

# The evolution of child health programmes in developing countries: from targeting diseases to targeting people

Mariam Claeson<sup>1</sup> & Ronald J. Waldman<sup>2</sup>

Mortality rates among children and the absolute number of children dying annually in developing countries have declined considerably over the past few decades. However, the gains made have not been distributed evenly: childhood mortality remains higher among poorer people and the gap between rich and poor has grown. Several poor countries, and some poorer regions within countries, have experienced a levelling off of or even an increase in childhood mortality over the past few years. Until now, two types of programmes — short-term, disease-specific initiatives and more general programmes of primary health care — have contributed to the decline in mortality. Both types of programme can contribute substantially to the strengthening of health systems and in enabling households and communities to improve their health care. In order for them to do so, and in order to complete the unfinished agenda of improving child health globally, new strategies are needed. On the one hand, greater emphasis should be placed on promoting those household behaviours that are not dependent on the performance of health systems. On the other hand, more attention should be paid to interventions that affect health at other stages of the life cycle while efforts that have been made to develop interventions that can be used during childhood continue.

**Keywords:** child welfare; child health services, trends; communicable diseases, prevention and control; delivery of health care; infant mortality, trends; models, theoretical.

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Voir page 1243 le résumé en français. En la página 1244 figura un resumen en español.

## Introduction

For the past 35 years, the steep decline in deaths among infants and children has provided evidence of an important success story in international development. Mortality has declined steadily at an average of about 1% per year. The absolute number of children under the age of 5 years dying has fallen from an estimated 15 million in 1980 to about 11 million at the end of the 1990s (1). Remarkably, this decline has occurred in the face of increased births, spreading resistance to commonly used antibiotics and anti-malarial drugs and, most menacingly, the growth of the AIDS pandemic.

A closer look at this favourable trend, however, reveals that progress has been distributed unevenly. Recently, the decline in mortality among children under 5 years has stalled in a number of countries and in some the trend has reversed and mortality seems to be rising. In 1998, in more than

50 countries the mortality for children under 5 years was greater than 100 deaths per 1000 live births. In 12 countries (11 of them in Africa), one in every five children born alive did not survive to the age of five years (1). Of the nearly 11 million children who will die before their fifth birthday this year, 70% will die from a disease, a combination of a few diseases, or a condition for which safe and effective interventions are readily available in industrialized countries: acute respiratory infections, diarrhoea, measles, malaria, and malnutrition (2).

Better access to basic health services — including vaccinations, oral rehydration therapy, and antibiotics for pneumonia — together with improvements in social conditions — including higher standards of living and smaller families living on larger incomes — have been important factors in improving the survival rate of children. As deaths among children under 5 years have declined in many developing countries, contributing to both demographic and epidemiological transitions, the proportional mortality accounted for by some conditions has increased: this problem has been relatively ignored by the international health community. For example, the greatest decline in childhood mortality rates has occurred among children in the post-neonatal period; this has led to a relative increase in the importance of neonatal and perinatal mortality. Also, gender-specific issues have emerged in some

<sup>1</sup> Principal Public Health Specialist, Health, Nutrition, and Population, Human Development Department, World Bank, Washington, DC, 20433, USA (email: mclaeson@worldbank.org). Correspondence should be addressed to this author.

<sup>2</sup> Professor of Clinical Public Health and Director, Program on Forced Migration and Health, Center for Population and Family Health, Joseph L. Mailman School of Public Health, Columbia University, New York, USA.

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parts of the world, notably on the Indian subcontinent where girls aged between 1 month and 5 years still experience considerably higher mortality and morbidity than boys (3, 4). And, although this paper does not deal with it specifically, increases in deaths from AIDS in Africa are already slowing or reversing these downward trends. Without a major assault on AIDS throughout local health systems and in the community, childhood mortality, whether from infection or from the increased risks associated with being orphaned, can be expected to increase in some parts of the world.

In this paper, we examine the roots from which current child health programmes have grown, some of the causes behind the apparent slowing of progress in many parts of the world, and we suggest ways in which the nature of these programmes must change if continued gains are to be made throughout the world.

## Trends and milestones

Global strategies for reducing childhood mortality have been of two basic types. The first were ambitious disease-specific, technologically dependent strategies aimed at achieving dramatic, albeit narrow, successes in a relatively short time. The notable failure of the most ambitious programme of this type — the malaria eradication programme (not exclusively a child health programme, but one that was expected to make a major contribution to reducing child mortality) launched in the 1950s and abandoned in the 1970s — contributed strongly to a shift in thinking (5).

The more people-centred, community-based strategy typified by primary health care, with its goal of health for all by the year 2000, was adopted by the World Health Assembly in 1977. Primary health care sought to broaden the focus of health services by emphasizing programmatic areas instead of specific diseases. Accordingly, the provision of universal services for maternal and child health, family planning, improved water supplies, and environmental sanitation became objectives; these were to be achieved through an equitable distribution of resources, community involvement, an emphasis on prevention instead of clinic-based curative interventions, and a multisectoral approach.

Neither strategic approach ever totally eclipsed the other. Although attempts to eradicate malaria failed, the ensuing smallpox eradication programme is probably the most successful large-scale public health programme in history, with the last case of smallpox acquired by human-to-human transmission having occurred in 1977. Important lessons have been learnt from both the failed malaria eradication programme and the successful smallpox programme; these lessons have been applied to current attempts to eradicate dracunculiasis and poliomyelitis, two programmes which are on the verge of success. To an important degree, the appeal of these programmes is rooted in the acceptance that disease-specific

programmes must, when possible, promote community involvement while contributing to the ongoing development and strengthening of national health systems (6).

Similarly, a debate over the degree to which the objectives of primary health care can be translated into effective programmes resulted in the emergence of “selective primary health care” (7). This new strategy, which targeted the control of diseases identified as the most important contributors to increased mortality, was intended to be more focused and more feasible. A number of specific, more vertical programmes (so named because of the self-contained way they appear on organizational charts and, more importantly, in budget lines of health ministries) were promoted to channel relatively meagre resources into areas in which demonstrable success could be achieved in the medium-term. Furthermore, the emphasis was clearly put on programmes that would contribute to achieving decreases in mortality among infants and children, since children were considered to be the most vulnerable segment of the population because they have the highest rates of preventable death.

The World Health Organization, for example, first developed the Expanded Programme on Immunization and subsequently the Programme for the Control of Diarrhoeal Diseases. UNICEF chose four specific interventions on which to focus: growth monitoring, oral rehydration therapy, breast-feeding promotion, and immunization, known by the acronym GOBI. It later added three more (food, family planning, and female education). Bilateral donors followed, channelling funds into what came to be called “child survival” programmes; these retained their roots in community-oriented, population-based, primary health care, but at the same time had the appeal of using relatively inexpensive medical technologies to reach specific, stated objectives.

