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REDESIGNING CHILD AND ADOLESCENT HEALTH PROGRAMMES

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This document is the report of the technical meeting jointly convened by the World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) on Redesigning Child and Adolescent Health Programmes in the context of the Sustainable Development Goals (SDGs). The meeting was organized by the WHO Departments of Maternal, Newborn, Child and Adolescent Health and the Child and Community Health Unit of UNICEF in collaboration with other departments and units in both organizations. Collaborating departments in WHO included, Public Health and Environment; Non Communicable Diseases; Mental Health and Substance Abuse; Nutrition for Health and Development; and Reproductive Health and Research. Collaborating units in UNICEF included Division of Data, Research and Policy, Care for Child Development, and Maternal Newborn and Adolescent Health, Units.

WHO and UNICEF thanks all participants and partners listed in the Annex 2 for their time, resources and technical contributions in support of the meeting. WHO and UNICEF gratefully acknowledges the chairs of the sessions, Professor Elizabeth Saewyc, Shams El Arifeen and Mark Tomlinson for their contributions and Rosie Ameyan who acted as the main rapporteur.

We also greatly acknowledge participants listed in Annex 1 who made presentations at the meeting.

Special thanks to the lead authors of the background papers for the meeting, Zulfiqar Bhutta, The Hospital for Sick Children, Toronto, Canada; Alarcos Cieza, WHO Department of Noncommunicable Diseases; Diana Estevez, Consultant, Ecuador; Regina Guthold and Kathleen Strong, WHO Department of Maternal, Newborn, Child and Adolescent Health (MCA); Mira Johri, University of Montreal, Canada; Zeina Maalouf, Consultant, USA; Mark Tomlinson, Stellenbosch University, South Africa; and Dazhzen You, Division of Data, Research and Policy, UNICEF. We acknowledge and thank all WHO and UNICEF staff who coordinated the Child Health Redesign Project and supported the preparations of the meeting, Anne Detjen; Rory Nefdt and Stefan Peterson, UNICEF; and Rajiv Bahl; Anshu Banerjee; Ornella Lincetto; David Ross; Jonathon Simon and Wilson Were, WHO Department of Maternal, Newborn, Child and Adolescent Health (MCA).

We acknowledge financial support for preparations and convening of the meeting from the Bill and Melinda Gates Foundation Investment Grant No. OPP1163037 for Redesign of Global Guidance on Care for Newborns, Infants and Children.
### Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>HIC</td>
<td>high-income country</td>
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<tr>
<td>IMNCI</td>
<td>integrated management of neonatal and childhood illness</td>
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<tr>
<td>LMIC</td>
<td>low- and middle-income country</td>
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<tr>
<td>NCD</td>
<td>noncommunicable disease</td>
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<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
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<td>YLD</td>
<td>years of life lost due to disease</td>
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Executive summary

The epidemiology of child health has changed markedly over the past two decades in terms of age structure, causes and spatial distribution of health, illness and death. The prevalence of infectious causes like diarrhoea, pneumonia and malaria has fallen progressively, and most childhood deaths today occur in the first 2 years of life, particularly in the first month (1). As the proportion of deaths among newborns and young infants increases, they must become the focus of the unfinished child survival agenda, and the reductions in the numbers of deaths from diarrhoea and pneumonia in children under 5 years must be sustained. As communicable diseases become less common as causes of death among children and adolescents aged 5–18 years, other causes, including injuries and noncommunicable diseases (NCDs), become more important. To achieve optimal child and adolescent health and well-being, the reductions in mortality must be sustained and the resilience of all children assured along their life-course to adulthood. The gains made during the era of the Millennium Development Goals and the emphasis on the Sustainable Development Goals (SDGs) in the Global Strategy for Women’s, Children’s and Adolescents’ Health (2) must continue in order to decrease the number of child and adolescent deaths, while ensuring that they have opportunities to thrive.

It became clear, therefore, that the response of health and social systems must change to focus on the determinants, causes and timing of death, making use of advances in clinical sciences and in understanding of the social determinants of health, disease prevention and survival. Better integration of interventions along the life-course and the continuum of care of children and adolescents, with delivery of better-quality services, are essential elements of redesigned health services for these groups. The global community must therefore review and redesign programmes for child and adolescent health to maximize the promotion of health and prevention of health risks during the first two decades of life. The human capital resulting from health programmes should be:

a 19-year-old person who is optimally healthy, having been raised in a safe, secure environment and appropriately prepared physically, mentally and emotionally to contribute socially and economically to society (3).

To achieve this goal, new principles, shifts and actions were defined on the basis of global trends in demographics, mortality, morbidity, disability, growth and nutrition. Furthermore, a detailed review was made of the determinants of health and of the opportunities for addressing them throughout the life-course, building on the gains at each life stage (4). The principles, shifts and actions form the basis for redesigning child and adolescent programmes, identifying critical areas and setting priorities for WHO and UNICEF and the broader health community. Programming should be guided by the following principles, shifts and actions.

Guiding principles

• a life-course approach in the first two decades (0–19 years) in the delivery of comprehensive, integrated, age-, condition- and context-specific interventions and actions at each stage of life;

• equitable, rights-based, universal access to high-quality, essential interventions and services for every child and adolescent everywhere to promote health, growth and well-being and to prevent exposure to risk factors, disease and complications;

• empowerment of individuals, families and communities in assuring health and well-being for all children and adolescents; and

1 WHO defines “well-being” as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”.

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• a multisectoral approach and coordination among all health-related sectors to achieve these outcomes.

Shifts in child and adolescent health programming

The strategic shifts in programming required to optimize human capital are as to:
• extend the predominant focus of programmes from survival of children under 5 years to health, nutrition and psychosocial support in the first two decades of life;
• extend and refocus the agenda to address high mortality in specific age groups, with greater emphasis on quality, coverage and equity for vulnerable populations;
• build children’s resilience through nurturing care, early learning and promoting health and well-being while addressing high morbidity along the life-course; and
• ensure delivery of comprehensive family-, child- and adolescent-centred care and services in all health programmes and health-related sectors.

Actions

• Provide comprehensive, integrated care at all levels and throughout the life-course to build resilience, which should be based on children’s needs.
• Actively engage and empower individuals, families and communities in generating health, well-being and accountability.
• Adopt a multisectoral approach to health and programming in all government sectors at all levels to maximize the enabling environment and optimize human capital.
• Build on existing structures, policies and initiatives, and create new structures where necessary to respond to increasing demands and changing needs.
• Provide flexible, adaptable, context-specific guidance and programmes according to regional, national and local epidemiology and health systems.
• Reflect on current trends, and adopt and continuously innovate to respond better to changing global health and technology.

Recent data and trends in child and adolescent health were analysed by experts for WHO and UNICEF and discussed at a meeting in Geneva, Switzerland, in January 2019. The papers produced for that meeting, which will be published shortly, are summarized below, with the consensus of the meeting participants on the areas of focus and steps for designing the public health response required for newborns, children and adolescents to survive, be healthy and grow and develop to achieve their full potential.
Introduction

Coordinated global action halved the mortality rate of children under 5 years from 12 million to less than 6 million during the period of the Millennium Development Goals (2000–2015) (5). Those Goals, however, had limited emphasis on child development or well-being and almost none on the health and development requirements of older children and adolescents; furthermore, the links among programmes for different age groups were ill defined. Consequently, the public health community paid little attention to the fact that children and adolescents must not only survive but also be healthy and thrive as they progress towards adulthood. The SDGs provide an opportunity to re-emphasize the importance of focused, sound scientific strategies to address the needs of children and adolescents in an integrated manner for their optimal survival, health, growth and development towards their full potential. This should stimulate new thinking about the actions required to attain the common goal of improving the health and well-being of all children and adolescents.

In order to address the broad, comprehensive SDG agenda, a strategic review was conducted in 2015 of global child health programmes. The review “Towards a grand convergence for child survival and health” (5) generated ideas about child and adolescent health and well-being, including the quality of services and the coverage of effective interventions. A key recommendation was to design flexible, adaptable guidelines and guidance for users to reflect the changing epidemiology, capacity of health systems and technological advances based on lessons learnt from implementation of the Integrated Management of Neonatal and Childhood Illness (IMNCI) strategy. The findings and recommendations of the review for addressing the broad, multisectoral SDG agenda, with inputs to the health system, equity, gender and communities are listed in Fig. 1.
Fig. 1. Findings and recommendations of the strategic review, Towards a grand convergence for child survival and health (5)

<table>
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<th>Findings</th>
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<tr>
<td>Widespread implementation of IMNCI is part of the child health strategy in 90 of 97 lower- and middle-income countries (LMICs).</td>
<td>Those involved in child health must mobilize political support to ensure government ownership, planning and implementation.</td>
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<td>The spread of IMNCI is limited, and implementation is uneven among and within countries; the focus is more on improving the skills of health workers, and the components for strengthening health systems and improving family and community practices are neglected.</td>
<td>Countries must have the support of global partners to define strategies adapted to their epidemiology and health systems.</td>
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<td>Lack of sustainable funding and fragmented support compromise synergy among the three components.</td>
<td>Countries should explicitly prioritize poor, underserved populations by analysing and mapping equity.</td>
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<td>Late availability of tools for health systems and communities prevented countries from building comprehensive programmes.</td>
<td>Fragmentation of global child health efforts should be addressed by a global expert advisory group.</td>
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<tr>
<td>Leadership from UNICEF and WHO is insufficient and not sustained.</td>
<td>A new IMNCI strategy should be based on a programme approach, with clear indicators, national and global targets and milestones for measuring progress.</td>
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<tr>
<td>IMNCI is better implemented when the health system context is favourable, a systematic approach is used in planning and implementation, and political commitment allows institutionalization.</td>
<td>The options should be flexible, with guidance on creating context-specific packages while maintaining the holistic approach necessary to meet child health goals.</td>
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Building on the success of the Millennium Development Goals in reducing mortality among children under 5 and taking into consideration the changing epidemiology, shifting demographics and emerging priorities in child health, the actions required to attain the common goal of improving the health and well-being of all children and adolescents must be reconsidered. A paradigm shift is required to build children’s and adolescents’ resilience to ensure that they survive, are healthy and grow and develop to achieve their full potential. The life-cycle approach, from preconception through childhood to adolescence, is critical for all children; a healthy start in life is essential for a sound childhood and a productive adult life. Individuals, households, communities and services must be linked for optimal delivery of the necessary interventions.

