

Children's health priorities and interventions

Wilson Were and colleagues explain why the global community should continue to invest in children's health, to complete the unfinished child survival agenda and tackle the emerging child health priorities



Globally, deaths in children aged under 5 years declined by approximately 50% from 12.7 million in 1990 to 6.3 million in 2013, but progress has been insufficient to achieve the millennium development goal 4 target of a two thirds reduction by 2015.¹ The good news is that many countries have been able to accelerate the decline in under 5 mortality in the past two decades, more so following the launch of the United Nations secretary general's Global Strategy for Women's and Children's Health in 2010.² However, 17 000 children under 5 still die every day, largely from preventable communicable diseases and malnutrition; among those who survive, an estimated 200 million children are unable to attain their full developmental potential.^{3 4} At the same time, congenital anomalies, non-communicable diseases, and injuries are becoming increasingly important causes of morbidity and mortality in childhood.⁵ As a consequence, the decades ahead will be marked by this dual burden of childhood diseases, affecting most countries.

Here, we define children as aged 0-10 years. We present evidence based essential interventions to end preventable child deaths and promote healthy growth and development⁶; and we provide strategic directions in support of the new Global Strategy for Women's, Children's and Adolescents'

KEY MESSAGES

The millennium development goals were instrumental in increasing investment and action for child survival, thus reducing under 5 mortality by approximately 50% over the past two decades

Despite the gains made, 17 000 children under 5 years of age still die every day, mostly in sub-Saharan Africa and southern Asia and in countries affected by conflict and natural disasters

The future demands attention not only to the unfinished child survival agenda but also to a more holistic global child health agenda recognising the emerging priorities

Strategic choices have to be made to move from "business as usual" to innovative, multiple, and tailored delivery approaches to increase access, coverage, and quality of child health services

Health and the sustainable development goals agenda.

Methods

This paper is based on the forecasted changes in the distribution of causes of death in under 5s as countries move towards an absolute target of 25 or fewer deaths per 1000 live births by 2030. We estimated changes in the profile of the causes of death by examining the current distribution of causes of death in countries with different levels of under 5 mortality (table 1). Data on levels and causes of mortality by country came from WHO's Global Health Observatory.⁵ This predicted epidemiological profile served as a basis to identify emerging priorities. We drew priority interventions from the evidence syntheses previously conducted by WHO and partners.^{6 7} Priority interventions identified are those that tackle major causes of newborn and child mortality, as well as child development, and have been shown to have a high impact or are beneficial for the emerging priorities.

We drew strategic directions from the concept of universal health coverage, whereby all people should be able to equitably receive the full spectrum of essential, high quality health services—including health promotion, prevention; and treatment; rehabilitation; and palliative care—without suffering financial hardship.⁸ The paper also draws on the comments and feedback provided during the expert and public consultation on the background paper on children's health priorities prepared for the new Global Strategy for Women's, Children's and Adolescents' Health.⁹

The unfinished agenda for children's health

Of the estimated 6.3 million children aged under 5 years who died in 2013, more than 70% died in the first year of life.⁵ The leading causes of mortality were preventable newborn problems and infectious diseases—that is, preterm birth complications (15%), intrapartum related complications (11%), pneumonia (15%), diarrhoea (9%), and malaria (7%). In addition, 45% of all deaths in under 5s were associated with undernutrition, and more than 80% of newborn deaths were associated with low birth weight (fig 1).¹⁰

The reduction in neonatal mortality has been slower than that for older children; as a consequence, the proportion of deaths in

under 5s that occurs within the first month of life increased from 37% in 1990 to 44% in 2013.¹ Deaths in under 5s are increasingly concentrated in sub-Saharan Africa and southern Asia, and more than 50% occur in settings affected by conflict, displacement, and natural disasters. Sub-Saharan Africa has the highest under 5 mortality rate of 92 deaths per 1000 live births—more than 15 times the average for developed regions. Deaths are unevenly distributed between and within countries.