Although the two strategies, at different ends of the intervention spectrum, have been able to coexist relatively peacefully, they have never quite coalesced. Currently, several attempts at rapprochement are under way. For example, the multi-agency Roll Back Malaria movement includes components aimed at health systems and at the community. Reduced rates of morbidity and death from malaria, it suggests, should be viewed as markers of improved health systems. Similarly, the Integrated Management of Childhood Illness initiative explicitly incorporates a component of community development; this programme evolved from selective primary health care programmes that aimed to control diarrhoeal diseases and acute respiratory infections in childhood by working with health workers and strengthening health systems. Both of these efforts, and many others currently being implemented (including the poliomyelitis and dracunculiasis eradication programmes) emphasize the need for community participation, for strong and effective partnerships between public and private sectors, for intersectoral links, and the need to combine medical technology

with behavioural interventions. That is, they recognize these needs in rhetoric, if not in practice. This reflects current thinking as to how programmes to improve children's health should be implemented, not necessarily how resources are being invested. Although emphasis on community-level interventions is generally recognized to be a desirable and effective approach to implementing successful programmes, activities still tend to focus on improving the delivery of services through an organized health system, rather than on effecting behavioural change.

### The past: research and action

The recognition that there were multiple technical and operational challenges to the implementation of child health and nutrition programmes over the past 20 years led to an evolution of research priorities (8). Before 1985, microbiological, epidemiological, immunological, and clinical research contributed to the development of both preventive and therapeutic interventions for the control of common diseases in childhood. A prototypical example is the finding that treatment of acute, watery diarrhoea did not depend on the etiological agent and that oral rehydration therapy with a single, standard solution is safe and effective in almost all cases; this finding shaped global treatment policies for childhood diarrhoeal diseases. Similarly, the identification of *Streptococcus pneumoniae* and *Haemophilus influenzae* as the leading bacterial causes of mortality from pneumonia led to the development of a universal case-management strategy based on symptomatic diagnosis and standardized antibiotic treatment. After the development of these technical approaches, research priorities shifted from focusing on incidence, etiology, and other descriptive research to focusing on analytical research that was directed at designing, monitoring, and evaluating the impact of priority interventions.

For example, in the mid-1980s, the World Health Organization commissioned a review of research that might contribute to determining the potential effectiveness, feasibility, and cost of 18 suggested preventive interventions for childhood diarrhoea (9). The most promising were found to be promoting breastfeeding, improving water supplies, modifying sanitation and hygiene behaviours, increasing measles vaccination coverage and, after development of the appropriate technologies was ensured, vaccinating against rotavirus infections and cholera. Similar reviews were done for the Programme on Acute Respiratory Infections in the 1990s (10). This process identified eight potential interventions, each with the ability to prevent at least 5% of deaths from pneumonia. These were vaccinating children against measles, *S. pneumoniae*, *H. influenzae* type B, and respiratory syncytial virus; minimizing indoor air pollution; reducing the rates of children born at low birth weight; and exclusively breastfeeding until the child was aged 4–6 months. These

reviews influenced the direction of global efforts in preventing and controlling childhood acute respiratory infections and diarrhoea.

In the 1990s, research priorities have evolved as efforts to develop a more integrated approach to case management both in the home and within the health system have intensified. The success of case-management strategies depends only in part upon the availability of services provided by trained health care workers. Equally important, if not more so, are the behaviours of the carer in the home and in the community. Case management in the home, care-seeking practices (including the extent to which available health services are used), and compliance with counselling provided by health workers all have an important impact on children's health. Research priorities have therefore focused increasingly on promoting and maintaining household and community support for the home management of childhood illnesses (with appropriate referral when indicated) through interventions designed to encourage communication and change behaviour. Ethnographic research, participatory rural appraisal, and other qualitative methods have been the tools that have guided the development, local adaptation, and implementation of many of these effective, community-level interventions (11).

To a considerable extent, the progress in reducing childhood mortality rates is the result of efficient interactions between research, analysis, policy development, and programme evaluation. The cycle — which includes the dissemination of research findings, implementation of programmes based on those findings, and feedback regarding successes and failures — has involved the research community, bilateral and international donors, health ministries, and nongovernmental organizations in developed and developing countries. WHO has played a critical part in the analysis and formulation of policy and has provided guidance in implementing and evaluating efforts in various countries.

### The present: new initiatives and programmatic approaches

For much of the past few decades, the international health agenda has been dominated by strategies and programmes aimed at reducing mortality in childhood. Reich proposes a number of reasons why this was the case. For one, it was important that children's health problems were being addressed by large, influential organizations, including UNICEF, WHO, and public-private coalitions, such as the Task Force for Child Survival and Development. They also had symbolic power in the emotional appeal of being able to save children's lives with simple, cheap interventions. Also, with the exception of the infant formula industry, children's health issues posed no competition to vested corporate interests. Additionally, science was on its side: the use of infant mortality rates as a proxy for national health status and

development called attention to the causes of early deaths and to the interventions that could be aimed at them. Finally, for the most part, the agenda setters — that is, the politicians — found that child health is a readily accepted cause that meets with little opposition when proposed as a subject for social investment (12). It should also be mentioned that childhood illnesses make a substantial contribution to the global burden of disease (the Integrated Management of Childhood Illness strategy alone, at the time it was formulated, addressed conditions that accounted for as much as 14% of disability-adjusted life years) (13), and high mortality rates in children under 5 years of age are an important contributor to reduced life expectancy in developing countries.

Recently, however, the primacy of child health concerns has been challenged, although most advocates of adolescent and adult health programmes agree that it is not useful to promote competition between initiatives that target other age groups and those aimed at child health problems (14). Yet, unless careful attention is paid to consolidating the gains made to date and to reversing emerging negative trends in some parts of the world, the gap in life expectancy between richer and poorer nations, and between rich and poor within nations, may continue to grow. Preventing this situation will require continued emphasis on controlling communicable diseases, especially those diseases that affect children disproportionately (15).

## Health sector reforms

Even if resources for child health are maintained at current levels or increased, strategies will have to be adapted to current trends. Presently, many health activities in a large number of developing countries are unfolding in an environment of health sector reform. Donor support seems to have shifted from specific programmes to the development of leaner and potentially more efficient administrative and managerial structures. Typical features of most health reform efforts are the decentralization of budgetary and, sometimes, programmatic authority to provincial or district levels and the administrative integration of centralized programmes. These reform processes and sectorwide approaches can provide opportunities to identify priority problems and more cost-effective and affordable interventions. Additionally, they may aid the development of sustainable health systems that are capable of devising local solutions for local problems. However, there has been less emphasis put on maintaining the quality of the more traditional, technically dependent programmes such as those dealing with childhood diseases, including the Expanded Programme on Immunization, the Control of Diarrhoeal Diseases programme, the Programme on Acute Respiratory Infections, and nutrition. For example, decentralization has often been accompanied by a reduction in support for essential programme activities such as

supervision, monitoring, training, and supplying drugs or vaccines. Without the technical and programmatic support to which they have become accustomed, and which cannot be made available at the provincial or district level in most developing countries, child health services are at risk of levelling off or even declining in both quantity and quality.

