Towards a Grand Convergence for Child Survival and Health

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

November 2016
Acknowledgements

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# Table of Contents

Executive Summary ........................................ 1
Introduction .................................................. 8
Methods and data ............................................ 9
IMNCI implementation twenty years on .............. 11
Looking forward: options for countries ............... 23
Looking forward: child health at global level ........ 34
Recommendations for strategic action ................. 39
References .................................................. 42
Annex 1: Detailed actions for recommendations ...... 47
Annex 2: Sources of data for the Strategic Review .... 52
Annex 3: Summary of evidence from IMNCI Global Implementation Survey report 54
Annex 4: Summary of evidence from the community IMNCI review 61
Annex 5: Summary of solutions suggested during key informant interviews with experts 65
Annex 6: Systemic constraints to advancing child health and possible digital health solutions 68
Annex 7: Summary of evidence on IMNCI and the private sector 71
### Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ASHA</td>
<td>Accredited social health activist</td>
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<tr>
<td>BIVA</td>
<td>Bioelectrical impedance vector analysis</td>
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<tr>
<td>BMGF</td>
<td>Bill &amp; Melinda Gates Foundation</td>
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<tr>
<td>CBD</td>
<td>Community-based distributor</td>
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<tr>
<td>CBNC</td>
<td>Community-based newborn care</td>
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<tr>
<td>CHW</td>
<td>Community health worker</td>
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<td>C-IMCI</td>
<td>Community IMCI</td>
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<tr>
<td>DHIS2</td>
<td>District Health Information Systems 2</td>
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<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<tr>
<td>ENAP</td>
<td>Every Newborn Action Plan</td>
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<tr>
<td>EPI</td>
<td>Expanded Programme on Immunization</td>
</tr>
<tr>
<td>EQUEST</td>
<td>Equitable strategies to save lives</td>
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<tr>
<td>ETAT</td>
<td>Emergency triage assessment and treatments</td>
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<td>EWEC</td>
<td>Every Woman Every Child</td>
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<tr>
<td>GAPPD</td>
<td>Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea</td>
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<td>GAVI</td>
<td>Global Vaccine Alliance</td>
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<tr>
<td>GFATM</td>
<td>Global Fund for the fight against AIDS, TB and Malaria</td>
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<td>GFF</td>
<td>Global Financing Facility</td>
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<tr>
<td>GIS</td>
<td>Geographic information system</td>
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<td>GKI</td>
<td>Global key informant</td>
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<tr>
<td>GPS</td>
<td>Global positioning system</td>
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<tr>
<td>HBB</td>
<td>Helping babies breathe</td>
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<tr>
<td>HMIS</td>
<td>Health management information system</td>
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<td>ICATT</td>
<td>IMCI computerized adaptation and training tool</td>
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<td>iCCM</td>
<td>integrated community case management</td>
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<td>IMCI</td>
<td>Integrated management of childhood illness</td>
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<td>IMNCI</td>
<td>Integrated management of newborn and childhood illness</td>
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<td>IMPAC</td>
<td>Integrated management of pregnancy and child birth</td>
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<tr>
<td>LiST</td>
<td>Lives saved tool</td>
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<tr>
<td>LMIC</td>
<td>Low- and middle-income countries</td>
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<td>MBB</td>
<td>Marginal budgeting for bottlenecks</td>
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<td>MDG</td>
<td>Millennium development goal</td>
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<td>MoH</td>
<td>Ministry of health</td>
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<td>MNCH</td>
<td>Maternal, newborn and child health</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<td>OSCE</td>
<td>Objective structured clinical examination</td>
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<td>PHC</td>
<td>Primary health care</td>
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<td>PIP</td>
<td>Performance improvement plan</td>
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<td>PLA</td>
<td>Participatory learning and action</td>
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<td>QoC</td>
<td>Quality of care</td>
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<tr>
<td>RCT</td>
<td>Randomized controlled trial</td>
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<td>REC</td>
<td>Registre Electronique de Consultation</td>
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<tr>
<td>RMNCAH</td>
<td>Reproductive, maternal, newborn, child and adolescent health</td>
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<td>SCT</td>
<td>Social cognitive theory</td>
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<td>SDG</td>
<td>Sustainable development goal</td>
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<td>SMS</td>
<td>Short message service</td>
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<td>TB</td>
<td>Tuberculosis</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>WASH</td>
<td>Water, sanitation and hygiene</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Executive Summary

1. Over the past quarter century, child mortality has more than halved, dropping from 91 to 43 deaths per 1000 live births between 1990 and 2015. Yet in 2015 an estimated 5.9 million children still died before reaching their fifth birthday, most from conditions that are readily preventable or treatable with proven, cost-effective interventions. Given the stakes we, the global child health community, must do far better to assist countries to deliver the best possible strategies to help each child survive and thrive.

2. In 1995, WHO and UNICEF developed Integrated Management of Childhood Illness (IMCI) as a premier strategy to promote health and provide preventive and curative services for children under five in countries with greater than 40 deaths per 1000 live births. In 2003 care for newborns under one week of age was added and the strategy was renamed as IMNCI in many countries. Over 100 countries have adopted IMNCI and implemented to varying degrees its three components: 1) improving health worker skills, 2) strengthening health systems and 3) improving family and community practices.

3. Twenty years later a stock-taking is warranted. Interest and funding for IMNCI have waned, implementation has proved problematic and coverage at scale was rarely achieved. With attention focused on specific child health areas such as immunization and communicable diseases, a holistic view of child health has arguably been lost inside the continuum of reproductive, maternal, newborn, child and adolescent health (RMNCAH). Nevertheless, IMNCI ushered in a transformation in how we view effective child health services. We now must build on lessons learnt to redesign the strategy, incorporating the latest evidence-based interventions and most effective delivery mechanisms, and integrating the rich repository of tools and resources that have become available since IMNCI was launched. We must also reposition IMNCI under the Sustainable Development Goals (SDGs) and the U.N. Secretary-General’s Global Strategy for Women’s, Children’s and Adolescents’ Health (2016-2030). Our Review aims to maximize the potential of IMNCI to end preventable newborn and child mortality and help children thrive wherever they live, by supporting a seamless continuum of high-quality care spanning the home, community and health facility.

4. All countries have committed to reducing under-five mortality to 25 or less and newborn mortality to 12 or less per 1000 live births by 2030. These targets are ambitious yet achievable, provided there is political will, adequate investment and concerted action. To achieve a “Grand Convergence for child survival and health within a generation”, we must strengthen health systems, build capabilities to meet children’s health needs, and work towards universal health coverage. We have the knowledge, resources and opportunities to invest. What is required now is renewed energy to capture attention and mobilize action, maximizing funding from domestic, bilateral and multilateral sources including the Global Financing Facility (GFF).

5. The present Strategic Review brought together an independent expert advisory group with study group members at WHO and UNICEF to review past lessons and propose an agenda to stimulate momentum for improving care for children. The Review draws its conclusions from 34 unique sources of data, 32 of which were specifically commissioned. The data set represents contributions from over 90 countries and hundreds of experts in child health and related areas, and considers findings from a comprehensive review of the published and unpublished literature as well as in-depth case studies of implementation. Study group members used data to answer pre-defined questions and extracted key messages at

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1 We use the term IMNCI for consistency throughout this report, recognizing that newborn care was added at a later date.
2 Hereafter referred to as the “Global Strategy”.

Towards a Grand Convergence for Child Survival and Health | November 2016 | 1
participatory workshops; preliminary recommendations were then refined by a small group of high-level stakeholders representing global, regional and country levels. The findings of our review will be shared widely.

IMNCI implementation twenty years on

6. IMNCI was developed to increase coverage of evidence-based, high-impact interventions, taking an integrated approach to promotion, prevention and treatment and focusing on the top killers of children under five. IMNCI also represented a set of core values, by promoting a holistic, child-centred approach to childhood illness that sought to address basic human rights to health and health care. As such, IMNCI attempted to address the tension between selective and comprehensive approaches to primary health care and related questions around rights and programme expediency.

7. There has been near universal adoption of the IMNCI strategy by target countries, with widespread reported implementation of facility-based activities. Since 2010 there has been increasing implementation of integrated community case management (iCCM), building on WHO/UNICEF guidance and training materials. A 2016 Cochrane review found that IMNCI was associated with a 15% reduction in child mortality when activities were implemented in health facilities and communities. Other data have shown positive effects on health worker practices and quality of care. Improvements in care-seeking and household practices have been more rarely documented, as investment in community and home-based interventions has lagged. IMNCI's distillation of case management of the major killers of children under five years of age into a clinical algorithm and guidelines was highly appreciated by service providers and policy-makers for its simplicity and comprehensiveness, and it transformed how care for children is perceived at global and country levels.

8. However, IMNCI implementation suffered from a number of setbacks, with uneven implementation between and within countries, and insufficient attention to improvements in health systems and family and community practices. Countries and donors failed to agree on sustainable funding, and fragmentation of support by global partners led to a loss of IMNCI's built-in synergy around its three components. The fact that tools to support the health system and community components became available slowly and had variable uptake did not help countries build coherent programmes from the start. The emerging global attention to newborn mortality also contributed to a shift of focus in countries, with insufficient clarity on the complementary roles of maternal and child health units in addressing newborn health.

9. After IMCI was launched, WHO and UNICEF did not provide sufficient, sustained, focused global leadership, and too little attention was paid to programme monitoring, targets and operational research. Only countries with strong government leadership and political commitment were able to engage in the unified, country-led planning necessary to support scaling up. IMNCI was better implemented when: a) the health system context was favourable, b) a systematic approach to planning and implementation was used and c) political commitment allowed for institutionalization. The absence of an explicit emphasis on equity, community engagement and linkages to other sectors (for example education or water and sanitation (WASH)) were blind spots that limited IMNCI's contribution to reducing child mortality.

Looking forward: options for countries

10. Past experiences make clear that government ownership and government-led planning and implementation are required to scale up interventions and services – but that these depend on strong country leaders and disciplined partners. Child health stakeholders must work to mobilize political support in the context of a renewed focus on primary health care. Country actors and partners must reach convergence around an integrated, funded plan that aligns
maternal, newborn and child health programming under a common national vision, with specific national targets and monitoring to assess progress.

11. The highest-achieving countries in the era of the Millennium Development Goals (MDGs) were those that implemented tailored responses to the main bottlenecks to providing care for children. Countries must work with support from global partners to define strategies adapted to their epidemiological and health systems contexts, reviewing points of service and building on systems strengths. Examples include engaging the private sector to improve quality of care in countries with high rates of care-seeking in this sector, or adopting iCCM in contexts with low access to facilities and an existing cadre of CHWs. Integrated case management and delivery of interventions combining prevention and treatment remains the recommended approach for reasons of quality, effectiveness, efficiency and child rights.

12. District teams are the *sine qua non* of operational planning and implementation, and their efforts will be essential to improving quality of care. As such, IMNCI is a key element of both primary health care and universal health coverage. Resources for district teams must be mobilized including through advocacy at subnational level, alongside efforts to avoid rapid staff turnover and build up child health teams. Much greater attention must be paid to operational detail at district level, with improved data central to decision-making. Demonstration districts within countries can serve as laboratories to determine what works best, creating a learning system among district teams through which successful approaches can be generalized. Simultaneous monitoring can allow countries to quickly adjust course; active district child health committees comprising users, leaders and professionals can provide independent review.

13. Countries should explicitly prioritize reaching poor, under-served populations by using equity and mapping analyses to target service provision, and ensure free services for children at the point of care. Strategies to support households’ capacity to produce health must be integrated into efforts to create a continuum of care for children at household, community and facility levels. To promote care-seeking and healthy practices, especially for newborns, countries should scale up evidence-based strategies for community engagement such as women’s groups, accredited social health activists, home visits and health committees, linking these to ongoing monitoring to provide accountability for results.
Looking forward: child health at global level

14. Fragmentation of global child health efforts urgently needs to be resolved. Failure to coordinate on child health guidance and implementation has placed a large burden on countries with poor synergy among IMNCI’s three components and led to inefficient use of funds. To facilitate greater coherence in response to country needs, it is imperative that global actors come together around a single unified vision and global architecture, within the frameworks of the SDGs and the Global Strategy (see global architecture as proposed in the diagrams on p. 5). WHO and UNICEF must lead this process. As part of this improved consultative process, a global expert advisory group should be established to systematically review technical and implementation guidelines in light of new evidence and provide recommendations for agreement among all concerned partners. This will also inform how donor investments are made.

15. Whereas many interventions such as Stop TB, the Global Malaria Programme or the Expanded Programme on Immunization (EPI) are implemented as programmes, IMNCI has been promoted as a strategy. The resulting lack of specific and easily understood targets, budget lines and dedicated staff were noted as limitations by operational actors in countries. Global and country actors should clarify that implementation of a redesigned and repositioned IMNCI will follow a programme approach with a clear set of indicators, national and global targets and milestones to measure progress.

16. Current IMNCI guidelines and tools do not fully serve countries’ needs in terms of flexibility, adaptability and user-centred design. With changing epidemiology and technological advances, there is not, and need not be, a “one size fits all” solution. A thoughtful harmonization and redesign of existing guidelines for interventions and delivery strategies will lead to a flexible menu of options, with guidance on creating context-specific packages while maintaining the holistic approach needed to achieve child health goals. To reduce the burden on countries, there is a need to refine existing and develop additional options for improving health worker skills including self-directed learning, distance learning, in-service training and improved pre-service training.

17. IMNCI must be repositioned in its role to accelerate progress towards the SDGs, the “survive and thrive” goals of the Global Strategy, and other global initiatives. Activities to save newborn and child lives are best undertaken in harmony with those to address maternal health, as evidence shows that at least 50% of the impact on newborn survival derives from interventions delivered to the mother, and in concert with activities around immunization, nutrition, malaria, HIV, tuberculosis, and water and sanitation. New investments under the GFF and from other sources will be needed to support these efforts and achieve implementation at scale. The integration and harmonization of existing packages can be done without losing the powerful brand of IMNCI, which enjoys widespread recognition and popular support.

18. Whichever convergence strategy is adopted, children and families must be placed at the centre, supported by global and national advocacy that fully engages communities and public opinion. Proactive participation and engagement by users and beneficiaries will be key to its success. Policymakers cannot be reminded too frequently about the importance of investing in child health and nutrition as a bedrock for economic development.
The global-level expert group responsible for the Strategic Review identified five main problems impeding the achievement of child health goals and improved care for children. Based on these findings, we recommend specific solutions for each problem, selected using the criteria that the solution be specific, feasible and actionable. Additional details and process indicators associated with each recommendation are provided in Annex 1.
Problem 1  
**Fragmentation of global strategies for child survival and health undermines country programming and limits potential impact.**

**Recommendation 1a:** WHO and UNICEF immediately publish a joint statement repositioning IMNCI in the context of a package of care for the newborn and child spanning the home, community and health facilities, articulated within the framework of the Global Strategy, and have it endorsed by partners.

**Recommendation 1b:** All partners consolidate around a single leadership mechanism to coordinate implementation support for IMNCI at global, regional, and country levels, and work to harmonize activities with major funding structures including the GFF, the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM), and the Vaccine Alliance (GAVI).

**Recommendation 1c:** Child health stakeholders in countries advocate for high-level representation in country coordinating mechanisms to 1) maximize effective coordination of partners’ technical support and funding, 2) ensure integration of recommendations from the joint statement into national child health policies and 3) leverage investments in other sectors that can benefit child health.

Problem 2  
**The ambitious vision of the SDGs and universal access to quality health care will not be realized unless care for newborns and children is adequately funded and delivered to the most vulnerable and marginalized populations.**

**Recommendation 2a:** Global partners develop innovative strategies to identify poor, under-served populations; target programme activities spanning the home, community and health facilities; and support equity-based policy actions such as removal of user fees.

**Recommendation 2b:** Child health leaders in countries mobilize political support and financial resources at national and sub-national levels using arguments about the value of investing in children’s health, and use GFF investment cases to develop ambitious, costed child health plans and secure additional funding.

**Recommendation 2c:** WHO and UNICEF identify new, less resource-intensive approaches to training and supervision, such as self-directed learning, distance learning, clinical mentoring, and improved pre-service training, to reduce the financial burden on countries.

Problem 3  
**Evidence for the impact and effectiveness of interventions and delivery strategies is not systematically generated, captured and integrated into policy and programming.**

**Recommendation 3a:** WHO and UNICEF establish a global expert advisory group to systematically review evidence and provide state-of-the-art recommendations on clinical interventions, delivery mechanisms and determinants of newborn and child health, and gain consensus on this process from major donors and governments.

**Recommendation 3b:** Global partners establish an online hub with 1) a repository of guidelines, tools, and documentation and 2) discussion forums to promote systematic south-to-south collaboration on operations research and sharing of best practices.

**Recommendation 3c:** Partners and stakeholders at regional levels link to the global expert advisory group to provide technical support and help countries translate guidance into policy.
**Recommendation 3d**: Country authorities integrate quality improvement methods and implementation science into programming and facilitate shared learning among district teams to allow local solutions to emerge and be generalized.

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**Problem 4**

**Strategies and programmes for care of newborns and children are insufficiently tailored to countries’ epidemiological and health systems contexts, and practice tools do not always respond to end users’ needs.**

**Recommendation 4a**: WHO and UNICEF bring together existing guidance packages on care for newborn and child health into one set of flexible, adaptable, user-friendly tools, incorporating input from end users and design specialists.

**Recommendation 4b**: The global expert advisory group recommends additional strategies to build upon the efforts of diverse actors at country level, including the private sector, non-governmental organizations, professional associations, and other child health-influencing programmes and sectors, with a strong focus on community engagement.

**Recommendation 4c**: Governments and partners focus on combined interventions in districts to improve health workers skills, strengthen health systems, and strengthen community engagement and family practices.

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**Problem 5**

**There is lack of accountability to populations and mutual accountability among partners, and a corresponding need for clear targets and strong monitoring at all levels.**

**Recommendation 5a**: WHO and UNICEF immediately establish a joint leadership process to develop and adopt clear IMNCI programme targets at global, regional, national, and sub-national levels and coordinate progress tracking with accountability processes under the Every Woman Every Child (EWEC) movement and the Global Strategy.