WHO and UNICEF therefore convened a meeting to review recent data and trends in child and adolescent health and seek consensus on the areas of focus and steps for designing the public health response required for newborns, children and adolescents to survive, be healthy and grow and develop to achieve their full potential.
Meeting objectives and participants

Objectives

• to discuss the rationale for redesigning child and adolescent health programmes in the context of the SDGs and related initiatives;

• to discuss a proposal for a paradigm shift in programming to ensure that all children and adolescents are optimally healthy, thrive and develop socially to achieve their full potential;

• to define the future needs of children and adolescents for health and well-being along the life-course and the implications for the public health response and programming; and

• to make recommendations on the implications of the paradigm shift for the public health response.

Expected outputs

• consensus on a paradigm shift in child and adolescent health programming in the context of the SDGs and

• recommendations on the implications for the public health response and the actions required.

Participants

The meeting brought together a group of 50 experts with diverse knowledge in child and adolescent health, the environment, child and adolescent health programmes, health systems, water and sanitation, social determinants of health, clinical care, child rights and communication and implementation or delivery science. Participants included childhood and adolescence programme managers, clinicians, global and regional experts and representatives of academic institutions and multilateral agencies (African Centre for Disease Control, UNICEF, WHO, World Bank), donors (Bill & Melinda Gates Foundation, Foundation Botnar, Global Fund and Save the Children), technical and implementing partners and nongovernmental organizations.

Declarations of interest

All meeting participants were required to declare any potential conflict of interest. Dr Zulfiqar Bhutta, Dr Robert Black and Dr Cesar Victoria all declared their involvement in a Lancet series on child and adolescent health. The other participants declared no conflict of interest.
Redesigning child and adolescent health programmes
1. Analyses of the burden, levels and trends in child and adolescent health

Eight background analyses were commissioned to provide the rationale for, implications of and necessity for redesigning programmes over the next 15 years. The papers provided information on population trends; levels and trends in morbidity, mortality, disability, growth and nutrition; determinants of health and well-being; and strategies for engagement. The findings, key messages and implications from the background papers presented at the meeting are summarized in this report.

1.1 Population trends and their implications

In the paper presented by Danzhen You from UNICEF, it showed that while the total global population is expected to increase from 7.6 billion in 2018 to 9.8 billion by 2050, an increase of 29%, the population of children under 5 years will remain stable, at around 680 million, in 2018–2030 and reach 702 million by 2050 (3% increase, medium variant) (6). The population aged 5–17 years will increase by 9% over the same period; the sharpest increase will be in the population aged ≥ 60 years, from 990 million in 2018 to 1.4 billion in 2030 and a projected 2.0 billion by 2050. The population of children under 5 years is driven by the decreasing fertility rate, which fell from 5 births per woman the 1950s and 1960s to 2.5 in 2018. Despite this reduction, the number of births globally will remain stable until 2050 because past high fertility led to more women of reproductive age, a demographic phenomenon called “population momentum”.

Only in Africa the child population expected to grow

Global population development is driven mainly by the demographics in Africa and Asia. In 2018, more than half of all infants in the world (53%) were born in Asia and another 31% were born in Africa. Higher past and current fertility will contribute to changing this pattern, as the number of births in Asia, which has been decreasing since the late 1980s, will continue to decrease, while the number of births in Africa will increase. By 2050, similar numbers of infants will be born in Africa and Asia (60 million, around 42% of global births). Thereafter, Africa will become the continent with the largest number of births, accounting for > 50% by the end of the century.

One implication of these changes for child and adolescent health programmes is that significantly more resources will be required in Africa to meet their needs. These programmes are already under-resourced and will be further stretched. For example, in 2015, there were 1.7 skilled health professionals for every 1000 inhabitants, falling short of the 4.45 minimum standard called for by WHO. If trends in the numbers of health personnel during the

Key messages

- The largest reduction in mortality between 2000 and 2016 was seen among children under 5 years, due to a decrease in infectious causes in most regions.
- 77% of all deaths in children and adolescents occur among those under 5, with the highest proportion during the neonatal period, accounting for 46% of deaths; 75% of those deaths occur in the first week of life.
- As neonatal mortality rates decrease, the proportion of deaths due to congenital abnormalities and complications of prematurity increases.
- After children under 5, adolescents aged 15–19 have the highest risk of death.
- Programmes should therefore:
  - focus on reducing preventable mortality in children under 5, particularly during the neonatal period;
  - extend the focus to include emerging and leading causes of death in older children and adolescents;
  - include consideration of differences in causes of death by region, age group and sex (for adolescents); and
  - ensure a multi-sectoral approach to address emerging causes of death (road traffic accidents, violence, self-harm and NCDs), particularly for older children and adolescents.
period 2000–2015 continue, 1.4 million frontline skilled health professionals will be necessary by 2030. In view of Africa’s demographics, however, an additional 4.2 million professionals will be required for the continent to reach the WHO minimum standard of 7.6 million professionals by 2030.

Another demographic change is in urbanization. While the majority of the global population began to live in urban areas from about 2007, the population under 18 years has remained mostly rural. From about 2021, however, about 50% of the global child population is expected to live in urban areas, and the proportion will continue to increase.

1.2 Global and regional trends in child and adolescent mortality, 2000–2016

In a background paper presented by Kathleen Strong from WHO, it showed that substantial progress was made in reducing child and adolescent mortality between 2000 and 2016. While global mortality rates decreased for all age groups, the greatest gains were made for children under 5, among whom the mortality rate decreased from 77 per 1000 live births in 2000 to 41 in 2016, a 47% reduction. The slowest progress was made for adolescents (15–19 years), with a 19% decrease in the same period. While mortality has decreased, 7.3 million children and adolescents died worldwide in 2016, almost half (48%) of whom were in LMICs in Africa.
In 2016, the highest risk for death was during the neonatal period (0–27 days): 46% of deaths of children under 5 occurred in the first month of life and 75% of neonatal deaths in the first week, due mainly to preterm birth complications, birth asphyxia, birth trauma, neonatal sepsis, infections and congenital anomalies, globally and in most regions. While neonatal mortality has been reduced from 31 to 19 deaths per 1000 live births globally (a 39% reduction), deaths of children aged 1–4 were reduced by 57%. Nearly one third (29%) of the deaths among children under 5 years occur between 1 and 11 months, making this age group that with the highest mortality after the neonatal period, accounting for 1.6 million deaths in 2016. The leading causes of death in this period are pneumonia, malaria, diarrhoeal diseases, malnutrition, other infectious diseases, congenital anomalies and NCDs. Between 2000 and 2016, mortality rates in this age group were reduced by over 50% in all regions except the Eastern Mediterranean Region and in HICs in which the death rates in this group were already low. Children aged 1–4 years still have a significant mortality rate, with 1.4 million deaths at these ages in 2016. While the greatest percentage reduction in mortality in 2000–2016 occurred in this age group, about half the deaths among children aged 1–4 years in 2016 were due to common infections (pneumonia, diarrhoea, malaria, measles and meningitis) that are both preventable and treatable with simple, affordable interventions. In regions with lower mortality rates (HICs and LMICs in the Americas, European and Western Pacific regions), most deaths among children aged 1–4 years were due to injuries and NCDs, with minimal change over time, except for decreasing rates in HICs. Globally, death rates among children aged 5–9 years decreased from 158 per 100 000 population in 2000 to 96 in 2016 – a 39% reduction. Progress in reducing the mortality rates among older children was made in every region, with the largest percentage reductions in LMICs in the South-East Asia and European regions (61% and 54%, respectively). The highest mortality rate for older children, however, was seen in African LMICs, at 249 deaths per 100 000 population in 2016, which is far higher than in any other region. Globally, the leading causes of death among children aged 5–9 years in 2016 were diarrhoeal diseases, lower respiratory tract infections, road traffic injuries, malaria and drowning. During the 17-year period 2000–2016, the rate of death due to measles among older children decreased from 19 to 2 per 100 000 population; the rates of other leading causes of death (malaria and road traffic injury) decreased more slowly or not at all. In LMICs in the Eastern Mediterranean Region, violence in regional conflicts remained the leading cause of death among older children and adolescents. The age group with the highest mortality, after 0–4 years, is adolescents aged 15–19 years. In 2016,
the mortality rate in this group was 119 per 100,000 population, while that for adolescents aged 10–14 years was 66 per 100,000 population and that for children aged 5–9 years was 96 per 100,000 population. While differences in mortality patterns by sex begin to emerge in younger adolescents, they are far more marked in older adolescents. The risk for mortality of older adolescent males was 21% higher than that of their female counterparts. The widest differences by sex were found in the areas with the lowest mortality rates for this age group: LMICs in the Americas, Europe and the Western Pacific regions and HICs. The causes of death also differed by sex. The five most prevalent causes among male adolescents were road injuries, interpersonal violence, self-harm, drowning and HIV infection, while among females they were maternal conditions, self-harm, road injuries, diarrhoea and tuberculosis. Maternal conditions were among the main causes of death of older adolescent girls globally and in high-mortality LMICs in the African, Eastern Mediterranean and South-East Asia regions, accounting for 95% of deaths in this group. Road injuries remained a leading cause of death among older adolescents globally and in most regions throughout 2000–2016. Some regions experienced rising rates of road injury deaths among older adolescents (LMICs in the Americas and South-East Asia regions), while the rates fell in HICs and LMICs in the European and Western Pacific regions.