At the same time, child health programmes, especially vaccination programmes, have benefited from major new funding from non-traditional sources. Although it seems as if some of the activities being pursued may be contradictory, the potential for each activity to help reduce childhood mortality is evident. A few of the more prominent initiatives currently being implemented around the world are discussed below.

## Vaccination strategies

Vaccine-preventable diseases are responsible for a significant proportion of the approximately 11 million deaths that occur annually among children under 5 years of age (Table 1). Yet, nowhere is the contrast between short-term disease-specific programmes and long-term developmental programmes more evident than in the area of childhood vaccination. Two contemporary vaccination strategies have received massive support from both the public and private sectors. The highest profile public health programme is the initiative to eradicate poliomyelitis. Supported by a 1988 resolution of the World Health Assembly (16) and by a major coalition of international agencies and private organizations, the drive to eradicate poliomyelitis is a direct descendant of previous eradication programmes. Based on a strategy of multiple national mass immunization days accompanied by intensified surveillance, poliomyelitis has been eliminated from industrialized countries and is on the verge of being eradicated worldwide.

The concept of poliomyelitis eradication is laudable. If successful, it will rid the world of a disease which causes permanent disability and it will allow for the cessation of the production, distribution, and administration of poliomyelitis vaccine. It will give public health workers around the world a tangible success and, perhaps, provide strong motivation for achieving comparable success in other health programmes. However, poliomyelitis does not contribute substantially to the global burden of disease, and its eradication will not appreciably affect childhood mortality rates. Furthermore, despite the heroic mobilization efforts that have been undertaken for mass immunization days to be successful, eradication is ultimately dependent upon the ability of a health system to organize special campaigns for the delivery of services. A strong partnership between communities and the health system is a fundamental requirement but, unless it is made an explicit goal, there is little transfer of responsibility to parents and communities. So, in some countries, although immunization days have been successful, vaccination coverage with antigens other than those for polio-

Table 1. Annual deaths due to vaccine-preventable diseases (21)

Disease	No. of preventable annual deaths
Poliomyelitis	720
Diphtheria	5000
Pertussis	346 000
Measles	888 000
Tetanus (including 215 000 neonatal deaths)	410 000
<i>Haemophilus influenzae</i> type b	400 000
Hepatitis B <sup>a</sup>	900 000
Yellow fever <sup>a</sup>	30 000
<b>Total</b>	<b>2 979 720</b>

<sup>a</sup> Most deaths do not occur in childhood.

myelitis, delivered through the routine health services, is declining. Additionally, it is apparent that those countries with the weakest health systems will be the last to achieve eradication. As a result, as the deadline for eradication approaches, there will be increased pressure on these countries to focus only on the narrow goal of eradicating poliomyelitis and to abandon the accompanying objectives related to strengthening their health systems. Accordingly, there is a real potential that the gap in the ability of countries to carry out other programmes that are dependent on their health systems, including those directed toward improving child health, will continue to grow.

As the drive toward poliomyelitis eradication nears its successful end, plans are being made to embark upon a global initiative to eradicate measles. Unlike poliomyelitis, measles is an important cause of childhood mortality, and its eradication would make an important contribution towards reducing childhood mortality. Technical and programmatic arguments have been advanced, both in favour of and against devoting major resources to eradicating measles. The potential operational, technical, epidemiological, and financial problems that such a programme might face have been discussed (17, 18).

While poliomyelitis eradication efforts have been progressing, and while measles elimination is being pursued in several regions, vaccination coverage with the standard six antigens of the WHO Expanded Programme on Immunization has, in fact, fallen over the past decade (19). UNICEF estimates that, despite the proclaimed success of its Universal Childhood Immunization programme efforts in the 1980s, which sought to achieve 80% vaccination coverage with the antigens described in the WHO programme by the second half of the 1990s, 44 countries had measles vaccine coverage of less than 65% for children aged 1 year. Populous countries, such as Nigeria, are included in this category; India had an estimated measles vaccine coverage of 67% (20). The new Global Alliance for Vaccines and Immunizations is responding to this negative trend and is a major promoter of vaccination and immunization. The organization seeks to provide more vaccines to more children in more countries (21). Like the poliomyelitis

eradication initiative, the global alliance is a public-private consortium whose principal members are WHO, UNICEF, the World Bank, national governments, public health and research institutions, the Rockefeller Foundation, the International Federation of Pharmaceutical Manufacturers Associations, and the Bill and Melinda Gates Foundation.

The global alliance reports that although children in developing countries are scheduled by their national immunization programmes to receive six or seven antigens as part of their routine series of vaccination, children in the wealthier countries in Europe and North America can expect to receive protection against more than 10 vaccine-preventable diseases. This “vaccine gap” is another example of the inequitable distribution of health services that contributes to the growing difference in mortality between rich and poor. Incorporating newer, safe, and effective vaccines into routine immunization programmes and increasing coverage for all vaccines in a consistent and sustainable manner for all segments of the population will require a long-term commitment to developing and implementing programmes. Additionally, the development and maintenance of the infrastructure required to support vaccination programmes will be important as new vaccines against diseases that are major contributors to both childhood and adult mortality, including malaria, AIDS, and tuberculosis, are developed and marketed.

There is no obvious reason why both types of programmes—shorter-term eradication initiatives and longer-term developmental programmes—should not coexist. If funding is available, if personnel and other non-monetary resources are sufficient to support both kinds of efforts as well as other programmes for which health ministries are responsible, and if demonstrable benefits to the target populations can be shown, eradication programmes—which appeal to politicians, donors, and the public—could not only contribute to reducing mortality but could also serve as a leading edge to prepare countries for longer-term programmes. However, it might be important to make developmental goals more explicit in order to ensure that eradication-type programmes are held accountable for their achievements in all countries, both richer and poorer. This might be accomplished by setting longer-term goals—for example, by deciding what ought to be achieved over the next 25 years—and allowing countries to pursue those globally agreed goals at their own pace in accordance with their own priorities. The advent of public health endowments, such as the Global Alliance for Vaccines and Immunization, may allow for longer-term planning, as the urgency to raise funding for short-term programmes may be somewhat alleviated in the future.

### Case-management: the trend towards integrating and packaging services

To conform to the changing characteristics of health ministries, which have undergone substantial reorga-

nization and reform, including a reduction in the emphasis on technical programmes, efforts have been made to incorporate disease-control programmes in more integrated and manageable packages of basic services. The Integrated Management of Childhood Illness programme is one example of this approach. Developed jointly by WHO and UNICEF, this programme has been embraced by more than 60 countries and has attracted support from a large number of donor agencies, including more than 25 projects supported by the World Bank.

The conditions included in the package include major communicable diseases (pneumonia, diarrhoea, malaria, and measles). The package also emphasizes addressing malnutrition, which has been shown to contribute to more than half of all childhood deaths (22). To a greater extent than many earlier strategies, this package includes both treatment and prevention interventions. In addition to training health workers in standard case-management protocols for treating all five diseases, the package urges the promotion of breastfeeding, improvements in feeding practices, the use of micronutrient supplements, and vaccines.

