result of the relatively narrow focus of these initiatives, we have often lost sight of a crucial fact: that producing health—whether for a child, a mother, or anyone else—is primarily the task of a family health system.<sup>1</sup> For most people, health outcomes, both positive and negative, are determined largely by decisions made by the family and within the household. For most children, it is the mother and father who have the greatest impact on their health. From infancy to adulthood, parents provide (or fail to provide) everything from nutrition and shelter to education and health care. The family is the key provider of health services during illness and the major source of health promotion and disease prevention activities. The family is also typically the source of care and support for older people, who in turn often contribute to the care of children. Maternal health and child health are thus part of a “family health cycle” connecting mothers, fathers, children, and grandparents in a system that, as a whole, produces the health of individual family members. The family or household interacts with the community and the formal and informal health services system and is in turn affected by a wide range of external conditions and inputs.

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<sup>1</sup> As is discussed in more detail below, *family* is used here to refer to whatever grouping of persons assumes responsibility for the health of the individual. It is not necessarily limited to biological relatives and can encompass the broad array of kinship and household patterns around the world.

In this paper, we attempt to position public health policies, programs, and interventions in an overall family health cycle that encompasses age- and gender-specific stages for girls, boys, mothers, fathers, and grandparents. We start with the observation that after passing through the family health cycle as an infant, a child, and an adolescent, a boy or girl often cycles through again as a parent, and then, barring misfortune, again as a grandparent. Each stage carries with it age- and gender-specific health risks, and thus calls for different health interventions. Interventions at each stage can be viewed as inputs to help the individual survive and benefit from lower morbidity until the next stage, when new intervention inputs are required. This framework also helps us identify kinds of interventions—biomedical, social, economic, environmental—that are likely to be most effective at each stage of the cycle. The family health cycle approach to understanding the household production of health thus has the potential to improve our understanding of the linkages among the many MCH and other interventions that are available and help put scarce public health resources to better use.

The paper is organized in two sections. Section 1 provides a conceptual framework for considering families as the key focus for the production of health and the family health cycle as the appropriate approach. This section lays out the basic maternal and child health cycle and the full family health cycle for a girl child and a boy child. Following the basic description, we then look at the interventions that affect the family health cycle. In Section 2, the implementation component provides examples of the adaptation of the family health cycle; the use of the life-cycle in the framework of the World Bank human development approaches. The paper concludes with some observations on how the family health cycle approach can be applied to different contexts and can lead to a more efficient allocation of the scarce resources available to promote public health in developing countries

## **I CONCEPTUAL FRAMEWORK**

### **1. Why a Family Health Cycle?**

The core argument of this paper is that producing health for an individual—a child, a mother, or anyone else—is the task of an entire “family health system.” We have chosen to label this a family health system to emphasize the central role that family members, particularly parents, play in determining children’s health. The family health cycle relates the members of the family health system across time, incorporating children, parents, and people who bear no children or are beyond the child-bearing years. It is thus explicitly includes the non-reproductive aspects of adult health and intergenerational contributions to the production of health.

It would be equally valid to call our model a “household health system,” and thus to link it explicitly to our understanding of the household production of health. Neither term overcomes the critical question of what constitutes a “family” or a “household.” As a practical solution to this problem, Berman, Kendall, and Bhattacharya (1994) recommend defining the household functionally, on the basis of whatever issue is being considered in the analysis. Since the issue that interests us in this paper is the household contribution to the production of health, *family* here refers to any group of persons that assumes responsibility for an individual’s health. It is

not limited to biological relatives, and it can encompass the broad array of kinship and habitation patterns around the world.

Most of the disease-specific interventions and approaches described in the introduction to this paper can be—and typically are—applied narrowly, to just one component of the family health system at a time. As a result, the existence of a family health cycle that is central to determining maternal and child health outcomes is often overlooked. This has (at least) two major drawbacks. First, it hinders efforts to position individual interventions within a comprehensive program, based on an understanding of how families produce health. Viewing maternal and child health as components of a conceptually simple life-cycle that includes all ages of the child and mother, and accounts for the increasingly recognized role of the father, would allow program planners, implementers, and donors to look for new opportunities to improve family health outcomes.

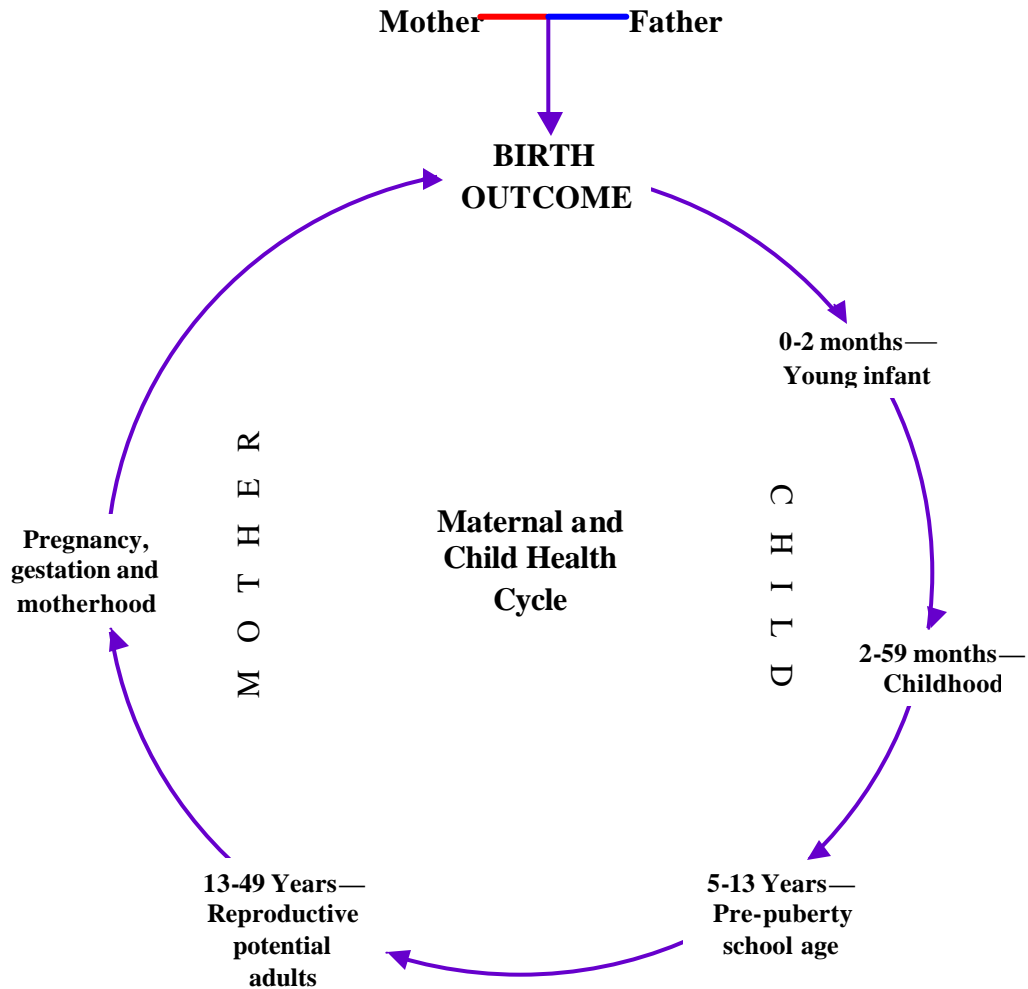
Second, the neglect of the family health cycle often leads to competition and inefficiency in the allocation of resources to address MCH and other public health problems. Over the years, the enormity of MCH problems and the scarcity of resources for research and programming, combined with individual disciplinary interests, have led many scientists to assert the primacy of their preferred piece of the health system. The result has been an age-specific, gender-specific, discipline-specific, or intervention-specific approach to public health programming and an inefficient allocation of resources, as well-intentioned scientists or disciplines compete for larger shares of a finite pie. Understanding maternal and child health as part of a family health cycle may allow us to achieve a better balance and complementarity among our programs, instead of fostering competition for resources and programming priority.

Is looking at MCH as part of a larger system or within a life-cycle or life span approach a new concept? Absolutely not. It draws upon long-standing scholarship and experience in social medicine, community health and development, and a rich literature on the household production of health (ACC/SCN 2000; Popkin 1982; Howson et al. 1996; Tinker et al. 1994; World Bank 1994; and Berman, Kendall, and Bhattacharya 1994). But the extraordinary technical breakthroughs in modern medical science—from the human genome project to new vaccines—may divert our attention from the simple, but crucial, social and behavioral aspects of the production of good health for women and children. Similarly, the analytical tools on which we rely, such as attributable risk reduced or DALYs (disability adjusted life years), threaten to drive us farther away from understanding the production of improved maternal and child health as a function of complementary interventions within a system. Focusing on the family health cycle will help ensure that technical and analytical achievements are seen as tools to assist us in attaining our goal of improved maternal and child health, and not as the goal.

## 2. The Family Health Cycle

The family health cycle starts with the simplified conceptual cycle.

Figure 1 Basic Maternal and Child Health Cycle



Although we could start anywhere in the cycle, for ease we will use the birth outcome as the starting point. We divide the cycle into five periods.

1. The first period is the initial two months of life. This “young infant” timeframe includes the perinatal and neonatal periods. If the child survives the risks associated with late gestation, labor and delivery, and congenital malformations, most of the remaining risk to survival during this period is related to infectious diseases. The main interventions involve clinical case management of infectious diseases if they occur. Environmental interventions to reduce exposure to infectious agents are also important. There are few reasons for gender-specific interventions in this age group as long as both girls and boys have equal access to breastfeeding and health services.