**Recommendation 5b**: Under the umbrella of joint leadership and in coordination with the Health Data Collaborative, partners strengthen country capabilities to routinely monitor and evaluate progress in child health, with a focus on both coverage and quality of care, and promote and support specific, well-designed systems for review and follow up, using scorecards to track progress.

**Recommendation 5c**: Country authorities scale up monitoring initiatives alongside a strong push for community engagement, providing communities with readily interpretable data on the availability and quality of child health services.
Introduction

Over the past quarter century, child mortality has more than halved, dropping from 91 to 43 deaths per 1000 live births between 1990 and 2015 (1). Yet in 2015, an estimated 5.9 million children still died before reaching their fifth birthday, most from conditions that are readily preventable or treatable with proven, cost-effective interventions (1, 2) (Figure 1). When essential child health services of good quality are in place, deaths should be rare from preterm birth complications (16% of deaths) and intrapartum-related complications (11%), and even rarer from pneumonia (16%), diarrhoea (9%) and malaria (5%). Furthermore, 45% of deaths of children less than 5 years of age are associated with undernutrition, and more than 80% of newborn deaths are associated with low birthweight, showing a failure to nurture the child as well as to prevent and cure illness. The “unfinished agenda” of the MDGs remains with us. We, the global child health community, must do far better to assist countries to deliver the best possible strategies to save lives and ensure each child’s healthy growth and development.

In 1995, WHO and UNICEF introduced Integrated Management of Childhood Illness (IMCI) as a premier strategy to provide prevention, treatment and care for sick children and improve child survival in countries with more than 40 deaths per 1000 live births. Care for sick newborns under one week of age was added in 2003, after which many countries renamed it IMNCI. Over 100 countries have adopted IMNCI and implemented, with varying degrees of success, its three components: 1) improving health worker skills, 2) strengthening health systems, and 3) improving family and community practices. Although it is hard to measure cause and effect, a recent Cochrane review and other evidence suggest that IMNCI has contributed to reductions in child mortality over the MDG era in countries where it was implemented (3).

As deaths among older children have decreased, neonatal conditions now account for 45% of deaths in children under 5 years of age (Figure 1). Policymakers face other challenges:

Figure 1 Causes of death among neonates and children under five years of age globally

![Figure 1](image1.png)

Source: WHO Global Health Observatory

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3 We use the term IMNCI for consistency throughout this document, recognizing that newborn care was added to the strategy at a later date.
the double burden of malnutrition (undernutrition and overweight), environmental dangers to child health, rising numbers of institutional deliveries with concerns about quality of care, increasing recognition of the importance of community engagement, emerging new technologies, greater concern about inequalities in access to care and outcomes for child health, declining donor interest in IMNCI, and fragmentation in global initiatives. Innovations in vaccines, therapies and communication strategies have emerged and the scientific evidence on the best clinical interventions and delivery strategies has expanded. And while new technologies such as cell phones have transformed the way we live, their full potential to transform our health strategies and systems has not yet been realized.

Over the next 20 years, congenital malformations, non-communicable diseases and injuries will rise in importance as infectious diseases decline (2), while the pace of technical and technological change will likely accelerate. The tension that emerged after Alma-Ata between selective versus comprehensive approaches to primary health care (PHC), and the questions these approaches raise around human rights and programme expediency, are yet to be settled (4, 5). The SDGs challenge us to reduce under-five mortality to 25 or less per 1000 live births and newborn mortality to 12 or less by 2030, and countries have committed to achieving these targets under the U.N Secretary-General’s Global Strategy for Women’s, Children’s and Adolescents’ Health (2016–2030) (6). Can we mobilize existing technical and financial capacities to achieve a “Grand Convergence within a generation” (7)? Can we revitalize IMNCI in its twentieth year to respond to current and future challenges and ensure all children fulfil their human right to survive and thrive, in societies transformed to promote health at every level?

The present Strategic Review, supported by the Bill & Melinda Gates Foundation (BMGF), aligns lessons learnt from implementing IMNCI with new thinking on effective interventions and how to deliver them to children. The Review brought together an independent expert advisory group with study coordinators at WHO and UNICEF.

Methods and data

Review authors drew upon 34 unique sources of data, 32 of which were specifically commissioned, aiming to provide a comprehensive view of 1) lessons from IMNCI implementation and 2) the state of the art in delivering child health services. Taken together, this data set represents contributions from over 90 countries, hundreds of experts in child health and related areas, and findings from a comprehensive review of the published and unpublished literature, as well as in-depth looks at implementation and innovations from countries around the world. The sources of data can be summarized as follows:

1. **global survey** of IMNCI implementation, with detailed responses from 90 countries;  
   
   Ref. IMNCI survey

2. **desk reviews** on topic areas related to child health, collectively drawing upon hundreds of expert opinions and publications;  
   
   Ref. DR-

3. **global key informant interview report**, based on interviews with 20 high-level informants in child health and related areas;  
   
   Ref. GKI report

4. **country assessments** providing an in-depth look at IMNCI and child health programme implementation, including three in Africa, four in Asia, one in Europe and one in the Middle East;  
   
   Ref. CA-
8 vignettes of successful child health interventions from countries around the world;

3 quantitative analyses, drawing on Demographic and Health Surveys (DHS), geo-coded data and data from the IMNCI survey.

Data are cited throughout the Review using an abbreviation of the type of data source followed by the author’s last name for desk reviews and quantitative analyses (for example, DR-Labadie indicates a desk review written by G. Labadie), or the country name for country assessments and vignettes (for example, V-Peru refers to a vignette on an experience from Peru). Data were analysed by members of the independent expert advisory group and study coordinators through semi-monthly teleconferences, structured analysis to answer pre-defined research questions, and a three-day workshop to achieve consensus on key themes.

The findings of the Strategic Review are presented in three parts. First, we share lessons learnt from 20 years of IMNCI implementation and report progress to build on. Next, we propose options for improving child health strategies in countries, focusing on problems and solutions at the levels of health systems, facilities and communities. Third, we present options for repositioning child health within the global health and development agenda and discuss how to generate sustainable investment. These three parts are followed by a set of recommendations for strategic action that we believe can drive progress in ending preventable newborn and child mortality and ensuring children’s healthy growth and development.

Further information on all data sources is provided in Annex 2. Annexes 3-7 present a digest of selected evidence extracted from the extensive data sources.

This study was deemed exempt from ethical review by the WHO Ethics Review Committee.
Towards a Grand Convergence for Child Survival and Health | November 2016 | 11

IMNCI implementation twenty years on

IMNCI was developed to increase coverage of evidence-based, high-impact interventions, taking an integrated approach to promotion, prevention, and case management.

IMCI was launched in 1997 as a set of integrated guidelines for managing sick children seen in first-level health facilities, with interventions targeting countries with infant mortality of 40 or more per 1000 live births. These guidelines focused on the main causes of child mortality (pneumonia, diarrhoea, malaria where endemic, measles and undernutrition). Strongly evidence-based (8), the integrated guidelines and training tools were adapted based on local epidemiology to include conditions such as other causes of fever, HIV and tuberculosis (9) (DR-Kudlova). Adaptations were also conducted to take into account health system characteristics (including emergency contexts) and culture, such as using local terms and local foods for infant and young child feeding (IMNCI survey, V-Sudan). Care for the newborn (0-7 days) was added in 2003, and the strategy became known in many places as IMNCI.

At its inception IMNCI had three components: 1) improving health worker skills, 2) strengthening health systems and 3) improving family and community practices. In 1998 WHO and UNICEF developed further guidance on “Family and Community Practices” (10), which evolved to become Community IMCI or C-IMCI, meant to empower communities and households to adopt healthy and safe practices to protect the health of children under 5 years of age (11). In 2011 WHO and UNICEF further developed Caring for newborns and children in the community, guidance that includes home visits for newborn care and for children’s healthy growth and development, and integrated community case management (iCCM) by community health workers (CHWs). Intended as a community-based adaptation and extension of front-line care, iCCM guidelines recommend that countries train, supply, and supervise CHWs to diagnose and treat diarrhoea, malaria, and pneumonia among children 2-59 months, and to detect severe acute malnutrition in children 6-59 months, in communities where access to facility-based health services is poor (12, 13).

Over time, IMNCI has expanded to include a range of interventions and tools addressing health systems support for programme management and health worker practice for newborn and child health at household, community, facility and referral levels (DR-Wolfheim).

In The Words of Countries

**INDIA**
“IMNCI is a comprehensive, scientific, evidence-based package that enables one to approach a child holistically by every category of health care provider (doctors, nurses, frontline workers).”

**MYANMAR**
“IMNCI is very relevant for the country. It is a complete holistic module with child health, development, newborn, etc. Nothing needs to be taken out.”

**NIGERIA**
“Even though I’m [retired], I want IMCI to continue for the sake of children. Because IMCI is a strategy that really can help children.”
There has been near universal adoption of the IMNCI strategy by target countries, with widespread reported implementation of IMNCI and growing implementation of iCCM.

IMNCI is part of the national child health strategy in 90 of the 97 low- and middle-income countries responding to the IMNCI survey, and is usually the primary strategy for child health (IMNCI survey). Countries regularly update IMNCI materials based on global-level recommendations: 70% of countries report having updated their chart booklets since 2014 and half have updated guidelines following the 2013 revision of the Pocket book (IMNCI survey). Countries also reported widespread implementation of IMNCI: 58 of 82 countries (71%) said at least three-quarters of districts were implementing IMNCI, with the highest levels reported in the WHO Regions of Africa, the Americas, the Eastern Mediterranean and Europe\(^4\) (Figure 2); however data concerning the quality of implementation is limited.

Countries report increasing implementation of iCCM, which is included under the rubric of IMNCI in this Review. This approach has gained momentum since its introduction some five years ago, with 23 countries (26%) saying that at least three quarters of districts were implementing. Most implementing countries are in Africa (nine countries), the Americas (six countries) and South-East Asia (four countries) (IMNCI survey). These findings are supported by other surveys of iCCM, which have highlighted increasing policy adoption and implementation, particularly in Africa and South-East Asia (14). The survey suggests that countries with higher incomes (and lower child mortality rates) have higher rates of iCCM implementation.

**However, countries were rarely able to scale up IMNCI, with uneven implementation between and within countries, and insufficient attention to the second and third components.**

The difficulties of scaling up IMNCI as a comprehensive strategy have been known at least since the days of the Multi-Country Evaluation in the early 2000s, where limitations in implementing all three components in a balanced way were observed in all countries (15).

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\(^4\) Results from Europe to be interpreted with caution given the small number of countries responding.
Similarly, the 2003 Analytic Review found varied implementation of IMNCI’s three components, with most efforts focused on improving health worker skills and not on the systems and community components (16). The present Review finds similar results and provides additional detail (Table 1):

1. **Improving health worker skills**: Countries focused their efforts on in-service training, which many shortened from the original 11 days to six in response to perceived costs in terms of time and resources (17). Uptake of the IMCI computerized adaptation and training tool (ICATT), which became available in 2006, was limited, and distance learning materials became available only in 2013 (IMNCI survey). Pre-service training was deemed a lesser priority (18), and IMNCI was often incorporated into curricula in less effective ways, for example as a block at the end of paediatric training, instead of as the primary strategy for case management of children (CA-Ethiopia, CA-Nigeria). Exceptionally, in the WHO Eastern Mediterranean region, countries integrated IMNCI into pre-service training using a systematic approach with sequential steps, monitoring progress with well-defined indicators and tools to support each step. As a result, more than 50 medical schools and 100 nursing institutions adopted pre-service training for IMNCI, which was also introduced into intern training to address the two- to four-year lapse between teaching rounds and start of service (V-EMRO).

2. **Strengthening health systems**: Poorly functioning health systems were identified as a major constraint to implementing IMNCI at the time of the Multi-Country Evaluation; this is still true today. Although uptake of WHO guidance for various areas of health systems strengthening was fairly good (Table 1), health systems were not able to support rapid scaling up of IMNCI. A recent, comprehensive UNICEF review of IMNCI and iCCM found that numerous health systems bottlenecks meant strategies were not implemented “in a way that would show demonstrable impact” (DR-Rudan). Specific weaknesses included staff turnover, lack of supportive supervision and lack of logistics support (IMNCI survey, CAs). IMNCI health facility survey data from implementing countries show a highly mixed picture in terms of the potential to offer reliable, high-quality care. The limited emphasis on results-based planning and management was also identified as an impediment to successful implementation (GKI report).

3. **Improving family and community practices**: This was by far the least-implemented component of IMNCI. After initial enthusiasm at the 1997 Santo Domingo conference where IMNCI was launched (19), and the implementation framework for C-IMCI put forth by the CORE group in 2001 (11), some progress was made in the early 2000s, as reported in many country case studies. However, the community component remained poorly defined, and while many countries reported implementing activities to promote key family practices (Figure 3), country assessments showed activities were often scattered, though some likely fell under the aegis of programmes other than IMNCI. C-IMCI was often supported by non-governmental organizations (NGOs) in an isolated fashion: “There has to be a linkage between facilities and communities ... but there is no such linkage, rather there’s a vertical programme concerning community IMCI” (CA-Nigeria).

In 2010 WHO and UNICEF released *Caring for newborns and children in the community*, a unified set of tools to help CHWs support practices for newborn health and children’s healthy growth and development through home visits and other opportunities, and manage sick children in the community. A rapid increase in adoption of related policies was observed in high-burden countries (20). A planning guide was added in 2013, yet the need to institutionalize the delivery cadre (usually CHWs) remained an issue: “Other countries should learn, they have to institutionalize it, they shouldn’t depend on volunteers” (CA-Ethiopia) (21). In 2014, based on strong evidence of large reductions in newborn mortality in poor rural areas, WHO released a recommendation on community mobilization through
facilitated participatory learning and action (PLA) cycles with women’s groups (22), but few countries have incorporated this into national policy.

**Figure 3** Delivery mechanisms used to promote key family practices
(Source: IMNCI survey)
**Table 1**  
**Summary of IMNCI implementation by component**

<table>
<thead>
<tr>
<th>Component</th>
<th>Summary</th>
<th>Primary funder</th>
<th>Key data points</th>
</tr>
</thead>
</table>
| 1. Improving health worker skills               | Most-implemented component, but scaling up limited by cost.             | Bilateral agencies for IMNCI, multilateral agencies for iCCM                    | • Most-implemented component, however only half of countries had initiated IMNCI training in > 75% of districts (57% of countries in the African Region, 71% in the Americas) (IMNCI survey).  
• Close to half of countries (41%) reduced length of in-service training or used ICATT/distance learning to cope with the high cost (IMNCI survey, CAs).  
• IMNCI was frequently incorporated into pre-service curricula but rarely as the primary mode of case management (CA- Bangladesh, Ethiopia, Kazakhstan and Nigeria).  
• Lack of follow-up and supervision limited effectiveness of training (GKI report, CA-Ethiopia, India and Nigeria).  
• “Training without supervision is useless” (GKI report). |
| 2. Strengthening health systems                 | Moderately high use of IMNCI tools, however weak health systems hindered overall implementation. | Government is primary funder for IMNCI and iCCM                               | • 53 countries (69%) had conducted a programme review since 2010; only 32 (43%) use planning tools (OneHealth, Marginal Budgeting for Bottlenecks).  
• Two-thirds of countries had a paediatric quality of care (QoC) programme for facilities, fewer at referral hospitals.  
• Although 60 countries (67%) reported that HMIS included IMNCI indicators, only 29 (33%) had a comprehensive monitoring and evaluation plan for IMNCI, resulting in dependence on large-scale population-based surveys for intervention coverage data.  
• “Saying IMNCI is going to ‘do’ health systems strengthening is not realistic or effective” (GKI report). |
| 3. Improving family and community practices     | Scaling up hindered by unclear definition and lack of delivery platforms. | Often multilateral agencies or NGOs                                           | • 77 countries (87%) reported activities to promote key family practices through home visits, social mobilization or community groups.  
• 24 countries in the WHO African Region and 10 in Asia (WHO Western Pacific and South-East Asia regions) reported home visits for newborn care.  
• Country assessments indicate there was often a push for key family practices shortly after introducing IMNCI in the early 2000s, but no long-term gains in programming.  
• Few countries fully implemented this component, though its importance was widely recognized (IMNCI survey, CAs).  
• Link between communities and facilities is often sub-optimal (CA-Nepal, Nigeria).  
• Limited evidence of coordinated planning and implementation of home-based and community care for newborns and children. |

GREEN=full implementation  YELLOW=partial implementation  RED=limited implementation / urgent action needed

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5 Summarized from the IMNCI survey
IMNCI’s distillation of case management of the major killers of children into a single algorithm and guideline was highly appreciated by service providers and policy-makers for its simplicity and comprehensiveness, and for the confidence they gained in caring for children.

Informants at every level lauded IMNCI’s integrated approach, simplicity, and methodical algorithm (GKI report, CAs). As one global expert said, “IMNCI is remarkable for its simplicity – a lot of brilliance went behind what looks so simple”. Another said, “Its staying power is strong and it is still the way to screen and treat children and the best integrated approach we have” (GKI report). Across countries, IMNCI’s scientific, integrated approach was used by policy-makers to refocus child health policies and programmes on evidence-based, high-impact interventions and delivery strategies (DR-Rudan). In some contexts, IMNCI helped countries focus on primary health care and went beyond being just an approach to training (23).

Interviews with providers similarly showed a sincere appreciation for IMNCI. Typically, in Myanmar, comments such as “I felt more confident in giving advice to mothers”, “I was happy to give the right treatment” and “I have made a difference” were frequent amongst health workers trained in IMNCI (CA-Myanmar). Despite this widespread appreciation, health workers did sometimes complain that IMNCI case management was too time-consuming, and it should be noted that providers were not always adequately supported with follow-up and supervision to correctly practice IMNCI. Immediate post-training assessments show that IMNCI trained health workers do not perform correctly about one third of the time (17).

