Towards a Grand Convergence for child survival and health:

*A strategic review of options for the future building on lessons learnt from IMNCI*

## Abstract

Background. WHO and UNICEF launched Integrated Management of Childhood Illness (IMCI) in 1995 as a key strategy for improving child survival, adding care for newborns under one week of age to become IMNCI in 2003. IMNCI focuses on major causes of childhood mortality from birth to 5 years of age. After two decades of implementation, there is a need to understand successes and constraining factors (particularly related to the health system) that have limited IMNCI’s impact, as well as to examine the latest evidence on effective interventions, delivery approaches and technologies to increase access and coverage of essential child health interventions. There is also need to position strategies to treat, care for and prevent illness in the sick child within emerging priorities under the “survive, thrive and transform” global agenda, part of the new [Global Strategy for Women’s, Children’s, and Adolescent’s Health 2016-2030](http://www.who.int/life-course/partners/global-strategy/en/). WHO is conducting a review to provide strategic directions on how to achieve ambitious goals of ending preventable newborn and child mortality and promoting child health and development.

Aim. The Strategic Review will take stock of IMNCI implementation and the latest evidence on expanding coverage of high-quality case management for sick children, to identify options for increasing access to and utilization of child health services at country and global levels.

Methodology. The review uses qualitative and quantitative methods. An extensive desk review will summarize what is known about IMNCI implementation and provide a concise but thorough synthesis of developments in knowledge and evidence on effective case management interventions. Evidence briefs commissioned on topics including assessment and management of major childhood conditions, health worker performance improvement, engaging the private sector, community interventions, and mHealth and other innovations, will provide an overview of the state of the art in these areas. A global implementation survey of IMNCI will describe the extent to which IMNCI’s three components have been scaled-up. Semi-structured interviews with global-level key informants will qualitatively describe implementation successes and problems with programme management and co-ordination, and inform options for the future. Finally, country assessments will be done in four focus countries (Ethiopia, Democratic Republic of Congo, Nigeria, India) plus 3-5 additional countries, providing insights into implementation of IMNCI and complementary strategies for addressing major childhood illnesses, as well as innovations and best practices, via a desk review and key informant interviews at national, district and facility levels. All strands of data will feed into a final analysis of opportunities for revitalizing the global child survival agenda to expand coverage of effective interventions for sick children, undertaken by an independent expert advisory group. Preliminary results and recommendations will be reviewed at a two-day technical meeting of high level policy and child health leaders.

Expected outcomes. Lessons learned from scale-up of IMNCI and a review of the latest evidence & knowledge on caring for the sick child will guide recommendations on re-energised approaches to reaching child health goals by improving access to and quality of child care at facilities and in communities. The report will be presented to the Bill and Melinda Gates Foundation in July 2016 for further discussion about taking options forward.

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## List of abbreviations

|  |  |
| --- | --- |
| ACTs | Artemisinin Combination Treatments |
| ANC | Antenatal care |
| ARI | Acute respiratory infections |
| BASICS | Basic Support for Institutionalizing Child Survival (USAID) |
| CDD | Control of diarrheal diseases |
| CHERG | Child Health Epidemiology Research Group |
| CHW | Community Health Worker |
| C-IMNCI | Community-level component of IMNCI strategy |
| CI/IHSS | Catalytic Initiative “Integrated Health Systems Strengthening” Program |
| DHMT | District Health Management Team |
| DHS / MICS | Demographic and Health Surveys / Multiple Indicator Cluster Survey |
| DRC | Democratic Republic of Congo |
| ENAP | Every Newborn Action Plan |
| GAPP-D | Global Action Plan on Pneumonia and Diarrhea |
| GAVI | Global Vaccine Alliance |
| GIS | Geographic Information Systems |
| HFS | Health Facility Surveys (WHO) |
| HMIS | Health Management Information System |
| HMM | Home Management of Malaria |
| ICATT | IMNCI Computerized Adaptation and Training Tool |
| iCCM | Integrated Community Case Management of Childhood Illnesses |
| IMNCI | Integrated Management of Childhood Illnesses |
| IYCF | Infant and young child feeding |
| KFP | Key Family Practices |
| LiST | Lives Saved Tool |
| LMICs | Low- and middle-income countries |
| MCE | IMNCI Multi-country evaluation (2004) |
| MDGs | Millennium Development Goals |
| NGO | Non-Governmental Organization |
| ODA | Overseas Development Aid |
| ORS | Oral Rehydration Salts |
| PHC | Primary Health Care |
| RAcE | Rapid Access Expansion (program to support scale-up of iCCM in sub-Saharan Africa) |
| RBM | Roll Back Malaria (WHO) |
| RDT | Rapid Diagnostic Test |
| RMNCAH | Reproductive Maternal Newborn Child and Adolescent Health |
| SBCC | Social Behavior Change Communication |
| SDGs | Sustainable Development Goals |
| SPA / SARA | Service Provision Assessment / Service Availability and Readiness Assessment (WHO) |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |

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## INVESTIGATORS

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## INTRODUCTION

In 2015, an estimated 5.9 million children died before reaching their fifth birthday [[1](#_ENREF_1)]. The leading causes of death are preventable newborn conditions and infectious diseases, including preterm birth complications (15%), intrapartum-related complications (11%), pneumonia (15%), diarrhoea (9%) and malaria (7%) [[2](#_ENREF_2)]. In addition, 45 % of all under-five deaths are associated with undernutrition, and more than 80% of newborn deaths are associated with low birth weight. As global child mortality declines from the current rate of 55 per 1000 live births, with epidemiological projections showing inequities likely to persist between and within countries, the global community has agreed to apply its knowledge, tools and resources to end preventable child mortality and achieve a “grand convergence” in child survival within a generation [[3](#_ENREF_3)]. Ambitious goals of reducing under-five mortality to 25 or less per 1000 live births and newborn mortality to 12 or less per 1000 by 2030 in all countries were adopted as targets under the health-related Sustainable Development Goal 3 and the [Global Strategy for Women’s, Children’s, and Adolescents’ Health 2016-2030](http://www.who.int/life-course/partners/global-strategy/en/).

WHO and UNICEF launched Integrated Management of Childhood Illness (IMCI) in 1995 as a key strategy to treat the sick child and improve child survival in countries with the highest burden of child mortality (greater than 40 deaths per 1,000 live births). The strategy provided guidance on treatment and care for the major causes of childhood mortality, particularly pneumonia, diarrhea, malaria and malnutrition, and was modified in a number of countries to cover sick newborns below 1 week of age and became known as IMNCI[[1]](#footnote-1). Since the original launch of IMNCI, over 100 countries have implemented some or all of its three components: 1) improving health worker skills, 2) health systems strengthening, and 3) family and community practices. Previous reviews of IMNCI (notably the 2003 Analytic Review and 2004 Multi-Country Evaluation) found that while the IMNCI case management guidelines were generally appropriate and effective, implementation and scale-up were constrained by health systems factors, limiting the impact and benefits of the strategy [[4-6](#_ENREF_4)].

Since then, evidence of effective interventions, delivery approaches and technologies to increase access and coverage of essential child health interventions has evolved rapidly, and much has been learned about factors of success in child health programming. Alongside the need to consider emerging priorities and new developments in the “survive, thrive and transform” global agenda, part of the new [Global Strategy for Women’s, Children’s, and Adolescents’ Health](http://www.who.int/life-course/partners/global-strategy/en/), we also need to address the ‘unfinished agenda’ of the MDG targets and learn lessons from why we failed to achieve these survival targets in many countries. After two decades of implementation and a succession of updates and new tools, the Strategic Review will help us understand IMNCI’s contributions to improving access to and quality of child health care, and how it may be repositioned to achieve ambitious survival targets, reach high coverage of effective treatment interventions for sick children, and link communities and clinics in ways that maximise survival and health.

The Strategic Review brings together an independent expert advisory group with partners including WHO, Unicef, USAID, and the Gates Foundation to conduct a high-level stock-taking exercise to learn from the past and above all inform the future in terms of guidelines, protocols, and delivery approaches to increase access, use and coverage of effective case management of sick children. The review will assess strengths and weaknesses in child survival programme delivery in countries, consider changing epidemiology and evidence of effective interventions, capture new ideas and innovations for delivery of quality child health services, and develop recommendations to inform an agenda to energize, strengthen, finance and expand initiatives to increase global coverage and effectiveness to save children’s lives and treat illness. Findings from the review will provide a stepping-stone towards a broader global programme of work for strengthening newborn and child health services.