2. The second period is from 2 to 59 months, capturing most of infancy and childhood. This is the usual focus of child survival interventions, ranging from traditional health and nutrition programs (immunization services, IMCI ) to social and environmental improvements (maternal education efforts, vector control). Most need not be gender-specific unless systematic gender discrimination disadvantages girl children.
3. The third period covers school-age children prior to puberty, approximately 5 to 13 years. As this is a period of low mortality (except due to injury), health and nutrition interventions can focus less on control and management of infectious diseases (except for school-based deworming) and more on disease prevention and health promotion. Programs to reduce risky behaviors in adolescence (unplanned pregnancy, sexually transmitted diseases [STD]s, tobacco consumption, alcohol abuse) can begin during this period and may be more effective if the interventions are tailored to each gender.
4. The fourth period is the period of reproductive potential (usually 13 to 49 years for women, slightly longer for men). This is the core period for the reproductive health agenda, and safe motherhood interventions are well detailed. As this period covers much of adulthood, and not all adults are biologically able to, or choose to, become parents, interventions among both men and women to reduce risk behaviors (smoking, alcohol abuse, STDs), vehicular accidents, workplace injuries, and domestic and other forms of violence are also appropriate. Gender-specific approaches are essential at this stage of the cycle.
5. The fifth period occurs after the biological reproductive potential has passed. With life expectancies increasing in most areas of the world (sub-Saharan Africa being the notable exception), the number of relatively healthy and active years left to most people after the potential reproductive period is over has risen markedly. Even in Africa, individuals who survive childhood illnesses and do not succumb to HIV/AIDS or violence are likely to live many years beyond the age of completing their reproductive potential. Current MCH interventions fail to account for this portion of the cycle at all. Older women may still be mothers (or grandmothers) and be contributing to the production of healthy children even if their own childbearing period has passed. This is especially true in Africa, where older women are increasingly bearing the burden of caring for children orphaned by the AIDS epidemic. We leave this stage off our diagrams for the sake of simplicity, but we note it as an unfortunate omission in most public health programming.

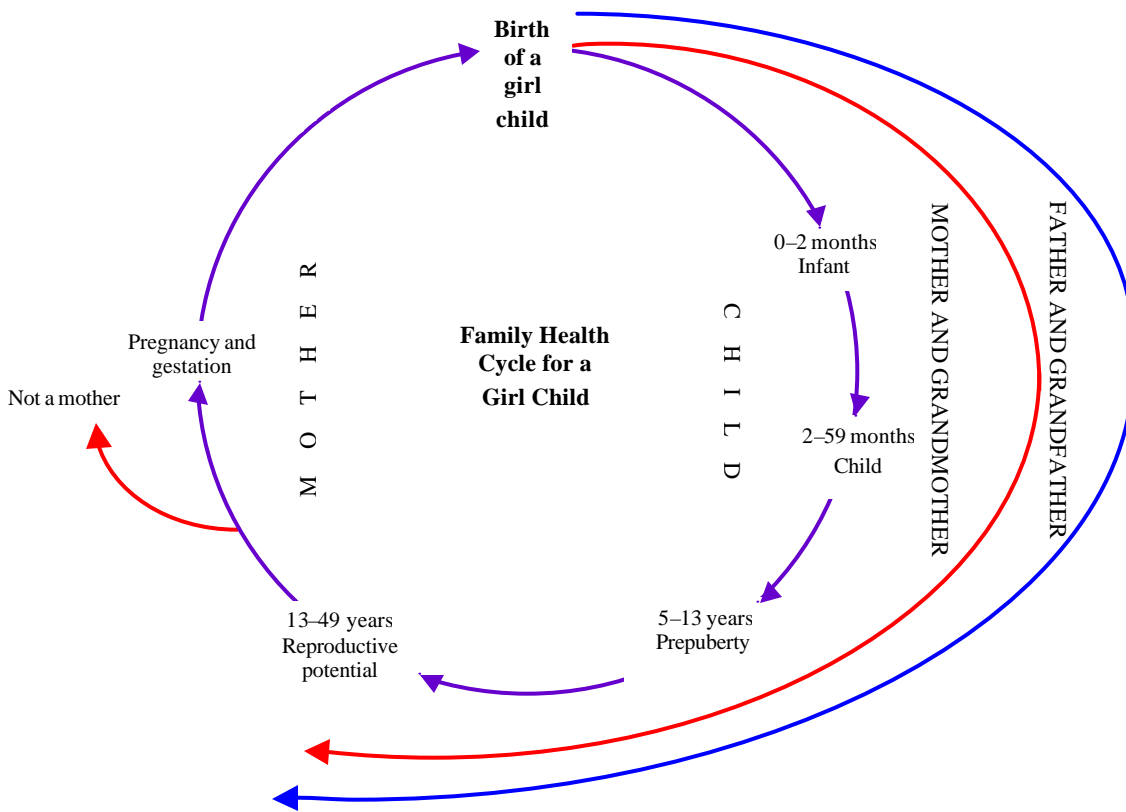
To turn the basic MCH cycle depicted above into a family health cycle, parents (and in some cases grandparents) must be added, and interventions must be tailored to the age and gender of the target groups. The basic MCH cycle includes only mothers and children, and is thus representative of most of our current public health programming. The more comprehensive diagrams below reflect our belief that a family health cycle that includes interventions related to the father and to adults who do not become parents is more appropriate for the public health community. The production of healthy adults is a worthwhile goal in its own right—for moral and economic reasons—and has the direct benefit of influencing favorable child health outcomes.

In the following section, we describe the family health cycle for a girl child and a boy child, highlighting the similarities and differences.

### 2.1 The Family Health Cycle for a Girl Child

The family health cycle for a girl child, depicted in Figure 2, is similar to the basic cycle shown in Figure 1. The principal difference is that it schematically accounts for the role played by the mother and father of the girl child throughout her life and allows for a nonpregnant state in adulthood.

**Figure 2 Family Health Cycle for a Girl Child**



The child-centered interventions in the 0 to 2 month and 2 to 59 month periods are the standard child survival interventions. Using the family health framework, however, educational interventions to improve the mother’s skills and behaviors (lactation counseling, child nutrition education) would be seen as important. Interventions to improve fathers’ skills and behaviors (improved care and feeding of infants, avoidance of substance abuse, or domestic violence prevention) also should be seen as core contributions to the production of good maternal and child health.

As the girl child enters school age, adolescence, and early adulthood, the interventions will begin to differ from those for boys. Family life education for school-age girls before they reach puberty may reduce risk of acquiring STDs or HIV. The interventions available in the reproductive years to produce a healthy woman and foster a healthy birth outcome are numerous. Ensuring access to general education, providing tetanus toxoid immunization when appropriate, fostering adequate nutrition during both pregnant and nonpregnant states, and providing the full range of reproductive health services (both antenatal and post-partum) are important parts of the intervention package. Interventions that minimize domestic violence and abandonment of women or create income-generating activities are not usually seen as part of the standard range of MCH interventions, but within the family health cycle approach, they are important for maintaining healthy women and improving child survival.

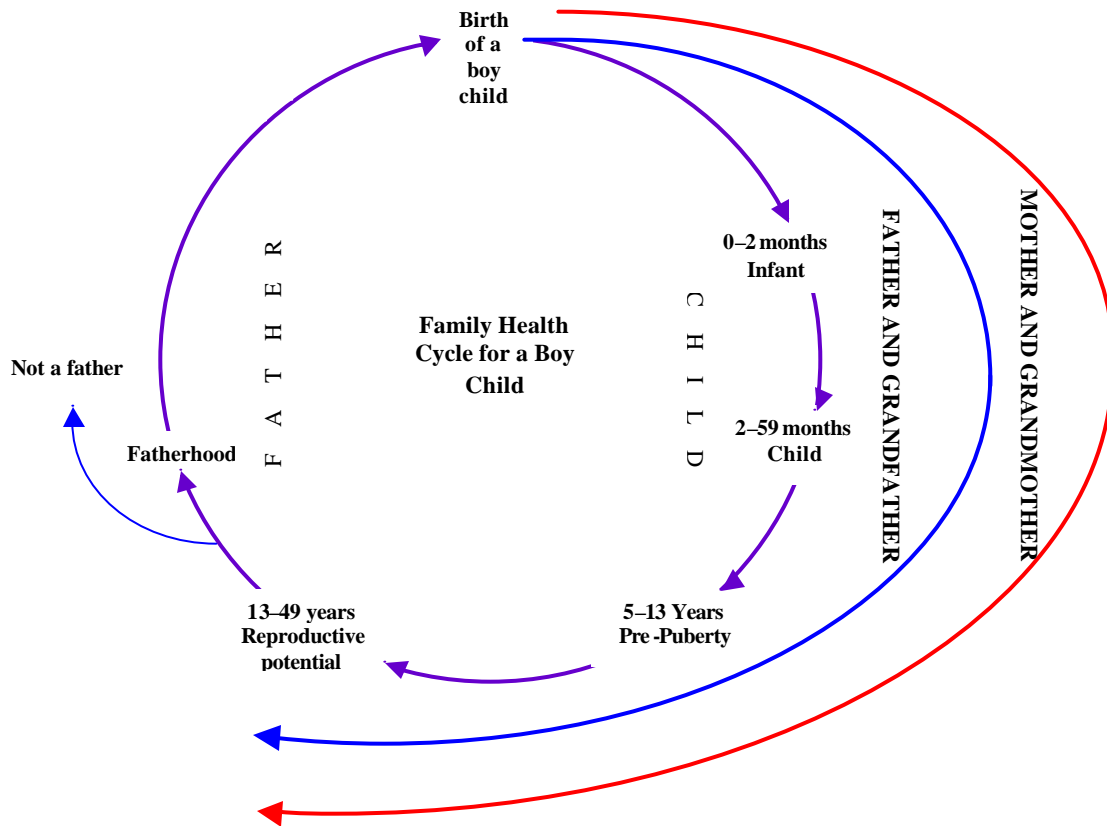
The arcs in Figure 2, symbolizing the involvement of the mother and father throughout the life-cycle of the child, are reminders of the importance of parents' roles in improving child survival. The contributions are not limited to the mother or solely to the biologically vulnerable period of infancy and childhood. Parents can participate throughout the life of their children as sources of health advice and care, financial support, or extra sources of labor for domestic and income-generating activities. Each of these inputs can operate in a positive or negative fashion. The quality of the health advice or care may be associated with parental educational levels and their own experiences. Parents can either be a net benefit to household income or a net drain—and often will serve as both at different stages of their lives.

## ***2.2 Family Health Cycle for a Boy Child***

The family health cycle for a boy child (Figure 3) is similar to that of a girl child until the school-age years. At that point, gender-specific interventions begin to make more sense. The interventions strongly differ when the boy child nears his reproductive potential. Reproductive health services for older boys and men are focused on sex education and the provision of contraceptive and STD prevention commodities. Interventions to foster safe sex practices are essential, especially in areas where HIV/AIDS is a public health concern. Interventions to reduce exposure to other STDs, occupational injuries, or vehicular accidents may be more extensive than for females in areas where, in population terms, males face potentially greater exposures.