**Evaluations of IMNCI have shown benefits on quality of care and efficiency. Impact on child mortality was found when facility and community-level interventions were implemented together.**

The Multi-Country Evaluation and related studies demonstrated that IMNCI could effectively improve quality of care for children and reduce child mortality when the three components were introduced and implemented concurrently and adequately (15). In settings where this could not be achieved, IMNCI was still found to improve quality of care, often at a reduced cost (V- Kyrgyzstan) (24). In Bangladesh, IMNCI implementation led to a non-statistically significant reduction in child mortality (25). Notably, study sites that demonstrated effectiveness focused on a few implementation districts, which received varying levels of

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Health workers trained in IMNCI in 2008-10 in Bihar (India), with their IMNCI booklets
external support. Additionally, studies demonstrate that health worker performance can be improved by IMNCI training (26) and that household practices such as infant feeding can be improved when there is balanced implementation of IMNCI components (27, 28).

In country interviews, stakeholders often expressed certainty that IMNCI had contributed to reductions in child mortality in their country. A 2016 Cochrane review of IMNCI including 12 articles from four studies (two randomized controlled trials and two controlled pre-post trials in Bangladesh, India and the United Republic of Tanzania) found that IMNCI had had a significant, moderately positive effect (15%) on infant and child mortality compared to no IMNCI, where similar interventions were delivered in a less organized manner (Figure 4) (3). It should be noted that these studies took place in settings where facility and community-level interventions were both included. However, the Cochrane review found little or no effect on stunting/wasting or on coverage of key IMNCI deliverables. It was unable to determine the effect on quality of care, even though improvements in the quality of case management were found in almost all studies. Several studies with pre-post designs have shown a mortality effect, as in Benin and Egypt (23, 29), but this was not found in comparative studies (DR-Labadie). Interpretation of these findings must take into account the difficulty of measuring the effects of a complex, systems-wide strategy that often was not fully implemented: “How could we evaluate something that never got implemented?” (CA-India). The question of impact is also linked to IMNCI’s positioning alongside other child health strategies; it should be noted that the Cochrane review excluded studies where IMNCI was accompanied by another intervention.

![Figure 4](image)

**Figure 4** Rate Ratio for IMNCI vs. no IMNCI, infant and child mortality (Source: Cochrane review)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>log [Rate Ratio] (SE)</th>
<th>Rate Ratio IV,Fixed,95% CI</th>
<th>Weight</th>
<th>Rate Ratio IV,Fixed,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Child mortality</td>
<td>-0.1458704 (0.1229592)</td>
<td>0.87 [0.68, 1.10]</td>
<td>14.4%</td>
<td>0.87 [0.68, 1.10]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>14.4%</td>
<td>0.87 [0.68, 1.10]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 1.17 (P = 0.24)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Infant mortality</td>
<td>-0.1625 (0.0504)</td>
<td>0.85 [0.77, 0.94]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>85.6%</td>
<td>0.85 [0.77, 0.94]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: not applicable</td>
<td>Test for overall effect: Z = 3.22 (P = 0.0013)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>100.0%</td>
<td>0.85 [0.78, 0.93]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterogeneity: Chi² = 0.02, df = 1 (P = 0.99), I² = 0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test for subgroup differences: Chi² = 0.02, df = 1 (P = 0.89), I² = 0.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With respect to iCCM, very few settings have been able to implement at scale with enough intensity and quality to achieve mortality and coverage impact. Reviews from Burkina Faso, Ethiopia and Malawi found that the objectives of increasing care-seeking for childhood illness or improving coverage of effective treatment interventions at the population level were not achieved (30). While uptake of services did increase in Uganda (31) and Zambia (32), insufficient utilization was found to limit impact in many contexts (33, 34). Nonetheless, in some settings important changes in health systems have been achieved, and analysts have urged not to “throw the baby out with the bathwater” based on disappointing first results (21). Indeed it appears clear that both IMNCI and iCCM have contributed to child health gains in populations with a ready delivery platform and initial lower levels of access to health facilities, as in Malawi and Niger where estimates made using the Lives Saved Tool (LiST) suggest that treatment for diarrhoea, pneumonia, and malaria may have accounted for about one quarter of recent reductions in mortality rates (35-37).
Given that IMNCI is a systems-wide approach, implemented to varying degrees, it is difficult to judge the cost or cost-effectiveness of the strategy. IMNCI was not associated with higher costs than routine care for child health in a study in four districts in the United Republic of Tanzania (38). In Brazil in 2001, there was no statistically significant difference in the cost of care per under-5 child in IMNCI municipalities (US$ 95) relative to comparison municipalities (US$ 98) (39). Moreover, IMNCI training had no independent effect on unit costs at primary facilities, the largest component in overall costs per child (79%). In India, IMNCI was found to be very cost-effective (40), though cost-effectiveness is strongly influenced by case load (and therefore utilization) (39) and to a lesser extent by health worker attrition (41). IMNCI training was also found to promote more rational use of medicines in multiple health facility surveys; this motivated IMNCI implementation in countries in Europe.

The lack of sustainable funding agreed upon by countries and donors, coupled with fragmentation of actors at global level, created uneven implementation and a loss of built-in synergy. In many countries IMNCI “died.”

The sustained, coordinated investment needed for scaling up IMNCI did not occur in most countries. Survey respondents frequently mentioned insufficient budget for training (74 countries), cost of programme/sustainability (55 countries), and non-availability of a dedicated budget line (53 countries) as barriers to implementation (IMNCI survey) (42). Similarly, a survey of iCCM in 42 countries in sub-Saharan Africa revealed issues of financing and sustainability, with development partners providing most funding and only nine countries having a separate budget line for iCCM (14). As reported in most country assessments, IMNCI (and iCCM) started and remained donor-driven initiatives that were perennially at a loss for funds, as donors often committed only to initial funding and countries rarely picked up thereafter. For example in Kenya, international actors promoted iCCM but did not commit to funding scale-up (43). Lack of government ownership and sustainable funding meant that IMNCI “died,” a word that arose in several country assessments.

Coordination of activities at global level was problematic, due in part to the global community’s lack of experience in managing and implementing integrated approaches, compared to other health issues with their own funding streams such as HIV, malaria, TB and immunization (GKI report, DR-Taylor). Beginning in the early 2000s, a multiplicity of child health-related initiatives sprung up, often with separate coordination and funding mechanisms, ultimately impeding collaboration (Figure 5). In many countries, donor-influenced programming focused on single-issue, short-term solutions rather than a more holistic vision of improving child health. One global respondent suggested that IMNCI’s lack of “sex appeal” compared to single-issue programmes may have negatively influenced funding (GKI report), with more resources going to vertical, siloed approaches (DR-Taylor). One global expert pointed towards funding mechanisms as setting the wrong incentives: “there was a desire to see results in the short run and not after a decade” (GKI report).

IMNCI’s three components were often planned and implemented independently of one another: bilateral agencies mainly supported health worker training, governments funded health systems strengthening, and donors supported NGOs and UNICEF to focus on C-IMCI and/or iCCM (IMNCI survey, GKI report, CAs). Even though country stakeholders frequently pointed out that IMNCI is a “stool with three legs”, in most countries work on the three components appears to have been linked tenuously at best: “The facility component was going at it alone and left behind health systems strengthening and the community component” (GKI report). In Peru, for example, poor coordination between where and when facility- and community-based activities were introduced resulted in a loss of synergy and effective functioning (44). In the words of one global key informant, “The [global community’s] failure to coordinate the different components [of IMNCI] was inexcusable” (GKI report).
In The Words of Countries

INDIA

Respondents "were of the opinion that an initial hand-holding was done by UNICEF to promote trainings and IMNCI was therefore looked upon as a partner-driven training-focused initiative."

Figure 5

Key events and initiatives for child health
(Source: DR-Taylor)

- MDGs launched (2000)
- Polynomial Eradication Initiative (1998)
- Roll Back Malaria (1998)
- PMNCH launched (2005)
- New focus on Child Survival (fear of MDG4 failure)
- Every Woman Every Child (2010)
- Global Health Initiative (2009)
- World Health Assembly (call for nutrition) (2012)
- ENAP (2014)
- GAVI launched (1999)
- President's Malaria Initiative (2005)
- Muskoka initiative (2010)
- A Promise Renewed (2012)
- MDG Health Alliance (2010)
- GAPPD (2013)
- EPCMD (2014)
- GEF launched (2015)
- SDGs launched (2015)

2000
- UNAIDS (1996)
- PEPFAR launched (2003)
- Paris Declaration on Aid Effectiveness (2005)

2005
- Countdown to 2015 (2005)

2010
- Global Health Initiative (2009)
- World Health Assembly (call for nutrition) (2012)
- MDG Health Alliance (2010)
- A Promise Renewed (2012)
- EPCMD (2014)

2015
- GEF launched (2015)
- SDGs launched (2015)
Given such fragmentation, only countries with strong government leadership and political commitment were able to engage in the unified, country-led planning necessary to support scaling up.

Actors at global and country levels stressed the need for a strong hand at the ministry of health (MoH) to oversee the work of different donors, coordinate activities and engage in country-led planning and implementation. Whether or not scaling-up occurs “really depends on who is at the helm of child health” – and whether this person benefitted from political commitment to child health more broadly (GKI report). A study nonetheless showed that in six countries in sub-Saharan Africa, iCCM policies evolved in an ad hoc fashion with little or no mobilization of political leadership (45). In countries where IMNCI implementation was more widespread, political commitment supported efforts to institutionalize the strategy (46), as in the United Republic of Tanzania where the TEHIP6 pilot study was used to successfully lobby for adoption of IMNCI as national policy (47).

Given the lack of global coordination and leadership, it is not surprising that inadequate country-led planning and implementation posed major limits on IMNCI scale-up and impact (CAs). For both IMNCI and iCCM, implementation did not always reflect current best practice for managing effective RMNCAH programmes (21). This is reflected in the low number of countries with target-setting, monitoring of quality and coverage, and supervisory mechanisms built into their child health programmes (48). Donor-driven and sometimes rushed implementation led to mistakes, as in the selection of inappropriate CHW cadres for iCCM in Burkina Faso (49). Furthermore, country efforts to plan and implement IMNCI were handicapped by sub-optimal support from global level, with updates released according to no set schedule, and tools sometimes cumbersome to adapt (CAs). There was also lack of clarity about whether IMNCI was a strategy, as global-level actors understood it, or a programme with the essential attributes of results-based planning and management, which may have been easier to operationalize at country level.

Difficulties in planning were also evident at district level, where operational planning for IMNCI needed to take place. Many country assessments reported a lack of ownership and involvement of district authorities (CA-Ethiopia, CA-Nigeria), even though IMNCI “should be a programme of district managers” (CA-Bangladesh). In countries where implementation was stronger, empowered district-level management was a key factor for success, as in the TEHIP project where decentralization gave districts autonomy over funds, enabling them to experiment with IMNCI (50). In Kazakhstan, successful scaling up was achieved via phased planning with expansion to oblast (province) level, applying lessons learned along the way and guided by a National IMNCI Centre (CA-Kazakhstan).

### In The Words of Countries

**What is needed for successful scale-up of child health interventions?**

**NIGERIA**

“Manpower, materials, and money” alongside an explicit prioritization of child health.

**ETHIOPIA**

1) strong government commitment and leadership;
2) coordination of partners directed by government leaders;
3) resources to implement;
4) a ready platform for implementation.

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6 Tanzania Essential Health Interventions Project
In summary, IMNCI was better implemented when:

a) the health system context was favourable. Indeed IMNCI “turned out to be a good indicator that health systems were not working well in most contexts” (GKI report). Implementation occurred where basic health systems building blocks were in place (especially as this concerns service delivery, access to essential medicines, and financing), and where country delivery mechanisms were in sync with global guidance (for example, the need for a functioning and supported CHW cadre for iCCM).

b) a systematic approach to planning and implementation was used. In the countries where IMNCI was most successfully implemented, the ministry of health engaged in systematic planning and directed partners how to implement (DR-Rudan, V-Egypt, CA-Ethiopia). District-level management teams were also provided the resources and authority to operationalize national strategies (DR-Rudan) (47).

c) political commitment allowed for institutionalization. Where child health authorities were given the resources they needed and the support of political authorities, and efforts were informed by focused planning, monitoring and review, scaling up of IMNCI could be achieved, with reported positive results on child health and health systems (V-Egypt, CA-Kazakhstan) (23).

Box 1  Egypt: when IMNCI reaches scale

Systematic planning and implementation was essential to IMNCI’s success in Egypt. Egypt was one of the first countries to adopt IMNCI in 1996 and achieved close to national coverage, where implementation was associated with a doubling in the annual rate of reduction of under-5 mortality (3.3% before compared with 6.3% after IMNCI implementation, p<0.0001). This accelerated reduction in under-5 deaths was enabled by improved essential health systems in the country, strong political commitment and institutionalization of IMNCI as part of the national Basic Benefit Package. Government provided a dedicated budget line and strong programme structure staff at national, governorate and district levels, with coordinated support from partners. The systematic approach to planning both at the national and subnational level was key to scale-up and to monitoring and evaluation of IMNCI (Rakha 2013; V-Egypt).

The Egyptian experience suggests that commitment, planning and institutionalization are essential to reaping the full benefits of IMNCI, however sustained strong programme management is required to maintain system-wide improvements.

The absence of an explicit emphasis on equity, community engagement and inter-sectoral approaches to target social determinants of health were blind spots that limited IMNCI’s contribution to reducing under-5 mortality.

IMNCI is a potentially equitable strategy for caring for children (35), and a quantitative analysis found that implementation was positively associated with equitable outcomes in care-seeking (Q-Victora). Across countries, strong implementation of IMNCI and iCCM was associated with faster increases in care-seeking for pneumonia and for any disease (Figure 6). In both cases, the differences in the trends are much more marked for the poorest quintiles (“Q1”, in beige circles) than for the richest ones (“Q5”, in purple circles). However, increases in care-seeking were still sub-optimal (1.5% average annual change for countries with strong IMNCI/iCCM implementation versus 0.9% in countries with weak implementation), particularly given that baseline levels were so low.

There were several missed opportunities in the design and roll-out of IMNCI that limited its ability to address inequities. IMNCI training materials were developed first, and while they were accompanied with guidance for a systematic process of early implementation and scale-up, explicit pro-equity criteria were not stated, leading to convenience expansion in countries. As a consequence, areas of greatest need were not always prioritized (51). In Brazil, for example, IMNCI was not well
implemented in municipalities with low per capita income and small populations, or which were far from the state capital (51). In Yemen, authorities reported that poor planning and rushed implementation during the expansion phase resulted in a failure to target areas where mortality was higher and intervention coverage was lower (CA-Yemen).

Finally, community engagement and inter-sectoral linkages were often neglected in implementation, despite clear evidence that such approaches can contribute significantly to reducing under-5 deaths (DR-Prost) (52, 53). Said one global expert, “While we’ve paid lip service [to community engagement] we haven’t addressed it … beyond distributing bed nets” (GKI report). When it comes to inter-sectoral approaches to addressing social determinants of health, evidence from case studies under the Countdown to 2015 initiative demonstrates a clear pathway to reduced under-5 mortality. The two highest performing countries over the MDG era, China and Peru, relied heavily on gains in water and sanitation, education of mothers, and poverty reduction; the Peru study found that moving away from vertical programmes and an exclusive emphasis on maternal and child health contributed to reducing under-5 deaths (54, 55).
Looking forward: options for countries

**Government ownership and country-led planning are the only ways forward but require strong country leaders and disciplined partners to agree on sustainable financing.**

Lack of government-led planning and ownership was a primary barrier to scaling up IMNCI and related child health strategies; donors taking the lead in policy and implementation was often both a cause and an effect (CA-Bangladesh, India, Myanmar, Nepal and Nigeria). In Nigeria, a lack of commitment and funding by Nigerian government officials meant that IMNCI remained both “donor-driven” and programmatically anaemic. In India, since the government was initially not very supportive of IMNCI “it remained as a UNICEF strategy instead of a government strategy” (CA-India). In Bangladesh, informants claimed the government should take the driver’s seat when it comes to implementing global health programmes: “They should not depend upon WHO or UNICEF or donors for doing this” (CA-Bangladesh).

Despite promises to the contrary under the 2005 Paris Declaration for Aid Effectiveness, when country leadership was not strong enough to channel partners’ support to country plans, donors turned to prioritizing their own agendas. This sometimes meant taking actions that undermined principles of rational implementation. Countries’ frustration was palpable:

“[Partners] know it, but they don’t do it. Trust the country. They think they know much better than the country – which is unlikely.” (CA-Ethiopia)

In some instances partners’ efforts to be helpful can backfire: “Donors try to influence policy without building capacity to face challenges coming out while implementing those policies” (CA-Bangladesh). Donors may also contribute to the persistence of vertical programming. One example is a Clinton Health Access Initiative “community activation” programme for treatment of diarrhoea in Nigeria that omitted other common childhood conditions (CA-Nigeria). Informants at global and country levels alike said the role of global partners should be to support, not prescribe. Each country needs to understand its own strengths and to develop and implement functioning and coordinated national health plans (GKI report).

Government ownership will depend on political commitment and ministerial leadership, with coordinated partners aligned behind government plans, all of which were found in countries that made greater progress towards scaling-up. In Kazakhstan, government political support and leadership from a National IMNCI Centre enabled stakeholders to effectively harness technical assistance from WHO, UNICEF and USAID (CA-Kazakhstan). In Egypt, IMNCI succeeded largely thanks to a high level of political commitment, a well-staffed national IMNCI Directorate with coordinators in all governorates, and a clear division of tasks among partners (V-Egypt). In Ethiopia, a strong ministry and an effective partnership between government and donors ensured successful planning and rational implementation across regions (CA-Ethiopia) (56). Similarly in Malawi, the Minister of Health successfully coordinated partners to ensure alignment with country goals and objectives (57). In cases where leadership is weaker, the global child health community will be challenged to find a balance between efforts to encourage the development of stronger ownership and national health systems, and faster progress towards achieving health targets, while adhering to the principles of unified technical and financial support and action (DR-Taylor).