### Problem statement

Since its introduction and the early multi-country evaluation [[4](#_ENREF_4)], IMNCI has been implemented to varying degrees and with variable quality in different geographies. While the strategy was meant to cover activities to strengthen health systems at all levels, in many countries implementation was restricted to health worker training without substantive investments in necessary complementary activities to improve availability of commodities, referral, health information, and community interventions. Furthermore, over the past 20 years, there has been significant progress in understanding different components of care for the sick child including on diagnostics, illness classification, treatment recommendations, emphasis on appropriate care of newborns and undernourished children and importantly, integrating and reconciling facility based care with community care, and how to monitor and ensure the quality of country and district programs. We need to combine this knowledge with an understanding of the extent to which programme management failure and poor international coordination may have limited the impact of IMNCI.

There is currently an opportunity and imperative to assess the current state of child health programs to identify areas requiring further support and those which can be leveraged for strengthening primary healthcare systems that are responsive to the needs of newborns and children. This review, taking stock of the current state of IMNCI implementation globally and in key geographies, aims to propose directions in future programming to provide treatment for the sick child and improve public health approaches for newborn and child health. We seek new ideas and a consensus among key stakeholders on harmonized implementation approaches and hope to propose a unified message on the way forward to policymakers and global and country levels. Our report will consider options for the management, tools and implementation approaches of future strategies to increase coverage of high quality interventions for newborn infants and children, using multiple delivery platforms and ensuring a continuum of care.

### Aim

The Strategic Review will take stock of IMNCI implementation and the latest evidence on how to expand coverage of high-quality case management of sick children, to identify options to increase access to and use of child health services in high-mortality countries and position these in the global agenda.

### Specific objectives

The specific objectives of the Strategic Review are to:

1.  Assess how widely and effectively facility and community-based IMNCI was implemented between 1995 and 2015 using both quantitative and qualitative methods, and describe leadership, policy, program and systems characteristics of countries that successfully implemented IMNCI.

2. Review the evidence on state of the art in caring for the sick child and options for new interventions, diagnostics, algorithms, treatments and communication tools that might be used to improve child survival & health programming.

3. Identify options for change at the national level: new ways to increase access, utilization and coverage of effective child health services through better coordination of international initiatives, programme management, supervision, training, monitoring and evaluation and use of mobile communications.

4. Identify options for repositioning IMNCI within the global agenda: integration with routine newborn, infant and child health programs, links with other global initiatives linked with child survival, branding, and how to attract new investment for global child survival programming over the next 15 years.

## BACKGROUND

Introduced by WHO and Unicef in 1995, Integrated Management of Childhood Illness (IMNCI) is a strategy for improving child health and development by providing treatment and preventive care at facility and community levels. IMNCI has 3 components: 1) Improving health worker practices through in- and pre-service training and reinforcement of correct performance using standard evidence-based case-management guidelines; 2) Improving health system supports for child health service delivery, including the availability of drugs, effective supervision, and the use of monitoring and health information system data; 3) Strengthening family practices for child health and development by encouraging the development and implementation of community-and household-based interventions. (The iCCM strategy is an extension of IMNCI case management guidelines from the facility to the community level and thus includes activities falling under all three components.)

**Figure 1**. Working definition of IMNCI for the Strategic Review

|  |
| --- |
| **IMNCI** is a strategy to treat, care for and prevent illness in sick children and newborns in primary health care services1:   * 1. *Improving health worker practices* – training courses (pre-service, in service, additional training) in integrated algorithms for health workers at each level of the primary health care unit;   2. *Health systems strengthening* – program planning & management, ensuring essential medicines and supplies, supervision, supportive policies;   3. *Family & community practices* – counseling on key family practices, community participation activities.   1 *Primary health care services* are provided at first-level facilities and first-level referral facilities and at community level. Community case management of childhood illness (**CCM** or **iCCM**) activities fall under this definition and are included in analyses under the Strategic Review. |

IMNCI began with a set of case-management guidelines for sick children seen in first-level health facilities (see **Annex 1** for a timeline of IMNCI’s evolution as a strategy since its debut). Over time, the strategy expanded to include a range of guidelines and interventions addressing health systems support for program management, practice, referral care, and child health needs at household and community levels. In 1998 WHO and UNICEF added a component to IMNCI called “Family and Community Health Practices” [[7](#_ENREF_7)] – which evolved to become Community IMNCI or C-IMNCI [[8](#_ENREF_8)]. C-IMNCI supports clinical IMNCI by empowering communities at a household level to develop healthy and safe practices to protect the health of children under 5 years of age. C-IMNCI also links community to the facility for speedy and accurate referrals, clarifying the roles and responsibilities of both the community and the facilities.

The IMNCI case-management guidelines were initially designed to include interventions targeting countries with an infant mortality of 40/1000 or greater, focusing on the most important causes of child mortality (pneumonia, diarrhea, malaria where endemic, measles, undernutrition). They were locally adapted based on local epidemiology and in some settings sections on infant and young child feeding, (IYCF), HIV and common causes of fever were added. Adaptation was also conducted to take into account health system characteristics and culture. Management of sick newborns (young infants) was added to generic guidelines in 2003 –reflecting an increasing proportion of U5 deaths in the newborn period in most countries; shortened training was also adopted by countries in response to perceived costs in terms of time and resources [[9](#_ENREF_9)].

The IMNCI strategy was implemented in Tanzania, Uganda and a handful of other countries starting in 1995 and was introduced in more than 100 countries by the turn of the century. The multi-country evaluation of IMNCI (MCE) (2005) demonstrated the strategy could effectively improve quality of child care and reduce child mortality when three components of IMNCI were introduced concurrently and adequately; however difficulties in scaling-up were observed in all but one of five countries (Tanzania) [[5](#_ENREF_5)]. In settings where this could not be achieved, IMNCI was still found to improve quality of care, often at a lower cost; in Bangladesh there was a non-statistically significant reduction in child mortality. Study sites that demonstrated effectiveness focused on a few implementation districts receiving varying levels of external support. Data from Egypt suggest that close to national implementation has been achieved and IMNCI implementation was associated with a doubling in the annual rate of under-five mortality reduction (3.3% before compared with 6.3% after IMNCI implementation) [[10](#_ENREF_10)]. A quasi-experimental study in Benin (2011) found that IMNCI was significantly associated with a 14.1% reduction in early childhood (age < about 30 months) mortality [[11](#_ENREF_11)].

Evaluation data from the MCE and an analytic review of IMNCI found that 7-10 years after introduction of IMNCI, training coverage was low, most implementation had focused only on HW training and not on systems and community components, and that there were several barriers to full introduction, including lack of political support and integration with routine maternal and child health policies and strategies, lack of designated financing, cost, requirement for a large and competent network of facilitators, and systems gaps at all levels [[6](#_ENREF_6)].

Studies have demonstrated that health worker performance can be improved by IMNCI training [[12](#_ENREF_12)]. However, immediate post-training assessments show that IMNCI trained health workers typically do not perform correctly about 34% of the time [[9](#_ENREF_9)]. IMNCI facility survey data from implementing countries often show a highly mixed picture. Activities have focused on alternative methods of shorter IMNCI training, computerized training (ICATT) and distance learning approaches – to reduce cost, time burden and increase flexibility. Regardless of training method, it is recognized that follow-up after training, observations of practice and problem solving is essential for maintaining quality. The MCE and other reviews highlight that staff deployment and retention policies are critical to achieving adequate coverage with trained staff.

In the late 2000s integrated community case management (iCCM) – intended as a community-based adaptation and extension of IMNCI – was endorsed as an equity-focused strategy to train, supply, and supervise community health workers (CHWs) to diagnose and treat diarrhea, malaria, and pneumonia among children 2-59 months in communities where access to facility-based health services is poor [[13](#_ENREF_13), [14](#_ENREF_14)]. In many countries iCCM grew out of community case management (CCM) for malaria by CHWs to include diarrhea and pneumonia in an effort to assess and treat the sick child more holistically and deliver integrated curative services at community level. Low- and middle-income countries (LMICs), including those in Africa and southeast Asia, have increasingly adopted iCCM and similar strategies [[15](#_ENREF_15)].