During male adulthood, a series of interventions can improve children's and women's health outcomes. A father influences his child's health both directly, for example, by his willingness to space births appropriately, and indirectly, through his effect on the mother's health. Demographic and Health Survey data highlight the importance in reducing child mortality of the father's education level and his willingness to participate in health-promoting practices (Ughade et al. 2000; D'Ascoli et al. 1997; Victora et al. 1994; Caldwell and McDonald 1982). Fathers play a nurturing and protective role during childhood and, depending on the society, may continue this role in adulthood. Equally important, fathers are often largely responsible for children's economic, social, and physical security. Through their own behavior, fathers (and mothers) can enhance or diminish children's security, and thus their health.

**Figure 3 Family Health Cycle for a Boy Child**



### 3. Understanding the Connections among Health Interventions

If the health of individual family members is indeed a product of an overall family health cycle, as we argue above, two ideas become important in thinking about how to improve maternal and child health. First, as individuals proceed through the life-cycle, interventions at each stage affect the need for, and outcomes of, interventions at later stages. This relationship among interventions occurs within the individual, but it also has impacts across generations. Second, although it may appear obvious, different stages of the cycle call for different interventions. Customizing the package of interventions to the gender and age of the individual is critical to the success of MCH programming.

### ***3.1 Interrelatedness of Interventions***

The major advantage of conceptualizing MCH activities within an overall family health cycle is that it emphasizes the interrelatedness of all our individual maternal and child health interventions. We can identify four ways in which this will improve MCH programming.

First, instead of seeing each intervention as a discrete activity, important in its own right, the family health cycle approach highlights the notion that interventions at each stage of life are inputs to help the individual survive until the next stage, when new intervention inputs are required. Once the child passes through the cycle, he or she cycles through again as a parent, and perhaps once again as a grandparent. Interventions that improve an individual's health at one stage of the cycle are likely to affect the individual's "stock" of health at later stages. This is seen through the impact of exclusive breastfeeding on reducing infectious disease incidence in childhood and in the differences in birthing complications among women who are stunted due to malnutrition during childhood.

Second, the cycle illustrates the fact that children, parents, and grandparents all have a role to play in the production of good health for themselves and their families across multiple generations. Producing good maternal and child health may require interventions well back in the cycle, even in the previous generation. Research on intergenerational health impacts from Guatemala raises profound questions about the most effective timing for specific interventions (Ramakrishnan, U.; R. Martorell, D. G. Schroeder and R. Flores. 1999). Nutritional interventions that improve female children's and adolescents' nutritional status may influence the birth weight of offspring which, in turn, influences the health status of that next generation. The low birth weight second-generation child is more likely to suffer infection and be malnourished herself, leading to further stunting and unfavorable birth outcomes for the third generation . . . and the cycle continues. Our best intervention point for this third-generation malnourished child may have occurred one or two generations before the child's birth—perhaps the best example we have of the importance of the family health cycle framework. Interventions undertaken today may generate a stream of health benefits far into the future.

Third, just as they act across generations, interventions that reduce morbidity in a child can also affect the child's siblings, both by reducing exposure to disease-causing agents and by minimizing demands on parental labor needed to care for a sick child, at the expense of other children or income-generating activities. Healthy children are both a cause and an effect of healthy households. Sickly children drain resources (both time and money) from households and may partially explain the morbidity and mortality clustering we observe in communities.

Finally, the current hypothesis that intrauterine growth retardation (IUGR) is related to adult-onset chronic disease, and the idea that selected adult chronic diseases are a function of exposures to infectious agents in utero or during childhood, force us to pay attention to the whole

life-cycle.<sup>2</sup> This runs counter to the historical focus of MCH activities on narrower periods of childhood and pregnancy (Martorell et al. 1998). For all these reasons, positioning maternal and child health within the overall family health cycle enriches our understanding of how to achieve healthy mothers and children.

### **3.2 Matching Interventions to Stages of the Family Health Cycle**

The ability of the family health cycle described above to achieve good health outcomes for individual family members depends heavily on a wide range of positive and negative inputs into the system. Public health interventions to improve maternal and child health should be positive inputs themselves or designed to mitigate the negative effects of other behaviors. In this section, we consider how the family health cycle approach influences our thinking about the selection and timing of intervention packages.

MCH interventions can be grouped broadly into four categories: biological, medical, and health interventions; nutritional interventions; environmental interventions; and family, social, political, and economic interventions.

*Biological/medical/health interventions.* This is the group of interventions most readily understood by health professionals, program personnel, and donors. These include obvious interventions like immunizations and improved clinical case management. This set of interventions attempts to prevent disease or mitigate its impact.

*Nutritional interventions.* To highlight their importance to child, maternal, and family health, nutritional interventions are arbitrarily separated from the previous category. Nutritional status is strongly related to the success of the body's response to infectious disease challenges. Making nutritional interventions age- and gender-specific is critical, as the nutritional requirements of men, women, and children vary tremendously. Adequate nutrition in adolescent girls and women prior to pregnancy and among mothers during the gestational period influence healthy birth outcomes (e.g., consumption of iodized salt will protect against abortion, stillbirth, birth defects, cretinism, psychomotor defects and neonatal mortality). Micronutrient supplements (e.g., vitamin A, folic acid and iron, and potentially zinc in the future) have become standard child survival interventions.

*Environmental interventions.* Environmental interventions are mostly related to health promotion and disease prevention. Interventions of this type include vector control to reduce exposure to parasitic diseases, improved stoves to curtail indoor air pollution from biomass fuels, and infrastructural investments in improving the quantity and quality of household water supplies and sanitation services.

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<sup>2</sup> The *fetal origins of disease hypothesis*, first constructed by D. Barker and colleagues in Southampton, UK, in the 1980s, suggests that fetal under nutrition during critical periods in utero and during infancy can lead to permanent metabolic and body structure changes. Analysis of large data sets from England demonstrate an increased risk of coronary heart disease, noninsulin dependent diabetes mellitus, hypertension, obstructive lung disease, high blood cholesterol, and renal damage for adults who were born with a weight (<2500 g) relative to individuals weighing >4000 g at birth (Barker 1998).

*Family/social/political/economic interventions.* These interventions range from micro-level decisions under the control of the family (whether to buy over-the-counter drugs and self-treat or seek care from a practitioner outside the household) to actions far beyond the control of the family (e.g., changes in government policies, exchange rates, market prices for essential goods). These interventions capture the social and behavioral aspects of the household production of health and management of illness.

Although all kinds of interventions can make contributions in all periods, the relative importance of each type changes at different times. Moreover, the same interventions will have different impacts on males and females. The age and gender of the family member, the specific condition we wish to modify, and the focus of the program or donor personnel will thus influence the choice of intervention.

Categorizing family health interventions as we have done should not obscure the overlap among the categories. A water and sanitation project financed with a World Bank infrastructure loan is both an environmental and a political/economic intervention. Intrahousehold distribution of food, medical care, and other resources by gender, age, and working status is a family/social factor with strong implications for health and nutrition outcomes. A project aimed at keeping adolescent girls in school can be seen as a social/economic intervention for the current generation and a health intervention for the next generation.

Although we focus on specific interventions, our conceptual model of the family health cycle would be incomplete if we did not include the larger environment in which the family exists. This external environment, illustrated in Figure 4, includes the forces and factors, separate from the specific interventions and actors described elsewhere in the model, that both constrain and facilitate the effectiveness of the interventions and the actors. These external, often uncontrollable, influences remind us that the production of healthy families is not solely a technological and bureaucratic process of securing the people and funds to implement the best tools and technologies. It should remind us to be cautious about the promises we make and the guarantees we offer.



## **II IMPLEMENTING THE LIFE-CYCLE CONCEPT IN WORLD BANK PROGRAMMING AND POLICY DEVELOPMENT**

As discussed above, the family health cycle approach -- or the life-cycle as it is more commonly called in World Bank analysis and operations -- can be used to better understand the interrelatedness of specific interventions within a sector, between sectors, and as a conceptual framework to improve policy development and programming. In this section, we review a few adaptations and applications of the life-cycle approach for planning and programming purposes in Bank-financed health development assistance.

At the Bank, discussions of ways of bringing the synergy of reproductive and child health and nutrition to bear on project effectiveness and to achieve a common framework, instead of pursuing competitive age-, gender-, and sector-specific approaches, resulted in a review of this family health cycle approach in September 1999. A consultation on the life-cycle approach was held with partners, including the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the maternal and child health research community. The ideas presented during this consultation were taken forward by the cluster of thematic groups in the Health, Nutrition, and Population network. We first discuss the life-cycle approach as it is applied in the health section of the *Poverty Reduction Strategy Sourcebook* (Claeson et al. 2000b). We review its application in social protection, education and linking school health with other childhood interventions, and in health sector work, and in nutrition programming. We present two country case studies, Jamaica and Dominican Republic, as illustrations of the ways the life-cycle has been used in social protection programming. Finally, we present the implementation of the life-cycle approach in a reproductive health project in the Philippines, in the supervision of a Maternal and Child Health project in China, in nutrition planning in Senegal and in health sector work in India and Brazil.

### **4. The Poverty Reduction Strategy Life-Cycle Approach**

Ill health is increasingly recognized as one of the main reasons households end up in poverty and that the causality is bi-directional.<sup>3</sup> Health improvements for the poor not only benefit the poor but can also improve health outcomes for the entire society. Widespread communicable diseases among the poor are a health risk for everyone in the community and, with increasing mobility and globalization, for the nation and beyond (Garrett 2000). The poorest group in a country has worse health outcomes than other groups. For example, in Bolivia, the under-5 mortality rate is four times larger in the poorest fifth of the population than in the richest fifth. The under-5 mortality worsens as we move across the income groups from richest to poorest. However, the poor non-poor gaps, and the progressive differences across economic groups, vary from country to country. As discussed above, health, nutrition, and population interventions can improve health outcomes, and so can interventions in such other sectors as education, environment, safe water, and social protection. The life-cycle approach can help identify the risks that disproportionately affect poor individuals and families, organize cooperation between the different sectors that deal with these risks and within the various fields of public health and clinical medicine.

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<sup>3</sup> This section draws heavily on Wagstaff's work in the PRSP Sourcebook (Claeson et al. 2000b).