Autonomous ministerial planning and effective coordination of partners will usually require an adequate in-country budget line for child health programming, though it is unclear the extent to which ministries of finance have been involved in relevant budgeting discussions. Effective basket funding, with government actors setting priorities and directing resources toward them, appears uncommon, yet lack of country-controlled funds severely limits the ministry of health’s ability to deal with fractious partners, as in the Democratic Republic of the Congo, where country actors said they were put in the position of having to accept aid without being truly able to negotiate (CA-DRC). Few countries in sub-Saharan Africa have a line item for ICCM in their domestic budgets, even for aspects normally covered by governments such as salaries and commodities, and only a minority of countries report plans to increase...
the proportion of funding from domestic resources (14). In countries that have been hesitant about proceeding with iCCM, concerns about sustainable funding were foremost in policymakers’ minds, whereas those that moved forward quickly identified funding, albeit frequently external funding, to support their initiatives (45). Questions about domestic financing are linked to conversations about universal health coverage and social protection, and further scaling up will require understanding of how political accountability can be harnessed to sustain policies and programmes (58).

In The Words of Countries

NIGERIA

“Partners have to support [government] to call meetings and government doesn’t have capacity to coordinate ... You have to have the financial muscle, the budget behind you.”

Implementation must explicitly prioritize reaching poor, under-served populations using equity and mapping analyses to target service provision and ensure free services for children at point of care.

The 2015 Countdown report found that equity of coverage of child health interventions is improving in both absolute and relative terms, yet in virtually every Countdown country,7 systematic pro-rich inequalities were found on nearly every coverage indicator. The largest gaps concern interventions that require 24-hour access to health facilities (20). Studies modelling the impact of equity-focused approaches find that reducing inequities in effective intervention coverage, health outcomes, and out-of-pocket spending could result in sharp decreases in child mortality and stunting compared to non-targeted approaches (59, 60). Analyses with EQUIST, a tool to evaluate the cost-effectiveness of approaches to scaling up health interventions, find that equity-promoting approaches are always more cost-effective in terms of cost per life saved, saving between $1.10 per life in Bangladesh to $59.92 in Peru compared to the next most costly approach (61). In Countdown countries, the most rapid rise in coverage came about when countries effectively reached the poorest families (20). A series of trials has also shown that community engagement through participatory women’s groups had a much larger effect on newborn mortality rates in the most marginalized groups (DR-Prost).

A number of programmatic tools are available to improve equity-informed planning in countries. GPS and GIS8 technology can be used to identify areas of high mortality, low coverage and sub-optimal distribution of human resources, and can help direct partners and resources to areas of need. For example, GIS mappings of high-mortality areas in the Democratic Republic of the Congo and in Ethiopia identify clear areas of concern, and other areas that are performing well (Figure 7) (Q-Root); these analyses can be compared to mappings of health facilities and health worker distributions. While such mappings are not necessarily able to define socio-economic inequities within a single geographic area, policy-makers may find it difficult to target interventions strictly by wealth quintile (61) and thus prefer geographic targeting. GIS applications can also be used to verify implementation, as in in South Sudan, where analyses showed that over three quarters of community-based distributors (CBD) were deployed within a five-kilometre radius of a health facility or another CBD, contrary to programme planning and design (62).

7 Countdown focused on the 74 countries representing the greatest burden of maternal and child mortality.
8 GPS: Global positioning system. GIS: Geographic information system
Another important strategy used to promote equitable outcomes is reducing or eliminating user fees. This strategy has been widely shown to increase use of curative services and facility-based deliveries, with the greatest increases among the poorest quintiles (63, 64). WHO recommends free health services for newborns and children at the point of care. Cash transfers have also been found to improve health outcomes, especially for poor families. For example, the Progresa cash transfer programme in Mexico showed the greatest reduction of diarrhoea incidence among children in the most deprived households (65, 66). There are a number of strategies to increase access and coverage by targeting poor, remote or under-served populations, which merit further consideration (Box 2).

### Box 2 Strategies used by countries to increase access and coverage

- **Outreach**: Roving Care Givers (Grenada), outreach to children in remote communities (Guyana), strengthening of OutReach Clinics (Nepal), Lady Health Workers (V-Pakistan), mobile health teams in remote areas (Yemen)
- **School health**: follow-up of children in schools (Niger)
- **Social protection**: community-based insurance (many countries); universal child health allowance (Argentina); integral health insurance (Bolivia)
- **Funding**: mobilization of resources with the oil sector (Republic of the Congo)

*Source: IMNCI survey*

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**To lead operational planning, district teams must be strengthened with the resources, capacity and tools they need to manage implementation and learn from one another.**

District management teams are critical for implementation, and strong district management can drive improvements in health outcomes in countries (67). District teams emerged as an important determinant of successful IMNCI implementation (68). For example, in the United Republic of Tanzania, the attitude of the district health management teams was a stronger influence on IMNCI implementation than the availability of donor funds or the level of socio-economic development (51). Country assessments back up this message: insufficient focus on district level management was highlighted in Bangladesh, the Democratic Republic of the Congo, Ethiopia, Myanmar, Nepal and Nigeria (CAs).
District management teams must be supported with adequate resources. According to the IMNCI survey, the major barriers at regional and district level were staff turnover (71 countries), budget for training (70 countries) and lack of mentorship and supervision (62 countries), issues that were highlighted in country assessments. In terms of financial resources, country informants noted that while financing of districts often occurs at state level, advocacy activities targeting state decision-makers are rare (CA-Ethiopia and Nigeria). Peru has found success in allocating budget to maternal and child health programmes at regional level on the basis of progress on nationally-agreed coverage and impact indicators (V-Peru). Building support for districts must also involve sensitizing and mobilizing district stakeholders, for example via programme and case management training.

Improved skills in managing health programmes and forecasting and procuring drugs are essential, suggesting a role for strengthened in-service and pre-service training and mentorship in these areas. In addition, real time data capture could be a "game changer" in managing key aspects of implementation. Mobile phone applications are available to support supply management, supervision, monitoring and evaluation, and other relevant areas (DR-Agarwal, GKI report). In Malawi, health surveillance assistants use eStock to report stock-outs of IMNCI drugs via SMS messaging, while District Product Availability Teams ensure that drugs are available for pick-up at the health facility (DR-Agarwal). This system significantly improved the availability of six tracer products from 22% to 66%, and mean stock reporting increased to 90% (V-Malawi). New technologies also have the potential to revolutionize monitoring, for example by producing HMIS scorecards linked with community structures to improve social accountability (GKI report). Non-paper-based mechanisms will be key to future efforts in this direction (GKI report), as in Uganda, where community members can send reports on health service delivery issues such as drug stock-outs, provider absenteeism, or mistreatment to district health teams using an anonymous SMS hotline advertised at all health facilities and through radio and print (DR-Agarwal).

Evidence-based district-level planning and organized management will be needed to bring together all the pieces, but adequate support from central level has been the exception rather than the rule. One of the exceptions is Egypt, where district-level workshops to develop comprehensive plans were followed by stepwise implementation that included problem-solving, mentorship and guidance from the central level (V-Egypt). Such mentorship and support could also be provided via peer learning among districts, for example by setting up platforms (a website or national conference) to share experiences. This could be complemented by a learning agenda that builds on existing strengths and follows a cycle of demonstrate, learn, adapt, expand, repeat (69, 70). Involving district stakeholders at early stages of policy introduction promotes legitimacy and ownership, favouring successful scale-up (47).
Current training approaches are too costly and not effective enough: there is a need to promote improved pre-service training accompanied by regular supervision, clinical mentoring and updates through on-site visits and distance technology.

Although classic in-service training for IMNCI has its partisans (“it’s an excellent, excellent, excellent training programme,” CA-Nigeria), there is broad consensus that current training modalities are too costly, and have limited impact because of insufficient follow-up and supervision. Over the past two decades, a substantial body of evidence has emerged on the effectiveness of strategies to improve health worker performance (DR-Labadie-Rowe), with the effect of commonly used strategies ranging from “modest” (training only) to “almost none” (providing printed information to health workers) (Rowe, unpublished) (Table 2). High-intensity training, when accompanied by supervision, has a significant effect size, supported by strong evidence; for supervision, a meta-analysis suggested that effectiveness increases by as much as 11 percentage points when supervisors give explicit feedback to health workers (Rowe, unpublished). While evidence is weak, outcomes of in-service training may be better if: a) the duration is at least six days, b) interactive methods are included and c) training is done on-site at the health worker’s health facility (Rowe, unpublished). Another meta-analysis suggests that a longer duration of IMNCI training is better (17), while two head-to-head IMNCI studies found little difference between shorter courses (six to eight days) and longer courses (11 days) (71, 72). The observed variability in effect sizes might be explained by differences in context (hospitals vs. outpatient clinics vs. community settings) and type of content (treatment vs. counselling), and underscores the need to monitor performance for any strategy used. Finally the evidence for pre-service training and strategies to improve CHW performance is relatively scant and weak (Table 2, sections 2 and 4).

The need to integrate IMNCI and related strategies into pre-service training emerged as a strong theme of our Review, cited as an approach for improving case management, reducing costs, and promoting the sustainability of interventions (IMNCI Survey, GKI report, CAs). Challenges to successful pre-service training include poor coordination among professional associations, university officials and programme officials, as well as the perception among medical professionals that IMNCI is inferior to standard paediatric care (GKI report, CAs). On the other hand, positive reactions from university teachers were reported in Bangladesh and Kazakhstan (CAs) and the successful experience in the WHO Eastern Mediterranean Region confirms advice provided in a 2007 WHO report (73) on integrating IMNCI into pre-service training, such as involving senior faculty, students and stakeholders early in the process (V-EMRO).
## Table 2  
**Key findings on strategies to improve health worker performance and increase utilization**  
(Source: DR-Labadie-Rowe)

<table>
<thead>
<tr>
<th>Performance area, delivery strategy, context</th>
<th>Median effect size(^a) (interquartile range)</th>
<th>Strength of evidence(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 1. Improving processes of care at health facility level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervision + high-intensity training(^c)</td>
<td>22 %-points (13, 29)</td>
<td>Relatively strong</td>
</tr>
<tr>
<td>Structured prescribing form + poster for health workers + high-intensity training(^c)</td>
<td>Only one study: 57 %-points</td>
<td>Weak</td>
</tr>
<tr>
<td>Collaborative improvement +/- low-intensity training(^c)</td>
<td>31 %-points (14, 41)</td>
<td>Weak</td>
</tr>
<tr>
<td>Low-intensity training(^c) only</td>
<td>11 %-points (4, 31)</td>
<td>Moderate</td>
</tr>
<tr>
<td>Printed or electronic information or job aids for health workers only</td>
<td>-5 %-points (-9, 3)</td>
<td>Relatively strong</td>
</tr>
<tr>
<td><strong>Section 2. Improving processes of care at community level (via CHWs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-intensity training(^c) + community education</td>
<td>Only two studies: 29 and 45 %-points</td>
<td>Weak</td>
</tr>
<tr>
<td><strong>Section 3. Improving utilization of health services at health facility level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial incentives for health workers or health facilities, alone or with other strategy components</td>
<td>67 %-points (2, 119)</td>
<td>Weak</td>
</tr>
<tr>
<td>Reduce or remove user fees only</td>
<td>15 %-points (-12, 42)</td>
<td>Weak</td>
</tr>
<tr>
<td>Introduce or increase user fees only</td>
<td>-53 %-points (-82, -17)</td>
<td>Weak</td>
</tr>
<tr>
<td><strong>Section 4. Improving utilization of health services at community level (via CHWs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervision + low-intensity training(^c) + community education</td>
<td>Only two studies: 5 and 306 %-points</td>
<td>Very weak</td>
</tr>
</tbody>
</table>

\(^a\) Effect sizes calculated as an absolute percentage-point change (e.g., if quality improved from 40% to 50% among intervention clinics and was unchanged among controls, then the effect size would be 10 percentage points).  
\(^b\) Strength of evidence was assessed by examining the number of studies, consistency of results and risk of bias for studies testing a given strategy.  
\(^c\) High-intensity training has a duration > 5 days and uses interactive educational methods; low-intensity training has a duration < 5 days or uses no interactive educational methods.

Country assessments also highlighted the need for refresher training and continuous education (CA- Bangladesh, Ethiopia, India, Myanmar and Nigeria). On-site trainings with peer review have proven to be an effective approach to reducing absenteeism and increasing retention of information presented in training materials (DR-Simoes). Although the original IMNCI training process included a follow-up visit to health workers within six weeks of training, few countries implemented this recommendation due to financial and human resource constraints (16).

Digital tools, when thoughtfully incorporated into care delivery systems, have the potential to improve support for on-site learning and distance learning. When used as complements to face-to-face training, these tools can reduce costs and increase accountability (DR-Simoes). Distance learning tools have proven beneficial in countries (V-Burkina Faso, CA-Ethiopia, Kazakhstan and Nigeria) and strong demand was reported for the IMNCI computerized adaptation and training tool (ICATT) as well as for electronic versions of IMNCI tools such as the chart booklet, optimized for mobile phones (IMNCI survey, CAs). Electronic IMNCI case registers have been introduced successfully in Burkina Faso, Malawi and the United Republic of Tanzania, improving adherence to
guidelines by front-line health workers (V-Burkina). Another innovative approach to watch is India’s Mobile Academy for CHWs, designed by BBC Media and launched nationwide, which provides audio training courses using interactive voice response to strengthen knowledge of preventive maternal and child health behaviours (DR-Agarwal).

**Neglected up to now, private sector engagement is central to improving access to and quality of care.**

The private sector remains an essential source of health care in many countries, used by people from all income quintiles. In the poorest quintile, private sector care-seeking ranges from 22.5% in Latin America and the Caribbean to almost 80% in South Asia (DR-Awor). In India the large majority of families seek care for children from private sources (Q-Bellizzi). When the definition of “private sector” includes unlicensed and uncertified providers such as drug shop owners, the majority of patients appear to access care in the private sector. Generally speaking, private sector health services tend to cater more to groups with higher income and fewer medical needs (“inverse care law”) even though quality of care in the private sector is generally lower than in the public sector (74).

Most private sector consultations for child health and the bulk of community-level management of childhood fever, diarrhoea and pneumonia symptoms involve informal providers and the retail health sector (DR-Awor). Data from 198 DHS carried out between 1990 and 2012 in 70 countries reveal that the private medical sector provided more than half of treatments for diarrhoea, fever and cough (75). Country assessments in the Democratic Republic of the Congo, Ethiopia, India, Myanmar, Nepal, and Nigeria, as well as comments by global key informants (GKI report), highlight the importance of the private sector in the future delivery of child health services. Yet current strategies to engage the private sector typically focus on single-disease interventions (especially malaria) rather than integrated care, and the full potential for involving the private sector in improving child health is far from realized (DR-Awor).

Two examples from Uganda show the potential of using IMNCI, iCCM and other child health strategies to improve quality of care for children through the private sector (DR-Awor):

- A social franchise model provided 1) subsidized, dose specific, pre-packaged drugs and free diagnostics for childhood malaria, pneumonia and diarrhoea, 2) training of drug shop attendants in iCCM and 3) a community awareness campaign. The intervention led to increased levels of appropriate care and better adherence to treatment protocols by drug shop attendants.
- iCCM was promoted through a network of mainly female community health promoters who earn a margin on product sales and performance-based incentives, leading to a 25% reduction in under-five mortality in intervention compared to control clusters (76).

Other promising interventions tested elsewhere include accreditation and contracting of services (especially in conflict situations or fragile states). Most of these approaches require more evidence and testing before they can be widely recommended, especially given equity-based differences in access, affordability, and quality of care among private sector providers and in regulatory capacity among countries. Governments seeking to engage with private providers should first perform a careful analysis of health system bottlenecks in service delivery and assess how engaging the private sector would address these problems and improve health outcomes (77) (Dr-Awor).
Evidence-based strategies for community engagement and capacity strengthening must be integrated into service delivery.

Lack of demand and low utilization of services have been highlighted as limiting the impact and cost-effectiveness of IMNCI and other child health strategies (21, 41). Global key informants noted that despite the need for community buy-in, the design of IMNCI did not include strong mechanisms to create demand for services at community level (GKI report). Given the positive impact of such strategies on infant and child health, with additional benefits related to equity and accountability, key informants argued strongly for incorporating evidenced-based community mobilization and support mechanisms into future child health strategies.

Specifically, strategies such as women’s groups, social mobilization and engagement, and home visiting and counselling have an increasingly solid evidence base. A meta-analysis of trials in Bangladesh, India, Malawi and Nepal showed that women’s groups practicing PLA led to a 20% reduction in neonatal mortality, a figure that increased to 30% in rural areas when at least one third of pregnant women attended meetings (78). Women’s groups showed the greatest impact on maternal and neonatal mortality among the most marginalized (DR-Prost). Changes in home care practices likely accounted for much of the impact. In India, women’s groups supported by Accredited Social Health Activists (ASHAs) were found to be scalable and to reduce neonatal mortality in rural, under-served areas (79). In the state of Odissa (population 44 million), state health authorities have scaled up women’s groups, and similar plans are under way in Jharkhand. Analogous interventions in Ethiopia (DR-Prost) and Nigeria (80), where the approach was coupled with health system strengthening, led to strong improvements in care-seeking and other positive practices for maternal and newborn health. There are also promising results beyond the neonatal period, especially with the Care Group approach (DR-Prost).