1.3 Global and regional trends in child and adolescent morbidity, 2000–2016

Recent estimates of the burden on morbidity in children and adolescents based on the background paper presented by Regina Guthold from WHO, showed that, despite substantial reductions in mortality between 2000 and 2016, limited progress has been made in reducing the burden of non-fatal disease. Disability-adjusted life-years comprise years of life lost and healthy years lost due to disease (YLD). With age, the proportion of disability-adjusted life-years attributable to YLD increases, while the YLD decreases; therefore, adolescents aged 15–19 years have the highest global YLD (6736/100,000 population in 2016) and neonates the lowest (2971/100,000). NCDs are increasingly prevalent with age and contribute more than 50% of the non-fatal disease burden by the ages of 5–9 years. In the first decade of life, nutritional deficiencies, including iron-deficiency anaemia and protein-energy malnutrition, are the most prevalent causes of YLD. In the second decade of life, mental and substance use disorders are the most important causes

Key messages

• Little progress has been made in reducing the burden of non-fatal disease in children and adolescents.
• Greater focus is required on reducing morbidity as part of the “thrive” agenda.
• Nutritional deficiencies, including iron-deficiency anaemia and protein-energy malnutrition, are important causes of healthy years of life lost due to disease (YLD) in the first decade of life.
• Mental and substance use disorders are the most prevalent causes of YLD in the second decade of life.
• The causes of YLD differ widely by region and income group, and programmes must be tailored to each context.
• Programmes must:
  – be more effective in addressing non-fatal diseases, particularly in older children;
  – focus on nutritional deficiencies in young children, particularly in LMICs; and
  – include sex-specific interventions to reduce mental and substance use disorders in adolescents.
globally but differ by sex: the main disorders in males are behavioural, alcohol and substance use disorders, and those in females are anxiety disorders; both have depressive disorders.

Causes of global YLD rates due to 18 broad cause groups by age and sex, 2016

The ranking of the main causes of YLD showed little change between 2000 and 2016 in any age group. As in 2000, iron-deficiency anaemia remained one of the main global causes of YLDs in 2016 for all age groups and both sexes. Among children under 5 years, diarrhoeal diseases and protein-energy malnutrition were still among the five main global causes of YLDs in 2016. Among adolescents aged 10–19 years, the most prevalent forms of morbidity in 2016 were skin diseases, behavioural disorders and mental disorders. The main five causes of YLDs, however, differed widely by region and country income groups, with a large burden due to nutritional deficiencies in LMICs in the African, Eastern Mediterranean and South-East Asia regions and in LMICs in general, while mental and substance use disorders among adolescents (10–19 years) were more prevalent in LMICs in the Americas, European and Western Pacific regions and in upper-middle- and HICs.
1.4 Disability in children and adolescents

In a background paper presented by Alarcos Cieza from WHO on disability, the rates of disability among children and adolescents have not changed significantly over the past 30 years, remaining at the World Bank estimate in 2011 of about 5.1%. Because of the growing numbers of children and adolescents globally, however, the number who live with a disability will continue to increase. Disability has not been a primary focus in child and adolescent health programmes; however, as more and more children will be living with the consequences of health conditions that are associated with high levels of disability, programmes must change. Additionally, while mortality rates have decreased, the number of children with congenital anomalies, disabling impairments and other chronic health conditions has risen substantially. The prevalence of certain conditions, such as hearing impairment, may be increasing due to lifestyle changes; up to 1.1 billion adolescents and adults are at risk of hearing loss because of unsafe listening practices. The number of children with vision impairment globally has also increased (from 75.1 million in 1990 to 80.6 million in 2016), although the prevalence is stable. The prevalence of both hearing and vision impairment is notably higher in the African and South-East Asia regions, in some cases by a factor of two. The challenge is exacerbated by the extreme lack of ophthalmologists in LMICs.

“Development intellectual disability”, defined as below-average intelligence or mental ability, can severely affect children’s educational performance. The global number of children with such disability increased from 78.7 million in 1990 to 80.6 million in 2016, although the burden differs by region, with much lower estimated prevalence in all age groups in HICs and in the Americas and European regions than in the other WHO regions.

Programmes to address disability should include systems to prevent, treat and rehabilitate with existing high-quality, cost-effective interventions. Health systems should prioritize strategies to prevent health conditions for which the causes are known. Rehabilitation, which is designed to reduce disability and optimize functioning, is most effective when combined with curative approaches but is particularly valuable when curative approaches are not feasible. Addressing disability goes beyond improving individual capacity, however; frequently, what is required is adaptation of the child’s external environment with the support of physical and occupational therapists. There is a dearth of specialists to support individuals and families with disability in all the WHO regions, and the target ratios are not met even in HICs. In a future in which the reduction and management of disabilities are priorities, mechanisms must be in place for collecting and disseminating evidence and information about the needs of children with chronic disabling impairment and about appropriate interventions.

Key messages

- Disability rates have remained stable at 5.1% for the past 30 years, but the increasing population means that more children and adolescents will live with a disability.
- Programmes must:
  - address disability by strengthening health systems to provide integrated, comprehensive care that includes prevention, treatment and rehabilitation, as part of universal health coverage; and
  - strengthen collection of evidence and information about the needs of children with chronic disabling impairment and about appropriate interventions.
In a background paper presented by Diana Estevez and Zeina Maalouf from WHO on global nutrition trends, stunting among children under 5 years decreased from 39.9% in 1990 to 22.2% in 2017. The highest prevalence was in the African Region (33.6%), and a similar prevalence (33.0%) is found in the South-East Asia Region because of the larger population. An additional 12 million children are affected by stunting in the African Region, and the number increased from 43.9 million in 1990 to 56.1 million in 2017. During this period, there was little improvement in wasting rates globally, and the rates of thinness were even higher in school-aged children (now 10.5%), particularly in the South-East Asia Region, where the prevalence is 22.5%.

Paradoxically, the proportion of overweight and obese school-aged children increased from 8.6% and 2.2%, respectively, in 1995 to 18.4% and 6.8% in 2016. In the Americas, every other school-aged child is now either overweight or obese.

Key messages

• The rates of stunting are decreasing globally, although this alone is not a good measure of nutritional trends.
• The burden of wasting and thinness is high, and the rates are either static or increasing.
• A high burden of anaemia globally affects over 40% of children under 5, which impacts their health and development.
• The rates of both overweight and obesity in school-aged children have more than doubled and tripled over the past two decades.
• The rates of exclusive breastfeeding have increased only marginally over the past 20 years, while annual sales of breast-milk substitutes have increased by 8%.
• Programmes must:
  - mitigate the drivers of persisting rates of wasting and thinness;
  - anticipate and address the double burden of over- and undernutrition through health services;
  - continue support for and protection of breastfeeding and complementary feeding;
  - increase research on the causes of anaemia and its control; and
  - ensure adequate data to guide appropriate responses.
Anaemia remains a significant problem in all regions, affecting 41.7% of children under 5 and 32.8% of women of reproductive age in 2016. Vitamin A deficiency is still prevalent in almost 50% of children under 5 in sub-Saharan Africa, in more than 40% in South Asia and in almost 30% in all LMICs. While the available data on the global situation show a marginal increase in early initiation and exclusive breastfeeding, the most recent estimate indicates that the prevalence of exclusive breastfeeding is low, 40.7%, although information on the rates of breastfeeding
and complementary feeding in HICs is often lacking. Even when solid or semi-solid foods are introduced in a timely manner, the adequacy of complementary feeding is extremely poor, and the prevalence of introduction of a minimum acceptable diet is less than 16%.