## STUDY DESIGN

The Strategic Review will use both qualitative and quantitative methods to address the following research questions, regrouped into four topic areas (**Table 1**):

**Table 1**. Key research questions by topic area

|  |  |
| --- | --- |
| **Topic area** | **Key research questions** |
| T1. IMNCI implementation 20 years on | * How have countries used IMNCI to improve policies, programmes and services? * What can be said about its impact and effectiveness based on the scholarly literature? * What are stakeholder opinions about its strengths and weaknesses? * What lessons have been learnt about scale-up, monitoring and impact? * Where has IMNCI thrived and why? * What other strategies have been used to increase access and coverage of treatment interventions for childhood illness? |
| T2. State of the art in caring for the sick child | * What effective interventions and delivery approaches at different levels of the health system could improve management of childhood illness? * Which new diagnostics, algorithms and treatments could improve the management of childhood illness? * Which delivery strategies could improve care and prevention of childhood illness at facility and community levels? * How can mHealth and other innovations be used more effectively to increase access to and coverage of effective treatment interventions? * What can be learned from other program areas about the above issues? |
| T3. Options for child survival & health programming in countries | * What are gaps in coverage of high-impact child health interventions in terms of access, quality of care, and utilization at community, facility and health system levels? * How should child health strategies adapt to changing epidemiology? * How to improve district implementation? * How to improve health worker practices via training, supervision and other strategies? * How to strengthen key components of the health system? * How to link facility and community treatment and prevention? Should treatment and prevention interventions be separated? |
| T4. Options for positioning child health strategies in the global agenda | * How can partners co-ordinate more effectively for country implementation? * How can global child health strategies be best tailored for country-level needs? How can they be communicated more effectively to governments & donors? * How can the global community support countries to effectively scale-up child health interventions? * Should IMNCI be re-branded? * How to attract sustainable domestic and donor investment? |

## PROCEDURE

Following an initial planning phase in late 2015 and early 2016, activities will begin in March and conclude in early July with a technical review of the draft report. The review uses both qualitative and quantitative methods. An extensive Desk Review will summarize what is known about IMNCI implementation, and provide a concise but thorough synthesis of developments in knowledge and evidence about effective case management interventions, with evidence briefs commissioned on topics including state of the art evidence on assessment and management of major childhood conditions, health worker performance improvement, engaging the private sector, community interventions, and mHealth and other innovations. A global implementation survey of IMNCI will be used to show the extent to which IMNCI’s three components have been adopted and scaled-up. Next, in-depth interviews with global-level key informants will qualitatively inform both these topics (IMNCI implementation and knowledge about effective care for the sick child). Finally, Country Assessments will include case studies from four focus countries (Ethiopia, Democratic Republic of Congo, Nigeria, India), as well as an additional 2-3 countries to be determined, to highlight issues such as useful innovations, effective program planning, or any positive impacts across the health sector or in other program areas beyond child health. Methods include an extensive in-country desk review and key informant interviews at national, district and facility levels. These case studies will provide data on the benefits of IMNCI, barriers and facilitators to implementation and scaling up, complementary strategies used to address major childhood illnesses, innovations and best practices, and will be conducted in collaboration with local public health research institutes.

A Visual Snapshot of the procedure and timing of the Strategic Review is available in **Annex 2**, and will be updated as work proceeds.

## 5a. Global implementation survey

| **Description** | **Topic areas addressed** | **Key deadlines &**  **Links to other activities** | **Respons.** |
| --- | --- | --- | --- |
| Structured survey targeting 75 Countdown countries, administered through WHO & Unicef, on implementation of IMNCI and other child health strategies | T1 (IMNCI implementation 20 years on) | - Survey goes out 21 April, responses received within 1 month  - In 4 focus countries, survey led by national consultant to feed into data collection | Samira & Cynthia |

The global implementation survey, to be administered by WHO and Unicef regional offices, will provide a holistic view of IMNCI implementation worldwide, with the objective of providing relevant data for T1 (IMNCI 20 years on). Given the need to administer the survey quickly and abstract results to feed into other aspects of the Strategic Review, notably the country case studies, the survey will be necessarily short, concise and include mainly close-ended questions, though these will extend to non-IMNCI aspects of child health policy and programming, including those outside the public sector. Prepared in Excel format to make data extraction easy subsequently, the survey may be pre-populated with data provided in other surveys (e.g the MNCAH policy survey, HFS) and will apply learnings from the Unicef experience of administering the iCCM survey.

Topics covered by the survey will include: 1) child health policies, 2) use & updating of IMNCI guidelines, 3) community case management of newborns and children, 4) activities to promote quality of care and health systems strengthening, 5) innovations, and 6) organization of work at the national level. On the basis of this information, specific research questions to be addressed by the survey include:

* What strategies are used to treat and care for the sick child?
* To what extent have the three components of IMNCI been implemented at scale at facility and community levels in low and middle income countries (LMICs)?
* How are activities under IMNCI organized within the health system? What sources of financing and investment are most important and how are these coordinated?
* What specific barriers to implementation are most widely experienced?
* What useful innovations in treatment of the sick child can be identified?

A first version of a structured survey instrument is being refined by study coordinators and will then be tested by staff at WHO and Unicef HQ to ensure it can be completed in the allotted time and produce intelligible and useful results.

The final version of the survey (in all U.N. languages) will be filled out by an in-country team consisting of representatives from MOH and WHO and Unicef country offices. Follow-up will be handled by WHO and Unicef regional offices, with final collection of completed surveys and analysis to take place at WHO and Unicef HQ with input from regional advisers. Analysis of the data will focus on 1) levels of implementation across countries and regions, 2) identification of potentially useful adaptations and innovations, 3) barriers and opportunities in expanding care for the sick child in countries. These analyses will be complemented by specific analyses on iCCM by Unicef. Results will show “what’s happening with IMNCI” and include simple syntheses of data presented in a user-friendly way.

## 5b. Desk review

| **Description** | **Topic areas addressed** | **Key deadlines &**  **Links to other activities** | **Respons.** |
| --- | --- | --- | --- |
| - Extensive review of existing evidence and knowledge on IMNCI and caring for the sick child  - Reviews build on each other and become progressively more prescriptive | All topic areas | - Staggered data collection and analysis as detailed in Table 2  - Reviews addressing T1-T2 to be commissioned earlier, followed those for T3-4 | Sarah & Joanna |

Literature and document reviews will inform all topic areas, providing an overview about what is already known about IMNCI and its place in the child health landscape, and with in-depth reviews on issues of specific interest for the future of IMNCI. Key research questions to be addressed in the desk review, as well as details about included information and responsible parties are detailed in **Table 2**, in roughly chronological order. In a process that is already underway, questions will be addressed by examining documents related to IMNCI published by WHO, countries and partners, studies from the scientific literature and relevant operational and implementation research, as well as available databases on child health, coverage and evidence on health worker performance, among others. In addition to the reviews described below, further reviews may be commissioned as research advances and new areas of inquiry are pursued.