Even more importantly, the package calls attention to the need not only to train health professionals but also to strengthen existing health systems to ensure the availability of drugs and supplies and widespread access to them. Supervision, monitoring, and evaluation activities are also emphasized. The third, and essential, component of the package is the promotion of improved prevention and care-seeking behaviours in the community and the family.

Diseases that contribute directly to childhood mortality are not the only subjects of these new initiatives. Increased attention is being paid to early childhood development, emphasizing the psychological and intellectual growth of the child. Interventions in childhood development are traditionally focused on the family and community and are not delivered through the health system. Nevertheless, certain aspects of the care of young children have recently been added as an option in adapting the Integrated Management of Childhood Illness package for countries that want early childhood development to be incorporated as an integral part of recovery from childhood illness. Similarly, just as early childhood development programmes combine interventions in nutrition, health, and psychology to achieve improved outcomes overall, recent interagency efforts (between WHO, UNICEF, and the World Bank) combine the teaching of life skills with the provision of appropriate health services at schools, including adequate water and sanitation facilities.

## The link between poverty and child health outcomes

It is increasingly understood that the relation between health and poverty is bi-directional. Just as low

income is a contributing factor to ill-health and malnutrition, so are poor health, malnutrition, and large family size key determinants of poverty. In targeting health interventions at poorer people, there are two formidable challenges: to lower the incidence of outcomes associated with adverse health and poor nutrition and to protect households against potentially impoverishing effects when adverse outcomes do occur.

It is not only that poor people are in ill-health: ill-health causes poverty. In *Voices of the poor*, a recent World Bank study, ill-health emerged as one of the principal reasons why households become poor and remain poor (23). Explanations are numerous: they include the burden of health care expenditures incurred by caring for sick household members (24), the lost income of the sick, and the lost income of other household members who care for the sick. Nationally, although data relating the impact of health indicators to poverty rates are scarce, evidence is emerging about the impact of health on economic growth. One study estimated that health and demographic variables accounted for half of the difference in growth rates between Africa and the rest of the world from 1965 to 1990 (25).

Malnutrition is also known to be an important determinant of poverty through its direct effects on loss of earnings: the chronically malnourished work less and earn less (26, 27). In addition, malnutrition exerts indirect effects on health status, cognitive development, and the productivity of workers. Numerous examples can be cited: non-breastfed babies have a 14-fold increased risk of dying from diarrhoea (28); iodine deficiency disorder has been estimated to reduce intelligence quotient (IQ) by an average of 13.5 points (29); and in Chile, iron-deficient children who were successfully treated performed 10–400% better on standardized tests than anaemic children (30).

Improving health and nutrition especially among people living in poverty or close to poverty is thus likely to pay dividends by contributing to rises in household income and raising incomes will help lower mortality. Because of the gross health inequalities between rich and poor both within and between countries it seems reasonable to encourage a change in health programming. If mortality rates, especially in childhood, are to be further reduced and stagnating or reversed trends are to be corrected, it may be more important in the future to address the needs of specific families and households rather than to emphasize the development of programmes aimed at specific diseases, wherever they might occur. This people-oriented approach may be more difficult, and it may entail the development and application of sociological rather than biomedical research. But it is increasingly clear that reducing poverty can be achieved by introducing policies and applying programmes that protect households from the impoverishing effects of ill health, malnutrition, and high fertility.

## The future of child health efforts in a changing political environment

To a certain extent, the easiest part of achieving lasting reductions in childhood mortality has occurred in some countries. In others, the strategies that have been used — strengthening health systems and training health care providers in the appropriate use of safe, effective, affordable technologies — have been inadequate or not sustainable. In these countries, mortality rates have stagnated or are rising. In all cases, further improvements will depend to a large extent on what happens in the household and community and to what extent the health system is responsive and will play a supportive part. The promotion of a limited set of household behaviours that have direct links to the prevention and cure of common childhood illnesses needs to become the centrepiece of intensified activity (see Box 1). Since the ability and willingness of families to adopt new behaviours are influenced by a variety of factors, it will need to be determined locally how best to promote these behaviours. Factors influencing the adoption of new behaviours include the household's resources, attitudes in the community; and the price, quality, and availability of services and goods such as food, energy, transport, water, and sanitation facilities.

A graphical depiction of the relation between the household or the community and the health system is shown in Fig. 1 (31). The Pathway to Survival is a guide that distinguishes between prevention behaviours, such as breastfeeding, that can be implemented entirely in the home and those, such as vaccination, that require more direct support from the health system. Similarly, it shows how the management of childhood illness can also be carried out in the home in many instances, with mothers responsible for making the critical decision of when external support is required. One of the most attractive features of the pathway is that it can be used as a quantitative tool for measuring problems in home care, health care-seeking behaviour, the delivery of primary and secondary health care, counselling patients, and the compliance of carers. In fact, a distribution of causes of death can be established on the basis of "social autopsies" taken from mothers whose children have recently died. One study in the periurban area of El Alto, near La Paz, the Republic of Bolivia, where childhood mortality was high, found that considerably more than half of the deaths could be ascribed to inadequate knowledge or incorrect behaviour, or both, occurring in the household or community. Findings such as these support the notion that further progress in child survival can only be made by making greater investments in communities and families.

A recent adaptation of the strategic framework first presented by Mosley & Chen in 1984 adds an additional dimension to the Pathway for Survival model (32). In addition to showing the relation between the health system and the household and community, the recent *Poverty reduction strategy (health,*

### Box 1. A list of key household behaviours for reducing childhood mortality (11)

#### Reproductive health behaviours

Women of reproductive age should delay age of first pregnancy, practise birth spacing, limit family size. Pregnant women should seek antenatal care at least twice during pregnancy.

Women should take iron supplementation during pregnancy.

#### Infant and child feeding practices

Mothers should breastfeed their children exclusively for about six months.

From six months mothers should give children appropriate complementary feeding and continue to breastfeed for 24 months (if testing positive for human immunodeficiency virus, current recommendations should be followed).

#### Immunization practices

All infants should be taken for measles vaccination at nine months of age.

Infants should be taken for routine vaccinations even when sick.

Pregnant women and other women of childbearing age should seek tetanus toxoid vaccine at every opportunity.

#### Home health practices

##### Prevention

All children should sleep under insecticide-treated bednets when indicated.

Wash hands with soap at appropriate times.

All infants and children should consume enough vitamin A, by whatever means available.

All families should use iodized salt.

##### Treatment

Continue feeding and increase fluid intake during illness; increase feeding after illness.

Mix and administer oral rehydration salts, or an appropriate home-available fluid, correctly.