Epidemiological transition in under 5 mortality

As under 5 mortality declines, countries will face an epidemiological transition marked by a shift in the relative contribution of communicable and non-communicable diseases as major causes of childhood morbidity and mortality.¹¹ In the next two decades, these changes are likely to occur in the 68 countries where current under 5 mortality is at least 35/1000 live births. As a result, most countries will see a steady increase in the relative importance of deaths due to congenital anomalies, non-communicable diseases, and injuries.

Figure 2 illustrates the epidemiological transition of the causes of death as the under 5 mortality rate declines from 55 per 1000 live births to 50, 20, and less than 5 per 1000 live births.⁵ The relative contribution of congenital anomalies, non-communicable diseases, and injuries together is likely to increase from 12% to 14%, 34%, and 52%, respectively, of all deaths in under 5s. Meanwhile, the relative contribution of infectious diseases is likely to decline from 53% to 40%, 24%, and 8%, respectively. For example, in Bangladesh, the under 5 mortality declined from 144/1000 live births in

Table 1 | Distribution of countries and number of deaths in under 5s according to levels of mortality, 2013⁵

Under 5 mortality rate (per 1000 live births)	No (%) of countries (n=194)	No (%) of deaths (n=6 282 286)
<5	33 (17)	26 273 (0.4)
5-15	51 (26)	425 262 (6.8)
15-25	29 (15)	199 529 (3.2)
25-35	13 (7)	329 956 (5.3)
35-45	11 (6)	251 570 (4.0)
45-55	12 (6)	1 580 486 (25.2)
>55	45 (23)	3 469 210 (55.2)

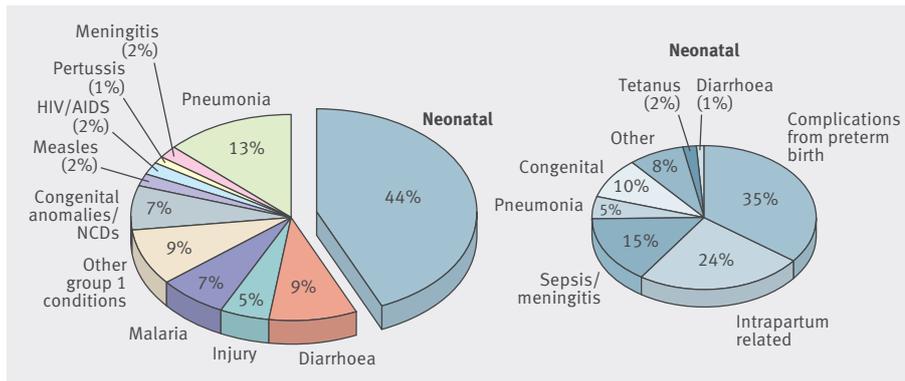


Fig 1 | Global causes newborn and under 5 mortality.^{5 10} NCD=non-communicable disease

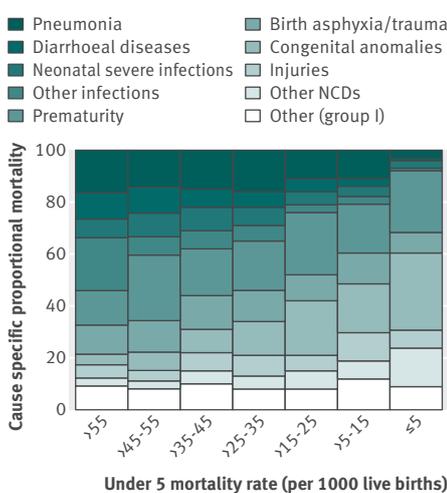


Fig 2 | Distribution of causes of death in children under 5 according to levels of under 5 mortality rate.⁵ NCD=non-communicable disease

1990 to 88/1000 live births in 2000 and to 41/1000 live births in 2013, at an annual rate of reduction of 5.4%. In the period 2000-13, the relative contribution of diarrhoea decreased from 13% to 6%, that of measles from 4% to 1%, and that of pneumonia from 18% to 14%.