**Table 2**. Components of the Desk Review by Topic Area (T1-T4)

| **Component** | **Inputs** | **Research question(s) / purpose** | **Respons. (timing)** |
| --- | --- | --- | --- |
| **T1. IMNCI implementation 20 years on** | | | |
| * + - 1. Evolution of IMNCI | - Global policy documents (guidelines, recommendations, strategies)  - Reports and reviews of IMNCI found in academic and grey literature | - Will provide 1) a narrative description of the evolution of IMNCI and 2) timeline of key documents & implementation milestones, and 3) inform the operational definition of IMNCI | Cathy W. (ongoing) |
| * + 1. IMNCI implementation and impact | - Overview of literature on IMNCI, iCCM (2006-2016) (Sarah)  - Findings from IMNCI Cochrane review (available soon)  - Summary of findings on IMNCI from in-depth country case studies from Countdown (Tim)  - Summary of main findings from research specifically on iCCM (Nick O. and Sarah)  - External evaluation of Catalytic Initiative in 6 countries: summary of findings (Tanya)  - Findings from iCCM evidence symposium (Ghana, March 2014), other evidence since symposium (Unicef)  - IMNCI Health systems review on Impact of IMNCI on health systems, QOC, etc. (Smruti) | - How have countries used IMNCI to improve policies, programmes and services?  - What lessons have been learnt about scale-up, monitoring and impact?  - Where has IMNCI thrived and why? | WHO consultant (ongoing) |
| * + 1. Country adaptations of IMNCI | - Adaptations to IMNCI tools & strategies by country and regional actors identified via the global implementation survey  - Adaptations are narrated and categorized in a summary | - How have countries used IMNCI to improve policies, programmes and services?  - Will feed into concept note on how to change IMNCI algorithm | WHO consultant - Eva (early May) |
| ***T2. State of the art in caring for the sick child*** | | | |
| * + 1. Innovations in diagnostic & treatment guidelines | - Relevant innovations to be identified via key informant interviews and ideas from expert advisers  - Present a review of the evidence on the feasibility and potential effectiveness of selected interventions and their relevance for IMNCI | - Which new diagnostics, algorithms and treatments could improve the management of childhood illness? | Need to identify consultant (Eric McCollum of JHU has been suggested) |
| * + 1. Innovations in service delivery | - A synthetic review of what is being done in terms of new forms of service delivery for child health and survival that are not currently incorporated into IMNCI  - What is known about health worker performance improvement strategies (Alex’s database)  - Other approaches to promote quality of care  - Discuss relevance for future IMNCI | - What effective interventions at different levels of the health system can improve access, quality, utilization and coverage of management of childhood illness? | Have asked Winnie Yip, waiting for a response (in collab. With Alex Rowe’s team) |
| * + 1. mHealth innovations | - Alex’s database  - WHO databases  - UNICEF mHealth review (Maeghan Orton)  - Scholarly literature | - How can mHealth be used more effectively to increase access to and coverage of effective treatment interventions? | Have asked Alain Labrique (April) |
| * + 1. Linkage with private sector | - Overview of role of private sector in child health & promising linkages with private actors for planning, service delivery, follow up, etc  - Evidence of what influences the private sector | - Which delivery strategies could improve care and prevention of childhood illness at facility and community levels? | Farouk Jiwa of Merck? (ask Jon) |
| **T3. Options for changing IMNCI** | | | |
| * + 1. Adapting IMNCI to changing epidemiology | - Analytical piece based on 1) epidemiological projections, 2) innovations in prevention, diagnosis and treatment, and #) country adaptations (discussed in item #3 above) &  - Will draw on knowledge from various expert advisers & Gates teams e.g. on antibiotics for high-risk diarrhoea, etc.  - Will consider how to create a flexible algorithm (or multiple algorithms) for worldwide use, and future processes for adaptation | - How can IMNCI adapt to changing epidemiology? | Sandy Gove & Eric Simoes (TBC) (May) |
| * + 1. Options for real-time monitoring & interface w/ DHIS2 | - DHIS-2 publication from sub-group of Global Collaborative  - Informants from USAID, Oslo group to discuss forthcoming think piece on future of DHIS2  - Think piece on how future monitoring of IMNCI could work with these and other monitoring platforms  - Will draw on ongoing WHO processes for selecting RMNCAH indicators  - Will look at indicators relevant to IMNCI and child health more broadly, including systems inputs, process, etc. | - How to link IMNCI with routine child health programming in the longer term?  - How to strengthen key components of the health system? | Expert adviser / policy adviser TBD |
| * + 1. Rethinking IMNCI’s 3rd component (family / community practices) | - Examine options for expanding / reconfiguring 3rd component of IMNCI (family/community practices)  - Examine issues of sustainability in community delivery platforms for child health  - Will consider innovations in service delivery (e.g. the home as a place of care, Annie Portela’s recent review of Community interventions) & review barriers to care-seeking (e.g. Unicef’s study in Ethiopia)  - Draw on WHO expert group on SBCC, work by Unicef & USAID, WHO process of community actions for RMNCAH, latest on community participation (self-help groups, Indian studies) | - How to link IMNCI with routine child health programming in the longer term?  - How to link facility and community treatment (iCCM) and prevention?  - Should treatment and prevention interventions be separated? | Helen Smith, Henry Perry, David Sanders, George Pariyo? |
| * + 1. Review of child health tools for humanitarian settings | - Listing and summary description of available tools for child health in emergency / humanitarian settings | - Will establish existence of or need for IMNCI tools for these settings and suggest policy directions | Mark Young with Cynthia Boschi-Pinto (March) |
| ***T4. Options for positioning IMNCI in the global agenda*** | | | |
| * + 1. Global child health leadership mapping | - Based on Interviews with ~30 key informants in global child health  - Includes framing of child health, perceptions of effectiveness of interventions, future priorities | - How can partners co-ordinate more effectively for country implementation?  - How to attract sustainable domestic and donor investment? | USAID (M. Taylor), draft version available |
| * + 1. Investment analysis of IMNCI / iCCM | - What is known about cost & financing of IMNCI & iCCM as an intervention in specific countries, including focus countries, using WB & Global Fund portfolio analysis  - Link w/ Collins (MSH) & J. Tanner (WB) to focus question  - Look at streams of funding, needs vs. available funds | - How to attract sustainable domestic and donor investment?  - How can partners co-ordinate more effectively for country implementation? | Expert adviser TBD (April) |

## 5c. Global key informant interviews

| **Description** | **Topic areas addressed** | **Key deadlines &**  **Links to other activities** | **Respons.** |
| --- | --- | --- | --- |
| A small number (N=15-20) of semi-structured interviews with carefully selected key informants in global child health | All topic areas | - Interviews to occur March-April  - Interviews may uncover additional topics for study under the Desk Review | Sarah & Joanna |

The purpose of key informant interviews will be to better understand what has been working well and to identify key challenges in implementing high quality integrated prevention and treatment protocols, as well as identify strategic opportunities for changing IMNCI and positioning it in the global agenda (T1-T4). Interviews will elicit information to address some of the following research questions:

* What effective interventions at different levels of the health system can improve access, quality, utilization and coverage of management of childhood illness?
* Which delivery strategies could improve care and prevention of childhood illness at facility and community levels?
* How might national programme management and monitoring be improved?
* How could current global child survival and health strategies better address newborn and child health needs in high burden countries? In terms of content, delivery strategy, innovations, financing? What lessons can be learned from other health programs relevant to child health (TB, immunizations, HIV/AIDS, etc.)?

A semi-structured interview guide will be elaborated to be used during interviews with a selective list of key informants (N≈20) knowledgeable about child health interventions broadly or specific areas relevant to the Strategic Review. Interviews lasting approximately 45 minutes will be conducted in person or by telephone with global-level stakeholders including technical officials and experienced program officers working at major international agencies, bilateral aid agencies, NGOs, private foundations and other donors, and academic/research organizations. Stakeholders will have knowledge about global programming for child survival broadly speaking; specific pathologies including malaria, pneumonia, diarrhoea; newborn care; or related areas such as nutrition, health systems, and community-level approaches. Names of potential informants are in the process of being identified, and may draw on the UNICEF health strategy review and other relevant sources. The goal will be to speak to a small number of informants who are highly qualified to provide informed analysis of global child health and the past, current and future role of IMNCI.

Reflecting the large number of research questions and topic areas to be covered, the interview guide will be modular, enabling interviewers to focus on questions where the informant has greatest knowledge and experience. These interviews will be recorded and transcribed verbatim by a third-party transcription service and verified for accuracy by the study coordinator; however given the short timeline for the review, data collectors will also take notes and provide a comprehensive aide-memoire of each interview.

## 5d. Country case studies

| **Description** | **Topic areas addressed** | **Key deadlines &**  **Links to other activities** | **Respons.** |
| --- | --- | --- | --- |
| - Rapid, high-level assessments of IMNCI implementation & opportunities to improve treatment of the sick child  - Includes 4 focus countries and additional countries TBD | - T1 (IMNCI implementation 20 years on)  - T3 (Options for changing IMNCI) | - Staggered case studies begin early April  - Will build on global implementation study, other quant. findings | Sarah & Joanna |

The main purpose of these rapid assessments will be to understand health systems barriers in the implementation of IMNCI and to appraise barriers and opportunities for improving quality, access, coverage and utilization of child health services. These assessments will be conducted in four key geographies: 1) Ethiopia, 2) Democratic Republic of Congo (DRC), 3) Nigeria and 4) India (states of Uttar Pradesh and Bihar). An additional 2-3 case studies will be selected by WHO regional offices on criteria related to implementation, scaling up or innovation. Country case studies will be staggered to the extent possible to allow for course adjustment as necessary. The rapid assessments will provide a granular understanding of implementation dynamics at the national level (T1) and identify and understand relevant innovations and best practices that could be extended, generalized or built upon in future iterations of IMNCI (T3).

Preparatory activities will be carried out by a national consultant, along with focal points at WHO and Unicef country offices, over 1-2 weeks beginning in early April. An international consultant familiar with the Strategic Review will arrive for 5-10 days of in-country data collection (mainly interviews at national and district levels). The national and international consultant will collaborate on completing predefined report sections so as to debrief with WHO and Unicef focal points at the end of the week, after which the report will be finalized by the international consultant.