The evidence for the impact of home visits is increasingly compelling, especially for neonatal health. Meta-analyses from randomized controlled trials (RCTs) with a range of different interventions (including mobilization, home visitation) indicated significant improvement in care-seeking for neonatal illnesses when compared with standard or no care (RR 1.40, 95% CI 1.17–1.68), with reductions in stillbirths, perinatal deaths and newborn deaths; evidence was rated as high quality (81). Proof-of-principle trials of intervention packages that include both antenatal and postnatal home visits have shown 30-60% reductions in neonatal mortality. Beyond the neonatal period, home visits can be useful for promoting hygiene, illness prevention, appropriate care-seeking, infant and young child feeding, and early childhood stimulation (DR-Prost). Large scale roll-out of home visits has been difficult though, and larger scale impact studies have shown relatively small effects on mortality.
Health committees can also be effective in supporting CHW programmes and improving accountability. Case studies in Mozambique and Niger, as well as studies from Kenya and Viet Nam suggest that iCCM scale-up is more successful when accompanied by a comprehensive community engagement strategy that includes support from leadership and collaboration between CHWs and community health committees (DR-Prost). A systematic review found that health facility committees can effectively improve the coverage, quality and impact of health care (82). Experimental and quasi-experimental studies in Kenya and Viet Nam suggest that the effect of health committees is best achieved via improved dialogue and collaborative problem-solving between health care staff, political authorities and communities (83, 84).

There is somewhat less but still encouraging evidence that male involvement and mass media can positively and effectively influence child health. A meta-analysis of 14 studies showed that involving men during pregnancy and the post-partum period can increase utilization of maternal health services, including use of skilled birth attendants and postnatal care, and reduce the odds of post-partum depression (85). Evidence suggests that mass media is an effective complement to, but not a substitute for, face-to-face interventions with frontline health workers (DR-Prost). Community engagement interventions need to be structured according to a framework accounting for the multiple factors that influence care practices and care-seeking (86).

**To optimize delivery of context-specific strategies, simultaneous monitoring of effect and implementation bottlenecks can help countries learn what is working and adjust course as needed.**

In the IMNCI survey, only 29 countries (32%) reported having a comprehensive monitoring and evaluation plan for IMNCI, and assessments in Bangladesh, the Democratic Republic of the Congo, Ethiopia, India, Kazakhstan, Myanmar, Nepal and Nigeria highlighted inadequacies in country monitoring systems (CAS). In India, failures in ongoing monitoring and evaluation systems mean “we do not know whether the states are implementing IMNCI at all” (CA-India). Inadequate monitoring often means programmatic issues obvious at the level of delivery are not seen at higher levels in the system, where problems must be redressed. In Burkina Faso, stock-outs for iCCM drugs were not systematically monitored and therefore not identified as a problem until they were brought to light by an independent survey (49). Furthermore monitoring allows programme managers to understand how well strategies are working in each context, particularly as studies show highly variable effect sizes in different settings.

Viewed optimistically, the under-developed state of national monitoring systems can be taken as an opportunity to institute new more effective and efficient strategies with improved design and technology. Currently, there are separate registers for various programmes at health facilities, meaning that routine monitoring is simply too much paperwork for many systems to handle (CA-Nigeria) (87). There is a clear need to lighten the burden on health workers by harmonizing existing monitoring strategies and prioritizing a small number of indicators (88). This should be carried out in collaboration with ongoing work under the Health Data Collaborative and roll-out of DHIS2. Other recommended strategies to strengthen monitoring include involving a representative mix of end users in the process, integrating community treatment data into national health information systems, strengthening mechanisms for data use and timely response, periodic triangulation of routine data with other data sources and using mobile technologies for CHW case management and reporting (88). Monitoring systems should also be designed to capture data on equity and gender (89, 90).

New technologies offering real-time data capture will likely be critical for monitoring both processes and outcomes. In many country assessments stakeholders expressed interest in technology for monitoring and evaluation (CA-Bangladesh, Ethiopia, India, Kazakhstan and Myanmar). Some technological interventions target mainly reporting, as in the Millennium Villages Project in Ghana, where CHWs report deaths using an SMS message, complete detailed verbal autopsies using open-

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9 DHIS2 is an online web application of the District Health Information Software (DHIS), an open source software platform for data reporting, analysis and dissemination used in more than 40 countries.
source mobile forms, and upload them into the electronic medical record system to generate reports (DR-Agarwal). Other tools allow for ongoing monitoring, as in Burkina Faso, where the REC tool (Registre Electronique de Consultation) provides a user-friendly interface for management of the sick child and analysis of case management quality (V-Burkina). Similarly, cStock in Malawi or mVaccination in Mozambique target supply chains, while mSakhi in India and TulaSalud in Guatemala focus on improving pregnancy and newborn care, allowing for simultaneous ongoing monitoring (DR-Agarwal). However, mHealth interventions have shown variable levels of effectiveness, and technology breakdowns have been well documented (91), indicating a need for careful selection, planning and implementation.

Timely monitoring and reporting also have the potential to revolutionize the last and arguably most neglected step in the cycle of “monitor, review, act” (CA-Democratic Republic of the Congo, Ethiopia and Nepal). Informants from the Democratic Republic of the Congo said problems identified by monitoring should be addressed quickly and directly, otherwise health workers lose motivation to collect the data. The Ethiopian Minister of Health said advanced technological systems are less important than a “mindset revolution” among clinicians, who currently see data as “not their problem” and are thus not motivated to collect and transmit high-quality data. Data should be used to monitor clinical outcomes, allowing clinicians to learn and to advance their careers; Malawi does this through a combined case notes/monitoring form (GKI report). This type of monitoring can also enforce quality standards: in Bangladesh, with “e-based IMCI, the health worker cannot skip protocol – it is recorded, tracked and the data is transmitted in HMIS, so there’s no way for a shortcut or escape” (CA-Bangladesh).

Monitoring can also improve accountability by ensuring that communities have up-to-date, accurate information about local health services, potentially synthesized in the form of scorecards. Health committees have already been widely involved in social autopsies for maternal and child health, and experience suggests they effectively support CHW programmes and improve accountability when community participation is well established and there is support for decentralized planning and action (DR-Prost). Two examples are Ethiopia’s Last10k project, which links Primary Health Units and rural communities via health committees and community-based data monitoring and decision-making, and the CODES initiative in Uganda that uses Citizen Report Cards as a basis for systematized priority setting, allocation of resources and problem-solving with communities (DR-Prost).

Finally, several countries (mostly in Asia) have experimented with home-based records as self-monitoring tools to improve maternal and child health outcomes and enhance accountability. A meta-analysis found that mothers who used handbooks during pregnancy had a significantly higher
level of knowledge of good practices and appropriate care-seeking, as well as safer practice by skilled birth attendants and more frequent facility deliveries (92). These findings have been reinforced by recent cross-sectional and quasi-experimental studies on the benefits of home-based records (93-95).
Looking forward: child health at global level

**Fragmentation is the first problem we must solve.**

Development assistance for newborn and child health increased from US $2.2 billion to US$ 6.6 billion annually between 2000 and 2014 (DR-Taylor), a period during which many child health guidelines and strategies were introduced including Integrated Management of Pregnancy and Childbirth (IMPAC), Caring for newborns and children in the community, Helping Babies Breathe (HBB), the Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) and the Every Newborn Action Plan (ENAP). The multiplicity of these different efforts reflects the lack of coordination among global actors, a crucial stumbling block to progress identified by this Review.

The SDGs, the Global Strategy and the GFF provide an opportunity for international actors to support countries in a coordinated, inter-sectoral effort to improve maternal, newborn and child health. Key informants in country assessments often stated “the mother and child cannot be separated,” and indeed half of reductions in newborn mortality are attributed to interventions that target the mother (96). Long-term commitment to a holistic approach to caring for mothers, newborns and children is needed, supported by a shared vision and common message emphasizing the value of every child (GKI report, DR-Taylor).

While partners espouse many of these ideals already, organizational structures and needs have often stymied effective coordination (Table 3). Global key informants expressed a need for strong leadership: “We still don’t have a clear lead and common agenda [so] it would be useful to have an annual conference ... We’re getting pushed to do everything with child health and at present there are no common priorities and this is hurting progress” (GKI report). A critical appraisal of the ways partners have or have not worked together is sorely needed, leading to cohesion around a single global coordination mechanism.

### Table 3: Leading global actors’ engagement with child health in recent years

<table>
<thead>
<tr>
<th>Actor</th>
<th>Key Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHO</strong></td>
<td>Recognized technical mandate for maternal and child health but other programmes (malaria, HIV) compete for attention, often with greater funding and more targeted interventions</td>
</tr>
<tr>
<td><strong>UNICEF</strong></td>
<td>Loss of momentum with transition in emphasis to child rights</td>
</tr>
<tr>
<td><strong>USAID</strong></td>
<td>Decreased specific support for child health within overall increasing maternal and child health budgets, with resources focused on maternal and newborn health, immunization</td>
</tr>
<tr>
<td><strong>World Bank</strong></td>
<td>Historically indirect engagement with countries</td>
</tr>
<tr>
<td><strong>BMGF</strong></td>
<td>No single home for child health; activities spread out without close coordination</td>
</tr>
</tbody>
</table>
Evidence points to state-of-the-art diagnosis and treatment innovations available for technical guidelines, but a unified global advisory body of experts should assess the evidence before scale-up.

New clinical interventions for managing childhood illness in hospitals, first-level facilities and the community are available for consideration in global guidelines. In Figure 8, summarized from DR-McCollum, interventions supported by stronger evidence are indicated in bold. Intended level(s) of the health system are indicated by shading and whether or not they are boxed. Lower-cost interventions (those toward the bottom) with stronger evidence (in bold) are closer to being ready for adoption, such as pulse oximetry at first-level facilities. Other interventions, for example Bioelectrical impedance vector analysis (BIVA) for malnutrition or lung ultrasound for pneumonia, are further away from mainstream implementation. The interventions shown in the figure are illustrative. Updates of treatment guidelines will require additional rigorous review, including systematic reviews and WHO-coordinated expert opinion.

Although WHO has a process for considering new recommendations for integration into IMNCI, there is no global multi-stakeholder scientific advisory body to advise in a systematic way on translating useful innovations into guidelines and delivery strategies, taking into account how they fit into integrated programming. Country-level stakeholders find current processes opaque and unpredictable in terms of timing, while maintaining great trust in the evidence-based nature of global guidelines. A standing independent global external advisory committee would be an effective mechanism to set standards on technical excellence on scientific and operational issues while also broadening input and consensus. A regularly-conducted review of interventions and delivery strategies, coordinated by WHO and incorporating end user and stakeholder input, would enhance trust, ensure consideration of new ideas, facilitate broader engagement and promote the applicability and acceptance of recommendations.
Figure 8  Potential new clinical interventions for child health\textsuperscript{10}

Current practice tools require greater flexibility, adaptability and user-centred design to meet country needs – there is no “one size fits all” solution.

While IMNCI tools and guidelines are generally appreciated by operational actors, country and global key informants also noted a certain rigidity that contributed to difficulties in scaling up (DR-Taylor, GKI report, CA-Ethiopia). Furthermore, the range of new adaptations required to respond to changing epidemiology means that in some settings, the elasticity of the IMNCI algorithm is becoming overstretched (S. Gove, personal communication). Contextual barriers to implementation, such as poor infrastructure, poverty, and low-quality monitoring data were not adequately factored into guidelines, nor were mechanisms to help countries identify specific health systems challenges and strengths (GKI report). Targeting child health packages by child mortality burden alone was found to be inadequately granular, as a “one-size-fits-all” strategy cannot serve the differing needs of dense urban areas, remote rural areas, and emergency contexts, where delivery channels are vastly different (GKI report, V-Sudan). Indeed this lack of consideration for local context, in terms of the fit of new programmes to country health systems, has been noted as a major barrier to scaling up health interventions (97).

\textsuperscript{10} Expert MTB/RIF assay: a fully automated nucleic acid amplification test that enables rapid (<2 hours) detection of \textit{M. tuberculosis} and resistance to Rifampin; CPAP: Continuous positive airway pressure devices; HIV C&T: HIV counseling and testing, SAM/MAM: severe/moderate acute malnutrition, AAP: American Association of Pediatricians
Technical recommendations on clinical interventions and delivery strategies must go beyond a compendium of evidence and could be optimized for uptake by better consideration of country context and the health worker as end user. User-centred design, a longstanding and proven conceptual framework for developing products, services or systems, can improve health workers’ experience with guidelines and thereby increase effectiveness (98-101). Such an approach would also take into account sources of health worker motivation, including social status and connectedness to the community (GKI report, DR-Awor). The result may be a smaller core package of services that enhance confidence and reinforce the health workers’ place in the community, rather a long list of activities that may be untenable for any single provider. Experience from user-centred design also suggests the need for: a) guideline dissemination through electronic platforms that are simple, easily accessible, readily-updated and harmonized, b) clear characterization of the intended user and intended level of care for each recommendation and c) inclusion of indicators and suggested approaches for accountability and monitoring for each intervention.

Existing strategies must be harmonized to create a flexible menu of options with guidance on setting up packages. IMNCI and related child survival strategies should continue to emphasize the leading causes of child mortality, with attention focusing on infectious and neonatal causes, but guidelines may work better in a modular form that is more amenable to varying local epidemiology and new advances in the scientific evidence or technology (DR-Simoes). At the same time, consistent to viewing the mother and child together, maternal, newborn and child health packages and guidelines need to be brought together to prevent siloed approaches (see Table 4).

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Framework for RMNCAH services</th>
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<tr>
<td><strong>First level services</strong></td>
<td><strong>Community level services</strong></td>
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<tr>
<td><strong>Mother</strong></td>
<td>Family planning and reproductive care</td>
</tr>
<tr>
<td>Integrated Management of Pregnancy, Childbirth and Postnatal Care</td>
<td>Care for birth preparedness</td>
</tr>
<tr>
<td><strong>Newborn</strong></td>
<td>IMNCI Management of the sick young infant with possible serious bacterial infections where referral is not feasible</td>
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<tr>
<td><strong>Child</strong></td>
<td>IMNCI Care for child development</td>
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</tbody>
</table>

Towards a Grand Convergence for Child Survival and Health | November 2016 | 37
Global leaders should provide guidance on developing strong, appropriate country packages. WHO and UNICEF should set a ‘global menu’ of child health interventions, with sample menus proposed for settings with different epidemiology and resources (DR-Simoes). Countries could then select interventions relevant to their context, resources and systems readiness (GKI report, DR-Rudan), and follow an ‘expansion path’ for sequential adoption of interventions, using tools such as LiST to model potential outcomes (102) and EQUIST and PLANET to address issues of equity and of financial planning (DR-Rudan). Countries could also adapt IMNCI at national and subnational level in terms of content, training approaches and administrative aspects (GKI, CA-DRC). As one global key informant said, “There should be more openness to adapting IMNCI (or whatever it will be in the future) to the country context” (GKI report). The process should involve ministries of health and of finance, as well as WHO and UNICEF country offices and other stakeholders.

**Unifying existing newborn and child health packages may not mean re-branding IMNCI.**

At global and especially country level, there was near unanimous agreement that changing the name of IMNCI was not advisable, as a new name would be perceived as termination of global support to the IMNCI strategy and would require new efforts to advocate for a system with which countries are already familiar and engaged (GKI report, CAs). Country assessments clearly showed that IMNCI is a well-recognized brand name with many positive associations. Some members of our expert review group questioned whether these positive views represented a biased sample. Certainly IMNCI has high brand recognition and acceptance in many countries, though this is not the case everywhere.

If retained, the IMNCI “brand” would require a clearer definition, accompanied by a revitalized communication strategy, perhaps as “IMNCI Plus” (GKI, CAs). Several informants at global and country levels were keen on “re-marketing” IMNCI, for example by improving the look of training manuals, which “have been the same for ages – is there anything we can do to make it more exciting?” (GKI report, CA-Nigeria). Additionally, some respondents claimed that IMNCI had become too associated with expensive training and needed to attract new funds by motivating actors at global level. Said one country respondent, “Everything in life is about being able to market – there is nothing that is not marketable” (CA-Nigeria).

**In The Words of Countries**

**MYANMAR**

“The global level should not confuse names by rebranding.”

**ETHIOPIA**

“IMCI ... people even consider it’s an Amharic word. It has been already branded, and people accept it.”

In reframing IMNCI, the focus must remain on child health with emphasis on the value of children and on equitable outcomes (DR-Taylor). Large reductions in child mortality over the last 20 years are encouraging, but we must also look forward to the “thrive” goal of the Global Strategy. Global actors must continue to accelerate and expand treatment for common childhood illnesses, while simultaneously increasing investment to improve the quality of those lives that are saved and ensure that families have the resources to help children fulfil their potential (GKI report). The GFF should be an important part of the conversation around making an investment case and achieving the much hoped for – and we believe possible – Grand Convergence for child survival and health.
Recommendations for strategic action

Many of the findings of this Strategic Review will be familiar to members of the global child health community, as the primary obstacles to progress are well known. Our purpose in synthesizing the evidence in this report was to identify specific, strategic actions that will result in the best use of collective efforts and existing resources. Most importantly, we hope to spark a conversation about taking these actions together, as governments, donors, international agencies and civil society seize the opportunity to rejuvenate their commitment to integrated architecture, finance, plans and support for child health and development.

Over the course of our deliberations, we identified five main problems impeding the achievement of child health goals and improving care for children. We recommend specific solutions for each problem, based on the criteria that the solution be specific, feasible and actionable. Additional details and process indicators associated with each action are provided in Annex 1.

**Problem 1**  
**Fragmentation of global strategies for child survival and health undermines country programming and limits potential impact.**

**Recommendation 1a:** WHO and UNICEF immediately publish a joint statement repositioning IMNCI in the context of a package of care for the newborn and child spanning the home, community and health facilities, articulated within the framework of the Global Strategy, and have it endorsed by partners.

**Recommendation 1b:** All partners consolidate around a single leadership mechanism to coordinate implementation support for IMNCI at global, regional, and country levels, and work to harmonize activities with major funding structures including the GFF, the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM), and the Vaccine Alliance (GAVI).

**Recommendation 1c:** Child health stakeholders in countries advocate for high-level representation in country coordinating mechanisms to 1) maximize effective coordination of partners’ technical support and funding, 2) ensure integration of recommendations from the joint statement in to national child health policies and 3) leverage investments in other sectors that can benefit child health.