Many aspects of health have to be taken into consideration when planning interventions: mortality risks, morbidity patterns, nutritional status, fertility management, and disability issues. The life-cycle approach provides a useful way of organizing health assessments and identifying the most effective interventions. Some of the arguments for using the life-cycle in the poverty reduction context are that:

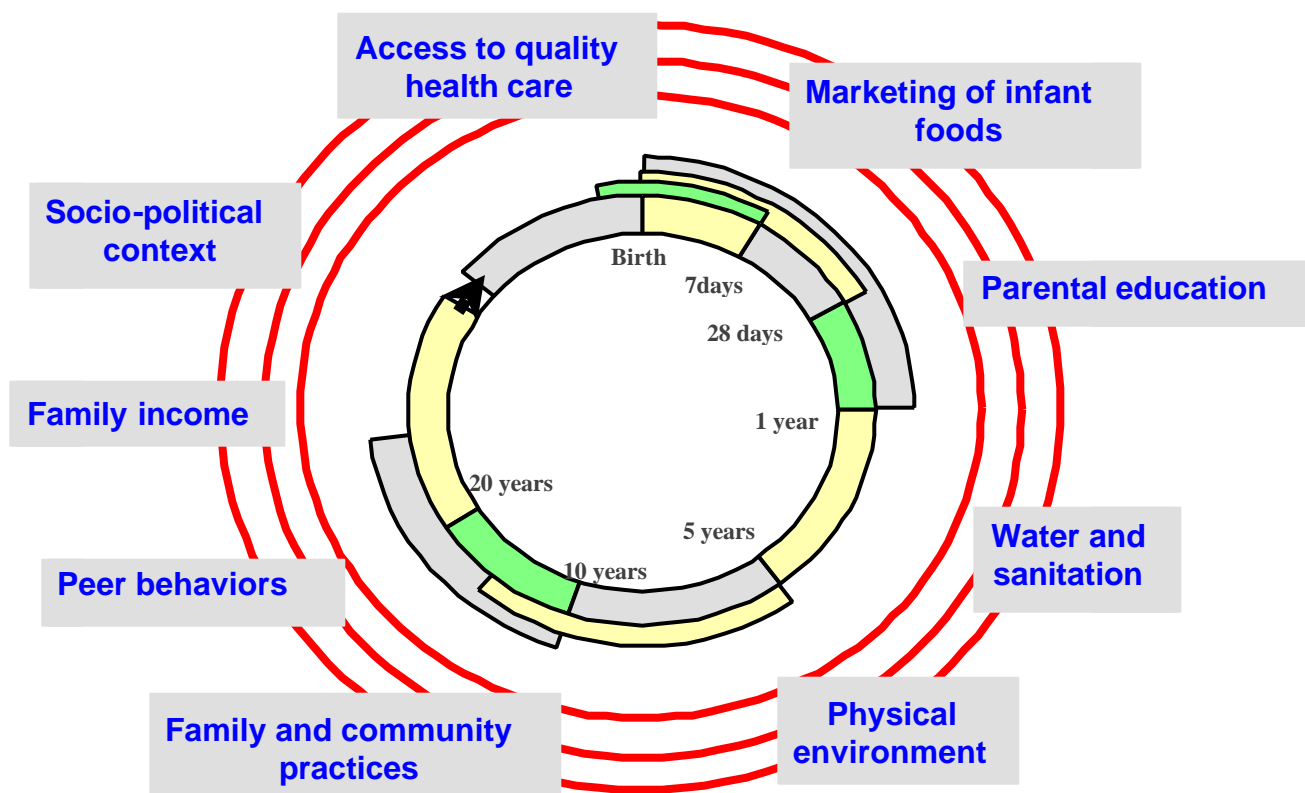
- Health interventions have a cumulative impact—the benefit, nature, and the cost of interventions at a later age is particularly dependent on earlier interventions.
- Priorities for interventions at several points across the life-cycle have to be set to sustain improvements in health outcomes.
- Interventions in one generation bring benefits to successive generations. The most obvious of these are good prenatal care and programs that help teenage girls delay pregnancy, both of which give babies a healthier start in life.
- The approach also facilitates identification of key risks for families and associated gaps in the health system, where interventions can break the cycle of poverty and ill health.

Life-cycle planning also improves the use of scarce resources by facilitating identification of key risks and gaps and key intervention priorities to help break the poverty–ill health cycle.

The health chapter of the PRS Sourcebook (Claeson et al. 2000b) recommends the life-cycle approach for use as an:

- *Assessment tool*—to identify gaps and neglected risks, interventions, and outcomes of the poor at different stages in the life-cycle.
- *Project planning tool*—to facilitate priority setting for selecting the interventions that influence critical risks and gaps among the poor, and that are feasible, affordable, appropriate, and cost-effective to implement.
- *Advocacy and communications tool*— to draw attention to the multiple determinants of ill health among the poor (using the life-cycle as a conceptual framework in poverty reduction strategy in the overall human development context).
- *Intersectoral tool*—to identify synergetic actions within and beyond the health sector.

**Figure 5 Intersectoral Influences on MCH Outcomes**



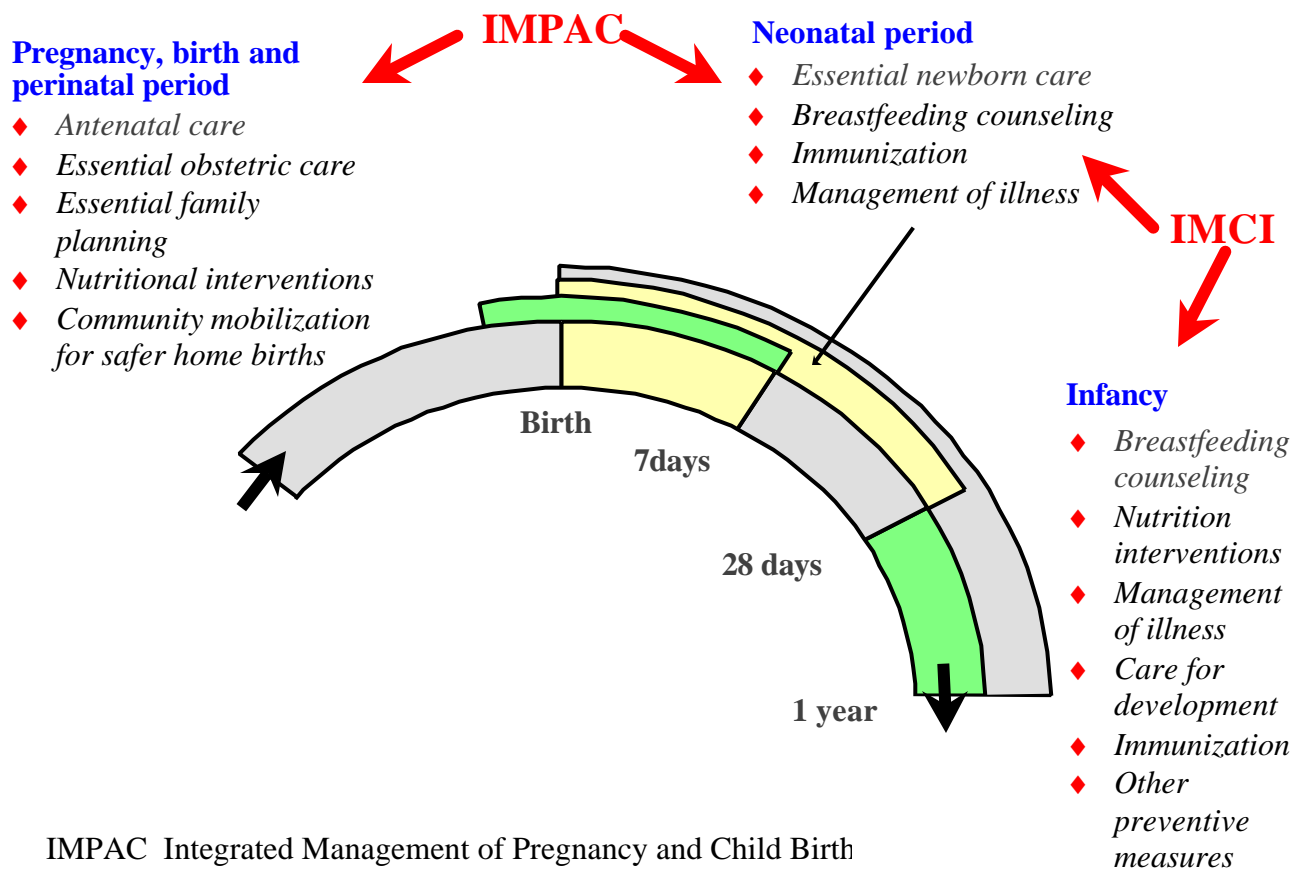
*Source:* Claeson et al. (2000b).

A challenge in applying the life-cycle approach is to be selective and to set further priorities among the potential interventions identified through the process. Possible criteria for ranking problems and interventions identified throughout the life-cycle are:

- The problem disproportionately affects the poor and can be significantly reduced among the poor.
- The interventions reduce a large problem among the poor as assessed by its prevalence, its contribution to the burden of disease and disability, or associated mortality or other non-health outcomes (school performance, work productivity) among the poor.
- The intervention is consistent with—and contributes to—overall poverty reduction.
- The intervention is affordable, effective, cost-effective, and culturally appropriate.
- The implementation strategies are feasible and efficient in reaching the poor.

Already some of the interventions have been “packaged” to maximize the benefits in a specific age group. IMPAC (Integrated Management of Pregnancy and Child Birth), IMCI and FRESH (Focused Resources on Effective School Health) are examples of such basic packages that address risks and problems that disproportionately affect the poor, especially vulnerable pregnant women and children (Figure 6).

**Figure 6 Life-Cycle–Specific Basic Services: IMPAC and IMCI**



IMPAC Integrated Management of Pregnancy and Child Birth  
 IMCI Integrated Management of Childhood Illness

Source: Claeson et al. (2000b).

## 5. Education

Empirical evidence suggests that access to, and performance in, basic education have a dramatic effect on poor children's chance to escape from poverty (Bundy 2000). Basic education can be expected to lead to increased earning potential, improved labor mobility, and better health for both adults and their children. Beyond private benefits to the individuals, nations where most of the population completes at least a basic education may enjoy better prospects for economic growth and social cohesion. Between 1990 and 2000, the number of children that did not have access to school increased. The diffusion of technology and globalization has not benefited the poor. Basic education is still the most important goal of low-income countries. One of the major issues regarding education is the quality of relevant education and teaching. The quality of education is typically poor at all levels in low- and middle-income countries.