More surveillance and data on nutrition are required in all regions and contexts, particularly in humanitarian settings and fragile states, where nutrition may be worse than in the stable settings in which most data are generated.

SAC: thinness and obesity, by WHO region
2. Determinants of and risk factors for child and adolescent health and well-being

A new approach to child and adolescent health must be guided by information not only on burden and trends but also on the determinants and risk factors for health and well-being. The focus of the Global Strategy for Women’s, Children’s and Adolescents’ Health (2) is the continuum of child development, from before birth to the end of adolescence and throughout the life-course. A child must grow and develop optimally during the first two decades of life to become a healthy, responsible, productive adult. Physical growth and psychosocial development are fostered by enabling environments in families, schools and communities.

2.1 Optimizing health and well-being: addressing determinants throughout the life-course

In a conceptual paper on optimising health and wellbeing presented by Mark Tomlinson from Stellenbosch University, South Africa, the life-course approach can be considered to be based on three underlying principles: biological embedding, cumulative risk and developmental cascades. “Biological embedding” refers to the influence of the environment during early development on the response of the individual during the life-course. “Cumulative risk” is the effect of the increasing number of contextual risks in a child’s life on the outcomes. “Development cascades” are the influence of early functioning in one domain of behavioural or emotional functioning on other domains. Consideration of both temporal and sectoral factors – the times at which a child is affected and the layers of influence on their exposure to risk – indicates that universal interventions may not be enough. Because of cumulative exposure to risk and the developmental cascades in a child’s life, many subpopulations will require extra support. Intensive, single-component interventions delivered at one time may have a significant short-term impact on survival but are unlikely to improve population health throughout the life-course. Therefore, iterative interventions throughout the life-course – some universal and others targeting more vulnerable children – are the best means for improving population health for generations. Essentially, all children require support in their development, but some require more.

Protection, prevention and rehabilitation are interlinked and interdependent and therefore should be delivered in cross-sectoral interventions. Prevention should target known risks at particular stages of development but should go further to subvert developmental cascades that are harmful to later development. Treatment should subvert any ill effects when they arise, so that subsequent stages of development are not threatened, and early gains must be reinforced throughout the life-course.

A life-course approach involves moving beyond child survival, adopting a broader, longer perspective to ensure optimal physical and psychosocial development. The approach reflects the principle that support for children will affect both their immediate well-being and their health and development in later years; any damage inflicted during the formative years of childhood and adolescence will continue in later generations.
2.2 Childhood nutrition for future well-being

Young children need nurturing care to develop their full potential. Nurturing care comprises five components: responsive care, security and safety, opportunities for early learning, good health and good nutrition (7). These five domains shape human capital along the life-course. A clear example is the interaction between health and education, as better health and nutrition improve academic achievement, and vice versa, especially for vulnerable children. Thus, good-quality education can overcome some of the vulnerability that leads to poor health. The 1000 days between conception and the age of 2 years are the most critical for formation of tissues and organs, including the brain; therefore, good nutrition during this period is essential. The largest deviations in linear growth away from the standard are seen in the first 2 years; however, the association between cognitive development and linear growth is much stronger in the first 2 years than in older children, so that deviation during this period is more detrimental. Early growth deficits are associated with more NCDs, and fetal growth restriction and premature delivery are important contributors to neonatal and infant mortality, stunting and wasting. It is unclear whether catch-up growth in older children or adolescents benefits human capital, as no difference was found in the cognitive scores of children who caught up in their growth and those who remained stunted (8–10).

2.3 Socioeconomic inequality

In a paper presented by Cesar Victora, Pelotas, Brazil, he showed that social equality in health and nutrition is essential for both practical and ethical reasons and must be considered in redesigning programmes. The COHORTS group, a consortium of five of the largest studies of birth cohorts, has collated data collected for over 20 years in Brazil, Guatemala, India, the Philippines and South Africa (10, 11). They found strong links between family income at birth and human capital, measured as IQ, number of years of schooling and monthly income, whereby the poorest quintile had the poorest outcomes and the richest quintile the best. They also found a strong association between stunting at the age of 2 years and IQ at the age of 30 years among poor but not among wealthy people. These findings demonstrate the impact of inequality on health and nutrition and on human capital and also of other measures of inequality, disadvantage and vulnerability, including ethnic group, sexual orientation, gender identification, migration, humanitarian situations and belonging to an indigenous population.

2.4 Environmental risk factors

In short presentations made by Marie-Noël Bruné Drisse, Richard Johnston, Heather Adair and Rohani from WHO on environmental risk factors (child environmental health, air pollution and water, sanitation and hygiene), early environments are powerful determinants of health and well-being and directly affect the morbidity and mortality of children. Each year, 1.7 child deaths are attributable to a poor environment, and one fourth of the deaths could be prevented by reducing environmental risks (12). The risks include air pollution, inadequate water, sanitation and hygiene, second-hand smoke, climate change, hazardous waste, ultraviolet radiation and hazardous chemicals. Infants and young children are particularly vulnerable to such risks, with immediate adverse effects or the lifelong risk of disease.

Air pollution has wide-reaching effects on populations. It has been estimated that 93% of all children and 630 million of those under 5 are exposed to air pollution at levels that exceed the WHO guidelines for air quality (13). In 2016, ambient household air pollution caused 543 000 deaths in children under 5 and 52 000 deaths among children aged 5–15 years. Air pollution also contributes to stunted growth, reduced lung function, asthma and respiratory infections, low birthweight and prematurity, impaired mental and motor development, childhood cancers and increased risks for diabetes, heart disease and stroke in adulthood (14).
The risks associated with poor water, sanitation and hygiene are significant and well documented and are a serious threat to children’s health. Four of the first five environmental causes of death in children under 5 are linked to water, sanitation and hygiene: diarrhoea, neonatal death, malaria and unintentional injuries including drowning, which accounted for over one million deaths of children under 5 annually.

2.5 Determinants of and risk factors for violence and injury

In a presentation made by David Meddings from WHO, half of all children aged 2–17 years, around 1 billion globally, have experienced emotional, physical or sexual violence in the past year (15), with vast health consequences, affecting children both directly and indirectly. Girls are particularly vulnerable, and nearly one in three girls aged 15–19 has been the victim of emotional, physical and/or sexual violence perpetrated by a husband or partner (16). As the risk of violence is directly linked to the status of women and children and cultural norms of gender and masculinity, these must be addressed in planning prevention, support and care. To understand the causes of violence and risks, they must be viewed in the context of the “social ecological model” of the interplay among individuals, relationships, community and social factors. Countries should use the best evidence across this spectrum to design programmes with the greatest potential to reduce violence against children.

Injury and death from road traffic accidents remain significant problems. In 2016, they were one of the five main causes of death among children aged 1–4 years in HICs, the main cause of injury in children aged 5–9 years in HICs and in European LMICs and the main cause of death in male adolescents aged 10–14 years in South Asia LMICs. Road traffic injuries were a leading cause of death among older adolescents globally and in most regions throughout 2000–2016. LMICs in the Americas and South-East Asia had rising death rates from road traffic injuries, while death rates from road traffic injuries decreased in LMICs in the European and the Western Pacific regions. In 2016, they were the leading cause of death among male adolescents aged 15–19 globally (17).

The 2030 SDGs include an ambitious target to reduce road traffic deaths and injuries by 50% by 2020. Access to emergency health care, continuing care and rehabilitative care is critical for mitigating the impact of road traffic injuries on well-being. The prevention of road traffic deaths and injuries is not the sole responsibility of the health sector, although the health sector has a role to play in advocacy. WHO issued a technical package for road safety in 2017 (18) that calls for leadership in addressing the issue, priority interventions and components and examples of successful interventions in several countries.

2.6 Determinants of and risk factors for mental health and well-being

In a presentation on determinants of and risk factors for mental health and well-being by Chiara Servili from WHO, worldwide, 10–20% of children and adolescents experience mental disorders; half of all mental illnesses begin by the age of 14. Among children aged 10–19 years, mental and substance use disorders were the largest cause of YLD, with the highest rates among older adolescents. In young adolescents (10–14 years), mental and substance use disorders, particularly behavioural and anxiety disorders, were important causes of YLDs in all regions and country income groups in 2016. In older adolescents (15–19 years), mental and substance use disorders, including depressive disorders, behavioural disorders, alcohol and drug use (particularly for males) and anxiety disorders (particularly for females) were important causes of YLDs (19).

The burden of mental disorders varies by region. In 2016, they were more prevalent in LMICs in the Americas, European and Western Pacific regions and in upper-middle- and HICs. Mental health and well-being are influenced by individual attributes
such as emotional and social intelligence as well as genetic and biological characteristics, social and economic circumstances and environmental factors such as access to basic amenities and services, cultural beliefs and practices and social and economic priorities. Because of the interaction of these factors, strategies for mental health promotion must be both intersectoral and ecological. As mental health is addressed in the SDGs and in view of the importance of social determinants of mental disorders, Lund et al. (20) conducted a review to determine whether there is synergy among the determinants of mental health and of other targets of the SDGs. They found strong links, which they illustrated in a conceptual framework (Fig. 2).