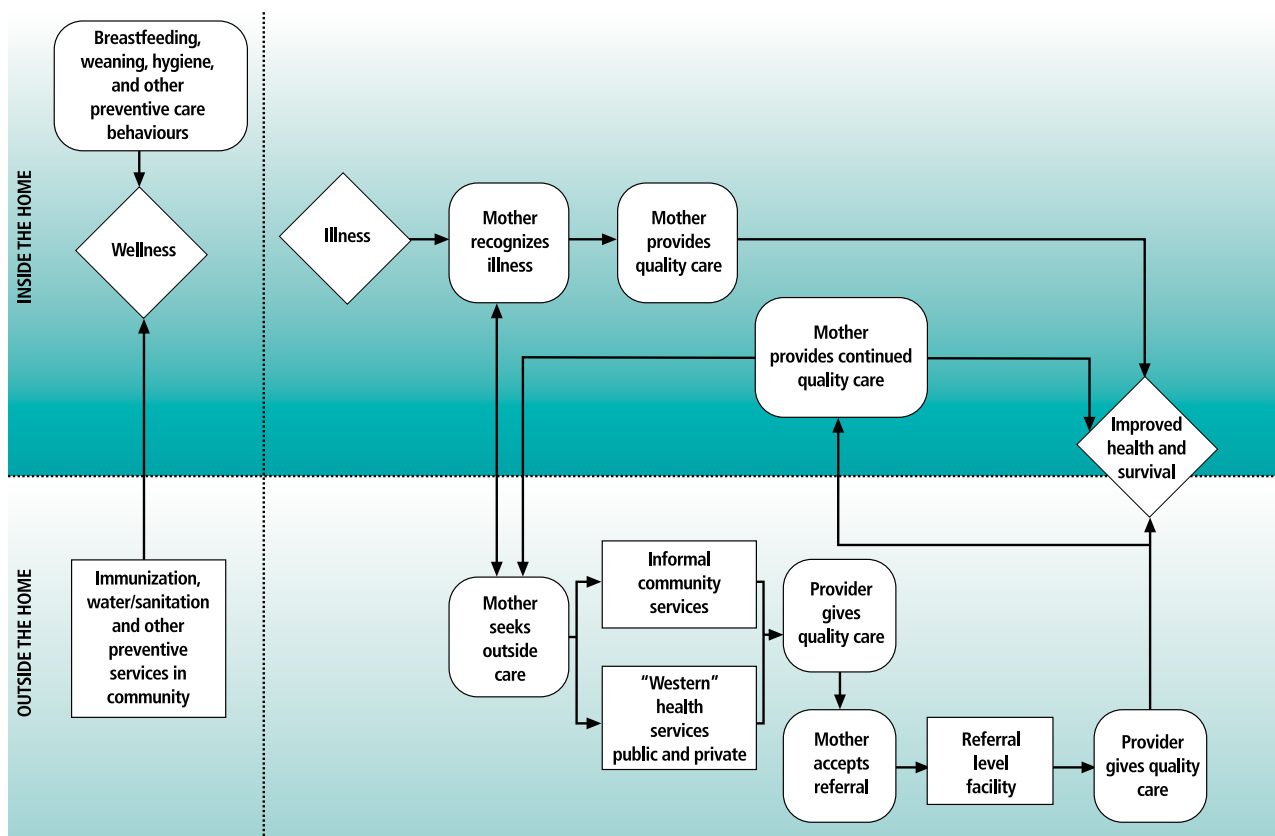
Administer treatment and medications according to instruction.

#### Care-seeking practices

Seek appropriate care when an infant or child is recognized as being sick.

*nutrition and population) sourcebook* of the World Bank includes the more distal role of government policies and actions (Fig. 2). The Mosley–Chen framework included both social and biological variables. It assumed that all influences on childhood mortality at the individual, household, and community levels operate through a set of common mechanisms, such as maternal factors, environmental contamination, nutrient deficiency, injury, and control over personal illness; these were the more proximate determinants. In the revised framework, the links between policy formulation and health outcomes have been made more explicit. The revised framework includes health systems interventions and the promotion of appropriate household and community behaviours as essential intermediate steps between policy and outcome. It recognizes that integrated packages of

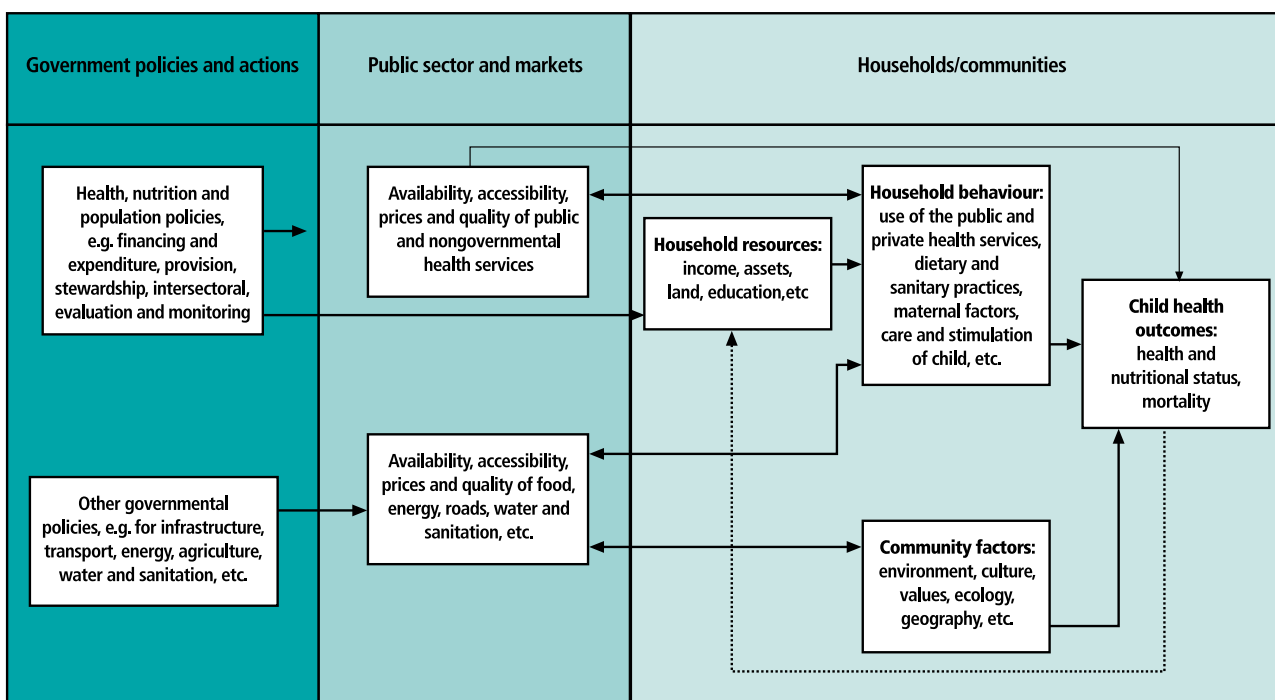
Fig. 1. The Pathway to Survival programme guide



Source: ref. 31.

WHO 00238

Fig. 2. Determinants of child health outcomes



Source: ref. 33.

WHO 00239



interventions, such as the Integrated Management of Childhood Illness, the Integrated Management of Pregnancy and Childbirth, school health programmes, nutritional interventions, and control of both communicable diseases (such as HIV/AIDS, tuberculosis, and malaria) and noncommunicable diseases, constitute one set of influences on household behaviours. Yet policies that determine the availability of health services and the financing of those services and others — such as food supply, water, sanitation, and other related commodities and services — are equally important. Finally, it explicitly recognizes that what happens in the household and community is the most proximate determinant of favourable health outcomes (33).