Different interventions to improve education can be organized around the life-cycle stages. Among the different interventions related to a specific stage, the following can be mentioned:

- Early Child Development (ECD) programs attempt to stimulate physical, cognitive, and emotional development of young children. They increase school enrollment and school readiness, and thus reduce the drop-out rates in the primary school level.
- Post basic education and training is necessary to enhance countries' international competitiveness. The whole population therefore benefits from investment in this area.
- Investments in girls' education programs have demonstrated a high economic and social return. It improves family health, decreases fertility rates, and increases household income. Those programs focus on improving girls' access to basic education.
- School health programs that are cost-effective. They help children to benefit fully from education, and they are a part of overall efforts to promote universal education.

**Table 1. Sub-Saharan Countries with World Bank Support to IMCI, ECD, and FRESH**

| <i>Country</i> | <i>IMCI</i>          | <i>ECD</i>  | <i>FRESH</i>         |
|----------------|----------------------|-------------|----------------------|
| Eritrea        | ECD project          | ECD Project | ECD and HNP projects |
| Gambia         | HNP project          | ED project  | ED project           |
| Guinea         | HNP project          | Ed project  | ED project           |
| Kenya          | HNP project          | ECD project | ED project           |
| Madagascar     | HNP project          | NUT project | NUT project          |
| Mali           | H-SIP project        | ED project  | ED project           |
| Mauritania     | H-SIP project        | ED project  | ED project           |
| Senegal        | NUT project          | ED project  | ED project           |
| Uganda         | ECD and HNP projects | ECD project | ED project           |

ED Education; H-SIP Health sector Investment Project; NUT Nutrition project; HNP Health, Nutrition, and Population project; ECD Early Child Development; IMCI Integrated Management of Childhood Illness; FRESH Focused Resources on Effective School Health.

*Note:* Some projects are in project preparation stages.

*Sources:* World Bank (October 2000).

To benefit from the synergy of child health and nutrition interventions and cognitive stimulation at different stages of early life, concerted efforts have been made to link investments in early child development, integrated management of childhood illness (IMCI) and focused resources on effective school health (FRESH) as shown in Table 1, above. The table shows the countries in sub-Saharan Africa where Bank-funded projects support all three of these complementary programs at overlapping stages of the life-cycle. The advantages of coordinated investment in ECD, IMCI, and FRESH are several: increasing the coverage of affordable, cost-effective interventions through different channels of delivery: at community level and through the health system and schools. Moreover, the interventions are complementary. ECD interventions help prepare children for school; IMCI provides the link to the health systems for community-based ECD interventions and school health services and referral; ECD and school health can help strengthen and incorporate the preventive elements of IMCI (care seeking, breastfeeding promotion, feeding during and after illness, immunization, sleeping under bednets and hand washing). As shown in Table 1, the Eritrea and Uganda ECD projects include IMCI at community level. The example of the linkages between FRESH, IMCI, and ECD efforts also illustrate the potential of cross-sectoral interventions in human development, covering health, nutrition and education. For families to fully benefit from these synergies, these programs need to be implemented in the same districts and reach the same communities and families.

## **6. Social Protection**

*Social protection* is a collection of measures to improve or protect human capital, ranging from labor market interventions, publicly mandated unemployment or old-age insurance or pensions, targeted incomes and social safety nets for the poorest, and social funds to assist communities in designing and implementing small projects. These interventions are also life-stage specific. In this section, we will explore how the life-cycle is used for risk assessment in social protection programs and advantages and disadvantages of using it. We present two country examples, from Jamaica and the Dominican Republic.

The life-cycle framework has been used in social protection programs in five countries: Argentina, Jamaica, Uruguay, Dominican Republic, and Mexico. Another four countries are involved in work in progress: Colombia, Nicaragua, Guatemala, and Brazil. The life-cycle approach has been useful as an organizing principle for the broad and cross-sectoral Social Risk Management (SRM) Framework. It also helps to look at social risks systematically to ensure that no age group is left out. Finally, the life-cycle is well suited to the institutional set-up in countries (Arriagada and Hall 2000).

The use of the life-cycle approach presents several advantages in data analysis, risk identification, and program planning and evaluation.

- *Risk identification.* The human capital theory provides a solid framework for looking at key income risks and determinants of risk by age group. It also points out programs that do not address key risks.

- *Data analysis.* With the life-cycle approach, the data analysis is easy. All countries have population and poverty data by age, and increasingly data on program coverage as well. The vulnerable groups can be identified, and the extent to which they are covered (or not) by existing programs can be analyzed in a simple way. It therefore points out coverage gaps, for example, in under-5 children. Moreover, it suits the institutional division of labor between government agencies.
- *Program planning and evaluation.* The life-cycle approach can be used to make projections to detect emerging issues, for example, population aging. Estimating the number of people in each category helps to assess the dimension of problems and the resources needed to address them. The risk approach, identifying the major risks, makes it easier to identify what needs to be done for each age group. It also indicates where interventions in one sector need to be complemented by interventions in other sectors.

One disadvantage of the life-cycle approach is that it needs to be supplemented with analysis of common risks and determinants that affect all or many age groups, for example, in housing, infrastructure, isolated rural communities. As the risks are country-specific, there is no rule for a systematic approach to identify these determinants.

### **6.1 Case Study: Jamaica—Risk Analysis and the Social Safety Net**

The Human Development Network Social Protection (HDNSP) has undertaken a major study of the public social safety net (SSN) programs in Jamaica (Blank 2000). Social safety nets include programs that provide income support and access to basic services to the poorest population groups or people needing assistance after economic downturns, natural disasters, or household-specific adverse events that lower income. SSN programs include a variety of social assistance programs such as cash and in-kind transfers, subsidies, public works, and social funds and are designed to help individuals or households cope with income risks or situations of chronic poverty.

The life-cycle approach was used within the analytical framework to organize the analysis of risk. First, the population was classified into age groups from birth to death. The cut-off points between age groups were determined by critical life-cycle events. The key risks for each age group were identified. This was done through a review of existing survey materials, reports, and studies. In completing the risk analysis, it became evident that several risks need to be treated separately. An initial listing of age groups and risks was refined through discussion with the Planning Institute of Jamaica.

The second step was to identify existing public programs designed to prevent, mitigate, and cope with major risks in each age group. This helped to identify areas where safety net programs can be used to support key preventive strategies. Those preventive strategies extend into the domains of other sectors, including health, education, and finance. For example, the best way to reduce risk among the school age population is to provide early childhood development programs, high-quality formal education that ensures acquisition of basic education and market-

relevant skills, and preventive and other basic health services, including nutrition and reproductive health programs—interventions at all stages of the life-cycle.

Finally, a matrix of risks and types of programs were constructed as shown in Table 2. This makes it possible to highlight gaps and overlaps in the safety net. The age groups selected were 0 to 3 years, 4 to 5, 6 to 11, 12 to 18, 19 to 24, 25 to 64, and 65 years and older. The identified risks, unrelated to a specific age group, include housing, disability, and weakened social cohesion.

To summarize the findings, Jamaica's existing safety net provides some coverage for all key risk groups. However, the coverage of the poor is low, and strategies are needed to ensure that the existing benefits reach more poor people. In addition, the safety net programs do not address all of the important risks.

**Table 2 Jamaica: Risk Analysis by Life-Cycle Stages<sup>4</sup>**

| Age Group                       | Incidence Of Poverty | Main Risks  | Leading Indicators Of Selected Risks   | Current Status Of Indicator   |
|---------------------------------|----------------------|---|--|---|
| Birth - 3                       | 18.4                 | Low birth weight; inadequate antenatal care; poor nutrition; incomplete immunization; diarrhea related diseases; lack of cognitive stimulation  | Incidence of low birth weight; average number of antenatal visits; nutritional status; immunization status; coverage of early childhood development programs   | Low birth weight = 10%; average antenatal visits = 4.5; 10% low height for age among poor; 30% iron deficient; 50% Vitamin E deficient; immunization coverage = 85%; diarrhea related diseases = 5%; 90% of age cohort not covered by early childhood development programs  |
| 4 - 5                           | 20.6                 | Non-enrollment in pre-school program; poor nutrition; poor health; incomplete immunization  | Pre-school coverage among poor, nutritional status, health status, immunization status   | 10% of cohort not enrolled; 8% low height for age among poorest quintile; 30% iron deficient; 50% Vitamin E deficient; immunization coverage =  |
| 6-11                            | 18.7                 | Poor quality education and irregular school attendance leading to low human capital development   | Literacy and numeracy rates<br>Attendance rates  | 30% of all students functionally illiterate at Grade 6; 33% absenteeism among poorest quintile  |
| 12-18                           | 17.8                 | Poor quality education and irregular school attendance leading to low human capital development; school attrition; unemployment; teenage pregnancy  | Literacy; numeracy rates; secondary school enrollment rates; attendance rates; drop-out rates; teenage fertility rates; youth unemployment rates; 12 - 18 crime rate; rates of drug abuse  | 32.8% absenteeism among poorest quintile; 6.2% attrition rate among 12-14 year olds in poorest quintile; 34.8% attrition among 15-16 year olds in poorest quintile; teenage fertility rate = 112; Unemployment rate: (14-19) = 38% Male 74% Female; 12 - 18 crime rate = ?  |
| 19-24                           | 15.9                 | Low academic achievement; Unemployment; limited vocational skills; delinquency; substance abuse; unwanted pregnancy   | Literacy; numeracy; Unemployment rates; percent of young people with training; 19 -24 crime rate; rates of drug abuse  | Unemployment rate: (20 - 24) = 18% Male 37% Female; 82% of unemployed have no training; 19 - 24 crime rate = ?  |
| 25-64                           | 12.7                 | Unemployment and underemployment  | Unemployment rates; under-employment; crime rate for persons 25 - 30   | 56% of poor are employed; 14% of employed are poor; 25 - 30 crime rate = ?  |
| 65+                             | 17.9                 | Low income; poor health; social isolation   | Poverty status, pension coverage; health status; health insurance coverage   | National Insurance coverage = 20%; Protracted illness = 19%<br>Insurance coverage = 5%  |
| <b>Risks Not Related to Age</b> |                      | <p><b>HIV/AIDS</b> (Inadequate access to pharmaceuticals and adaptive aids, inadequate hospice accommodation)</p> <p><b>Disabilities:</b> (Inequitable access to education and training; low income; poor health; inadequate access to pharmaceuticals and adaptive aids, labor market discrimination)</p> <p><b>Lack Of Adequate Housing</b></p> <p><b>Violence and Weakened Social Cohesion</b></p> | <p>HIV/AIDS rate</p> <p>Coverage of special education/training programs; poverty status of disabled; health status</p> <p>Access to Services, Overcrowding, Mortgage Rates, Home Ownership</p> <p>Incidence of crime, corruption index; inequality</p> | <p>AIDS rate = 170.5/100,000</p> <p>Data not available</p> <p>72% of poor households rely us outside pit latrine; 12% have access to indoor water pipe; 12% get their drinking water from unsafe sources</p> <p>Crime rate 1,606/100,000; murder rate = 33/100,000; Corruption Index = 3.8<sup>5</sup><br/>Gini Coefficient = .37</p> |

<sup>4</sup> A question mark in the last column under status of indicators means that information specific to that particular age group is not available.