**Fig. 2. Conceptual map of social determinants of mental disorders: domains, relevant SDGs and factors**

![Conceptual map of social determinants of mental disorders](image)

*Source: reference 20*
To maximize the effectiveness of interventions to promote mental health, they should be innovative, meet the needs of children and families and emphasize the importance of parenting. Interventions can be delivered at school, by children themselves or by peers.

2.7 Determinants of child and adolescent sexual and reproductive health

In a presentation on risk factors and determinants of child and adolescent sexual and reproductive health by Venkatraman Chandra-Mouli from WHO, every year, 1.1 million adolescents die from mainly preventable causes of sexual and reproductive conditions; millions more experience illness and injury, and hundreds of millions develop attitudes and initiate behaviour that will negatively affect their future health. Inequitable gender norms, which are an important determinant of adolescent and sexual reproductive health, begin early in life and are deeply rooted. Assessments of risk and vulnerability may help identify factors that increase or decrease vulnerability and in understanding context. For example, a study of adolescent girls and young women in Kisumu, Kenya, showed that those who were double orphans were more vulnerable to HIV infection, were sometimes hungry, were not connected to an adult in their household, had their sexual debut before the age of 14, had a moderate perception of HIV risk and little knowledge of the disease, and faced greater gender inequity. More vulnerable adolescent girls and young women were more likely to report risky sexual behaviour. It has also been found that poverty, risk and responsibility in adolescence influence later trajectories.

Re-programming has had some variable success. While the number of child marriages has been reduced, a reported 25 million such marriages having been averted during the past decade, there is wide variation, even within countries. In Ethiopia, for example, the rate of child marriage is three time higher in the northern region of Amhara than in the capital Addis Ababa. In India, variation is seen even within states. In Uttar Pradesh, 83% of women in the district of Shirtwaist and 16% in the district of Bijnor are married before the age of 18. Such variations provide opportunities to understand the factors that lead to early marriage and factors that might reduce the practice.
Key messages: determinants and risk factors

- Now is a unique opportunity for children and adolescents, because of the policy context of the SDGs.
- Children and adolescents should benefit from synergistic, evidence-based, multi-sectoral, interlinked responses to promote, prevent, treat and rehabilitate throughout their life-course.
- Programmes should go further than removing risk factors and consider predictive factors, protective actions and positive development throughout life.
- The most vulnerable children and adolescents are not always identified, and other measures of vulnerability should be studied, such as sexual orientation, gender identification, trouble with the law, migration, humanitarian situations and being a member of an indigenous population.
- Schools, families and communities must play major roles, and health care workers must have the skills and resources to identify and address risk factors.
- Even if environmental risk factors are not the responsibility of the health sector, it must maximize opportunities to advocate, using evidence.
- Interventions must be based on understanding of the importance and power of social and gender norms for individuals, communities and institutions, including schools.
- Programmes must:
  - focus on preventing and addressing inequalities by mainstreaming considerations of equity into the design, implementation, monitoring and evaluation of programmes and engaging other sectors;
  - recognize the importance of sustaining interventions throughout the life-course, with attention to age-specific differences in risks and vulnerability;
  - take a comprehensive approach to reinforce the gains made, ensure interlinkages and the interdependence of multisectoral components and actively build on existing synergies to create the conditions for children to flourish;
  - go beyond removal of risk factors and use predictive factors to ensure a safe, healthy, protective environment and protection from early and forced marriage or pregnancy; and
  - collaborate with the education sector to promote health and well-being.
3. Redesigning child and adolescent health programmes

As children and adolescents are at the centre of the SDGs, their health and well-being must be viewed as linked, directly or indirectly, to each SDG. A holistic view of child and adolescent health will require a deliberate, targeted response to the determinants of health, comprising everything that influences health and well-being and not just the risks for specific diseases. Participants reiterated that this view should include nutrition, health, environmental and psychosocial needs and also an enabling environment, the core values for their empowerment and active participation of their families and communities. It was recognised that while the health sector has a critical role to play, contributions from other sectors, such as education, agriculture, water and sanitation and social protection services, will be essential.

The goal should be to ensure that a 19-year-old person is optimally healthy, having been raised in a safe, secure environment, and is appropriately prepared physically, mentally and emotionally to contribute socially and economically to their society. This will require an integrated, multisector approach to programming, recognizing that health-enhancing factors including nutrition, education, water, clean air, sanitation, hygiene and infrastructure are essential to achieving the SDGs. The health sector has a central role to play by directly formulating and influencing policies, strategies and programmes to achieve this broader outcome and also catalysing and engaging multi-sectoral actions to respond to the needs of all children and adolescents.

The meeting agreed that a strategic shift in the emphasis of child and adolescent health programmes is required towards achieving optimal human capital by the age of 19 years as an outcome. As a result, meeting participants discussed in groups and agreed on the guiding principles, paradigm shift and actions required in redesigning child and adolescent programmes, as outlined below.

### 3.1 Guiding principles for child and adolescent programmes

1. Fully reflect the *life-course approach in the first two decades of life* in organizing the delivery of age-appropriate, context- and condition-specific interventions and actions in a comprehensive, integrated manner, building on the gains made at each stage of life. The life-course approach includes recognizing the importance of preconception, pregnancy and maternal health in the continuum of care, in building resilience and in minimizing cumulative risk and vulnerability.

2. Programmes should be rights-based and equitable and ensure that good-quality essential interventions and services are universally accessible to every child and adolescent everywhere to promote health, growth and well-being and to prevent risk factors, disease and complications. They should also ensure that context-specific interventions and services are provided for secondary prevention, management of illness or disability and protection.

3. Individuals, families and communities should be empowered to act in child and adolescent health and well-being by addressing the health, social, cultural, political and economic determinants of health and by building partnerships in finding solutions.

4. Children and adolescents should be placed at the centre of all policies and programmes.
3.2 Paradigm shift in child and adolescent health programmes

Strategic shifts in programming are required to achieve the optimal human capital for all children and adolescents by accounting for demographic changes (population dynamics, urbanization and migration), the changing epidemiology of health and illness and changes in politics, social economic status, technology and the environment.

1. Extend the focus of child health programmes from the age group 0–4 years to 0–19 years by ensuring appropriate health, nutrition and safe psychosocial and supportive environments for all children and adolescents.

2. Place greater emphasis on preventable mortality and the quality of care for newborns and post-neonatally, and extend care to prevent emerging causes of mortality in older children and adolescents, with improved coverage and equity.

3. Increase emphasis on thriving, growth and development by extending nurturing care to older children and adolescents.

4. Reduce the high morbidity of children and adolescents, including appropriate models of care for chronic physical and mental health conditions.

5. Increase emphasis on people-centred delivery of comprehensive (protection, prevention, promotion, treatment, rehabilitation) care and services for families, children and adolescents in all health programmes and health-related sectors.

3.3 Actions required

1. Adopt a multisectoral approach to health and development, in which all government sectors are required to maximize the enabling environments required for development of human capital.

   — Multisectoral policies, strategies and interventions must be at the core of child and adolescent health programmes, aligned and supported by integrated, multisectoral actions at district, municipal and local government levels.

   — The health sector should engage with and be engaged by other sectors, including public and private spheres, actors and organizations, for mutual influences on programming relevant to child and adolescent health and well-being.

   — District, municipal and local governments should also plan targeted, intersectoral actions.

2. Integrate care throughout the life-course according to the needs of healthy, vulnerable and sick children, moving away from interventions for single diseases, and provide interventions at home and in communities as well as in health facilities.

3. Build on existing structures, policies and initiatives and form new structures where necessary to respond to the increased demands for child and adolescent health programmes aligned with revitalized primary health care and universal health coverage.

4. Use external human and financial resources to catalyse provision of additional resources, including domestic resources, to support this ambitious, country-driven agenda for children’s and adolescents’ health.

5. Consider current trends and innovate continuously to respond better to the changing global landscape of globalization, digital technology, urbanization, demographic shifts, climate change, environmental degradation, migration and humanitarian crises.
6. Actively engage and empower individuals, families and communities in child and adolescent health and well-being, and encourage their accountability for health and the coverage and quality of services.

7. Use flexible, adaptable guidance and programming approaches, and support contextualization based on broader regional, country and local differences in epidemiology and health systems. Therefore:

- Each country, district and local government should know its epidemiology in order to define its context.
- Strengthen use of evidence-based local data for planning, monitoring and evaluating programmes, and continuously identify and focus on context-specific priorities.
- Provide easily adaptable programme guidance and tools.

Opportunities for programmes

- Design programmes with a “whole of government” and “whole of society” approach.
- Use a multisectoral approach, but clearly define the role of the health sector in policy and service delivery.
- Work in districts and municipalities, where there is more inter-sectoral collaboration.
- Mainstream equity considerations into programme design, implementation, monitoring and evaluation.
- Use existing evidence and guidance throughout the life-course.
- Explore use of urban delivery platforms and the role of technology (in particular digital technology) in future implementation strategies.
- Recognize the strengths of community platforms, including schools, in reaching children and adolescents.
4. Interventions, delivery platforms and quality of services

Delivery platforms and service contacts must be available to deliver a continuum of interventions, seamlessly, at multiple levels throughout the life-course for optimal child and adolescent health, growth and development. In presentation on delivery platforms for age-specific essential intervention packages along the life course by Kristen Danforth, Disease Control Priorities Network, USA, packaging evidence-based, cost-effective interventions to be delivered at the time of age-specific contacts with health services can result in savings and increase the number of services available to children. Packages of care and discrete interventions have different delivery platforms. In the third edition of Disease control priorities (21), each of the nine volumes identifies evidence-based interventions that are effective and feasible in LMICs. The volumes on reproductive, maternal, newborn and child health and child and adolescent health and development (22, 23) provide a total of 218 health interventions to be delivered on five platforms: population-based interventions, community services, health centres, first-level hospitals and referral and speciality hospitals.