### Preparatory phase

Initial preparatory tasks for the national consultant and WHO and Unicef focal points include the following:

* Coordinate the completion of the global implementation survey with targeted collaborators at WHO, Unicef and MOH
* Complete a structured desk review of relevant information on IMNCI and child health in country
* Prepare a stakeholder mapping leading to list of interviewees and make appointments with country key informants & district health management teams

The first important task for the national consultant will be to complete the global implementation survey (see section **5a** above), so as to quickly gain a broad overview of IMNCI implementation in country and identify key issues for further analysis.

Next, a country-specific desk review will be undertaken by the national consultant. Sources of data that could be included in the desk review include: ODA database, government expenditure data, Global Fund and GAVI proposals/reports, Health Facility Surveys, MNCAH policy survey, SARA/SPA, DHIS2, HMIS, RMNCAH scorecards, DHS mapping of coverage / care-seeking /mortality / morbidity. A draft synthesis of desk review findings should be available to the country lead prior to the data collection in order to probe further regarding desk review findings. This will include a dashboard of health systems & policy indicators, as well as coverage, similar to those used under Countdown to 2015 [[16](#_ENREF_16)].

When preparing the list of key informants, the national consultant will work with WHO and UNICEF country offices, giving consideration to gaining as wide a range of opinion and experience. Key informants may not currently be working on IMNCI or iCCM but may have played an important role in the past. Interviews will be conducted by the international consultant along with the national consultant. Where necessary, the services of an interpreter will be used. In preparation for the country data collection adaptations may be required to the interview guides including translation into French for the DRC visit.

Finally, before the international consultant arrives in country, the national consultant will organize a debriefing session with stakeholders at WHO, Unicef and MOH to take place at the end of the in-country data collection period, at which preliminary results will be presented for validation and comments taken into account in the final version of the country report.

### In country data collection

In-country data collection will take place over 8-10 working days starting in the country capital, to interview senior Ministry of Health staff, multi-lateral and bi-lateral organisations, academic institutions, researchers and where appropriate non-governmental organisations. Remaining days will be spent visiting districts for focus group interviews with district management teams and visits to first-level facilities (alternatively facility staff may be brought to the district level for interviews). To the extent possible, depending on distances, road infrastructure and travel time, consideration will be given to including districts that are rural/ hard to reach as well as more urban districts. Furthermore selection of districts will be informed by the desk review which may have identified districts as having implemented potentially generalizable innovations. Particular attention will be paid to capacity building and skills reinforcement models, team-building, management capabilities, incentives, innovations in community service delivery, monitoring and audit processes.

The in-country data collection will consist of a small number (N≈10) carefully selected key informant interviews at national level with a smaller number of FGDs at district and facility levels. Interviews will focus on probing further on what has been learned during the desk review and responses to the global implementation survey, to clarify responses or seek further detail. A single modular semi-structured interview guide will be developed around key theme areas which will guide the questions within each area, with different modules addressed to different informants according to knowledge and expertise:

* Governance and Policy
  + IMNCI included in child health strategy? (probing questions to include IMNCI in National ENAP)
  + National IMNCI working group?
  + Financing for IMNCI
  + In service and pre service training
  + Programme management for child health
  + HMIS and IMNCI
* Health systems
  + IMNCI medicines included in National Drugs list
  + Stock outs
  + Referral pathways
  + Supportive Supervision
  + Training, in-service and pre-service
  + Monitoring and Evaluation
* Case management
  + Protocol adaptations
  + Training adaptations
  + Innovations
  + Integration (HIV/Immunisations/tuberculosis etc)
* Community component/iCCM
  + iCCM as central to or separate from IMNCI
  + Community package
* Forward looking questions: could include:
  + What would you do differently in the implementation of IMNCI?
  + What lessons have you learnt from IMNCI implementation to date?
  + How is the country addressing the changing epidemiology in child health?
  + How are regional differences (in epidemiology, service implementation) within your country being addressed?
  + What do you think your future priorities in child health will be?

Key informants groups and focus topics are outlined in the table below (**Table 3**):

**Table 3**. In-country primary data collection

|  |  |  |
| --- | --- | --- |
| **Key informant group** | **Population** | **Topics** |
| National key informant interviews (N=8-10 per country) | Respondents will be selected from institutions including:  National Ministry,  Development partners, including UN agencies, bilaterals and NGOs  Professional associations  Academic training institutions  Researchers  Community groups and organizations (NGOs) | * Extent of and Limitations to IMNCI implementation * Explanations for observed utilization and coverage; and inputs that have contributed to observed change * Systems issues behind observed IMNCI quality * Involvement of the private sector * Organizational & management issues affecting sustainability & scaling up * Local perceptions about program feasibility, links with other integrated programming * Strategies to improve and expand child health programming * Relative role of pre-service and in-service training * Integration successes and challenges * Priorities for the future * Inputs for stakeholder mapping |
| Group interview with district management teams (N=1-2 per country) | District management teams (NB. In some countries DHMT and District Hospital are separate, in this case both should be consulted) | * Policy, systems and program characteristics affecting scaling-up (including budgetary and coordination) * Assessment of coverage & system readiness to provide care under IMNCI strategy (3 components, IMNCI/iCCM linkages) * Analysis of adaptations & innovations (newborn component) * Identification of gaps * Strategies for supportive supervision * Programme Management * How monitoring is done (HMIS, separate forms etc) * Proposals for future improvement |
| Facility-level key informant interviews or FGDs (N=2-3 per country) | Child health providers at first level facilities and with CHWs when appropriate | * Appreciation of IMNCI training and supervision issues * Implementation barriers at the operational level (medicines, referral etc) * Integration * Community component & iCCM delivery * Proposals for future improvement |

### Analysis

Data analysis will proceed iteratively concurrent with data collection, particularly via discussions between the national consultant, WHO and Unicef focal points and the international consultant. During key informant interviews and focus groups notes will be taken by one of the interviewers while the other leads the interview. Following the field work the interview notes will be read and key response outcomes either entered into a database as quantitative variables or as quotes cut and pasted into the data entry screen. The output will include frequencies, patterns of responses and key quotes in a format that can be discussed at meetings during an iterative and collaborative data analysis process. Similarly, data from literature and document reviews will be abstracted into a standardized coding form to systematically keep track of key findings and themes. Country data collection will conclude with a de-brief session where the initial impressions are presented and clarifications sought from WHO/UNICEF country leads. Following in-country data collection, themes will be refined and the report finalized. If possible given timelines, one or more of the country case studies will be selected for a more in-depth political analysis, as political characteristics of states have been shown to influence child health policies and outcomes in sub-Saharan Africa and other LMICs [[17-19](#_ENREF_17)]. Various frameworks are available to study political and economic determinants of development outcomes; we will use a problem-centred approach, focusing on practical barriers and facilitators to IMNCI implementation and child health efforts more broadly [[20](#_ENREF_20)]. Data will be gleaned from key informant interviews and the global implementation survey on 1) key stakeholders and their interests, constraints and relationships, 2) available financing for child health (from MOH and donors), and 3) institutional context.

## 5e. Additional “briefs”

| **Description** | **Topic areas addressed** | **Key deadlines &**  **Links to other activities** | **Respons.** |
| --- | --- | --- | --- |
| Short (600-word) case studies of useful adaptations or applications of IMNCI, or other relevant innovations in providing treatment for the sick child | - T1 (IMNCI implementation)  - T3 (Options of changing IMNCI) | - Used to spark thinking about best practices and opportunities  - May be used to fill in gaps in data collection | Sarah & Joanna |

In addition to the in-depth case studies above, WHO Regional Offices will produce short “briefs” (600 words) on notable aspects on IMNCI or other child health programming that could be pertinent to the goal of making IMNCI “fit for purpose,” as defined by Regional Offices. These briefs may 1) highlight aspects of implementation not found in focus countries, 2) describe innovations or successes in child health that bring light to how IMNCI can be improved. Potential topics might include adaptation of IMNCI for emergencies including Ebola, the use of technological innovations to promote or support IMNCI or other child health programs, or strong progress of particular components of IMNCI (such as the community component). These cases studies will contribute to T1-T3 by identifying the potential for IMNCI to achieve successful systems and health outcomes and the conditions under which this is likely to be fulfilled.