**Problem 2**  
**The ambitious vision of the SDGs and universal access to quality health care will not be realized unless care for newborns and children is adequately funded and delivered to the most vulnerable and marginalized populations.**

**Recommendation 2a:** Global partners develop innovative strategies to identify poor, underserved populations; target programme activities spanning the home, community and health facilities; and support equity-based policy actions such as removal of user fees.

**Recommendation 2b:** Child health leaders in countries mobilize political support and financial resources at national and sub-national levels using arguments about the value of investing in children’s health, and use GFF investment cases to develop ambitious, costed child health plans and secure additional funding.

**Recommendation 2c:** WHO and UNICEF identify new, less resource-intensive approaches to training and supervision, such as self-directed learning, distance learning, clinical mentoring, and improved pre-service training, to reduce the financial burden on countries.

**Problem 3**  
**Evidence for the impact and effectiveness of interventions and delivery strategies is not systematically generated, captured and integrated into policy and programming.**
**Recommendation 3a:** WHO and UNICEF establish a global expert advisory group to systematically review evidence and provide state-of-the-art recommendations on clinical interventions, delivery mechanisms and determinants of newborn and child health, and gain consensus on this process from major donors and governments.

**Recommendation 3b:** Global partners establish an online hub with 1) a repository of guidelines, tools, and documentation and 2) discussion forums to promote systematic south-to-south collaboration on operations research and sharing of best practices.

**Recommendation 3c:** Partners and stakeholders at regional levels link to the global expert advisory group to provide technical support and help countries translate guidance into policy.

**Recommendation 3d:** Country authorities integrate quality improvement methods and implementation science into programming and facilitate shared learning among district teams to allow local solutions to emerge and be generalized.

---

**Problem 4**  
*Strategies and programmes for care of newborns and children are insufficiently tailored to countries’ epidemiological and health systems contexts, and practice tools do not always respond to end users’ needs.*

**Recommendation 4a:** WHO and UNICEF bring together existing guidance packages on care for newborn and child health into one set of flexible, adaptable, user-friendly tools, incorporating input from end users and design specialists.

**Recommendation 4b:** The global expert advisory group recommends additional strategies to build upon the efforts of diverse actors at country level, including the private sector, non-governmental organizations, professional associations, and other child health-influencing programmes and sectors, with a strong focus on community engagement.

**Recommendation 4c:** Governments and partners focus on combined interventions in districts to improve health workers skills, strengthen health systems, and strengthen community engagement and family practices.

---

**Problem 5**  
*There is lack of accountability to populations and mutual accountability among partners, and a corresponding need for clear targets and strong monitoring at all levels.*

**Recommendation 5a:** WHO and UNICEF immediately establish a joint leadership process to develop and adopt clear IMNCI programme targets at global, regional, national, and sub-national levels and coordinate progress tracking with accountability processes under the Every Woman Every Child (EWEC) movement and the Global Strategy.

**Recommendation 5b:** Under the umbrella of joint leadership and in coordination with the Health Data Collaborative, partners strengthen country capabilities to routinely monitor and evaluate progress in child health, with a focus on both coverage and quality of care, and promote and support specific, well-designed systems for review and follow up, using scorecards to track progress.

**Recommendation 5c:** Country authorities scale up monitoring initiatives alongside a strong push for community engagement, providing communities with readily interpretable data on the availability and quality of child health services.
Achieving the SDGs for child health

**Promote health, growth and development**
- Nurturing care at home
- Infant and young child feeding, nutrition
- Care-seeking for illness
- Stimulation and care for child development

**Prevent illness**
- Immunization
- Water and sanitation, reduced indoor air pollution, safe and clean environment
- HIV prevention
- Malaria control

**Treat sick newborns and children**
- IMCI and ICCM jointly implemented (Primary Health Care)
- Referral level care

**Making it Happen**

**Country-led programme implementation**
- Children and families at the centre
- Targets and indicators
- Funded plan
- Harmonized implementation of promotion, prevention and treatment
- Multiple actors, public and private
- Monitoring and programme review
- Accountability mechanism

**Who**
- Global advisory group of experts
- UNICEF global leadership for partner coordination and accountability
- Global Financing Facility, Global Fund

**What**
- Innovation and research (discovery, development and delivery)
- Norms and guidance
- Learning platforms

Community engagement
Leadership, decision-making, participation

Effective health systems
Leadership and governance, financing, skilled health workers, information systems and essential commodities

Communities and families

Towards a Grand Convergence for Child Survival and Health | November 2016 | 41
References


75. Grépin KA. The role of the private sector in delivering maternal and child health services in low-income and middle-income countries: an observational, longitudinal analysis The Lancet. 2014; 384(87).


Annex 1: Detailed actions for recommendations

**Problem 1**

Fragmentation of global strategies for child survival and health undermines country programming and limits potential impact.

**Recommendation 1a:** WHO and UNICEF immediately publish a joint statement repositioning IMNCI in the context of a package of care for the newborn and child spanning the home, community and health facilities, articulated within the framework of the Global Strategy, and have it endorsed by partners.

**Recommendation 1b:** All partners consolidate around a single leadership mechanism to coordinate implementation support for IMNCI at global, regional, and country levels, and work to harmonize activities with major funding structures including the GFF, the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM), and the Vaccine Alliance (GAVI).

**Recommendation 1c:** Child health stakeholders in countries advocate for high-level representation in country coordinating mechanisms to 1) maximize effective coordination of partners’ technical support and funding, 2) ensure integration of recommendations from the joint statement into national child health policies and 3) leverage investments in other sectors that can benefit child health.

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<tr>
<th><strong>COUNTRY ACTIONS</strong></th>
<th><strong>GLOBAL ACTIONS</strong></th>
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<tr>
<td>a) Revitalized country-led, coordination mechanisms with common planning/ tasks/budget/accountability and supported by the country UN Coordination Team and other partners;</td>
<td>a) Initial meeting to define a common approach on promotion, prevention and care for newborns and children and the role of each partner;</td>
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<td>b) Mobilization of political support when necessary, including advocacy for a costed, budgeted, funded plan;</td>
<td>b) Joint WHO-UNICEF planning at the beginning of each year with monitoring of progress at global, regional and country levels;</td>
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<tr>
<td>c) Country leadership to develop an on-going review process, with links to policy-makers to stimulate action;</td>
<td>c) Map existing maternal, newborn and child health packages (IMNCI, IMPAC, Caring for newborns and children in the community including iCCM, CBNC, HBB, etc.) and strategies (ENAP, GAPPD, Global Nutrition Action Plan) against the continuum of care and levels of service provision, with strategic objectives aligned to inform implementation of the Global Strategy;</td>
</tr>
<tr>
<td>d) National consensus statement reflecting essential investments in newborn and child health agreed upon with partners.</td>
<td>d) Enhance linkages with other programme areas including health systems, nutrition, immunization, HIV, malaria, tuberculosis, mental health, WASH and environmental health.</td>
</tr>
</tbody>
</table>
The ambitious vision of the SDGs and universal access to quality health care will not be realized unless care for newborns and children is adequately funded and delivered to the most vulnerable and marginalized populations.

**Recommendation 2a:** Global partners develop innovative strategies to identify poor, underserved populations; target programme activities spanning the home, community and health facilities; and support equity-based policy actions such as removal of user fees.

**Recommendation 2b:** Child health leaders in countries mobilize political support and financial resources at national and sub-national levels using arguments about the value of investing in children’s health, and use GFF investment cases to develop ambitious, costed child health plans and secure additional funding.

**Recommendation 2c:** WHO and UNICEF identify new, less resource-intensive approaches to training and supervision, such as self-directed learning, distance learning, clinical mentoring, and improved pre-service training, to reduce the financial burden on countries.

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<th>COUNTRY ACTIONS</th>
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<tbody>
<tr>
<td>a) MoH planning departments, with partners, harmonize and adapt tools and guidance on equity-based targeting;</td>
<td>a) Global expert group documents, synthesizes and disseminates best practices for closing the equity gap, including but not limited to GIS and equity mapping;</td>
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<tr>
<td>b) Country-adapted guidance and toolkit for District Health Systems Strengthening developed;</td>
<td>b) Tools designed to plan, implement and monitor targeted service provision;</td>
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<tr>
<td>c) Enhanced management training integrated into curricula at schools of nursing and health technology;</td>
<td>c) Review and package joint WHO-UNICEF generic guidance on District Health Systems Strengthening with context-specific modules for rural, urban and humanitarian relief settings;</td>
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<tr>
<td>d) District-level joint planning and monitoring conducted with relevant partners;</td>
<td>d) Joint WHO/UNICEF guidance on issues such as supply chains, human resources for health, supervision etc;</td>
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<tr>
<td>e) Investments in pre-service training for newborn and child health and strengthened collaboration with professional associations, nurses, paediatricians and district and community based providers to influence curricula;</td>
<td>e) Guidance for user-friendly district data systems, with child health modules built into DHIS2 and data capture forms based on EQUIST and other tools, in alignment with the Health Data Collaborative.</td>
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<tr>
<td>f) Regular on-site clinical refreshers on adaptations and updates using technologies, linked to update cycles of global packages;</td>
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<tr>
<td>g) Monitoring of supervision (against a benchmark of how much supervision is expected) with results reported to the country coordinating team.</td>
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</tbody>
</table>
Problem 3: Evidence for the impact and effectiveness of interventions and delivery strategies is not systematically generated, captured and integrated into policy and programming.

**Recommendation 3a:** WHO and UNICEF establish a global expert advisory group to systematically review evidence and provide state-of-the-art recommendations on clinical interventions, delivery mechanisms and determinants of newborn and child health, and gain consensus on this process from major donors and governments.

**Recommendation 3b:** Global partners establish an online hub with 1) a repository of guidelines, tools, and documentation and 2) discussion forums to promote systematic south-to-south collaboration on operations research and sharing of best practices.

**Recommendation 3c:** Partners and stakeholders at regional levels link to the global expert advisory group to provide technical support and help countries translate guidance into policy.

**Recommendation 3d:** Country authorities integrate quality improvement methods and implementation science into programming and facilitate shared learning among district teams to allow local solutions to emerge and be generalized.

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<th>COUNTRY ACTIONS</th>
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<tr>
<td>a) Implementation research priorities identified at country, regional and global levels including with the global expert group (with funding linked to priorities);</td>
<td>a) Systematic review process for clinical interventions and for delivery strategies, including a partner-developed systematic approach to communicating new recommendations and facilitating adaptation at country level;</td>
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<tr>
<td>b) Selected districts to document, learn, adapt and expand effective delivery strategies, with strong monitoring component;</td>
<td>b) A full repository of available evidence, strategies and tools developed and made available online in easily adaptable formats.</td>
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<td>c) Peer-to-peer District Health Management Team development mechanisms funded and operationalized including means of sharing experiences (annual district conference, online web platform);</td>
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<tr>
<td>d) Advocacy to ensure adequate staff, budget and authority at state/district level, and the adoption of team-based learning.</td>
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Problem 4

Strategies and programmes for care of newborns and children are insufficiently tailored to countries’ epidemiological and health systems contexts, and practice tools do not always respond to end users’ needs.

**Recommendation 4a**: WHO and UNICEF bring together existing guidance packages on care for newborn and child health into one set of flexible, adaptable, user-friendly tools, incorporating input from end users and design specialists.

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<tr>
<td>a) Country authorities update country programmes and policies based on new guidance and develop processes for ongoing improvement;</td>
<td>a) Key architects of maternal, newborn and child health packages, country representatives, and independent experts are convened by WHO and UNICEF to develop a modular approach to newborn and child health building on IMNCI and accommodating emerging conditions (modules to be framed by cause of mortality/morbidity, with specific interventions, competencies, commodities, supplies, and indicators required by level of service delivery);</td>
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<tr>
<td>b) Countries strengthen community engagement and adaptation processes to reflect evidence based strategies.</td>
<td>b) Joint WHO/UNICEF statement promoting evidence-based strategies for community engagement;</td>
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<tr>
<td>c)</td>
<td>c) Flexible WHO/UNICEF toolkit for community engagement including modules for rural, urban and humanitarian contexts developed and made easily accessible online.</td>
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Problem 5  
There is lack of accountability to populations and mutual accountability among partners, and a corresponding need for clear targets and strong monitoring at all levels.

Recommendation 5a: WHO and UNICEF immediately establish a joint leadership process to develop and adopt clear IMNCI programme targets at global, regional, national, and sub-national levels and coordinate progress tracking with accountability processes under the Every Woman Every Child (EWEC) movement and the Global Strategy.

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**COUNTRY ACTIONS**

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<tr>
<td>a) Country adaptation of generic DHIS2 / HMIS modules and applications covering data capture, data quality, visualization, scorecards, automated alerts, and automated reports is completed, and capacity to use DHIS2/HMIS is institutionalized;</td>
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<tr>
<td>b) Accountability mechanisms (annual PIP scorecards, regular review) established and linked to ongoing monitoring, including at community level;</td>
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<td>c) Investment in periodic assessment of quality of care at referral, facility and community levels using standardized methods.</td>
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<td>d) Inclusion of IMNCI monitoring indicators on scorecards/ dashboards allowing citizens to follow district performance and demand improvements.</td>
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**GLOBAL ACTIONS**

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<tr>
<td>a) WHO and UNICEF develop and implement a leadership communications strategy to promote the vision articulated in the joint statement articulating a coherent approach to health care of newborns and children from the home to the community and clinic;</td>
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<tr>
<td>b) WHO-UNICEF joint responsibility around child health efforts concretized in a series of public communications.</td>
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</table>
# Annex 2: Sources of data for the Strategic Review

## IMNCI survey

1. IMCI Global Implementation Survey Report  
   Cynthia Boschi-Pinto, Dilip Thandassery, Samira Aboubaker, Wilson Were, Bernadette Daelmans, Eva Kudlova  
   IMNCI survey

## Desk reviews

2. “IMNCI evolution and timeline”  
   Cathy Wolfheim, Bernadette Daelmans, Samira Aboubaker  
   Wolfheim

   Igor Rudan, Smruti Patel, Donald Waters, Kerri Wazny, Iain Campbell, Devi Sridhar, Mickey Chopra and Harry Campbell  
   DR-Rudan

   Guilhem Labadie  
   Labadie

5. “Adaptations to IMCI 2006-2016”  
   Eva Kudlova  
   Kudlova

   W. Chris Buck, Nichola Connell, Michelle Eckerle, Azadeh Farzin, Amy Ginsburg, Carlos Grijalva-Eternod, Matthew S. Kelly, Marko Kerac, Marie McGrath, Rashmi Patil, Michele Usuelli, and Eric D. McCollum  
   McCollum

7. “Health Care Provider Performance Review: Identifying strategies to improve health worker performance, increase utilization of health services, and reduce mortality in LMIC”  
   Guilhem Labadie with Alexander Rowe  
   Labadie-Rowe

8. “Information and Communication Technologies to Advance Child Health”  
   Smisha Agarwal and Alain B. Labrique  
   Agarwal

9. “Engaging the Private Sector for Delivery of Child Health Interventions: The role of IMCI”  
   Phyllis Awor  
   DR-Awor

10. “Predictions/recommendations for future IMNCI taking into account mortality reductions and changing causes of death as well as etiologies within the major killers”  
    Eric Simoes and Sandy Gove  
    DR-Simoes

11. “Building on Community-IMCI: Community approaches that strengthen the capabilities of individuals, families and communities to improve child health in high-mortality settings”  
    Audrey Prost  
    DR-Prost

    Simran Chaudhri  
    DR-Chaudhri

13. “Mapping Global Leadership in Child Health” (USAID/MCSP report)  
    Mary E. Taylor, Renata Schumacher, and Nicole Davis  
    Taylor

## Global key informant interviews

    Jennifer Franz-Vasdeki  
    GKI report

## Country assessments

15. Bangladesh  
    CA-Bangladesh

16. Democratic Republic of the Congo  
    CA-DRC

17. Ethiopia  
    CA-
<table>
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<tr>
<th>Vignettes</th>
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<tbody>
<tr>
<td>18. India</td>
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<td>Sutapa B Neogi, Monika Chauhan</td>
<td>CA-India</td>
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<td>19. Kazakhstan</td>
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<td>Aigul Kuttumuratova, Gaukhar Abuova</td>
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<td>20. Myanmar</td>
<td>CA-Myanmar</td>
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<tr>
<td>Elizabeth Mason, Thwe Thwe Win, Anoma Jayathilaka</td>
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<tr>
<td>21. Nepal</td>
<td>CA-Nepal</td>
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<td>Ram Bhandari, Benu Bahadur Karki, Jyoti Ratna Dhakwa, Bijeta Bhandari,</td>
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<td>Eric Simoes</td>
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<td>22. Nigeria</td>
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<td>Andrew Mbewe, Robinson Wammanda and Sarah Dalglish</td>
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<td>23. Yemen</td>
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<td>32. “Global trends in care-seeking by IMCI and iCCM implementation”</td>
<td>Q-Victora</td>
</tr>
<tr>
<td>Cesar Victora and Aluisio Barros</td>
<td></td>
</tr>
<tr>
<td>33. “Mapping and GIS Analysis of IMCI programming and child health</td>
<td>Q-Root</td>
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<tr>
<td>outcomes: Ethiopia, Nigeria and the DRC”</td>
<td></td>
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<tr>
<td>Elisabeth Root and Eric Simoes</td>
<td></td>
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<tr>
<td>34. “Analysis of DHS data on care-seeking: Ethiopia, Nigeria, DRC, India”</td>
<td>Q-Bellizzi</td>
</tr>
<tr>
<td>Saverio Bellizzi</td>
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Annex 3: Summary of evidence from IMNCI Global Implementation Survey report

Methodology

- The Global Implementation Survey provides a general overview of IMNCI implementation worldwide. The survey is short and concise, with primarily close-ended questions and a few open-ended ones. It was prepared in Excel format.
- Topics covered include: 1) child health policies, 2) use of and updating IMNCI guidelines, 3) community case management of newborns and children, 4) activities to promote quality of care and strengthen health systems, 5) innovations and 6) organization of work at national level.
- The survey instrument was tested by staff in the WHO Regions of Africa, the Eastern Mediterranean and South-East Asia to ensure that questions were clear and appropriate, and to estimate the amount of time needed to complete the questionnaire.
- The final version of the survey was translated into all six U.N. languages (Arabic, Chinese, English, French, Russian and Spanish). Questionnaires were filled out by an in-country team consisting of representatives of the MoH and of WHO and UNICEF country offices. Regional offices were responsible for follow-up. The response rates are as follows:

<table>
<thead>
<tr>
<th>WHO Region</th>
<th>Countries (n)</th>
<th>LMICs** (n)</th>
<th>Completed questionnaires (n)</th>
<th>Reported no IMCI (n)</th>
<th>Response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>47</td>
<td>46</td>
<td>38</td>
<td>3</td>
<td>88.8</td>
</tr>
<tr>
<td>The Americas</td>
<td>35</td>
<td>24</td>
<td>14</td>
<td>4</td>
<td>75.0</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>11</td>
<td>11</td>
<td>9</td>
<td></td>
<td>81.8</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>22</td>
<td>15</td>
<td>14</td>
<td></td>
<td>93.3</td>
</tr>
<tr>
<td>Europe</td>
<td>53</td>
<td>19</td>
<td>7</td>
<td></td>
<td>36.8</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>27</td>
<td>20</td>
<td>8</td>
<td></td>
<td>40.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>195**</td>
<td>134</td>
<td>90</td>
<td>6</td>
<td>71.6</td>
</tr>
</tbody>
</table>

* Seven more questionnaires were received after 1 June: three from the African Region; one from the Region of the Americas; and three from the Western Pacific Region

**Low- and middle-income countries

Overview

- IMNCI is part of the national child health strategy in almost all (90/97) LMICs that responded to the survey, and 75% of countries reported that more than 75% of districts are implementing IMNCI.
- Out of 67 respondents, 36% reported having at least two IMNCI-trained health workers who care for sick children in more than 75% of first level health facilities.
- 34% of 89 respondents reported implementing iCCM in more than 75% of districts and 40% in more than half of districts.
- Countries with a low mortality rate and high income appear to have a higher rate of iCCM implementation than those with high mortality and low income.
Strategies used to treat and care for the sick child

- Among IMNCI components, improved management of sick children in first-level facilities was most implemented by countries (97%), while treatment of sick children in the community was least implemented (72%). The regions of the Americas and the Western Pacific, however, reported relatively high implementation rates (>85%) of treatment of sick children at community level.
- About 50% of countries reported strategies other than IMNCI for managing common childhood conditions, but many of the strategies listed are actually part of IMNCI.