<sup>5</sup> Out of a possible score of 10. Transparency International, 1999.

## 6.2 Case Study: Dominican Republic—Comprehensive Social Protection Strategy

Castaneda and Victoria's study (2000) conducted in the Dominican Republic provides analysis and recommendations on the design and implementation of a comprehensive social protection strategy. The recommendations and social policies aim at protecting the poor and managing social risks.

The Dominican Republic's economy has been performing well since 1991. Average GDP growth from 1991 to 1999 stood at 6 percent. Income per capita has increased and the unemployment rate has decreased. This has resulted in a decline the percentage of poor households, from about 22 percent in 1992 to about 15 percent in 1998. Still, poverty is widespread in marginal urban areas and in rural areas, and economic growth appears to have done little to reduce it. The Dominican Republic's poor share many of the characteristics identified in many Latin American countries. The poor, concentrated in rural areas, have larger families, and their income comes from agriculture and self-employment.

The conceptual framework for analyzing the social safety net in the Dominican Republic resembles the framework used in the Jamaica study. The concept of managing social risk comes from the notion that certain groups in the society are vulnerable to unexpected shocks that threaten their livelihood or survival. Yet others live in a chronic state of impoverishment that places their livelihood in a constant state of risk. Social risk management involves policies aimed at reducing key risks, breaking intergenerational cycles of poverty and vulnerability. In general, it is less costly for society to prevent risk than to cope with it after the fact. The best solutions enable individuals and households to protect themselves before risks materialize instead of turning to the government for assistance after an adverse event.

In theory, there are three main categories of social risk management; *Risk prevention* includes measures to reduce the probability that a risk will occur. *Risk mitigation* measures are also employed before a shock occurs, but involve strategies to reduce the potential impact of a risk. *Risk coping* aims at relieving the impact of a shock after it occurs. In the case of the Dominican Republic, the distinction between risk prevention and risk coping was found most useful.

To organize the analysis, the life-cycle approach was used. The population was classified by age group from birth to death, and the number of people in the lowest third and first income decile in each group was estimated. Then, the key risks by age group, and the leading indicators of these were identified (Table 3). Risks unrelated to age and affecting the general population were also identified. Current values for risk indicators for the poor were provided, and the numbers of poor not covered by existing programs were estimated. Finally, the paper discusses possible measures to address identified gaps, distinguishes between risk prevention and coping strategies, and clarifies the role of social protection programs in undertaking these strategies.

The study focused exclusively on state social programs. The analysis does not cover provincial or municipal programs or those operated by non-governmental organizations (NGOs). The study suggests that the chronic poor are the people who have benefited least from the economic upswing. Nevertheless, most social programs do not address the main risks of the poor and general population. There are many programs of questionable effectiveness and impact such as

food distribution programs. There are also great inefficiencies in social spending. A large share of expenditures is devoted to administrative costs and personnel. Moreover, the myriad of safety net programs are not coordinated, have questionable benefits, have no single uniform targeting criteria, and have not been systematically evaluated.

**Table 3 Dominican Republic: Risk Assessment by Life-Cycle Stage**

| <i>Age group (years)</i> | <i>Main risks</i>   | <i>Role for health, education, and infrastructure services</i>  | <i>Role for safety nets, social insurance, and social assistance</i> |   |
|--------------------------|---|---|--|---|
| 0 to 5                   | Stunted child development   | PHC services<br>Preschool education   | Early Child Development programs                                     | Nutrition programs for small children and mothers       |
| 6 to 13                  | Low human capital development   | Improve quality of primary education<br>Reduce late entry and repetition                                      | —  | —   |
| 14 to 24                 | Low human capital development<br>Unemployment, low wages<br>Teen pregnancy<br>Sexually Transmitted Diseases | Improve access/quality of secondary education<br>Remedial education<br>Reproductive health programs           | —  | Scholarships, return-to-school incentive programs       |
| 25 to 64                 | Low income<br>Unemployment/underemployment  | Promote labor-intensive growth<br>Emphasis in agricultural and rural development, where poor are concentrated | —  | Income transfers<br>Training, job search assistance     |
| 65 and older             | Chronic diseases<br>Low income  | Health insurance  | Social security (contributions, pensions)                            | Income transfers (noncontributory pensions) Health care |

Source: Castaneda and Victoria (2000).

## 7. Nutrition

Nutrition programming provides an example of the value of using the family health cycle as a framework for public health programming. Nutritional status is an important determinant of an individual's health both now and later in life, and the nutritional status of the mother is a key input to the health of a child (and potentially a grandchild). A country example, showing a shift in nutrition policy based on the realization of the interrelatedness of several nutrition interventions across the life-cycle and in successive generations is shown in Box 1. Nutrition outcomes throughout the life-cycle are summarized in Figure 7.

Five sets of nutrition interventions are suggested by the family health cycle. As noted above, any stage of the family health cycle can be taken as a starting point. For this example, let us begin with pregnancy. During pregnancy, a first set of nutrition interventions (e.g., micronutrient and caloric supplements) may be needed to improve intrauterine growth of the baby, ensure that the mother remains healthy during the pregnancy, increase birth weight, and minimize the chance of certain birth defects and birth complications. Once the baby is born, infant and young child interventions include the immediate initiation of exclusive breastfeeding. Exclusive breastfeeding over the first four to six months results in fewer and less severe infections and faster recovery, thereby reducing infant morbidity and mortality. After six months, adequate complementary feeding, with micronutrient supplementation if necessary, puts the child on a path toward healthy growth and development.

Older children and adolescents require a third set of nutritional interventions, including adequate caloric and nutrient intake, micronutrient supplementation if necessary, and dietary guidance for adolescents. In addition, deworming is generally viewed as a nutrition intervention for reduction for anemia. These interventions will result in continuing good growth and development and improved cognitive function and school performance.

As they become adults, men and women may require ongoing nutritional interventions to ensure continued good health, maximize productivity, and permit pregnancy, if desired. Finally, a fifth set of nutritional interventions might be appropriate for older men and women to reduce or avoid the chronic diseases associated with over-nutrition or deterioration of the body as they age.

## 7.1 Case study: Senegal—The Life-Cycle Approach in Nutrition Policy Dialogue

Following the completion of a 5-year urban-based Community Nutrition Project (CNP), the Government of Senegal negotiated continued support from the Bank for a follow-on project to extend nutrition services to rural areas in the country. The original CNP was designed in response to concerns that devaluation of the CFA would cause increased rates of malnutrition among at-risk groups in Senegal. The project successfully reached a large number of malnourished children and women with both therapeutic and preventive nutrition services, implemented through contracts with the private sector. The project features are summarized in the table:

**Table 4 Senegal: Project Features**

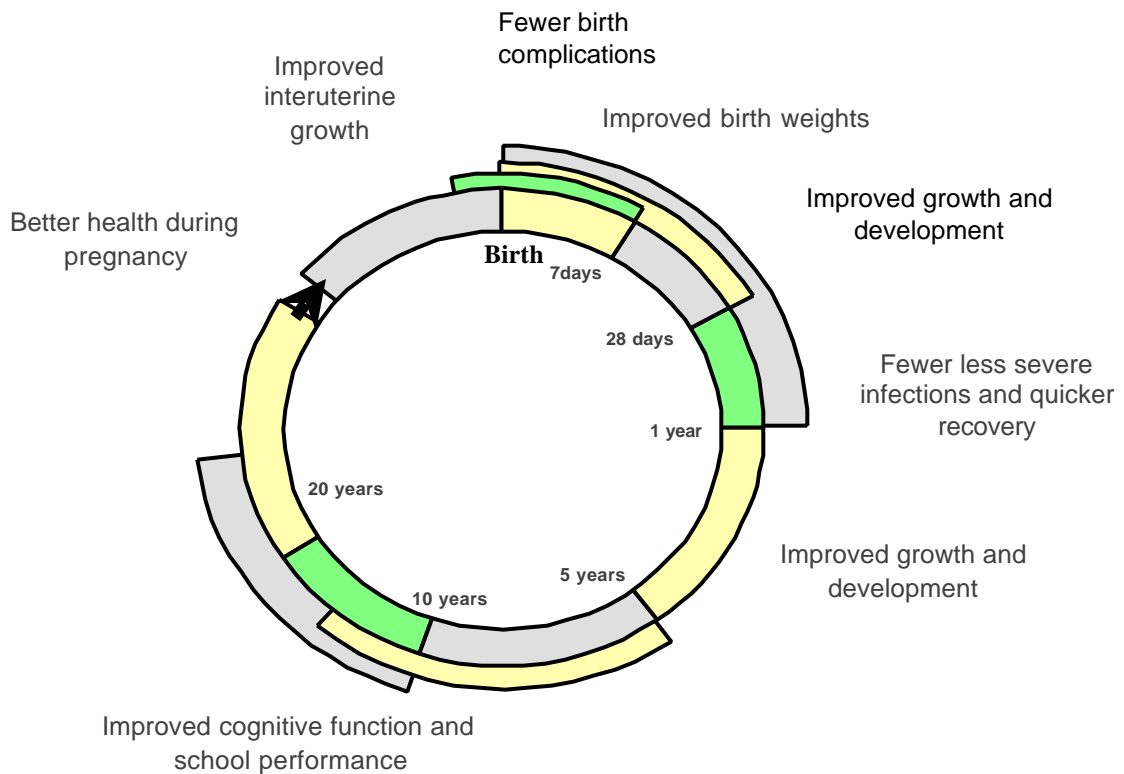
|                       |  |
|-----------------------|--|
| Beneficiaries reached | 457,000 pregnant/lactating women and children up to 3 years of age in 14 cities  |
| Overall management    | Agetip (Agence d' Execution des Travaux d'Intérêt Public)  |
| Services              | Growth promotion via monthly growth monitoring; weekly take-home food supplementation for malnourished children and targeted women; IEC for mothers; referral health services for unvaccinated, severely malnourished, and sick children       |
| Service delivery      | Community nutrition centers (CNCs) were established and managed by 4 locally recruited staff: Groupement d' Intérêt Economique (GIE)   |
| Supervision           | GIE or nongovernmental organization  |
| Remuneration          | Minimum salary to the community GIE  |
| Impact                | Achieved project objective to halt further deterioration in nutrition status of children under 3 in poor urban communities   |
| Replicability         | Expanded nationwide, growing from 23 to 292 CNCs in 10 urban districts   |
| Sustainability        | 47% of CNCs evolved into expanded development centers; new initiatives primarily financed through community/beneficiaries<br>CNC staff recruited from local communities<br>Local community steering committees monitored the CNCs' performance |