Implicit in this approach to achieving good health outcomes is the recognition that childhood mortality, for example, does not depend only on interventions in childhood. The health of mothers and fathers, siblings, grandparents, and other household members also influences the health of children. Similarly, interventions during childhood can have an important influence on health in adulthood. It is increasingly recognized that interventions in one generation can affect health outcomes in the next. Ensuring adequate nutrition among girls during childhood and adolescence, for example, can reduce the incidence of low birth-weight babies, an important risk factor for early mortality.

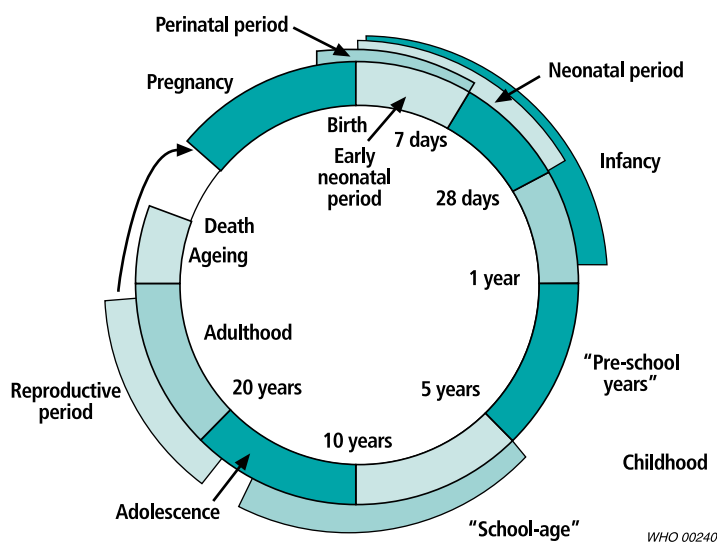
In order to account for these multiple and cross-cutting influences, and to organize them in a way that can be easily translated into health programmes, the World Bank and its partners have participated in the elaboration of a life cycle approach (Fig. 3). This framework, which includes interventions to be implemented throughout life (and gives special consideration to the reproductive period for women, which includes pregnancy and the start of a new cycle

for a new generation), takes into account four basic principles: that health interventions have a cumulative impact — the costs and benefits of interventions later in life are partially dependent upon those that occurred earlier; that sustaining improved outcomes at any stage of the life cycle depends on interventions occurring during several stages; that interventions in one generation can influence outcomes in later generations; and that clearly identifying the different stages of the life cycle facilitates the identification of risks for both individuals and families.

Identifying the major risks to good health at each stage of the life cycle allows appropriate interventions to be selected. These interventions could be implemented either exclusively within the health sector or, consistent with the modified Mosley–Chen framework, through other mechanisms for influencing household behaviours (34). The notion that interventions throughout the life cycle must be implemented to achieve the maximum reduction of deaths occurring in childhood will hopefully promote collaboration within the health sector and between sectors and help ensure that available resources are used more efficiently and effectively.

A discussion of current approaches to reducing childhood mortality would not be complete without mentioning the legal dimensions of this effort. The Convention on the Rights of the Child, adopted by the General Assembly of the United Nations in 1989 and subsequently ratified by all but a small number of countries, explicitly recognizes a child’s right to health and health services. Article 24 of the convention obligates all ratifying parties to “pursue full implementation of this right and, in particular, [to] take appropriate measures...to diminish infant and child mortality.” Guidance regarding implementation and monitoring of the actions called for by the convention has been developed and disseminated (35).

Fig. 3. Main stages for which interventions are implemented in the life cycle approach. Shown are the key stages in the life cycle starting from infancy through to late adulthood. In the life cycle approach, outcome indicators are linked to the risks to health at each stage of the life cycle.



## Conclusions

We have attempted to present briefly the traditions from which child survival efforts have developed, a concise description of some of the more prominent current initiatives and a few of the ideas being proposed for ensuring continued or resumed progress towards reducing childhood mortality. Although many of the technological tools necessary to address the principal biomedical causes of childhood mortality in developing countries are available, they have been used in a patchy and inequitable fashion: access to health services and to these tools has been restricted for large parts of the population in many countries. It is increasingly recognized that the health of children is integrally related to poverty, and that there is a strong correlation between high mortality and poverty.

Perinatal, neonatal, and early childhood mortality have become relatively more important in areas where reductions in mortality have already been

substantial. More effective technical interventions and strategies for implementing them still need to be developed for many of the potentially fatal conditions that occur earlier in life. But technological advances notwithstanding, an increased emphasis on improving health behaviours in households and in communities must occur if sustainable improvement in outcomes related to children's health is to be achieved across all segments of society. Research, and especially social science research, can contribute to the development of appropriate behavioural interventions but only if the close collaboration between the research and the programmatic communities can be strengthened.

Poverty is an important contributing factor to childhood mortality, and economists and international financial institutions are beginning to recognize that adverse health outcomes are an important contributor to poverty. Accordingly, it is important that strategies aimed at reducing poverty take into account the determinants of poor health outcomes at all stages of the life cycle. The formulation of policies and programmes that use a broad range of interventions implemented in an integrated manner can result both in improved health and improved standards of living.

The future of child health programmes in developing countries depends upon bridging gaps. In

order for substantial new reductions in mortality to be made, disease-specific programmes and those that address the determinants of common causes of mortality should be designed to complement each other. Research into new technologies and into new ways of influencing household behaviours should be strongly and effectively managed, and solutions to problems of implementation should be disseminated, widely applied, and evaluated. Strategic approaches, such as the Pathway to Survival model, the modified Mosley–Chen framework, and the life cycle approach, should be further developed to provide guidance to policy-makers, health service providers, and community leaders. These approaches that are more community-driven are necessary because the pattern and trends of childhood mortality have changed. Although impressive in some places, the apparent reductions over the past 20 years sometimes mask the fact that the rate of decline has stalled for many people and especially for those who are poor. Improving children's survival is an unfinished task, but by using innovative multisectoral approaches that recognize that health outcomes can be influenced in ways that have not yet been adequately explored, and especially by moving the centre of attention from the health system to the household, additional gains can be made rapidly and effectively. ■

## Résumé

### L'évolution des programmes de santé infantile dans les pays en développement : on cesse de cibler les maladies pour cibler les gens

Au cours des 30 dernières années, les taux de mortalité chez les nourrissons et les enfants ont baissé dans presque tous les pays. En outre, le nombre de décès d'enfants est passé d'environ 15 millions à environ 11 millions, malgré une augmentation du nombre des naissances, une résistance croissante aux antibiotiques et antipaludiques courants et la propagation – difficile à enrayer – du syndrome d'immunodéficience acquise (SIDA) dans une grande partie du monde. Plusieurs maladies et problèmes de santé, dont les infections respiratoires aiguës, les maladies diarrhéiques, le paludisme, la rougeole et la malnutrition, ont toujours été les principales causes d'une mortalité infantile élevée, bien qu'il existe contre chacun d'eux des interventions sans danger et efficaces.