Emerging priorities for children's health

Congenital anomalies, injuries, and non-communicable diseases (chronic respiratory diseases, acquired heart diseases, childhood cancers, diabetes, and obesity) are the emerging priorities in the global child health agenda. Congenital anomalies affect an estimated 1 in 33 infants, resulting in 3.2 million children with disabilities related to birth defects every year.¹⁰ The global disease burden due to non-communicable diseases affecting children in childhood and later in life is rapidly increasing, even though many of the risk factors can be prevented.¹²

Injuries (road traffic injuries, drowning, burns, and falls) rank among the top three causes of death and lifelong disability among children aged 5-15 years, yet they are

largely absent from global child survival initiatives.¹³ In 2012 violence and unintentional injuries killed an estimated 740 000 children under the age of 15, with the latter accounting for 90% of these deaths.⁵ Similarly, the worldwide number of overweight children increased from an estimated 32 million in 2000 to 42 million in 2013, including in countries with a high prevalence of childhood undernutrition.^{5 14} If these trends continue, by 2025 the prevalence of overweight in children under 5 years of age will rise to an estimated 11% from 7% worldwide.

Priority interventions

Box 1 summarises evidence based essential interventions for child survival, growth, and development that are well known but yet not reaching all children who need them.^{6 15 16} They include health and non-health sector interventions that need to be implemented at scale and with quality to close the equity gap and reach universal coverage.

Box 2 summarises beneficial interventions for tackling emerging priority conditions in childhood. They include clinical and non-clinical interventions and supportive laws and policies. Prevention of injuries, overweight, and obesity, for example, depend on appropriate national policies as well as services.^{17 18} The Commission on Ending Childhood Obesity recommended a multifaceted approach¹⁹: interventions that tackle maternal health, infant and young child feeding practices, marketing of unhealthy foods, and factors that restrict physical activity.¹⁸ Similarly preconception and periconception care interventions are increasingly important, not only to prevent congenital anomalies and optimise fetal development but also to enhance health during the child's life.²⁰

Multisectoral interventions are critical to tackle social determinants of health and child health outcomes. Alleviation of poverty, education and empowerment of women, laws and policies on marketing of food products, access to safe drinking water

and sanitation, and a safe environment are all essential to protect and support children's health and prevent common conditions such as pneumonia and diarrhoea.^{21 22}

Strategic directions

Delivery of comprehensive child health services requires functional health systems and strategies tailored to national and subnational epidemiological situations. Major bottlenecks to universal health coverage include limited access to and poor quality of health services, suboptimal programme management, poor procurements and supply chain management systems, inadequately prepared and supported health workforce with provider shortages, and failure to convert national policies into action plans.²³ As a consequence, the coverage of many essential interventions remains low (table 2), a challenge that must be overcome as part of the sustainable development agenda.

Health sector and multisectoral efforts are needed to overcome this low coverage of interventions, the inequalities, and the social determinants of health. We propose five strategic directions to improve the current situation and move from "business as usual" to innovative, multiple, and tailored delivery approaches to increase access, coverage, and quality of child health services.

Delivery platforms

Service delivery ought to ensure availability of and seamless access to integrated packages of interventions through an optimal mixture of community (including home) and facility (health centre and hospital) based care. Optimising the mixture of community and facility based delivery of services is a widely used strategy to ensure that interventions reach populations, when and where they need them.²⁴ Evidence has shown that community health workers can increase access to preventive interventions such as health education, breast feeding and nutrition promotion and support, essential newborn care, stimulation and psychosocial support, and use of insecticide treated nets.²⁵ Similarly, appropriately trained and supported community health workers can provide treatment interventions for pneumonia, diarrhoea, malaria, and severe acute malnutrition.²⁶ However, for community health services to function optimally, they need to be part of the health system, and country specific strategies need to be in place to determine where and how to deliver these services. In India, training of community health workers to conduct postnatal home visits, training of physicians and nurses to treat or refer sick children, and strengthening of drugs and supervision resulted in substantial improvements in neonatal and infant survival.²⁷

BOX 1: SUMMARY OF ESSENTIAL NEWBORN AND CHILDHOOD HEALTH INTERVENTIONS

Adolescence and pre-pregnancy

- Family planning
- Preconception care*

Pregnancy

- Appropriate care for normal and high risk pregnancies

Childbirth

- Promotion and provision of thermal care for all newborns
- Promotion and provision of hygienic cord and skin care
- Promotion and support for early initiation and exclusive breast feeding within the first hour
- Newborn resuscitation