In addition to building on the strengths of the first Community Nutrition Project, it was important to transition from a more crisis-oriented project design to one with a preventive health care approach in the follow-on project. One weakness identified in the implementation completion report of the project was the use of a cohort system for enrollment and care: malnourished children were identified in the community and enrolled in the project for a fixed period of six months, starting at six months of age. Yet damage to children's growth and development had already occurred in many cases, and an arbitrary six months of intervention did not necessarily meet the needs of each malnourished child.

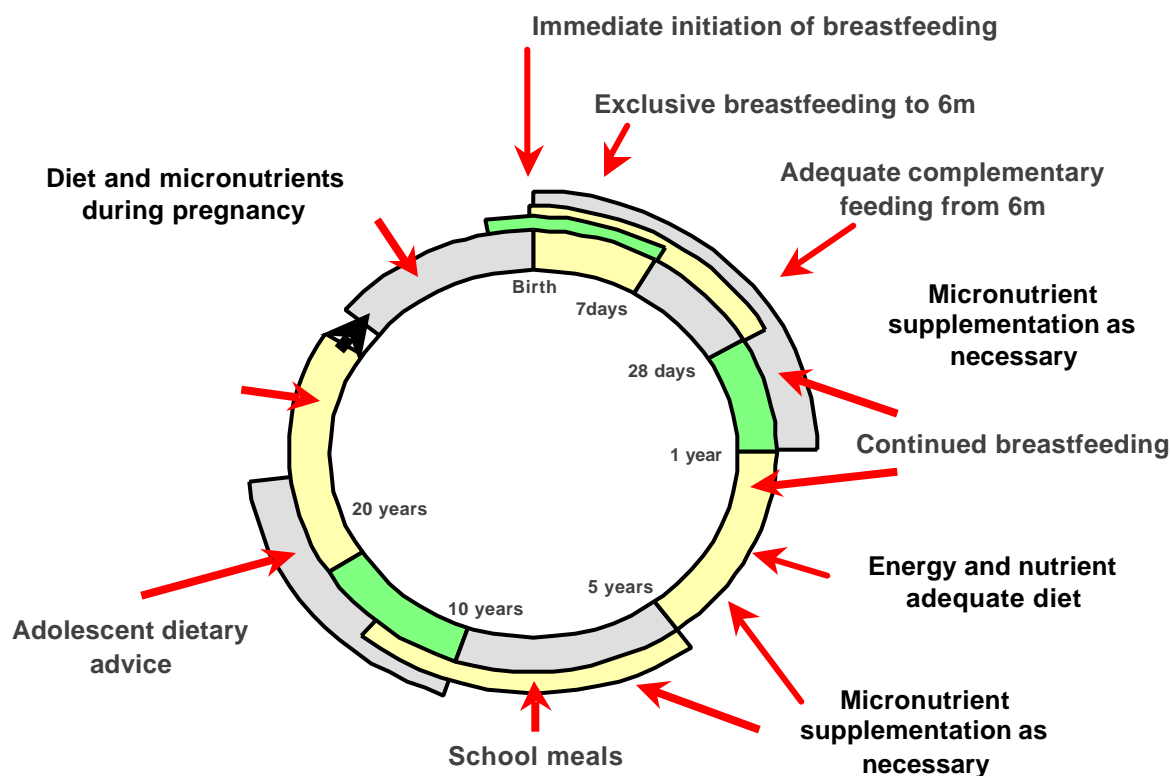
The goal of the second project is to prevent the processes leading to malnutrition from occurring at all. To reorient the project design, the concept of the life-cycle approach was used in the policy dialogue with the government, the Agetip, executing agency, and other partner organizations. During the preparation workshop, presentations on this concept stimulated discussion among all stakeholders.

The realization of the interrelatedness of several nutrition interventions across the life-cycle and in successive generations led the government to abandon the cohort system in the new project. Instead children will be enrolled in community groups from birth until 3 years of age. Growth promotion activities will be intense during the first six months of life, where support for exclusive breastfeeding and preparation for adequate complementary feeding is most needed to ensure optimal growth and prevent communicable diseases, particularly diarrhoeal diseases. In addition to the emphasis on growth promotion and malnutrition prevention strategies at younger ages, the new project will focus greater attention on micronutrient malnutrition among children and on reaching pregnant women for the promotion of adequate weight gain and the prevention of anemia and low birth weight. There are also ongoing discussions about the possibility of adding adolescent girls as a target population. By intervening with adolescents, many of the poor pregnancy outcomes associated with maternal health and nutrition can be averted or improved. Examples include neural tube defects attributable to folate deficiency, low birth weight associated with low prepregnancy maternal body mass index, and the range of negative impacts due to iodine deficiency disorders.

**Figure 7 Consequences of Improved Nutrition at Various Stages of the Life-Cycle**



*Source:* Claeson et al. (2000b, Table00).



## 8. Reproductive and child health

The life-cycle approach has been used in a project pilot in reproductive health, in the Philippines, in MCH project supervision in China, and in a sector study in Brazil to inform a new family health project. Finally, a life-cycle approach to child mortality reduction was recommended in a recent Bank supported child mortality study in India. These examples are summarized here to illustrate the different kinds of applications of the life-cycle approach in Bank HNP operations.

### 8.1 Case Study: Philippines – Safe motherhood project

In 1994, the Philippine government recognized that the country needed to give greater priority to women’s reproductive health (Lakshminarayanan and Epp 1900). MCH funds were being used mainly to support child health activities, and there was a shortage of services available to women at community level. As a result, maternal mortality remained high at more than 200 per 100,000 live births, and the Total Fertility Rate was at 4.3.

In early 1995, the Bank agreed to provide an \$18 million loan under the Woman’s Health and Safe Motherhood Project. The project included a pilot, conducted in Palawan province, to test the life-cycle approach and provide the Department of Health with a basis for evaluating the approach in the delivery of health services in rural areas. Alayka, a local grass-roots NGO, was

closely involved throughout the pilot period. The key prerequisites for the success of this life-cycle approach model were:

- commitment at political and technical levels
- above average health service delivery capacity at municipal level
- presence of a trusted NGO
- timely budget for implementation

The critical life-cycle stages covered in the pilot were the period before pregnancy, childbirth, the immediate post-natal stage, and the child's first five years, in collaboration with the ECD project, serving the needs of preschool children.

In the Philippine pilot, midwives and village health workers undertook outreach educational and promotional activities in an attempt to identify all poor women of reproductive age who were at abnormal risk due to pregnancy or who desired family planning services. The identified women were registered and given a choice of enrolling in the family planning program. Through the same outreach approach, an attempt was made to identify and register 100 percent of all women who became pregnant and to enroll them in preventive prenatal care. Women identified as high risk at delivery were monitored more frequently and separately from women with low-risk pregnancies. It should be noted that since this pilot, there is global recognition that all birthing women should have access to skilled birth attendance.

Among the reasons for adopting the life-cycle approach were:

- *To improve efficiency* by concentrating services at the most vulnerable part of the life-cycle stages.
- *To enhance equity* by shifting the focus of health workers on the most neediest clients. The systematic process of screening and registration helps to ensure that individuals in need get services, rather than just the nearest, the most well-off, or the most vocal.
- *To improve the quality of the client/provider relationship* through regular and predictable series of contacts with priority clients.
- *To foster sustainability* by institutionalizing the life-cycle approach nationwide. Setting intervention priorities and providing integrated services promote a sustainable approach to health.

The life-cycle approach implied a radical change from traditional modes of service delivery, particularly in the way health care workers organized their work. Its adoption therefore requires a new way of thinking for health workers as well as political leadership and a major retraining effort. The main implications involve:

- reordering priorities to apply limited resources for the most good
- reorienting policymakers, health care providers, and communities to understand the concept
- facilitating the essential community participation

- retraining health care providers
- modifying and strengthening information and reporting systems
- putting in place the essential infrastructure and financial and other resources for a functional referral system.

The preliminary evaluation of the Philippine pilot project was positive, and it seemed likely that the Ministry of Health (MOH) would expand the life-cycle approach program. It was found that the pre-implementation phase was important for community mobilization and training of health staff and community workers. An important lesson learned was that the life-cycle approach needs to be flexible in order to accommodate the demands of the local community. Although the focus was on women's health, a number of activities under the pilot were not initially envisaged under the framework but were included, based on the community's adaptation of the life-cycle framework.