How the three IMNCI components have been implemented in countries

1. IMPROVING HEALTH WORKER SKILLS

- Almost all responding countries (84 of 90 countries) have included care of the sick newborn as part of IMNCI guidelines.
- The most common health conditions added to IMNCI include jaundice (77%), HIV (60%), sore throat (60%) and skin conditions (44%). Other conditions commonly reported include tuberculosis (35%) and dengue (27%).
- IMNCI chart booklets continue to be adapted to the country context. Since the last WHO update in 2014, 25 countries have updated their national chart booklets, the majority in 2015.
- 44 of 90 responding countries have updated their national treatment guidelines based on the 2013 edition of the WHO Pocket book for hospital care of children.
- Of the 58 countries that reported policies on community-based care, 44 reported iCCM for diarrhoea, pneumonia, fever and malnutrition.
- 44 out of 58 countries reported pre-service training for CHWs in caring for the newborn. 19 countries reported this training duration to be less than one month.

2. STRENGTHENING HEALTH SYSTEMS

- As part of efforts to strengthen health systems, 52 countries (60%) reported that the MoH has a paediatric quality of care (QoC) improvement programme for health facilities. An assessment of QoC to improve management of childhood illnesses in referral hospitals was conducted in 42 countries (47%).
- 60 countries reported that their HMIS includes monitoring indicators for IMNCI, most of which (83%) are collected at primary health care level.
- Only 29 countries (32%) reported having a comprehensive monitoring and evaluation plan for IMNCI.
- 32 countries (42%) have conducted a Child Health Programme review since 2014 and 53 (59%) since 2010.
- 41 countries (47%) have introduced Child Health Programme Management training and 32 (39%) have introduced tools for bottleneck analysis and strategic planning. Twenty of these countries use the OneHealth tool and 22 use Marginal Budgeting for Bottlenecks (MBB).

3. IMPROVING FAMILY AND COMMUNITY PRACTICES

- 77 of 90 responding countries reported implementing activities to promote key family practices for child health, mostly through home visits and social mobilization/community groups.
- In 62 countries CHWs provide care for newborns and 67 countries reported that CHWs provide
care for children. The least-provided services are community management of severe malnutrition (28 countries) and of pneumonia with antibiotics (39 countries).

- 29 countries reported having no monetary incentives/payments and 7 countries reported no incentives for CHWs at all;
- In about half of countries, CHWs are responsible for care newborn babies and children at home or in the community in a population fewer than 1000.

**Finance, investment, and coordination**

- Out of 90 countries, eight (9%) reported the existence of an IMCI department/unit within the MoH. For most (59) countries, IMCI is situated in the Maternal and Child/Child departments.
- Rectal and parenteral artemether are the medicines from the essential medicines list least commonly encountered in countries.
- Government is the primary funder for IMCI implementation at first level health facility for salaries, general programme support, medicines and equipment, and monitoring and supervision. Bilateral agencies are the main funding sources for training and per diems.
- At community level, the primary funder for salaries, general programme support, medicines and equipment, and monitoring and supervision is also the government. Multilateral agencies have a larger role in funding activities at the community health level than in first-level health facilities.

**Barriers to implementation**

- Major barriers reported by countries at national level are: budget for training (74/87 countries), mentorship and supervision (64/87 countries), cost of programme/sustainability (55/87 countries), and availability of dedicated budget line (53/87 countries).
- At the sub-national level, major barriers reported are staff turnover (71/85 countries), budget for training (70/85 countries), and mentorship and supervision (62/85 countries).
- At facility level, barriers are mainly staff retention (69/86 countries), mentorship and supervision (67/86 countries), staff motivation (64/86 countries), and lack of enforcement of implementation of IMCI guidelines and job aids (60/86 countries).
- Finally, at community level, mentorship and supervision (67/85 countries), staff motivation and lack of remuneration and incentives for health workers (both reported by 59/85 countries), and training (58/85 countries) were the most common barriers named.
Innovations and technological support

- An abridged short course for first level health workers is currently used in 37 out of 90 countries, while computer-based courses are used in 13 countries.
- Behaviour change communication (BCC) has been scaled up nationally through technological innovations (mHealth, eHealth, etc) in 14 countries; data collection and reporting innovations in 24 countries; electronic decision support in 11 countries; supply chain management in 15 countries; and financial transactions and incentives in 10 countries.

Value of IMCI

The major strengths of IMCI identified by countries were:

- the holistic approach to the child (91%)
- the rational use of medicine (91%)
- the quality of health care service (89%) and
- the efficiency in service provision (81%).

What would make access, quality and coverage of child health services stronger in your country? (all regions)

- Actual implementation of current strategies (IMCI, ETAT, iCCM, C-IMCI) with full integration into general health services.
- A costed workplan with an implementation and monitoring framework for all levels.
- Ensure a committed funded budget for activities via aligned, inter-sectoral funding for IMNCI.
- More and better training at every level: implement pre-service training and establish systems of supervision/ mentoring.
- Improve health systems issues that limit implementation (to ensure equal functioning of the supply chain, HMIS, monitoring and evaluation systems);
- Do situation analyses and implement improvement plans.
- Create mechanisms for regulatory compliance (recognition of units correctly implementing programmes, for example).
- More emphasis on the community level: improve counseling, outreach, home visiting services.
- Improve management of sick newborns.
- High-level advocacy to create political will and allow the government to take leadership and ownership of child health.
- Improve capacity at national level for strategic planning.
- Improve coordination (dedicated focal person for child health, child health department at MOH, regular review meetings, national steering committee) with effective coordination of partners to overcome fragmentation especially at community level, including with pediatric associations, private sector actors and NGOs.
What would make access, quality and coverage of child health services stronger in your country? (by who region)

<table>
<thead>
<tr>
<th>Region</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Africa           | • Strong need for **greater resources** mentioned by many countries: mobilization of domestic and external resources, national budget line for RMNCAH, transform IMCI into a programme to ensure state financing  
• Implement **community and social health insurance** schemes  
• Improve **HR issues** (more staff, retention, motivation)                                                                                                                                  |
| The Americas     | • Strong interest in improving programming for **home / community-level care**  
• Strengthen **community participation** and programmes for social protection                                                                                                                                                                             |
| South-East Asia | • **Clearly define** place of IMNCI under RMNCH+A strategy  
• Expand to **urban health clinics and improve village health units**, especially in remote areas  
• Strong **reinforcement of standards** by National Health Insurance scheme                                                                                                                                  |
| Eastern Mediterranean | • **Funding**: increase budgetary allocation and sustainable commitments from donors  
• Focus on **political commitment and advocacy** to institutionalize gains that have been made  
• Improve the PHC system                                                                                                           |
| Europe           | • **Raise awareness** of IMCI and provide more sustainable financing (budget line for child health, UHC scheme)  
• Link to PHC and create an **empowered role of PHC-family medicine in child health service provision**                                                                                                     |
| Western Pacific  | • **Provide training for parents and caregivers** in nurseries to recognize danger signs                                                                                                                                         |

How could existing tools to implement the IMCI strategy be improved? (format)

- Simplify, simplify, simplify – make the package as easy as possible to implement for stretched health systems.
- Minimize the six reading modules (designed for the 11-day training), replace with one exercise booklet.
- Where possible, simplify decision algorithms for clinical diagnosis and review to reduce consultation time.
- Adopt innovative methods for clinical practicums (OSCE, skill lab, teaching aids, etc.) as appropriate clinical settings are not always available.
- Develop directives for IMCI when the chart booklet is not available!
- Costing of packages of services at all levels of care.
- Integrate training tools with data reporting and monitoring and evaluation, and develop key indicators for monitoring.
- Strong desire to regularly update, adapt and scale up ICATT and other distance-learning packages.

How could existing tools to implement the IMCI strategy be improved? (content)

- Add content on budgeting and planning: how to progressively assess gaps and use monitoring and evaluation to assist with evidence-based planning, how to monitor a costed budgeted
• More content on newborn! (case management, not just referral).
• Add content for dealing with displaced persons.
• Community: more educational materials at the community level, informing parents of danger signs, update and improve C-IMCI tools.
• Strong demand to increase materials on early child development and the healthy child.
• Update Early Childhood Development package.
• Develop communication materials and job aids for PHC providers' counselling services to support parenting skills and help children at risk or with special needs.
• Develop communication materials on parenting skills to support complementary feeding (for example video on complementary food cooking process) specific to each region.
• Develop module for health providers on developmental-behavioral pediatrics.

**Conditions to add to IMNCI**

• Early child neurological conditions
• Trauma/accident
• Zika virus (WHO Region of the Americas)
• Non-communicable diseases (NCDs)
• Common non-fatal conditions: skin conditions, urinary tract infections, other fevers (typhoid)
• Supplementary modules for emerging needs and illnesses (for example, thalassemia, dengue)

**If you were asked to improve IMNCI and make it more relevant to today's needs, what would you suggest?**

• Invest more in pre-service training and prioritize supportive supervision/mentoring
  - Emphasize that IMCI skills should be imparted in health training schools;
  - Update the guide for putting IMCI into pre-service training;
  - Develop modules that can be implemented in the form of on-the-job training and mentoring.
• Make use of communication technologies: VERY strong demand for ICATT, creation of electronic versions of IMCI documents for mobile phone application, and digitizing the IMCI chart booklet.
• Structured monitoring through a mhealth/ehealth platform implemented under a strict monitoring mechanism at health centers and districts.
• More on community outreach and mobilization (mentioned by all regions) and implementation of C-IMCI.
• Home visit strategy should be clearly defined as to which programme it belongs to: IMNCDI or HBNC? Avoid duplication. Define worker roles clearly.
• Increased funding and political commitment is a clear priority in all regions except Europe.
• Integrate IMNCI into other financing modalities (Global Fund, GAVI, GFF).
• Advocate for inclusion of IMNCI in country workplans with internal budgetary lines.
• Re-appropriation of IMNCI by funders.
• Continue evidence generation and uphold IMNCI as the best option to deliver high impact child health interventions.
• Institutionalize IMNCI and work to ensure country ownership.
• IMNCI to be included under health insurance coverage.
• Make IMNCI mandatory for every PHC worker and institution.
• Update and make consistent all related modules on newborn health (ENC and HBB, for example).
• Align with SDGs, and include the private sector.
Annex 4: Summary of evidence from the community IMNCI review (DR-Prost)

Learning from past reviews

The Multi-Country Evaluation and the Analytic Review of IMCI, published in 2003 suggest that C-IMCI was probably not scaled up extensively due to: (1) overall lack of resources for IMCI and community health worker programmes, (2) a lack of clarity regarding the specific activities to be carried out under C-IMCI and (3) a lack of practical, easy-to-use training tools and job aids for frontline workers and other community-based actors (for example, health committees).

Home visits

- There is strong evidence that counseling through home visits can improve essential newborn care practices, improve care-seeking for maternal and newborn health problems, and reduce neonatal mortality.
- In proof-of-principle trials, packages that include both antenatal and postnatal home visits have led to 30% to 60% reductions in neonatal mortality (Risk Ratio [RR]: 0.55, 95% CI: 0.48-0.63).
- Larger scale-up studies show smaller effects embedded within government programmes (RR: 0.88, 95% CI: 0.82-0.95).
- No systematic review exists of the effectiveness of home visits and of different counselling modalities for child survival beyond the neonatal period, though the evidence suggests that visits might be useful to deliver a number of interventions including hygiene promotion for illness prevention, appropriate care-seeking, infant and young child feeding, and early childhood development.

Women’s groups

- Studies and programmes have engaged women’s groups in three main ways, through didactic health education, behavior change communication drawing on social cognitive theory (SCT), Participatory Learning and Action (PLA).
- In the first category, women’s groups have served as peer ‘amplifiers’ to diffuse messages for behavior change (for example, Care Groups). This SCT-informed approach showed a high impact in efficacy trials where it was combined with home visits, but was less effective in scale-up initiatives: a large social and behavior change communication programme using group-based counseling with ASHAs and media approaches to improve maternal and newborn health in an area of India with 23 million people did not reduce neonatal mortality.
- The most widely tested approach to working with women’s groups in the perinatal period is PLA. PLA includes peer diffusion of information and negotiation of behaviors, and has an additional element of community capacity building. A group of 15-20 women comes together monthly or fortnightly under the guidance of a local facilitator, ideally with one group per 500 population. Groups 1) identify problems, analyse their immediate and more distal causes, prioritize the problems for which they want to take action, 2) discuss and prioritize possible strategies to address the problems, (3) implement the strategies and (4) evaluate progress.
- A meta-analysis of trials in Bangladesh, India, Malawi and Nepal found that PLA with women’s groups led to a 20% reduction in neonatal mortality (OR: 0.80, 95% CI: 0.67-0.96) and a 23% non-significant reduction in maternal mortality (OR: 0.77, 95% CI: 0.48-1.23). Neonatal mortality was reduced by over 30% in rural areas when at least one third of pregnant women attended meetings. The greatest impact on mortality was among the most marginalized.
- A recent trial in India found that neonatal mortality decreased by one third when PLA was delivered by ASHAs. This has led the India National Health Mission to recommend scale-up of
PLA in ten states.

- The Government of Ethiopia has adapted PLA for its Health Development Army based on experiences in Tigray, where strong improvements were seen in care-seeking for maternal and newborn health. The programme has been recommended for nation-wide scale up.

- Recent research also shows early positive results following implementation of an integrated MNCH strategy including health systems changes and participatory women’s groups in northern Nigeria.

- Evidence on the effectiveness of group-based strategies beyond the neonatal period is more tenuous. A common approach is the Care Group model, which has been used extensively by NGOs to improve child survival and appears to rely largely on the health belief model. A paid facilitator meets with a group of ten or so volunteer women every two to four weeks and shares up to three new health messages about prevention and care-seeking for mothers and children. Each group member relays the messages to ten households with pregnant women or children under 5 years of age. Care Group projects achieved a higher coverage of child survival interventions compared to non-Care Group projects in all countries.

- The increases in coverage of key child survival interventions in Care Group projects is impressive, but evaluation designs were not randomized. We need more information about which peer-counseling methods are used in Care Group projects beyond ‘communicating messages’, and impact data on infant or child mortality from randomized controlled trials or better-designed plausibility evaluations.

**Engaging with husbands and partners, community leaders and community health providers**

- A recent meta-analysis of 14 studies found that involving men in individual or group-based interventions increased utilization of maternal health services, including skilled birth attendance and postnatal care, and led to a 66% reduction in the likelihood of postpartum depression (OR: 0.34, 95% CI 0.19-0.62; five studies). Men were involved either through SCT-informed counseling during home visits, or as participants during meetings organized by women’s groups as part of PLA.

- Several studies described the importance of engaging with religious and political leaders to gain support for maternal and child health activities. Some teams used group or individual communication to sensitize political and religious leaders to upcoming interventions, or asked them to make supportive speeches and sermons. In PLA cycles, groups typically organized two community-level meetings to involve other community members and leaders in discussing maternal and child health problems, ask for their support in implementing proposed strategies, and share progress.

- Private providers (private doctors, drug-sellers and pharmacists) have not received enough attention in the literature on IMNCI. Involving private providers in orientation sessions about IMNCI or offering them a full or shortened IMNCI training course has been shown to improve their case detection and treatment skills.

- Community Dialogue has also been used to engage men, leaders and community health providers as part of iCCM in, for example, Malawi, Mozambique and Niger. This approach has the potential to build community capacity and would benefit from further implementation and evaluation.