Community-based interventions remain a central component of preventive, promotive and curative health care. A recent systematic review of community-based actions showed that interventions delivered by community health workers have been instrumental in improving health and survival over the past decade; they can also improve birth preparedness and use of essential services and referrals. They increase the rates of early and exclusive breastfeeding and complementary feeding and early detection and prompt management of bacterial infections, such as childhood pneumonia (24). The review also showed that interventions by community health workers are not yet effectively scaled up in LMICs and that they could be extended to include preventive and promotive strategies for adolescent health and NCDs. While the review did not include interventions in schools, this platform is effective for delivering health promotion, screening and preventive interventions, as children living in poor rural areas often have easier access to a school than to a health facility.

Interventions for adolescent and reproductive health were included in a review of studies of community engagement and social and behavioural activities (25), which showed that community programmes (including development, peer educators and education) improved knowledge about sexually transmitted infections, education, employment, service use and delayed sex. Mass media programmes were also found to increase understanding of and attitudes towards sexual and reproductive health, although the results for behaviour outcomes were mixed. Mass media and mHealth are being used increasingly to deliver education through entertainment, such as radio and television dramas, to improve use of health services. Social marketing studies have been conducted in which marketing concepts are used to influence the health-seeking behaviour of individuals and communities; and web-based and mobile technologies and software applications permit users to engage in dialogue and share information remotely. While there are few systematic reviews on such interventions, breastfeeding was increased through interventions delivered via SMS (26), and social marketing approaches to promote sanitation and hand-washing improved use of latrines and decreased open defaecation. Other effective social behavioural and community engagement activities include participatory learning and action by women’s groups for total sanitation. Demand-side financing schemes, also known as “conditional cash transfers”, are another approach shown to have positive outcomes. A review of the effectiveness of conditional cash transfers in improving access to care and health outcomes (27) found strong evidence of a positive impact on the uptake of preventive services by children and pregnant women and in nutritional status and health outcomes.

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In a presentation on systems thinking for integrated quality health service delivery by Margaret Kruk, Harvard T.H. Chan School of Public Health, health systems are responsible for about 8.6 million deaths per year, nearly 60% of which are due to poor quality (28). A common misconception is that coverage of health services alone results in better survival and health; however, only good-quality services can achieve this. A high-quality health system is one in which care is delivered consistently to improve or maintain health, is valued and trusted by the people it serves and responds to changing population requirements. Although in many settings users are considered to be passive, it has been shown repeatedly that individuals avoid seeking health care or use a different service if they consider it to be of better quality, even if they have to pay for it (29). To ensure high-quality health systems, they should be redesigned to maximize outcomes (e.g. increased referrals to secondary and tertiary care), and the health workforce should be strengthened by education and support after qualification. A demand for high-quality care should be promoted, and key components of health systems should be measured, including both health outcomes and patient experience with and confidence in the system.

The health system is only one of the drivers of health. Therefore, child and adolescent health programmes must be designed and implemented in an intersectoral approach, with policy actions at a high level to address global drivers of structural inequality, risk and determinants and clear roles and responsibilities. The trends and burdens of disease differ widely regionally and nationally, so that evidence-based, context-specific programming is necessary. Contexts also vary within countries, indicating the importance of decentralized or subnational programming. Interventions at district, local or municipal levels may be based on existing inter-sectoral planning cycles.

Key messages

• An inter-sectoral approach is critical.
• Recognize the strengths of community strategies and different platforms, and exploit them when appropriate, including the role of schools in reaching older children and adolescents.
• Provision of a set of integrated packages of interventions may create cost efficiencies and increase the benefit-cost ratio.
• Compile WHO-recommended interventions throughout the life-course, and review the mechanism for delivery to users and the accessibility of guidance.
• Consider the balance among preventive, promotive, therapeutic and rehabilitative care for each platform and life-course stage, as all children need some interventions, while others require more.
• Prepare guidance for measuring effective coverage, health outcomes, competent care and systems and patients’ experience of and confidence in the system.
• Strengthen the health workforce by reviewing pre-service training, training institutes, continuous learning and post-graduate support and development.
• Explore delivery platforms specifically for urban environments.
• Explore and maximize multisectoral collaboration in districts and municipalities.
• Exploit digital technology, and, in particular, test the extent to which artificial intelligence could accelerate the achievement of universal health coverage.
5. Conclusions

Participants at the meeting made observations and recommendations for shifting the focus of child and adolescent health programmes and the public health response. They concluded that the SDGs and the Global Strategy for Women’s, Children’s and Adolescents’ Health offer opportunities to review child and adolescent health programmes, building on gains made in reaching the Millennium Development Goals, to ensure that children and adolescents not only survive but also thrive and achieve their full development potential. Trends in mortality rates by age group demonstrate successes over the past two decades but also highlight the unfinished agenda of mortality of children under 5. Greater attention should be paid to the neonatal period (and associated maternal health) and also to mortality and morbidity among older children and adolescents. In extending the focus on childhood and adolescence, a life-course approach must be used, as interventions for one age group affect the next phase of life. The strategy must be embedded in a community approach, with recognition of the central role of individuals, families and communities in ensuring health and well-being.

Countries must take the lead in redesigning child and adolescent programmes according to their contexts, thus guided by their own demography and trends in morbidity, mortality and nutrition. They must use evidence-based, context-appropriate strategies to address inequity, risk factors and determinants of health and well-being, and the quality of care and services.

The conclusions of the analyses prepared for the meeting are summarized below.

- Changing population demography:
  - Health programming must take into consideration current and future population sizes and trends, the distribution by age, sex and location and projected changes.
  - Investment in child health programmes is critical for many countries in Africa and Asia.

- Concerted programming will be required for urban areas, in view of the growing proportion of the population that lives in those areas.
- More financial and human resources will be required to increase health coverage and the quality of services in Africa and South-East Asia, as these regions face substantial increases in the numbers of births.
- Regions with decreasing child populations will have to prioritize resources for rapidly ageing populations.

- Mortality trends:
  - Mortality rates vary widely by age group, sex and context.
  - Programming should continue to focus on newborns and children under 5, who have the highest rates of preventable mortality, from birth asphyxia, birth trauma, prematurity, sepsis, pneumonia, diarrhoea and malaria in LMICs and from prematurity and congenital anomalies in HIC and countries with low mortality rates.
  - Programmes should be extended to include the leading causes of death, which are diarrhoeal diseases, lower respiratory tract infections and malaria in young children, road traffic injuries and drowning in children aged 5–9 years and injuries, violence, NCDs and self-harm in adolescents.
  - A multisectoral approach should be taken to health and development to address emerging causes of deaths, such as drowning, road traffic accidents, violence, self-harm and NCDs, particularly in older children and adolescents.

- Morbidity trends:
  - The non-fatal disease burden, particularly iron-deficiency anaemia and protein-energy malnutrition in young children in LMICs and
skin diseases and mental and substance use disorders in adolescents, should be addressed by context-, sex- and age-specific interventions.

— Appropriate models of care should be available for children with chronic conditions such as asthma, chronic respiratory disease, epilepsy, cerebral palsy, congenital and rheumatic heart disease, diabetes, haemoglobinopathy and cancer.

• Disability trends:
  — Health systems should be strengthened and transformed to provide comprehensive, appropriate, integrated care for children and adolescents with disabling impairment and health conditions.

• Nutrition trends:
  — Drivers of persistently high levels of wasting should be mitigated, and breastfeeding and infant and young child feeding programmes should be strengthened.
  
  — Healthy diets and physical activity should be promoted to reduce overweight and obesity in children and adolescents.
  
  — Studies should be conducted on the aetiology of anaemia and on interventions to control anaemia and provide vitamin A supplementation and fortification.

• Inequity:
  — Programmes should prevent and address inequality by mainstreaming considerations of equity into their design, implementation, monitoring and evaluation.

• Risk factors and determinants of health and well-being:
  — Programmes should sustain interventions throughout the life course to address age-specific risks and vulnerability, based on the results of research on the long-term benefits.
  
  — A life-course approach should be used to reinforce the gains made, such that protection, prevention and treatment are interlinked, interdependent components.
  
  — Health and other relevant sectors should not only cooperate but also build on synergies and areas of common influence to create the conditions for children and adolescents to flourish.
  
  — The risk factors for the health and well-being of children and adolescents should be addressed to ensure a safe, healthy environment and protection against violence and early or forced marriage and pregnancy.
  
  — Nurturing care should be extended throughout childhood and adolescence to ensure human capital through health, nutrition, responsive relationships, learning, security, stability and safety.