Specific research questions meant to be addressed by additional case studies include:

* What were the policy, systems and program characteristics in countries where IMNCI was successfully scaled up and had a positive impact on child health outcomes?
* What should the role of IMNCI be in integrated child health programming in the future?
* How can IMNCI can be incorporated into routine newborn, infant and child health programs to maximize effectiveness?
* Which mHealth and other innovations could be incorporated into IMNCI?
* How can identified barriers to IMNCI scaling up be overcome?
* How might IMNCI programme management and monitoring be improved?

These brief case studies will complement the global scoping of current status of IMNCI implementation, and may include examples of considerable scale-up as in countries that participated in the IMNCI evaluation (Bangladesh, Brazil, Peru, Uganda, and Tanzania) and countries that have demonstrated successful scale up of child survival interventions including IMNCI and iCCM such as Egypt, Malawi, Niger, South Africa and Rwanda. Other countries with success in implementation, either due to high coverage, innovations, etc., as well as those which have not managed to scale up due to barriers, may be examined.

## 5f. Quantitative analysis

Quantitative analysis will NOT be a main objective of this review. Nonetheless BMGF is keen that we may take this opportunity to explore two areas which might inform the review:

1. Geo-mapping of child mortality/morbidity and implementation of IMNCI and other child health interventions (in 4 focus countries; this work will be led by Professor Eric Simoes independently).
2. Coverage high achievers: identification of countries achieving high coverage of treatment interventions for child health, with subsequent investigation as to how they did it.

The **first approach** has largely been refined; details are available in **Annex 3**, and will coordinate as necessary with Unicef’s related work (in Malawi, Niger, Liberia and Sierra Leone) and DHS Measure (Clara Burgert). For the **second approach**, the procedure for the quantitative analysis would use readily available data at WHO to identify countries having achieved high coverage of treatment for diarrhoea and pneumonia, with subsequent steps to be taken after viewing of preliminary results. Other analyses may also be developed in an iterative process, to help answer outstanding research questions and pursue emerging themes from other work under the Strategic Review. Such analyses may draw on sources of data outlined in the table below (**Table 4**):

**Table 4**. Sources of data available for quantitative analysis

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Database** | **Location of data** | **Relevant content** |
| 1. | DHS data (or MICS data when DHS data not available) | DHS/MICS surveys 1990-2015 (Cesar, Agbessi, others) | * Coverage –diarrhea treatment * Utilization – pneumonia and diarrhea care-seeking practices |
| 2. | GAPP-D & Countdown data | WHO GAPP-D database, Countdown | * Numbers and trends in child deaths from pneumonia and diarrhea |
| 3. | BMGF mortality projections | BMGF, link with IGME | * Modeling & projections of major causes of under-5 mortality in coming years given different scenarios |
| 4. | Health Facility Surveys (HFS) reports and data | WHO Health facility surveys 1995-2015 (N=300 surveys);  Other Facility surveys;  Program follow-up data | * Quality of child care (see Cathy Holloway’s work/data) * System supports for care |
| 5. | SARA (service availability and readiness) & SPA (Service provision assessment) databases | WHO SARA data for 11 available countries (Cynthia) | * Facility readiness to provide IMNCI and other child health services * Focus on AFRO |
| 6. | MNCAH global policy survey data | WHO survey available for all countries (Cynthia) | * Covers policy for newborn & child health, available longitudinally for some countries |
| 7. | Surveys from the World Bank’s Service Delivery Indicator program | Program Leader is Gayle Martin (World Bank) | Ordinal indicators in three categories:   * Provider competence and knowledge * Proxies for effort * Availability of key infrastructure and .inputs |
| 8. | IMNCI Strategic Review global implementation survey | WHO (Dilip) | * Survey targets 75 Countdown countries * Covers policy & implementation of IMNCI and other child health interventions |

## ANALYSIS

Data analysis will take place in a two-phase process, first focusing on T1 (IMNCI implementation) and T2 (State of the art in treating the sick child), results of which will feed into T3 (Options for changing IMNCI) and T4 (Options for positioning IMNCI in the global agenda). The data sources and analysis techniques used for all four topic areas are detailed in **Table 5**. Periodic stock-taking throughout data collection will inform ongoing analysis in an iterative process. Emerging topics will be developed primarily through the use of concept notes written by expert advisers, but also potentially through modelling, with ongoing triangulation between findings from different types of data sources. Once all data have been collected, the study coordinator and expert advisers will combine all strands of data and write report sections. As an annex to the final report, analysis will also include a synthesis document on outstanding research gaps to focus future efforts.

**Table 5**. Data analysis plan

|  |  |  |
| --- | --- | --- |
| **Topic area** | **Data sources** | **Analysis\*** |
| *Phase I* |  |  |
| T1. IMNCI implementation 20 years on | * Global implementation survey: data for tables & graphs of IMNCI implementation across countries & regions * Global key informant interviews: observed trends and explanations for them * Desk review: narrative description of IMNCI’s evolution & synthesis of findings on impact, effectiveness, strengths, barriers, etc. * Country case studies: detailed explorations of specific implementation dynamics & political, policy, program gaps | - Triangulation between data sources to produce a summary statement of what is known about IMNCI implementation and answer research questions  - High-level description of observed trends, illustrated by maps of implementation, with specific examples included in boxes |
| T2. State of the art in caring for the sick child | * Global key informant interviews: factors of success in achieving high coverage; lessons learned from other program areas; relevant innovations * Desk review: literature reviews commissioned to feed into concept notes (see right) | - Evidence briefs on 1) Innovations in service delivery/mHealth, 2) Health worker performance improvement, 3) Link with private sector, 4) Practices & care in the home/community, 5) Options for real-time monitoring, 6) other TBD |
| *Phase II* |  |  |
| T3. Options for child health programming in countries | * Findings from T1 & T2 * Global key informant interviews: observed trends and explanations for them * Country case studies: detailed explorations of specific implementation dynamics & political, policy, program gaps to provide a “reality check” on proposed options for future child health strategies * Briefs on observed best practices and opportunities | - Concept notes on emerging themes, innovations, etc. to be circulated among expert advisers  - Modelling of potential solutions, for example using LiST (TBC) |
| T4. Options for positioning child health strategies in the global agenda | * Findings from T1 & T2 * Global key informant interviews: stakeholders’ thoughts about how to position future child health strategies * Desk review: mapping of global child health leadership; synthesis document on global standards & indicators; investment analysis | - Soliciting of opinions and advice from expert advisers and policy advisers  - Presentation of considerations and options |

\*Analysis topics are linked to research questions (see section **4. Study design**)

## Ethical review

A finding of exemption from ethical review will be sought from the WHO Ethical Review Board, covering issues of consent from key informants and the issue of confidentiality.