Postnatal period

- Antibiotics for newborns at risk and for treatment of bacterial infections
- Appropriate postnatal visits
- Extra care for small and sick babies (kangaroo mother care, treatment of infection, support for feeding, and management of respiratory complications)

Infancy and childhood

- Exclusive breast feeding for six months and continued breast feeding up to at least two years with appropriate complementary feeding from six months
- Monitoring and care for child growth and development
- Routine immunisation for common childhood diseases, including introduction of new vaccines against *Haemophilus influenzae*, *Pneumococcus*, and rotavirus
- Micronutrient supplementation, including vitamin A from 6 months
- Prevention and management of childhood malaria
- Prevention and management of childhood pneumonia
- Prevention and management of diarrhoea
- Case management of severe acute malnutrition
- Comprehensive care of children exposed to or infected with HIV

Health and multisector actions

- Ensuring food security for the family (or mother and child)
- Maternal education
- Safe drinking water and sanitation
- Hand washing with soap
- Reduced household air pollution
- Health education in schools

*Preconception care includes birth spacing and preventing teenage pregnancy, promotion of contraceptive use, optimisation of weight and micronutrient status, prevention and management of infectious diseases, and screening for and managing chronic conditions

Table 2 | Coverage of essential interventions in countries with latest survey since 2008⁴⁰

Indicator	No of countries with data	Median (range) % coverage
Demand for family planning satisfied	54	64 (13-95)
Antenatal care ≥4 visits	48	53 (15-94)
Skilled attendant at birth	60	84 (43-94)
Postnatal visit newborn	17	30 (5-83)
Exclusive breast feeding	51	41 (3-85)
Measles immunisation (first dose)	75	84 (42-99)
Antibiotic treatment for pneumonia	40	46 (7-88)
Oral rehydration therapy for diarrhoea	45	47 (12-76)
Malaria treatment (first line)	35	32 (3-97)

Integrated delivery of services

The purpose of integration is to meet children's needs in a holistic manner and provide services together for effectiveness, quality, and efficiency.²⁸ Integration spans not only the levels of care (community, primary, and referral) but also the child's life (pre-pregnancy to childhood). Integrated management of childhood illness and integrated community case management are examples of integration of preventive and

treatment interventions during visits with sick children.²⁹ The aim is for children to receive appropriate interventions, ideally at a "one stop shop." Similarly, routine immunisation outreach sessions have been used to deliver interventions such as health promotion, insecticide treated nets, vitamin A supplementation, and treatment of common childhood illnesses.³⁰ Recent evidence strongly supports linking these integrated case management platforms and strategies

with strong demand creation and community buy-in.

The Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) is another form of integration.²² It provides a framework for coordinated and integrated actions to improve feeding and nutrition of infants and young children, access to safe drinking water and sanitation, hand washing with soap, reduction in indoor air pollution, immunisation, prevention of HIV, and treatment of pneumonia and diarrhoea. GAPPD is being implemented in several countries, and plans are under way to evaluate the extent to which it has been implemented. For example, Ghana, among other countries, introduced pneumococcal conjugate and rotavirus vaccines into routine immunisation and adapted the "Pocket book of hospital care for children."

Although integration of services is most efficient, vertical programmes may be desirable as a temporary measure where the health system is weak but a rapid response is needed to target vulnerable populations.³¹ This was the case in tackling the HIV epidemic, for which an urgent response was needed that is now being integrated into the health system. Vertical programmes may also provide a platform to incrementally build on other child health priority interventions.³²

Quality of services

Poor quality of care is a critical barrier to children's utilisation of health services and to health outcomes in many low and middle income countries. Provision of high quality services for children requires a competent and motivated health workforce, availability of essential medicines and physical resources, evidence based standards of care, an actionable health information system, and a functional referral system. Quality improvement processes should be embedded at all levels of service provision and be supported by appropriate managerial responses at subnational and national levels. Several strategies and approaches have been proposed to guide quality improvement in health services.³³ Programmes need to examine the effectiveness and cost of various approaches and determine which are most relevant in their context, with a view to long term feasibility and sustainability. Many of these approaches primarily identify barriers to high quality care and then implement quality improvement activities to overcome these barriers on the basis of "plan-do-study-act" cycle models.³⁴ Integrated management of childhood illness needs to be implemented at first level facilities, with improvements in triage, diagnosis, treatment guidelines, paediatric audits, monitoring, and follow-up at hospital level to improve paediatric quality of care.