• Delivery platforms:
  — The level at which interventions and services will be appropriately, effectively and efficiently delivered in national health systems should be identified, with consideration of opportunities for economies of scale.
  
  — Programming should account for the scope offered by communities, schools and health facilities as platforms for delivering phase-specific support throughout the life-course.

• Quality of care and services:
  — Ensure that interventions and services are delivered by high-quality health systems that are equitable, resilient and efficient, by creating a shared vision, learning systems, accountability and partnerships.
  
  — Redesign service delivery to maximize outcomes by involving other relevant sectors and inciting demand for good-quality care and services.
  
  — Transform the health workforce by strengthening the education of health professionals and ensuring continuing education.
6. Implications for WHO, UNICEF and partners

The shift in child and adolescent health programming described above will require leadership by WHO and UNICEF in promoting health, growth, development and well-being and focus on the diseases and conditions that make the largest contributions to mortality, morbidity and disability. The new technical guidance should include a life-course approach to increase survival, promote health, prevent disease, reduce exposure to known risk factors and supportive healthy environments for optimal growth and psychosocial development.

WHO and UNICEF should work with countries and partners to design comprehensive, integrated, context-specific child and adolescent health programmes. Stakeholders and government sectors beyond health will have to be engaged according to their strengths and limitations to improve child and adolescent health and well-being.

WHO and UNICEF should support countries in using evidence-based, up-to-date and (where appropriate) innovative solutions to deliver interventions to empower individuals, families and communities, to ensure that children and adolescents benefit from efficacious, cost-effective interventions. These organizations should:

- formulate and operationalize global, regional and national policies for child and adolescent health and ensure strong, steadfast political commitment to a comprehensive agenda that allows children and adolescents to survive and thrive;

- promote the establishment of safe, supportive environments by engaging families, schools and communities in promoting health, preventing ill health, injuries and violence and providing appropriate care for their children and adolescents when necessary;

- develop a comprehensive, integrated package of interventions for children and adolescents to be delivered throughout the life-course on current platforms and, when appropriate, establishing new platforms; and

- promote a multisectoral approach to ensure that health systems and other sectors provide services that respond to the needs of children and adolescents, with adequate quality and high, sustained coverage.

WHO and UNICEF should support Member States in identifying priorities, bearing in mind the local context, the burden of disease, the epidemiological situation, the capacity of the health system and the resources available. WHO should provide guidance to Member States and partners in preparing comprehensive, operational strategic responses. At the same time, WHO should continue to assume leadership to improve existing promotive, preventive, curative and rehabilitative interventions and develop interventions for the new challenges of changing demographics and disease epidemiology.

The broad SDG agenda requires raising awareness of the importance of investing in health and human capital, which represents an opportunity for WHO and UNICEF to strengthen partnerships and focus the global community. The two organizations are in a good position to identify the investments required to implement a new child and adolescent health agenda that leaves no one behind. They should establish effective partnerships to support Member States in using a multisectoral approach to the health and development of children and adolescents.


Annexes
# Annex 1. Agenda

## Day 1

**Wednesday 23 January 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30–09:00</td>
<td>Registration</td>
</tr>
<tr>
<td>09:00–09:15</td>
<td>Welcome and opening remarks</td>
</tr>
<tr>
<td>09:15–09:45</td>
<td>Introductions and DOIs</td>
</tr>
<tr>
<td>09:45–09:50</td>
<td>Meeting objectives &amp; Agenda</td>
</tr>
</tbody>
</table>

**CHAIR: Professor Elizabeth Saewyc**

**Co-chairs/facilitators: Anne Detjen, Wilson Were**

### SESSION I: CHILD AND ADOLESCENT HEALTH AND WELL-BEING IN THE CONTEXT OF SDGs, UHC AND PHC

<table>
<thead>
<tr>
<th>Time</th>
<th>Overview of global child and adolescent health in the context of SDGs, UHC and PHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:50–10:15</td>
<td>Anshu Banerjee, Director, MCA</td>
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<td></td>
<td>Stefan Peterson, Associate Director, Chief Health Section, UNICEF</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Purpose and the rationale for redesigning child and adolescent programming</th>
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</thead>
<tbody>
<tr>
<td>10:15–10:30</td>
<td>Jonathon Simon</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Approach to redesigning child and adolescent health programming</th>
</tr>
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<tbody>
<tr>
<td>11:00–11:20</td>
<td>Wilson Were</td>
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</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:20–11:30</td>
<td>Wilson Were</td>
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</table>

### THEME: WHAT IS THE BURDEN?

### SESSION II: RATIONALE FOR THE PARADIGM SHIFT IN CHILD AND ADOLESCENT HEALTH PROGRAMMING

<table>
<thead>
<tr>
<th>Time</th>
<th>The changing profile of child and adolescent demography: where are the children and adolescents?</th>
</tr>
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<tbody>
<tr>
<td>11:30–11:45</td>
<td>Danzhen You</td>
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</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Levels and trends of child and adolescent mortality and implications for programming</th>
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<tbody>
<tr>
<td>11:45–12:00</td>
<td>Kate Strong</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Discussion</th>
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</thead>
<tbody>
<tr>
<td>12:00–12:30</td>
<td>Wilson Were</td>
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</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Lunch</th>
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</thead>
<tbody>
<tr>
<td>12:30–13:30</td>
<td>Wilson Were</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Levels and trends of child and adolescent morbidity and implications for programming</th>
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<tbody>
<tr>
<td>13:30–13:45</td>
<td>Regina Guthold</td>
</tr>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Levels and trends of chronic disability among children and adolescents and implications for programming</th>
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<tbody>
<tr>
<td>13:45–14:00</td>
<td>Alarcos Cieza</td>
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<thead>
<tr>
<th>Time</th>
<th>Discussion</th>
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<tbody>
<tr>
<td>14:00 - 14:30</td>
<td>Wilson Were</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Levels and trends of child and adolescent growth and nutrition and implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:30-14:45</td>
<td>Diana Estevez, Zeina Maalouf</td>
</tr>
</tbody>
</table>
### Day 2  Thursday 24 January 2019

**Chair: Shams El Arifeen**

**Co-chairs/facilitators: Rory Nefdt, David Ross**

#### 08:30–09:00  Synthesis of day 1 outcomes  
UNICEF

#### THEME: DETERMINANTS OF HEALTH AND WELL-BEING (THRIVE)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00–09:20</td>
<td>Determinants that enable children and adolescents to thrive and risk factors for health and well-being</td>
<td>Mark Tomlinson</td>
</tr>
<tr>
<td>09:20–10:00</td>
<td>Panel discussion (5 min each)</td>
<td></td>
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<tr>
<td></td>
<td>Questions: What are the determinants and risk factors for children and adolescents? What needs to be done? What are the implications?</td>
<td>Marie-Noël Bruné Drisse, Richard Johnston, Heather Adair Rohani TBC</td>
</tr>
<tr>
<td></td>
<td>• Environmental risk factors (Child environmental health, air pollution and water, sanitation and hygiene)</td>
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<tr>
<td></td>
<td>• Determinants and risk factors for NCDs in children and adolescents</td>
<td></td>
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<tr>
<td></td>
<td>• Determinants and risk factors for violence and injury in children and adolescents</td>
<td>David Meddings</td>
</tr>
<tr>
<td></td>
<td>• Determinants and risk factors for mental health and well-being in children and adolescents</td>
<td>Chiara Servili Venkatraman Chandra-Mouli</td>
</tr>
<tr>
<td></td>
<td>• Risk factors and determinants of child and adolescent (&lt; 18 years) SRH</td>
<td></td>
</tr>
<tr>
<td>10:00–10:30</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10:30–11:00</td>
<td>Break</td>
<td></td>
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</tbody>
</table>

#### SESSION III: WHAT IS THE PARADIGM SHIFT?

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00–11:15</td>
<td>Proposed paradigm shift in child and adolescent health programming</td>
<td>WHO, UNICEF</td>
</tr>
<tr>
<td>11:15–11:30</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>11:30–11:40</td>
<td>Introduction to group work</td>
<td></td>
</tr>
<tr>
<td>11:40–12:30</td>
<td>Group work on the paradigm shift, and future health and well-being needs of child and adolescents in the SDG era</td>
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<tr>
<td>12:30 - 13:30</td>
<td>Lunch</td>
<td></td>
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</tbody>
</table>
### Day 3  
**Friday 25 January 2019**