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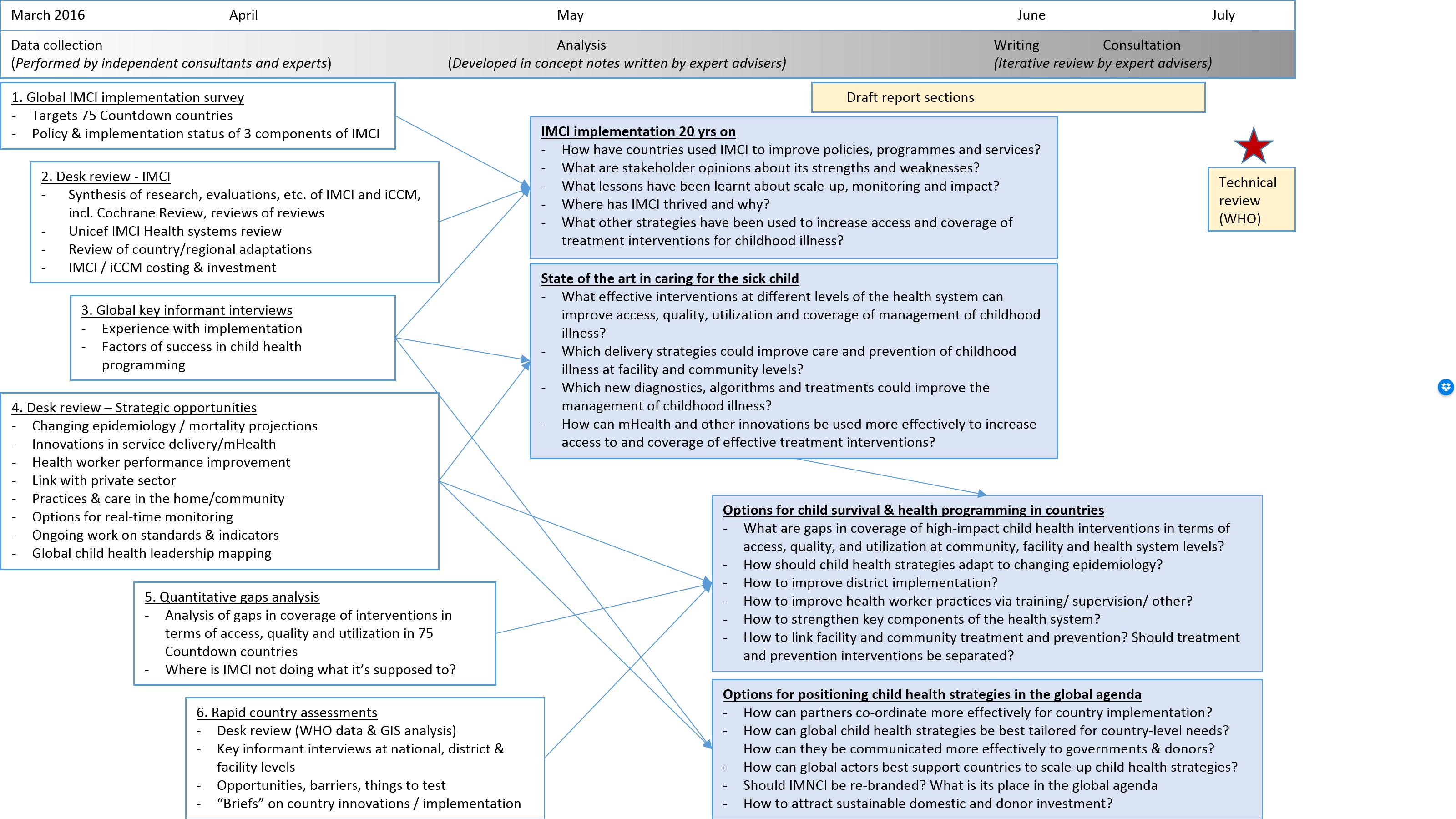
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## ANNEX 1: Timeline of IMNCI

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **General** | **Health worker skills** | **Health system** | **Community** |
| **1992 - 1996** | WHO and UNICEF develop IMCI to address major causes of child mortality |  |  |  |
| **1997** | Official launch of IMCI at Santo Domingo | IMCI in-service training course; Clinical guidelines and training incorporated Ask Praise Advise Check from CDD |  |  |
| **1998** |  |  | Drug supply management course | UN Inter-Agency Working Group established to develop guidelines for household / community IMCI with UNICEF leadership  Improving family practices (interagency agreement on 10, 12, or 16 practices) |
| **1999** | IMCI information package |  | IMCI follow-up after training course |  |
| **2000** |  | [Management of children with severe infections and severe malnutrition](http://www.who.int/maternal_child_adolescent/documents/fch_cah_00_1/en/) | IMCI Planning Guide |  |
| **2001** | [IMCI Care for Development](http://www.who.int/maternal_child_adolescent/documents/imci_care_for_development/en/)  Multi-country evaluation (MCE) initiated | Reference library of selected materials; technical seminars  Planning, implementing and evaluating preservice training; Model chapter for textbooks |  | CORE framework for C-IMCI developed with three elements: 1) partnerships community and facility, 2) care by CHWs, 3)promotion of key family practices |
| **2002** |  |  | IMCI Adaptation Guide |  |
| **2003** | Analytic Review |  | [Health facility survey for quality of care](http://www.who.int/maternal_child_adolescent/documents/9241545860/en/) | Evidence review: family and community practices to promote child health and development |
| **2004** | Diarrhoea treatment guidelines updated to include zinc and low-osmolarity ORS |  |  | Community IMCI Briefing package  WHO/Unicef Joint Statement: Management of pneumonia in the community  Management of sick children by CHWs: intervention models and programme examples |
| **2005** | Multi-country evaluation (MCE) published  IMNCI updated | [Model IMNCI handbook & Pocket Book of hospital care for children; A guide for educating healthcare providers](http://www.who.int/maternal_child_adolescent/documents/9241546700/en/) |  |  |
| **2006** |  | Systematic review of effectiveness of shortening IMNCI training  IMNCI complementary course on HIV/AIDS | Maternal and Child Health Delivery Channel Survey |  |
| **2008** | IMNCI updated | [IMNCI Computerized adaptation and training tool (ICATT)](http://www.icatt-impactt.org/dnn_icatt_impactt/ICATT-and-IMPACtt)  [IMNCI technical updates to the chart booklet.](http://www.icatt-impactt.org/dnn_icatt_impactt/ICATT-and-IMPACtt) |  | Establishment of interagency iCCM task force |
| **2009** |  |  | Managing programme to Improve Child Health | WHO/UNICEF Joint Statement: Home Visits for Newborn Care |
| **2011** |  |  |  | [Caring for newborns and children in the community: Caring for the sick child](http://www.who.int/maternal_child_adolescent/documents/imci_community_care/en/) |
| **2012** | IMCCI updated | [IMNCI generic online training course](http://online.icatt-training.org/se-0b062819295a460eb7163e9078552e02/AdminPage/) |  | CCM supplement published in *AJTMH*  WHO/UNICEF Joint Statement: iCCM  [Caring for newborns and children in the community: Caring for the newborn at home](http://www.who.int/maternal_child_adolescent/documents/caring_for_newborn/en/) Caring for newborns and children in the community- caring for the Child’s Health Growth and Development |
| **2013** |  | [2nd Edition Pocket Book of hospital care for children](http://www.who.int/maternal_child_adolescent/documents/child_hospital_care/en/) |  |  |
| **2014** |  | [IMNCI Chart booklet technical update & IMNCI Distance learning course](http://www.who.int/maternal_child_adolescent/documents/imci/en/) |  | [Caring for newborns and children in the community: Adaptation for HIV and TB](http://www.who.int/maternal_child_adolescent/documents/newborn-child-community-care/en/) |
| **2015** |  | [e-Pocketbook for hospital care for children](https://itunes.apple.com/us/app/who-e-pocketbook-hospital/id1044896085?mt=8) |  |  |

## ANNEX 2: Visual snapshot of IMNCI Strategic Review



## ANNEX 3: GIS Mapping of disease & IMNCI/iCCM Programming

[Will be updated to reflect that the analysis will focus on the 4 country cases.]

**Title: Disease Mapping to Support IMNCI/iCCM Programming**

**Elisabeth Root PhD (Ohio State University); Eric A. F. Simoes MD, ( University of Colorado)**

**Introduction**

The Integrated Management of Childhood Illness [IMNCI] was introduced as a global strategy by WHO in 1996 [1-3]. The strategy involves: 1) a community component, 2) recognition and management of common childhood illnesses at the first-level health facility and, 3) improvement of services at referral facilities. Each of the three components of the strategy requires both pre-service and in-service training. The WHO introduced training into many countries (Africa, Asia and Latin America), initially starting in geographic areas of a country with particularly high morbidity and mortality, but subsequently extending to the complete country (in most cases) [4,5].

Integrated Community Case Management [iCCM] is a strategy designed to train community health workers in the correct management of childhood pneumonia, diarrhea and malaria in the community, and to provide appropriate supervision and support with an uninterrupted supply of medicines and equipment required to manage these conditions [7]. Since UNICEF and WHO introduced the strategy into Africa in 2008, at least 38 countries have introduced some component of iCCM by 2014. While iCCM was designed primarily to be administered in areas with no access to care, it has been taken to scale in many countries, often with many thousands of community health workers being trained [8,9]. In many countries, the training has extended to all districts, regardless of high or low mortality. In fact in some countries, donor supported training has occurred in most districts, except the ones with the highest mortality [1].

.Map and geographic analysis are a key method that can be used to examine under 5 disease burden, current IMNCI/iCCM program implementation and the mismatch between need and service provision. For example, in our prior research in the Philippines, we used mapping and geographic methods to examine the uneven distribution of pneumonia in children under 5 in our study area [11]. Furthermore, we determined that children with poor access to health care, in this case those that lived farther from a health center, had a higher rate of severe pneumonia disease. We also observed that PCV efficacy appeared to be higher in this population of children. We concluded that children living a greater distance from a health center derive the most benefit from the PCV and recommend that this geographic subpopulation could be targeted for a PCV intervention. Such a targeting strategy could offer massive cost-savings over a universal vaccination strategy.