Nul ne peut garantir que les progrès continueront. D'abord, les succès enregistrés à ce jour n'ont pas été uniformes. Beaucoup de pays pauvres et de régions pauvres de nombreux pays n'ont pas obtenu les mêmes résultats que les pays prospères. Ensuite, à mesure que les taux de mortalité baissent, différentes affections jouent un rôle plus déterminant : les maladies périnatales et néonatales, contre lesquelles des interventions appropriées pouvant être appliquées sur une grande échelle n'ont pas encore été mises au point, sont désormais la cause d'une proportion plus élevée de décès chez les enfants de moins de cinq ans. Les questions sexospécifiques doivent aussi être abordées et la propagation continue du SIDA, notamment en Afrique

subsaharienne et en Asie du Sud-Est, compromet sérieusement la poursuite des progrès.

Le présent article examine les tendances observées dans les programmes visant à promouvoir la santé des enfants au cours des dernières décennies et avance des propositions sur la meilleure façon de concevoir les programmes futurs. Il passe en revue les différentes approches adoptées dans le passé : les initiatives à court terme et à objectifs étroits, dirigées contre des maladies déterminées, comme les premières campagnes d'éradication du paludisme (un échec) et de la variole (un succès), et les stratégies de grande envergure, axées sur le développement à long terme et sur les communautés, comme les soins de santé primaires. Les programmes modernes d'éradication de maladies telles que la poliomyélite et la dracunculose et les stratégies « sélectives » de soins de santé primaires, comme le programme de prise en charge intégrée des maladies de l'enfant, essaient de combiner des éléments de chacune de ces démarches.

Le rôle traditionnellement prépondérant des programmes de santé infantile semble s'amenuiser. Cela peut s'expliquer, entre autres, par le fait que le mouvement de réforme du secteur de la santé s'est davantage préoccupé de considérations administratives et financières que des programmes techniques ou ensembles de programmes. La décentralisation a entraîné dans de nombreux pays une détérioration des fonctions d'appui aux systèmes de santé, telles que la

formation et l'encadrement du personnel et le suivi et l'évaluation des programmes. Toutefois, les stratégies techniques, comme celles qui sont appliquées dans le cadre des programmes de vaccination et des initiatives de prise en charge des cas, continuent de s'affiner pour améliorer la prestation des services, renforcer les systèmes de santé et, par-dessus tout, favoriser la participation communautaire.

L'accent est mis désormais sur la relation bidirectionnelle entre la pauvreté et la santé. De grandes inégalités en matière de santé existent entre riches et pauvres, entre pays, au sein des pays et au sein des communautés. À l'avenir, il peut être important d'accorder plus d'attention aux ménages et aux familles dans lesquels, à cause de la pauvreté ou d'autres facteurs, les enfants sont davantage exposés au risque de mourir. Le message essentiel contenu dans cet article est que la réduction de la mortalité infanto-juvénile pourrait bien dépendre davantage de ce qui se passe dans les communautés et les ménages que de ce qui se passe à l'intérieur d'un système de santé.

Quatre modèles sont examinés. Le guide de la survie et une adaptation du cadre de Mosley-Chen illustrent la relation entre la communauté et le système de santé, mais sous un angle différent. La nouvelle approche du cycle biologique décrit au moyen de graphiques comment la santé de l'enfant dépend des risques et des interventions sanitaires à des âges différents et des influences entre générations. Enfin, il est fait mention de la Convention relative aux droits de l'enfant, et notamment du droit à la santé et aux services de santé.

Bien que l'on dispose dans une large mesure des outils technologiques permettant de réduire davantage la mortalité infantile, les stratégies de mise en œuvre doivent s'adapter au contexte local. La recherche en sciences sociales, qui vise à trouver des moyens d'atteindre les communautés et les familles à haut risque, en particulier celles dont l'accès aux services de santé est entravé par la pauvreté, devient de plus en plus importante.

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## Resumen

### La evolución de los programas de salud infantil en los países en desarrollo: el punto de mira se desplaza de las enfermedades a las personas

Durante los 30 últimos años, las tasas de mortalidad de lactantes y niños han disminuido en casi todos los países. Además, el número de defunciones infantiles ha descendido de unos 15 millones a cerca de 11 millones a pesar del aumento del número de nacimientos, de la resistencia creciente a antibióticos y antipalúdicos comunes y de la propagación relativamente incontrolada del SIDA en gran parte del mundo. Un número limitado de afecciones médicas, como las infecciones respiratorias agudas, las enfermedades diarreicas, el paludismo, el sarampión y la malnutrición, han constituido sistemáticamente las principales causas de mortalidad infantil pese a que existen intervenciones seguras y eficaces contra cada una de ellas.

El progreso continuo no está asegurado. Primero, hasta la fecha el éxito no ha sido uniforme. Muchos países pobres, y zonas pobres de muchos países, no han conseguido resultados tan buenos como los más ricos. Además, a medida que disminuyen las tasas de mortalidad, otras afecciones adquieren más importancia; la mortalidad perinatal y neonatal, para la cual todavía no se han desarrollado intervenciones que puedan implantarse de forma generalizada, contribuye aún más que antes al número de defunciones de menores de 5 años. También es necesario abordar las cuestiones relacionadas con la paridad entre los sexos, y la propagación continua del síndrome de inmunodeficiencia adquirida (SIDA), especialmente en el África subsahariana y en Asia Sudoriental, amenaza seriamente la continuidad de los progresos.

En este artículo se examinan las tendencias de los programas de promoción de la salud de los niños en los últimos decenios y se formulan sugerencias sobre la mejor manera de diseñar programas en el futuro. Se analizan los diferentes enfoques adoptados en el

pasado, a saber: iniciativas a corto plazo y con objetivos muy concretos contra enfermedades específicas, como las primeras iniciativas de erradicación del paludismo (un fracaso) y de la viruela (un éxito), y estrategias amplias, a largo plazo, de desarrollo, orientadas hacia la comunidad, como la de atención primaria de salud. Los programas modernos de erradicación de enfermedades como la poliomielitis y la dracunculosis y las estrategias «selectivas» de atención primaria, como la de lucha integrada contra las enfermedades de la infancia, tratan de combinar diversos elementos de cada uno de esos enfoques.

La importante función que han desempeñado tradicionalmente los programas de salud infantil parece estar disminuyendo. Una de las razones podría ser que el impulso hacia la reforma del sector de la salud se ha centrado más en consideraciones administrativas y financieras que en programas o conjuntos de programas técnicos. La descentralización ha dado lugar en muchos países a un deterioro de las funciones de apoyo a los sistemas, como la capacitación, la supervisión y la vigilancia y la evaluación de los programas. Sin embargo, las estrategias técnicas, como las de los programas de vacunación y las iniciativas de gestión de casos, siguen evolucionando para mejorar la prestación de servicios, fortalecer los sistemas de salud y, lo que es más importante, promover la participación comunitaria.