**Chair:** Mark Tomlinson  
**Co-chairs, facilitators:** Stefan Peterson, Jonathon Simon

#### THEME: IMPLICATION FOR PROGRAMATIC AND IMPLEMENTATION SHIFT

**SESSION IV: FUTURE HEALTH AND WELL-BEING NEEDS OF CHILDREN AND ADOLESCENTS: WHAT NEEDS TO BE DONE?**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30–09:00</td>
<td>Synthesis of day 2 outcomes</td>
<td>WHO</td>
</tr>
<tr>
<td>09:00–09:15</td>
<td>Packaging of interventions for delivery along the life course: known interventions and gaps?</td>
<td>Zulfiqar Bhutta</td>
</tr>
<tr>
<td>09:15–09:30</td>
<td>Delivery platforms for age-specific child and adolescent health and development essential intervention packages along the life course: DCP3 synthesis</td>
<td>Kristen Danforth</td>
</tr>
<tr>
<td>09:30–10:00</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10:00–10:15</td>
<td>Systems thinking for integrated quality health service delivery for children and adolescents</td>
<td>Margaret Kruk</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>10:30–11:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>11:00–11:30</td>
<td>Country panel discussion: (Armenia, Bangladesh, Mexico, Sudan)</td>
<td>Moderated</td>
</tr>
<tr>
<td></td>
<td>Question: What are the implications of these shifts for national child and adolescent health organizational structures and programmes? (Thematic questions to each country)</td>
<td></td>
</tr>
<tr>
<td>11:30–13:00</td>
<td>Group work: Programmatic shifts for future health and well-being needs of children and adolescents. What needs to be done? What are the implications for the paradigm shift and public health response and programming?</td>
<td></td>
</tr>
<tr>
<td>13:00 - 14:00</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>14:00–15:30</td>
<td>Plenary feedback and recommendations</td>
<td></td>
</tr>
<tr>
<td>15:30–16:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>16:00–17:00</td>
<td>Conclusions and closing</td>
<td></td>
</tr>
</tbody>
</table>
Annex 2. Participants

- **Sumaia Alfadil**, Nile College for Medical Sciences, Khartoum, Sudan
- **Satinder Aneja**, Sharda University, Greater Noida, India
- **Shabina Ariff**, Aga Khan University, Karachi, Pakistan
- **Zulfiqar Bhutta**, The Hospital for Sick Children, Toronto, Canada
- **Robert Black**, Johns Hopkins Bloomberg School of Public Health, Baltimore (MD), USA
- **Ties Boerma**, University of Manitoba, Winnipeg, Canada
- **Susanne Carai**, consultant, Denmark
- **Kristen Danforth**, Disease Control Priorities Network, University of Washington (WA), USA
- **Trevor Duke**, The Royal Children’s Hospital, Melbourne, Australia
- **Shams El Arifeen**, International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh
- **Mike English**, KEMRI-Wellcome Trust Collaborative Programme, Nairobi, Kenya
- **Margaret E. Kruk**, Harvard T.H. Chan School of Public Health, Boston (MA), USA
- **Elizabeth Mason**, independent consultant, London, United Kingdom
- **Neil McKerrow**, KwaZulu-Natal Department of Health, Durban, South Africa
- **Purnima Menon**, Consultative Group on International Agricultural Research, Hyderabad, India
- **Leyla Namazova-Baranova**, National Research Scientific Medical University, Moscow, Russian Federation
- **George Patton**, Royal Children’s Hospital, Melbourne, Australia
- **Elizabeth Saewyc**, University of British Columbia School of Nursing, Vancouver, Canada
- **Susan Sawyer**, The Royal Children’s Hospital, Victoria, Australia
- **Guélaye Sall**, Université Cheikh Anta Diop de Dakar, Dakar, Senegal
- **Sergey Sargsyan**, Arabkir Medical Centre, Institute of Child and Adolescent Health, Yerevan, Armenia
- **Dámaris Sosa de Antuñano**, National System for Integral Family Development, Mexico City, Mexico
- **Mark Tomlinson**, Stellenbosch University, Stellenbosch, South Africa
- **Andrea Torres Sansotta**, Bernard van Leer Foundation, The Hague, Netherlands
- **Cesar Victora**, Pelotas, Brazil
- **Stein Emil Vollset**, Institute for Health Metrics and Evaluation, University of Washington, Seattle (WA), USA
- **Rosie Ameyan**, Consultant, Geneva, Switzerland
- **John Borrazzo**, Global Financing Facility, World Bank, Washington DC, USA
- **Aline Cossy-Gantner**, Fondation Botnar, Switzerland
- **Helga Fogstad**, Partnership for Maternal, Newborn and Child health, Geneva, Switzerland
- **Suzanne Fournier**, The Children’s Investment Fund Foundation, United Kingdom
- **Nicholas Furtado**, The Global Fund to Fight AIDS Tuberculosis and Malaria, Geneva, Switzerland
- **Mira Johri**, University of Montreal, Montreal, Canada
- **Zeina Maalouf**, Consultant, Washington DC, USA
- **Hassan Mshinda**, Fondation Botnar, United Republic of Tanzania
- **Assaye Negussie**, Bill & Melinda Gates Foundation, Seattle (WA), USA
- **Nosa Orobaton**, Bill & Melinda Gates Foundation, Seattle (WA), USA
- **Ellen Piwoz**, Bill & Melinda Gates Foundation, Seattle (WA), USA
- **Alessandro Srievano**, International Council of Nurses, Geneva, Switzerland

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- **Raoul Bermejo III**, Care for Child Development, New York City (NY), USA
- **Anne Detjen**, Child and Community Health Unit, New York City (NY), USA
- **Rory Nefdt**, Child and Community Health Unit, New York City (NY), USA
- **Stefan Peterson**, Chief, Health Section, New York City (NY), USA
- **Jennifer Requejo**, Division of Data, Research and Policy, New York City (NY), USA
- **Cristina de Carvalho Eriksson**, Maternal Newborn and Adolescent Health, New York City (NY), USA
• **Ralph Midy**, Latin America and Caribbean, Panama City, Panama
• **Aline Simen Kapeu**, Countries of West and Central Africa
• **Maureen Keroubo Adudans**, Eastern and Southern Africa Regional Office, Nairobi, Kenya
• **Kunihiko Chris Hirabayashi**, East Asia and Pacific Regional Office
• **Basil Rodrigues**, East Asia and Pacific Regional Office

**WHO secretariat**

• **Geoffrey Bisoborwa**, Medical Officer, Infant and Child Nutrition, WHO Regional Office for Africa
• **Betzabe Butron Riveros**, Adviser, Integrated Child Health, WHO Regional Office for the Americas
• **Pablo Duran**, Medical Officer, WHO Regional Office for the Americas
• **Rajesh Mehta**, Regional Adviser, Newborn, Child and Adolescent Health, WHO Regional Office for South-East Asia
• **Khalid Sisseeg**, Medical Officer, Child Health, WHO Regional Office for the Eastern Mediterranean
• **Martin Weber**, Programme Manager, WHO Regional Office for Europe
• **Delgermaa Vanya**, Technical Officer, WHO Regional Office for Europe
• **Avni Amin**, Technical Officer, Adolescents and At-risk Populations, WHO/HQ/FWC/RHR
• **Annemiek Brands**, Technical Officer, WHO/HQ/CDS/GTP
• **Robert Alexander Butchart**, Coordinator, WHO/HQ/NVI/PVL
• **Alarcos Cieza**, Coordinator, WHO/HQ/NVI/BDD
• **Taran Dua**, Medical Officer, WHO/HQ/NVI/MSD
• **Tracey Goodman**, Manager, WHO/HQ/ FWC/IVB
• **Malgosia Grzemska**, Coordinator, Technical Support Coordination, WHO/HQ/CDS/GTP
• **Kaloyan Kamenov**, Consultant

• **Sophie Pauline Gumy**, Technical Officer, WHO/HQ/PHE
• **Richard Paul Johnston**, Technical Officer, WHO/HQ/PHE
• **Jostacio Lapitan**, WHO/HQ/WHE/CPI/IHR
• **David Meddings**, Scientist, WHO/HQ/NVI/UIP
• **Martina Penazzato**, Medical Officer, WHO/HQ/CDS/HIV
• **Gojka Roglic**, Medical Officer, WHO/HQ/NVI/MND
• **Salim Sadruddin**, Team Leader, WHO/HQ/CDS/GMP/PDT-RAcE
• **Kefas Samson**, Technical Officer, Technical Support Coordination, WHO/HQ/CDS/GTB
• **Chiara Servilli**, Technical Officer, WHO/HQ/NMH/MSD
• **Emily Wootton**, Technical Officer, FWC/IVB/Integration
• **Princess Nothemba Simelela**, Assistant Director-General, FWC
• **Anshu Banerjee**, Director, WHO/HQMCA
• **Rajiv Bahl**, Coordinator, WHO/HQ/FWC/MCA/MRD
• **Valentina Baltag**, Scientist, WHO/FWC/MCA/PPP
• **Bernadette Daelmans**, Coordinator, WHO/FWC/MCA/PPP
• **Theresa Diaz**, Coordinator, WHO/FWC/MCA/EME
• **Diana Estevez**, Consultant, Ecuador
• **Regina Guthold**, Scientist, WHO/FWC/MCA/EME
• **Ornella Lincetto**, Medical Officer, WHO/FWC/MCA/PPP
• **Annie Portela**, Technical Officer, WHO/FWC/MCA/MRD
• **Nigel Rollins**, Medical Officer, WHO/FWC/MCA/MRD
• **David Ross**, Medical Officer, WHO/FWC/MCA/MRD
• **Jonathon Simon**, Scientist, WHO/FWC/MCA/MRD
• **Kathleen Louise Strong**, Medical Officer, WHO/FWC/MCA/EME
• **Wilson Milton Were**, Medical Officer, WHO/FWC/MCA/PPP