**Project Purpose**

Most developing countries already have a variety of health and population data available for districts and villages. Some of it may be in electronic format, while other information may only be available through paper documentation. We propose requesting commonly available health and population data from several sources for Nigeria, Democratic Republic of Congo, India, Pakistan, Ethiopia, and Malawi. Ultimately, the work will provide: 1) immediate results for Nigeria, Democratic Republic of Congo, India, Pakistan, Ethiopia, and Malawi showing where disease burden is highest, where health programs have been implemented and how these can be used to prioritize public health efforts in these settings, 2) a set of simple methods and tools that can be used in many settings to map and examine the geographic distribution of morbidity, mortality, and health care resources and programs, such as the 75 countdown countries.

**Study Design**

We envision a study with three phases: 1) collection of data, 2) mapping and statistical analysis and, 3) inclusion of maps and results for the final report.

Data: The core data set used will be the Demographic Health Surveys (DHS) maintained by Measure DHS. The DHS have a variety of indicators on child morbidity and mortality, and many now collect GPS data which can be used to examine health indicators for small subnational areas. A 2014 report by USAID provides recommendations for geospatial analysis, suggests indicators appropriate for spatial analysis, and best practices for analyzing and displaying geographically explicit data [12]. This report clearly supports geospatial analysis of DHS data and suggests it is reliable and accurate at the subnational level if analyzed correctly. Table 1 provides the set of indicators that will be used from the DHS to examine child health.

The DHS program also conducts Service Provision Assessment (SPA) surveys in some countries. The SPA is a health facility assessment that provides information on health service delivery. The surveys specifically examine availability of children’s health services and IMNCI. They are currently not available for all countries, so we propose a case study using Ethiopia and Malawi for which data are available. The Service Availability and Readiness Assessment (SARA) tool by the WHO is a very similar tool which has been implemented in the Democratic Republic of Congo. We propose a secondary case study using the SARA data for the DRC.

Programmatic data will be derived from a variety of secondary sources, and may be maintained in either electronic or paper format. Data collection may require in-country stakeholder collaboration (e.g.,WR MOH, UNICEF, USAID, BMGF.) to understand the geographic extent of specific programs. Ideally, we would like to collect data at the lowest level of geography possible (e.g., village) but all data should at least be reported by district.

**Table 1: Potential variables for mapping project**

|  |  |  |  |
| --- | --- | --- | --- |
| **Domain** | **Indicator** | **Country** | **Source** |
| Population | * Population census: counts of children <1 year, <5 years, <10 years, <15 years of age | Nigeria, Democratic Republic of Congo, India, Pakistan, Ethiopia, Malawi | IPUMS International |
| Health Outcomes | * Infant mortality rate * Under 5 mortality rate * Full immunization * Use of ORS for treatment of diarrhea * Breastfeeding duration * Stunting among children <5 years | Nigeria, Democratic Republic of Congo, India, Pakistan, Ethiopia, Malawi | DHS |
| Health Resources | * Location of/number of hospitals/health clinics by village or district * Availability of vaccinations * Adherence to IMNCI and growth monitoring guidelines * Staff trained in IMNCI * Availability of equipment for growth monitoring * Availability of priority medicines for children | Ethiopia, Malawi  Democratic Republic of Congo | SPA  SARA |
| Programmatic | * Location of districts where specific programs have been implemented, including IMNCI, iCCM, vaccination, malaria programs | Nigeria, Democratic Republic of Congo, India, Pakistan, Ethiopia, Malawi | UNICEF, WHO, stakeholders |
| Geographic | * Boundaries for districts and villages, physical features such as rivers, lakes and roads |  |  |

Mapping: Data will be used to develop a series of maps that display the disease burden, mortality, health knowledge and use of services, the availability of health resources, and the geographic distribution of programs and interventions. Each of the indicators will be mapped separately by district. We will also create maps which overlay the service areas of programs (such as iCCM/IMNCI/vaccination) with health outcomes which may be related to the goals of those programs. An example of the maps we will produce are shown in Figures 1 and 2.

Statistical Analysis: Data will also be used to model where (e.g., which districts) programs could or should be implemented in each country. For this we propose building statistical models which predict the burden of disease in each district as a function of demographic characteristics, availability of health resources, and current programs and interventions. Such models can provide information on areas of unmet need and areas where there is a mismatch between need and resource use or government spending.

**Significance to the IMNCI Review**

Ultimately, the results of the mapping and statistical analyses will provide important information for the WHO/BMGF/USAID/UNICEF initiative for reassessing IMNCI. Mapping will allow program as assessment of where the burden of disease is, and potentially (from the DHS/SPA/SARA data) be able to identify where IMNCI/iCCM training has occurred and where the burden overlaps for the focus countries. This data will be useful to graphically and statistically present data in the report and can be used to discuss with Departments of health and other stakeholders in September.

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**Figure 1: Uganda Diarrhea Morbidity (children experiencing a diarrheal episode in the past 2 weeks) for a) cases of diarrhea and b) diarrhea rate (per 1,000)**



**A**

**B**

Source: Geographic Analysis of 2011 & 2006 Uganda DHS

Note: Calculations produced from small numbers, and should only be considered rough estimates of true morbidity

**Figure 2: LRI Morbidity (children experiencing a cough w/fever and rapid breathing in the past 2 weeks) for a) cases of LRI and b) LRI rate (per 1,000)**



**A**

**B**

Source: Geographic Analysis of 2011 & 2006 Uganda DHS

Note: Calculations produced from small numbers, and should only be considered rough estimates of true morbidity

## ANNEX 4: List of resource persons to be consulted (non-exhaustive)

***Global level***

Dr John Barazzo – Chief, Maternal and Child Health Division, Bureau for Global Health (USAID)

Dr Harry Campbell – Professor of Genetic Epidemiology and Public Health (University of Edinburgh)

Dr Mariam Claeson – Director, Maternal, Newborn and Child Health (Bill & Melinda Gates Foundation

Dr Youssouf Gamatie – Independent consultant

Dr Sandy Gove – Independent consultant

Dr Rasa Izadnegahdar – Senior Program Officer on Pneumonia (Bill & Melinda Gates Foundation)

Dr Troy Jacobs – Child Health and Pediatric HIV Advisor (USAID)

Dr Abadi Leul – Professor, Pediatrics / Child Health (Mekelle University, Ethiopia)

Dr Leslie Mgalula – Country office (WHO Malawi)

Dr Igor Rudan – Chair in International Health and Molecular Medicine (University of Edinburgh)

Dr Michel Pacqué – Child Health Team Lead (Maternal and Child Survival Program)

Dr Stefan Petersen – Chief, Health Section and Associate Director, Programme Division (Unicef)

Dr Salim Sadruddin – Rapid Access Expansion Project (RAcE)

Dr Mark Young – Senior Health Specialist (Unicef)

***Regional level***

Dr Jamela Alraiby – Medical Officer, EM/DHP Division of Health Protection and Promotion (EMRO)

Dr Olga Agbodjan-Prince – Medical Officer, Family and Reproductive Health (AFRO)

Dr Betzabe Butron Riveros – Advisor, Integrated Child Health (PAHO)

Dr Phanuel Habimana – Medical Officer, Family and Reproductive Health (AFRO)

Dr Aigul Kuttumuratova - Child and Adolescent Health (EURO)

Dr Neena Raina – Regional Adviser, SE/CAH Child and Adolescent Health (SEARO)

Dr Khalid Siddeeg – Child and Adolescent Health (EMRO)

Dr Howard Sobel – Regional Coordinator, RMNCAH (WPRO)

Dr Martin Weber – Programme manager, Child and Adolescent Health (EURO)

***WHO departments***

Dr Rajiv Bahl – MCA, Research and Development (MRD)

Dr Cynthia Boschi-Pinto – MCA, Epidemiology, Monitoring and Evaluation (EME)

Ms Annemieke Brands – Global TB Programm

Dr Matthews Mathai – MCA, Epidemiology, Monitoring and Evaluation (EME)

Dr Eyerusalem Negussie – Department of HIV and Global Hepatitis Programme

Dr Martina Penazzato – Department of HIV and Global Hepatitis Programme

Mrs Zita Wiese Prinzo – Department of Nutrition for Health and Development

Mr Salim Sadruddin – Prevention, Diagnostics & Treatment

Dr Maria Pura Solon – Department of Nutrition for Health and Development

Dr Dilip Thandassery – MCA, Epidemiology, Monitoring and Evaluation (EME)

1. References to child health are understood to include newborns unless otherwise specified. [↑](#footnote-ref-1)