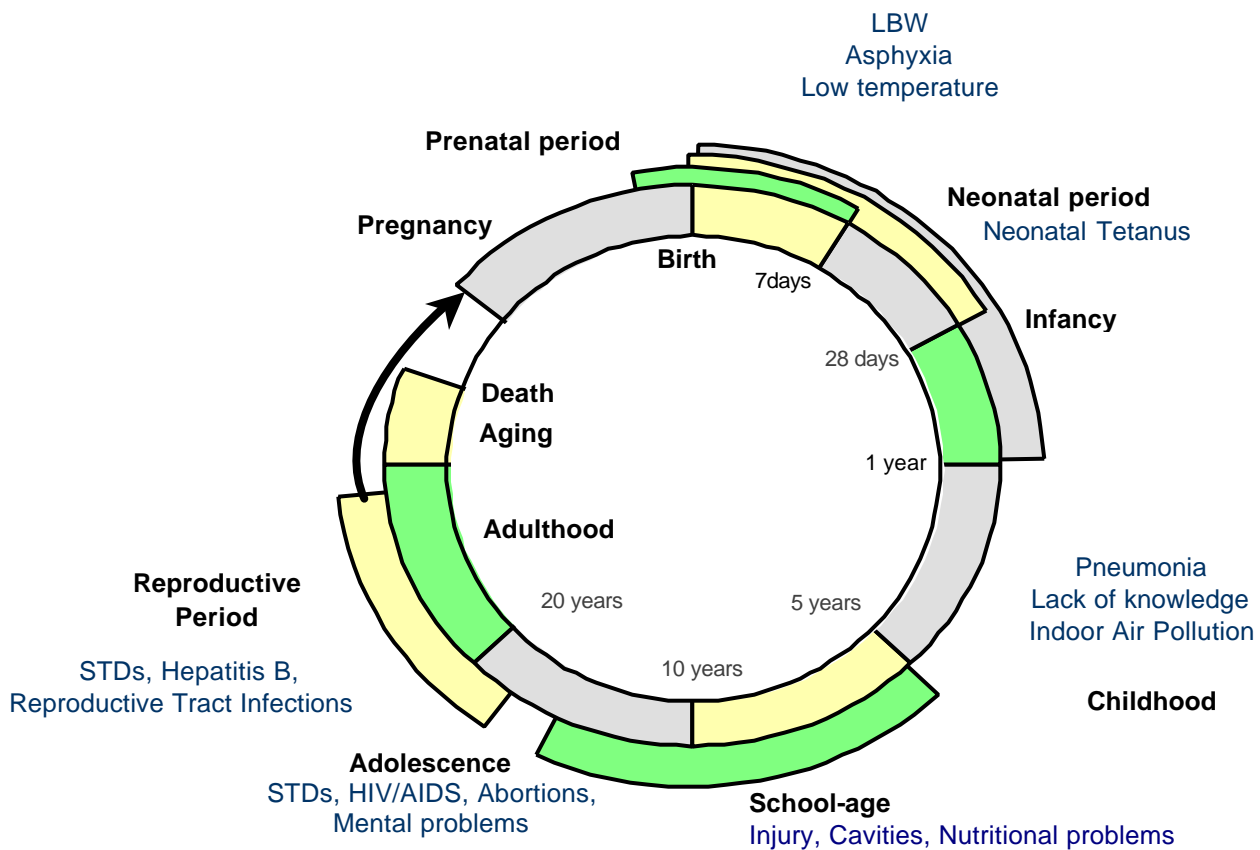
The life-cycle approach helped to build a continuing relationship between client and service provider, which did more to build clients' capacity for self- and family care than what was possible through the common approach of unsystematic encounters (Lakshminarayanan and Epp 1900).

## **8.2 Case Study: China—Assessing MCH Risks and Intervention Gaps**

During a Bank-supported project supervision meeting of provincial MCH program managers in China, the life-cycle approach was used to identify and discuss the major risks to the health of poor women and children. It helped identify gaps so as to refocus efforts toward the greatest inequities in health services in the participating project areas. The identified gaps throughout the life-cycle of women and children are shown in Figure 8. The discussion helped identify possible operations research issues and data needs related to coverage of the poor.

The identified risks to the poor included low birth weight and asphyxia in newborns and the unfinished agenda of pneumonia in childhood. They included nutritional problems, injury in school age children and a major environmental determinant: indoor air pollution. Among the reproductive health problems were HIV/AIDS, STDs, and abortions. Adolescents' mental health risks were also identified as areas needing increased attention. The life-cycle approach helped to structure a review of gaps at all the stages of the life-cycle and to open up a discussion about problems of the poor in project areas needing increased attention to sustain achievements in overall MCH outcomes and to further enhance efforts to reduce maternal and child mortality levels specifically among the poor.

**Figure 8 Assessment of Risks to Poor at Critical Life-Cycle Stages, China MCH Program**



Following the introduction of the life-cycle concept, the Women and Children Health Care Institute of Yunnan, Dr Chen Li, and the Yunnan Provincial MCH program adapted the life-cycle approach and developed an applied research project to increase access and utilization of the poor to quality reproductive and child health services. This is part of their operations research program supported by the Health VI project in China. First, the life-cycle approach has been translated and local evidence has been used for analysis of risk factors at different stages and identification of gaps in the life-cycle stages currently addressed by the MCH program: i.e., the perinatal period. Data has been used to identify how the main health outcomes, maternal mortality and neonatal mortality rates, are influenced by hospital delivery rates and “systemic” management of pregnancy and newborn care (before, during and after pregnancy). To achieve maximum effectiveness at that stage of the life-cycle, the Integrated Management of Pregnancy and Childbirth (IMPAC) has been identified as a priority intervention for improved management of antenatal and referral care in rural Yunnan.

To provide access to and utilization of IMPAC among rural poor, the program has developed a financial plan for how to increase the affordability of these quality services for the poor, linking provision of quality reproductive and newborn services with the government financial support to the poor for those services through the Poverty Alleviation Fund (PAF). In addition, major

intersectoral risk factors, the availability and cost of transportation, are also addressed by the project; a transportation fee is included in the Poverty Alleviation Fund. Charts have been prepared for the village health workers to monitor each pregnant woman, the routine clinical data, transportation means, where, who and when deliveries are done, the cost and the financial means to afford the services, including the PAF coverage. A mobilization plan has been developed for how to ensure full support and involvement of rural poor communities in the implementation of the poverty alleviation funded reproductive and infant health services, and how to implement and evaluate the project. The project will analyze health care services, PAF, site of delivery, emergency referral, deaths of pregnant women and infants. The main advantage of the life-cycle approach, in the views of the provincial research and program team, is the evidence-based data analysis, the identification of main risks at each stage of the life-cycle, the implementation of interventions through “multistrategies at multistages”, the monitoring and evaluation of implementation and the feed-back into the evidence base and re-assessment. The lifecycle approach to assess risks, identify interventions and pro poor delivery strategies is viewed as a reiterative process. The Health VI project will support the implementation and monitoring of this application of the lifecycle approach, as part of its operations research agenda.

### **8.3 Case Study: Brazil—Maternal and Child Health Study**

In Brazil, the Bank commissioned a study on maternal and child health conditions (World Bank/Varun et al. 2001) to find out why infant and maternal mortality rates are higher than in other countries with similar per capita income and level of maternal education. The study concludes that the health care system is critical for enhancing maternal and perinatal health and that certain health care interventions (e.g., immunizations, oral rehydration therapy, and integrated case management of illness), can reduce infant and child mortality from communicable diseases. In addition, because complications before or during the first seven days of life are responsible for more than half of infant deaths in every part of Brazil and because the failure to diagnose and treat complications in pregnancy largely explains the persistence of high maternal mortality, adequate health care for the poor will be increasingly important in determining future trends in maternal and child health. The life-cycle approach was used in the study as an organizing framework for the analysis of potential interventions to improve the health of mothers and children. In addition, it served as a tool to assess the adequacy of existing maternal and child health programs in Brazil and to identify gaps such as the weak and limited experience in essential newborn care.

The government of Brazil is negotiating a loan to support the expansion and strengthening of its flagship Family Health program. In the preparatory work, the government is proposing to include a human resources component to improve the skills and capacities of the family health teams, and to expand the existing manpower. The conceptual framework underpinning the development of the training programs for this component is the life-cycle approach.

### **8.4 Case Study: India—Policy Options for Reducing Child Mortality**

Several state managers of health in India have been asking: “Why are declines in child mortality slowing down?” To identify policy options that would help sustain progress, address gaps, and maximize the impact on child survival, the Bank supported a review of available child health data and child health programs in India (World Bank 1999; Claeson et al. 2000). As expected,

the factors contributing to child mortality levels included non-medical factors, medical care during the prenatal period, care at birth, and curative care in the postnatal period, maternal factors (age, parity and birth intervals, mothers' education) and household-community factors (water, sanitation, housing). The major findings pointed to the need to: eliminate gender differences in mortality rates, increase attention to the neonatal period of infancy while sustaining and expanding post-neonatal child survival interventions; address nutrition as an underlying and contributing factor to mortality from many causes (including the nutritional status of girls and young women as a key determinant of low birth weight in the next generation). A major conclusion and policy recommendation of the sector analysis of child mortality was:

*“Central to more effective and efficient strategies for child survival, health and development, is a better understanding of the maternal and child health and nutrition cycle and its main determinants.”*

## CONCLUSIONS

By adopting the family health cycle approach, the programmatic, scientific, and donor communities supporting health development activities should be better able to see their work as integrally connected instead of in competition, one part with another. Instead of focusing narrowly on child survival, adolescent health, maternal and reproductive health, or any other discipline, the development and public health community should concentrate on supporting a package of age- and sex-specific interventions centered on the family that will improve health within households. Today's healthy child is tomorrow's healthy parent and grandparent. Fostering the health of a mother or father (grandmother or grandfather) will also produce healthy children now and in the future.

As shown by the numerous examples provided, the family health cycle or life-cycle approach, can be used in a many ways. As an assessment tool, it provides an effective framework to identify age- and gender-specific risks and/or programmatic gaps that provide direction for identifying priority interventions. The tool can be used to emphasize equity issues and concerns by focusing on the risks, needs and gaps within poor households and families. The life-cycle approach leads logically toward intersectoral actions and interdisciplinary activities as it can highlight the multiple determinants of ill health among the poor.

Multiple actors support families in their efforts to improve health. Governments, the private sector (NGOs and firms), development organizations, and international donors all play a role. The family health cycle approach should make it clear that each institution can play a discreet but complementary role, if each pursues activities related to its mission, mandate, and comparative advantage. Within a broad conceptual framework, each institution's chosen activities should be seen as all contributing to a single goal—nurturing healthy families, including healthy women and children.

Healthy families are key to stimulating economic growth and fostering development with increasing equity. Poor, unhealthy households are unlikely to generate the increases in productivity and savings necessary for sustained economic growth. As our health and disease specialists interact more frequently with economists and economic planners, we need a framework that can enrich each community's understanding of the role of the other in facilitating improved health and increased economic growth. The family health cycle approach, drawing from the household production of health model and incorporating the knowledge about risks and disease from the core public health disciplines of epidemiology and demography, provides a language that can reach both communities and draw them together to improve policies and programs that contribute to our ultimate goal of improving the health status of populations throughout the world.

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