BOX 2: STRATEGIES FOR TACKLING KEY EMERGING PRIORITIES IN CHILD HEALTH**Congenital anomalies**

- Optimisation of maternal nutrition to prevent low birth weight
- Periconception supplementation with folic acid
- Minimising and reducing exposure to harmful environment and substances
- Preconception and periconception maternal screening
- Newborn screening (for example, for hypothyroidism and haemoglobinopathies)

Injuries

- Policy and regulations to prevent and reduce risks of injuries and accidents
- Setting standards for safe environments and recreation areas for children
- Developing better road infrastructure
- Health education on risks of injuries, burns, and drowning

Overweight and obesity

- Appropriate policies and regulations on marketing of unhealthy foods and beverages to children and ensuring availability of healthy and nutritious choices
- Limitation of energy intake from total fats and sugars
- Increase in consumption of fruit and vegetables, as well as legumes, whole grains, and nuts
- Reducing the fat, sugar, and salt content of complementary foods and other processed foods
- Ensuring that healthy and nutritious choices are available and affordable to all consumers
- Practising child and school food and beverage policies
- Increased regular physical activity and reduced screen time

Promoting equity

The concept of universal health coverage calls for all people to be able to access essential health services without undue financial hardship. However, large inequalities between poor and better off children exist, both between and within countries.³⁵ Understanding the key drivers of these inequities is necessary to identify appropriate actions. Evidence has shown the effectiveness of multidimensional approaches that may include conditional cash transfers, voucher schemes, microcredit, outreach services, and targeted community health services.³⁶

Innovations

Improved delivery of child services will require continuous innovation, and the most promising innovations need to be supported, tested, used, and refined in countries. Innovations such as digital systems (including mobile health) have potential to strengthen health systems, reduce barriers to access, and strengthen monitoring and evaluation. Development of dispersible child friendly medicines, adaptation of existing vaccines for use in resource poor settings, and point of care tests to improve early diagnosis and treatment are among the priorities for increasing access, quality, and coverage.

Global initiatives and action plans to achieve 2015-30 targets

Moving beyond 2015, the global community has set goals and targets for tackling the unfinished child survival agenda to achieve under 5 mortality of 25 or less per 1000 live births by 2030.³⁷ This momentum has been translated into several global initiatives: “ending preventable maternal mortality”

and “every newborn action plan” to promote universal coverage of high quality maternal and newborn care^{38–39}; the “global action plan for the prevention and treatment of pneumonia and diarrhoea” to prevent and treat pneumonia and diarrhoea²²; a “comprehensive implementation plan on maternal, and infant and young child nutrition” to reduce undernutrition and obesity⁴⁰; the Global Technical Strategy for Malaria to reduce global malaria case incidence and mortality by 2030⁴¹; and the Global Vaccine Action Plan to prevent childhood diseases through vaccination.⁴² These global initiatives and action plans must be effectively articulated in national plans and the new Global Strategy for Women's, Children's and Adolescents' Health, and the emerging child health priorities must be embraced.

Conclusions

The next 15 years provide a unique opportunity for the global community to overcome health challenges affecting children aged 0-10 years. The unfinished agenda of preventable child mortality should remain a priority, with a focus on those countries and populations in greatest need. At the same time, increased attention should be given to emerging child health priorities. Governments and the global community at large must invest in the health of their children. The sustainable development goals, by virtue of their intersectoral and integrated approach, provide an excellent opportunity to mobilise the actions necessary to provide children with the services and the care they need and to leave no child behind. Governments, development partners, donors, multilateral agencies, UN agencies, and non-governmental organisations have important roles to play in aligning

their efforts and creating incentives and framework for integrated approaches to child health. The year 2015 should be a turning point towards a reinvigorated agenda in which children are enabled not only to survive but also to thrive.

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