Se destaca la relación bidireccional entre la pobreza y la salud. Existen grandes desigualdades de salud entre ricos y pobres, entre los países, dentro de los países y dentro de las comunidades. En el futuro quizá sea importante dirigir los esfuerzos hacia los hogares y familias en los que, debido a la pobreza u otros factores, los niños corren mayor peligro de morir. El mensaje clave de este artículo es que los futuros avances en la reducción de la mortalidad de lactantes y

niños bien pueden depender de lo que suceda en las comunidades y los hogares, y no tanto de lo que suceda en el sistema de salud.

Se examinan cuatro modelos. El modelo «La Vía de la Supervivencia» y una adaptación del marco de Mosley-Chen muestran la relación entre la comunidad y el sistema de salud, pero de forma diferente. El nuevo enfoque del ciclo de vida ilustra gráficamente la manera en que la salud de los niños depende de los riesgos e intervenciones sanitarios a distintas edades y de influencias intergeneracionales. Por último se menciona

la Convención sobre los Derechos del Niño, que reconoce el derecho a la salud y a servicios de salud.

Aunque en gran medida se dispone de herramientas tecnológicas para seguir reduciendo la mortalidad infantil, es necesario adaptar las estrategias de aplicación a los contextos locales. Las investigaciones sociológicas encaminadas a identificar maneras de llegar a las comunidades y familias de alto riesgo, especialmente aquellas cuyo acceso a los servicios de salud se halla limitado por la pobreza, están cobrando una importancia creciente.

## References

1. UNICEF. *The state of the world's children report 2000*. New York, UNICEF, 2000: 83.
2. Tulloch J. Integrated approach to child health in developing countries. *Lancet*, 1999, **354**: 16–20.
3. Kurz KM, Johnson-Welch C. *Gender bias in health care among children 0–5 years: opportunities for child survival programs*. Arlington, VA, United States Agency for International Development, the BASICS Project, 1997.
4. Claeson M et al. Reducing child mortality in India in the new millennium, *Bulletin of the World Health Organization*, 2000, **78**: 1192–1199.
5. Newell KW. Selective primary health care: the counter revolution. *Social Science and Medicine*, 1988, **26**: 903–906.
6. Aylward RB et al. Disease eradication initiatives and general health services: ensuring common principles lead to mutual benefits. In: Dowdle WR, Hopkins DR, eds. *The eradication of infectious diseases*. Chichester, UK, John Wiley, 1998: 61–74.
7. Walsh JA, Warren KS. Selective primary health care: an interim strategy for disease control in developing countries. *New England Journal of Medicine*, 1979, **301**: 967–974.
8. *The evolution of diarrhoeal and acute respiratory disease control at WHO*. Geneva, World Health Organization, Department of Child and Adolescent Health and Development, 1999 (WHO/CHS/CAH/99.12).
9. Feachem RG. Preventing diarrhoea: what are the policy options. *Health Policy and Planning*, 1986, **1**: 109–117.
10. Kirkwood BR. Potential interventions for the prevention of childhood pneumonia in developing countries: a systematic review. *Bulletin of the World Health Organization*, 1995, **73**: 793–798.
11. Murray J et al. *Emphasis behaviors in maternal and child health: focusing on caretaker behaviors to develop maternal and child health programs in communities*. Arlington, VA, United States Agency for International Development, the BASICS Project, 1997.
12. Reich MR. The politics of agenda setting in international health: child health versus adult health in developing countries. *Journal of International Development*, 1995, **7**: 489–502.
13. *World development report 1993 — Investing in health*. Washington, DC, Oxford University Press for the World Bank, 1993.
14. Feachem RGA, Phillips MA, Bulatao RA. Introducing adult health. In: Feachem RGA et al, eds. *The health of adults in the developing world*. Washington, DC, The World Bank, 1992.
15. Gwatkin DR, Guilot M. *The burden of disease among the global poor: current situation, future trends, and implications for strategy*. Washington, DC, Human Development Network/Health, Nutrition, and Population, The World Bank, 2000.
16. *Global eradication of poliomyelitis by the year 2000*. Resolution WHA41.28, 41st World Health Assembly, May 1988. *Handbook of Resolutions and Decisions, Vol. III, 2nd ed*. Geneva, World Health Organization, 1990: 55–56.
17. Omer MI. Measles: a disease that has to be eradicated. *Annals of Tropical Paediatrics*, 1999, **19**: 125–134.
18. Cutts FT, Henao-Restrepo A, Olive JM. Measles elimination: progress and challenges. *Vaccine*, 1999, **17**: 47–52.
19. *Vaccine preventable diseases monitoring system, global summary, 1999*. Geneva, World Health Organization, 1999.
20. UNICEF. *The state of the world's children report 2000*. New York, UNICEF, 2000: 92–95.
21. **The Global Alliance for Vaccines and Immunization**. *A partnership for child health* (available on the Internet at <http://www.vaccinealliance.org>).
22. Pelletier DL et al. The effects of malnutrition on child mortality in developing countries. *Bulletin of the World Health Organization*, 1995, **73**: 443–448.
23. Narayan et al. *Voices of the poor: can anyone hear us?* New York, Oxford University Press for the World Bank, 2000.
24. Ettling M et al. Economic impact of malaria in Malawian households. *Tropical Medicine and Parasitology*, 1994, **45**: 74–79.
25. Bloom DE, Sachs JD. Geography, demography and economic growth in Africa. *Brookings Papers on Economic Activity*, 1998, **2**: 207–295.
26. Levin H. A benefit–cost analysis of nutritional programs for anemia reduction. *World Bank Research Observer*, 1986, **1**: 219–246.
27. McGuire JS, Austin JA. *Beyond survival: children's growth for national development*. New York, UNICEF, 1987.
28. Feachem R, Koblinsky M. Interventions for the control of diarrhoeal disease among young children: promotion of breast-feeding. *Bulletin of the World Health Organization*, 1984, **62**: 271–291.
29. Bleichrodt N, Born MP. A meta-analysis of research on iodine and its relationship to cognitive development. In: Stanbury JB, ed. *The damaged brain of iodine deficiency: cognitive, behavioural, neuromotor and educative aspects*. New York, Cognizant Communication, 1994: 195–200.
30. Walter TI et al. Iron deficiency anemia: adverse effects on infant psychomotor development. *Pediatrics*, 1989, **84**: 7–17.
31. Waldman RJ et al. *Overcoming remaining barriers: the pathway to child survival*. Arlington, VA, United States Agency for International Development, the BASICS Project, 1996.
32. Mosley WH, Chen LC, eds. *Child survival: strategies for research*. New York, Population Council, 1984 (Population and Development Review, supplement vol. 10).
33. *Health, nutrition, and population sourcebook for the poverty reduction strategy paper*. Washington, DC, Health Nutrition, and Population Division, The World Bank, 2000.
34. Simon J, Rosen S. *The family health cycle: creating a context for maternal and child health (MCH) interventions*. Paper Presented at World Bank Human Development Learning Week, Washington, DC, 22 February 2000.
35. Hodgkin R, Newell P, eds. *Implementation handbook for the convention on the rights of the child*. New York, UNICEF, 1998: 315–340.