- Increasing investment in iCCM through frontline workers, combined with community mobilization and innovative methods to improve supervision can increase treatment and care-seeking rates for diarrhoea, pneumonia and malaria.
Health committees

- Health committees (village health committees or health facility committees) have been used to increase demand for and access to equitable access to services and quality care. Experience suggests that health committees can be effective in supporting CHW programmes and improve accountability in cases where community participation is well-established and there is support for decentralized planning and action.

- Recent evidence suggests that iCCM has been scaled up more successfully in settings were it was accompanied by a comprehensive community engagement strategy, with support from leadership and collaboration between CHWs and community health committees. In Kenya for example, joint decision-making through dialogue between community members and service providers led to improvements in facility births and improved the accountability of service providers to the communities they served. In Viet Nam, local maternal and newborn stakeholder groups that included primary health care staff and local politicians used a PLA or triple-A problem-solving approach to improve birth outcomes, leading to increased antenatal care uptake and reduced neonatal mortality.

- Ethiopia’s Last 10k programme, which aims to improve maternal and child health in rural areas by linking Primary Health Units and communities, reports that health committees and community-based data monitoring and decision-making are key to their work. This emerging evidence supports the conclusions of a systematic review of the effects of health committees, which suggested that they can improve the quality and coverage of health care.

Mass media

- A systematic review of 111 mass media interventions for child survival found that the majority of campaigns addressed reproductive health (n=67), multiple child survival behaviors (n=44), diarrhoeal disease (n=15) and nutrition (n=14). Knowledge about desired behaviors and care-seeking improved after exposure to mass media interventions, but there was strong evidence of publication bias in favor of positive studies: only six out of 111 reported negative results.

- In Burkina Faso, the midline results of a cluster RCT testing the effects of a radio campaign to improve key family behaviors related to child survival found positive effects on care-seeking for diarrhoea (adjusted Difference in Difference [DiD] 17.5%; 95% CI: 2.5-32.5), antibiotic treatment for fast/difficult breathing, and saving money during pregnancy (adjusted DiD, 12.8%; 95% CI, 1.4-24.2) but no impact on population mortality.

- Overall, the evidence suggests that mass media is an effective complement to, but not a substitute for, dialogue-based interventions with frontline workers. The literature suggests that mass media campaigns can lead to changes in maternal and child health behaviors, especially when new policies, community-based activities, services or commodities are being implemented and when exposure to campaigns is high.

Combined approaches

- Lessons from successful trials and large-scale programmes such as Alive & Thrive suggest that working through multiple community platforms and dialogue-based approaches yields the best results. Malawi and Nepal have achieved considerable reductions in child and neonatal mortality over the past two decades, and both adopted a mix of community engagement strategies supported by CHWs in addition to IMNCI, community groups, health committees and iCCM.

- In Malawi, Health Surveillance Assistants were instrumental in increasing coverage of iCCM; they implemented the National Community-based Maternal and Newborn Care package through home visits and generated demand via Care Groups and Community Dialogue.
• In Nepal, Female Community Health Volunteers were trained to promote birth preparedness, essential newborn care, detection of and treatment for pneumonia; they also worked closely with Village Development Committees and women’s groups.

• The synergy between home visits and group-based community mobilization to improve neonatal survival has been demonstrated in several successful trials.

Overall

• The balance of evidence suggests that a community strategy combining home visits and group activities is likely to be the most effective to reduce neonatal mortality. PLA is recommended to increase the capabilities of communities to improve maternal and newborn health, and has shown good results in high mortality areas, especially when one third or more of pregnant women participate.

• Both home visits and PLA are supported by WHO recommendations and the Every Newborn Action Plan.
Annex 5: Summary of solutions suggested during key informant interviews with experts (GKI report)

All respondents had a range of expertise in the area of global child health; over half worked in a university and/or research setting and some had dual roles in research and in providing care in a health facility. Four respondents had senior roles in NGOs and three held very senior positions in international organizations. Respondents had a wide range of experience with IMNCI, some having worked on it since the early 1990s. Collectively, respondents had experience with IMNCI from countries from all regions of the world.

Improving health worker skills

Issue: The cost and length of pre-service training

- Employ a professional over months or years to supervise and mentor a group. A potential problem is that financers usually prefer to pay for a short-term training rather than investing in long-term professional development. As one respondent said, “NGOs and donors are like banks and their job is to spend money and they have to do it in a certain time frame. So it is easier to say, let’s train 1000 people that will spend all that money in two months and our job is done!”
- “Low-dose” or more frequent training opportunities; this approach might also be more widely supported by the private sector. However, potential problems with this approach include increased costs for travel and lodging.

Issue: In-service versus pre-service training

- Fund colleges and nurse training institutions; training would be applicable to the context and genuinely add to people’s knowledge. One respondent said, “…this is particularly important in light of the ‘brain-drain’ that is occurring all over Africa…we can’t lose this opportunity in the future”.
- Obtain buy-in from medical schools and associations to make sure pre-service and in-service training are harmonized.

Issue: Supervision, mentoring, monitoring and evaluation

- On-site training on a regular basis (for example once a week or every two weeks); you then give people homework and come back in two weeks’ time.
- A pool of supervisors and teachers to ensure quality of performance (not to “control and blame”), understand the health worker’s difficulties and provide support on how to do better within limitations of time and resources.
- To improve quality of care, one respondent said remuneration should play a role…”although this is probably too idealistic for many countries”.
- A functioning performance review would help keep workers keep abreast of changes in the guidelines and add to peer learning.
- Clinical mentoring to update front-line health workers, such as a rolling system that could accommodate different clinical areas: “that is a basic building block - IMCI doesn’t have to create such a system but it is necessary before you implement it”.
- Monthly supervision, three- and six-month follow-up; annual in-service refresher training.
- Introducing an information system for case notes and a monitoring form that acts as a treatment form; this allows for data collection and better assessment of programme functioning and then transmission of data back to MoH for monitoring and evaluation.
• One respondent described how training in IMNCI works well in Kenya at the district level: two senior trainers are vetted carefully, they return to train others with follow-up after six weeks and a strong focus on supervision. No certificates of completion are awarded until supervisors find evidence that the training has indeed been implemented throughout the facility.

**Issue: Applicability of IMNCI training materials and target audience**

• Training should use improved technology for challenging diagnoses, such as pneumonia.
• Modify training to reflect the type and quantity of health workers actually present in country; this would be similar to modifying content of the training package to fit most pressing needs in the country, for example including or excluding HIV.
• Adapt training and implementation as much as possible to the human resources and characteristics of each country’s health system.

**Strengthening health systems**

• IMNCI can bring attention to stock-outs and promote a well motivated workforce.
• Better managerial support structures within the health system are essential to rolling out IMNCI.
• In contrast to the one-size-fits-all approach, a comprehensive needs assessment can tailor new programmes to a country’s existing health system.
• Increased donor support will be necessary: “you can’t do health systems strengthening alone”.
• Ministries need to sit down and see how programmes can be rolled out, identify potential challenges and avoid pursuing interventions in isolation.
• Ministries and partners need to first focus on health system readiness, and then define what programme areas need most attention.

**Improving family and community practices**

• Incorporate evidenced-based community mobilization and support strategies such as women’s groups onto existing IMNCI community strategies and significantly improve integration with all other areas.
• Utilize community health contact points, such as antenatal visits, to raise awareness of IMNCI among households.
• Conditional cash transfers can be an excellent way to increase care-seeking behaviors though one respondent said “UN agencies have not pushed this”.
• Where IMNCI and iCCM work together, community volunteers have been successful in promoting care seeking, “…there is no need to have two components—rather they should be seen as one component with two arms moving together”.

Institutional barriers

- Greater flexibility on who can be a CHW and who is supported in this role.
- National alliances, government buy-in and partnership of like-minded partners to push iCCM to every corner.
- Clarify who is doing what: “Training needs to be targeted at different levels so you don’t have clinicians doing what CHWs are doing”.
- Doctors have to be convinced CHWs are not competing with them: “…we can’t work only on community case management; the training really has to be targeted at the different levels: community health centers, referral hospitals, etc. so everyone feels they have a value added”.
- A large cadre of CHWs paid by the government and trained in a broad package of interventions (WASH, breastfeeding, etc.) and a consistent presence of CHWs to increase utilization, such as the army of female health workers in Ethiopia.
- A fuller package for CHWs with a focus on newborn care, the well child and child development.
## Annex 6: Systemic constraints to advancing child health and possible digital health solutions (DR-Agarwal)

Initials (S, C, P) are used to denote whether the innovations are targeting constraints at the system infrastructure, client or provider level of the health system.

<table>
<thead>
<tr>
<th>Sample constraints to improving child health</th>
<th>Possible digital health solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>S Enumeration of new births or neonatal deaths</td>
<td>The Millennium Villages Project in Ghana initiated a vital registration and verbal autopsy system where CHWs report deaths using an SMS message. This is followed by a detailed verbal autopsy using Open Data Kit-support mobile forms. The forms are uploaded on the electronic medical record system called OpenMRS, which uses the verbal autopsy data to generate reports.¹¹</td>
</tr>
<tr>
<td>C Access to health information (about breastfeeding, home care for diarrhoea etc.)</td>
<td>Tahir et al. tested the effect of unidirectional telephone counselling to provide education on breast- and infant feeding practices, in order to encourage exclusive breastfeeding.¹²</td>
</tr>
<tr>
<td>S Regular supply of drugs to treat pneumonia, malaria and other childhood illnesses</td>
<td>cStock in Malawi allow health surveillance assistants to report community-level stock-out of drugs for IMNCI using an SMS message. District Product Availability Teams ensure that the drugs are available for pick-up at the health facility.¹³</td>
</tr>
<tr>
<td>P Lack of availability or access to diagnostic kits/centres or skills to use them</td>
<td>To reduce the time between blood sampling for detection of infant HIV and notification of the test results to the health facility, Project Mwana in Zambia uses an SMS message using RapidSMS to deliver the results to the facility ahead of paper records. Delays resulting from lack of local availability of skilled diagnosticians and labs are thus addressed.¹⁴ This is now scaling up as a national programme.</td>
</tr>
<tr>
<td>C Poor availability of transport services to seek emergency obstetric care</td>
<td>In Zanzibar, D-tree International D-tree uses a mobile algorithm to help trained birth attendants identify high-risk pregnancies. For births that need health facility referrals, these birth attendants partner with local transport services, and are able to pay promptly for transport using mobile money. D-tree partnered with with Zantel, the largest mobile phone operator in Zanzibar, and Etisalat, another telecom operator, to incorporate an SMS-mobile money payment system into the programme.¹⁵ This project is also in close collaboration with the Ministry of Health, aiming for district-level scale.</td>
</tr>
</tbody>
</table>


¹³ [http://sc4cm.jsi.com/countries/malawi/](http://sc4cm.jsi.com/countries/malawi/)

¹⁴ [http://www.unicef.org/partners/Partnership_profile_2012_Mwana_Zambia_V2_approved.pdf](http://www.unicef.org/partners/Partnership_profile_2012_Mwana_Zambia_V2_approved.pdf)

<table>
<thead>
<tr>
<th>Cost</th>
<th>Expenses association with the production and supply of commodities</th>
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<td></td>
<td>As a low cost option to addressing supply-chain issues, mVacciNation in Mozambique digitized information on vaccine demand, stocks and storage. The health facilities offering vaccination services receive a warning text message to alert them if their vaccine stock is running low. Other programmes, such as the Novartis and Malaria No More programme “SMS for Life” also demonstrated marked success in sharply reducing stock-outs through scheduled, text-message reporting of stock levels.</td>
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<td>C</td>
<td>Expenses of seeking care at a health facility</td>
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<td>The Wired Mothers intervention combined unidirectional text messaging and direct two-way communication in a free call voucher system to provide education on pregnancy, reminders for antenatal care visits and an emergency medical response system.</td>
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<tr>
<td>S</td>
<td>Timeliness of data collection, entry and use concerning high risk pregnancies</td>
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<td></td>
<td>mSakhi is a mobile-based multimedia job-aid used by CHWs in two districts in Uttar Pradesh, India. Using an open-source android platform, CHWs can register pregnant women and newborns. The data is then used for real-time tracking of the pregnancies and reduces delays in responding to any birth-related complications.</td>
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<tr>
<td>P</td>
<td>Timely provision of postnatal care</td>
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<td>The data collected as part of the mSakhi project is used to generate a work planning schedule for CHWs and sends them reminders to visit mothers and newborns as per the nationally recommended postpartum visitation schedule.</td>
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<tr>
<td>C</td>
<td>Timely diagnosis and start of treatment for childhood illnesses</td>
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<td></td>
<td>mSakhi alerts CHWs to visit newborns, They can then use the multimedia content, decision support, diagnosis and assessment tools available on their mSakhi smartphone to identify newborn and childhood illnesses, and make timely referrals to the health facility.</td>
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<tr>
<td>S</td>
<td>Counterfeit drugs for treatment of childhood illnesses</td>
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<td></td>
<td>In Nigeria, mPedigree allows consumers to send text messages with item-unique codes on medicine packaging to verify their authenticity.</td>
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</tr>
<tr>
<td>P</td>
<td>Poor knowledge of healthcare providers</td>
</tr>
<tr>
<td></td>
<td>Mobile Academy, designed by BBC Media Action and launched nationwide in India, provides audio (using interactive voice response) training courses to CHWs to strengthen their knowledge of preventive maternal and child healthcare behaviors. The course comprises of 36 chapters and nine quizzes. CHWs receive a certificate of completion. This is currently slated for national scale-up over the next two years in India.</td>
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<td>C</td>
<td>Acceptability of post abortion contraception use</td>
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<td></td>
<td>The Mobile Technology for Improved Family Planning (MOTIF) intervention in Cambodia addressed negative perceptions and fear of side-effects of the use of contraceptives in clients seeking care for abortion services. Clients willing to participate in the intervention receive post-abortion family planning counselling at the clinic followed</td>
</tr>
</tbody>
</table>

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66 https://www.povertyactionlab.org/evaluation/increasing-vaccination-coverage-using-mobile-phone-application-mozambique
67 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2978233/
70 http://mpedigree.net
71 http://www.rethink1000days.org/programme-outputs/mobile-academy/
by six automated interactive voice messages on the advantages of contraceptive use and availability of choices.\textsuperscript{22}

<table>
<thead>
<tr>
<th>Utilization</th>
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<tbody>
<tr>
<td><strong>P</strong> Poor health worker accountability and absenteeism</td>
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<tr>
<td><strong>C</strong> Low demand for services such as facility-based births or poor care-seeking for childhood illnesses</td>
</tr>
</tbody>
</table>

S: System-level constraint; P: Provider-level constraint; C: Client-level constraint

\textsuperscript{22} http://www.who.int/bulletin/volumes/93/12/15-160267/en/
\textsuperscript{23} http://www.mtrac.ug/content/how-mtrac-works
\textsuperscript{24} https://www.rethink1000days.org/programme-outputs/kilkari/
Annex 7: Summary of evidence on IMNCI and the private sector (DR-Awor)

The private health sector is conventionally defined as comprising “all providers who exist outside the public sector, to treat illness or prevent disease, whether their aim is commercial or philanthropic” (see table below from DR-Awor). A low tax base and inability to collect sufficient revenue to finance all sectors has rendered the western national health model insufficient to meet the health needs of most people. Thus, despite substantial public health investments made over the last 40 years in low- and middle-income countries, governments cannot always be viewed as the principal health care provider.

| Table 1: The heterogeneous and multilayered composition of the private sector |
|---------------------------------|---------------------------------|
| **For Profit**                  | **Informal**                    |
| ▪ Private hospitals/clinics     | ▪ Unregistered pharmacies and drug shops |
| (outpatient care, inpatient care, multi-specialty, super specialty) | ▪ Public sector frontline health workers providing private healthcare beyond their scope of work, for a fee |
| ▪ Private doctors (general physician) | ▪ Private practitioners of allopathic medicine. May be commonly referred to as ‘small doctors’ or ‘private doctors’ in India, ‘village doctors’ in Bangladesh. |
| ▪ Private registered/licensed pharmacies, drug shops and proprietary patent medicine vendors (Nigeria) | ▪ Traditional healers |
| ▪ Private mobile clinics        | ▪ Friends and relatives |
| ▪ Private nurse/paramedic/other formally trained health worker | ▪ Drug peddlers and vendors |
| ▪ Public private mixed: e.g. village doctors and village clinics in China, and public doctors working privately in India; Publicly owned hospitals and public providers with high user fees | ▪ It is possible for not-for-profit entities to function informally, for example small charities and un recognized spiritual healers |
| ▪ Private non-biomedical providers and facilities. E.g. formally qualified AYUSH practitioners in India and practitioners of Chinese medicine/integrated medicine in China. | |
| **Not for profit**              |                                 |
| ▪ Non-governmental hospitals/clinics (e.g. LV Prasad eye hospital, India) | |
| ▪ Faith based hospitals such as Mission Hospitals | |
| ▪ Community based depot holders and other fieldworkers | |
| ▪ Public Private Partnerships between governments and NGOs to deliver health services such as mobile clinics or delivery centers in hard to reach areas | |

The private sector particularly plays a significant role in the delivery of health services, providing more than 50% of all health care in sub-Saharan Africa and over 80% of health care in Asia outside of China.
Conclusions and recommendations for improved engagement with the private sector

1. There is growing evidence of private sector engagement approaches that are promising and relevant for improving child health outcomes. These particularly include: social marketing, social franchising, voucher systems, accreditation and contracting out. However, for maximum benefit, these delivery strategies must be utilized in various combinations.

2. It is important to use a systems approach when engaging the private sector for public health goals, in order to understand how the interventions interact with the rest of the health system, as well as the intended and unintended consequences.

3. There is potential for IMNCI and iCCM to act as vehicles to improving quality of care in the private sector, provided they are adapted for use in the sector. Conversely, the private sector can improve the reach and coverage of IMNCI. However, there is very little evidence available at present.

4. An implementation research agenda for private sector integrated care of febrile illness in children needs to be developed and implemented in conjunction with private sector programmes, in multiple settings. This research agenda should incorporate the different segments of the private sector including drug shops and the informal sector.