



# *The Lancet* Series on Maternal and Child Undernutrition Progress

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## Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda

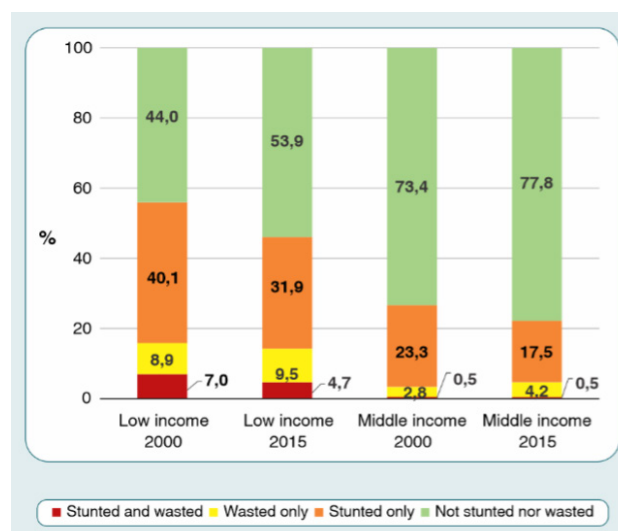
*Cesar G Victora, Parul Christian, Luis Paulo Vdaletti, Giovanna Gatica-Dominguez, Purnima Menon, Robert E Black*

13 years after the first *Lancet* Series on Maternal and Child Undernutrition, we reviewed the progress achieved on the basis of global estimates and new analyses of 50 low-income and middle-income countries with national surveys from around 2000 and 2015. The prevalence of childhood stunting has fallen, and linear growth faltering in early life has become less pronounced over time, markedly in middle-income countries but less so in low-income countries. Stunting and wasting remain public health problems in low-income countries, where 4·7% of children are simultaneously affected by both, a condition associated with a 4·8-times increase in mortality. New evidence shows that the incidence of stunting and wasting peaks in the first 6 months of life, but does also exist in part at birth. Global low birthweight prevalence declined slowly at about 1·0% a year. Knowledge has accumulated on the short-term and long-term consequences of child undernutrition and on its adverse effect on adult human capital. Existing data on vitamin A deficiency among children suggest persisting high prevalence in Africa and south Asia. Zinc deficiency affects close to half of all children in the few countries with data. New evidence on the causes of poor growth points towards subclinical inflammation and environmental enteric dysfunction. Among women of reproductive age, the prevalence of low body-mass index has reduced and halved in middle-income countries, but trends in short stature prevalence are less evident. Both conditions are associated with poor outcomes for mothers and their children, whereas data on gestational weight gain is scarce. Data on the micronutrient status of women are conspicuously scarce, which constitutes an unacceptable data gap given that prevalence of anaemia in women remains high and unabated in many countries. Social inequalities are evident for many forms of undernutrition in women and children, suggesting a key role for poverty and low education, and reinforcing the need for multisectoral actions to accelerate progress. Despite little progress in some areas, maternal and child undernutrition remains a major global health concern, particularly as recent gains might be offset by the COVID-19 pandemic.

### Key messages

- From 2000 to 2015, there were small improvements in linear growth for children younger than 5 years, but progress was slow for wasting and low birthweight.
- The whole distributions of height-for-age and weight-for-height remain shifted towards undernutrition in low-income countries, where stunting and wasting persist as important public health problems.
- New evidence shows that the incidence of stunting and wasting are highest during the first 6 months of life, reinforcing the need to focus on the first 1000 days from conception to age 2 years.
- Socioeconomic inequalities persist as a major distal determinant of undernutrition, as shown by between-country and within-country analyses.

- Regarding micronutrient deficiency in young children, vitamin A status has improved in east Asia, but persists at high rates in south Asia and in Africa. Zinc deficiency affects one in every two children in the few countries with information. Anaemia remains highly prevalent among women and young children. Investments to reduce undernutrition in women are important not only for women's own health but also for the health and nutrition of their children, as new evidence reinforces the link between nutrition of mothers and reproductive outcomes.
- There have been positive yet small reductions in the prevalence of low body-mass index among women of reproductive age.
- The growing availability of anthropometric data for women and young children has allowed progress to be monitored and interventions to become more focused, but the scarcity of information on micronutrient status needs to be addressed.



**Prevalence of wasting and stunting in children younger than 5 years**

## Effective interventions to address maternal and child malnutrition: an update of the evidence

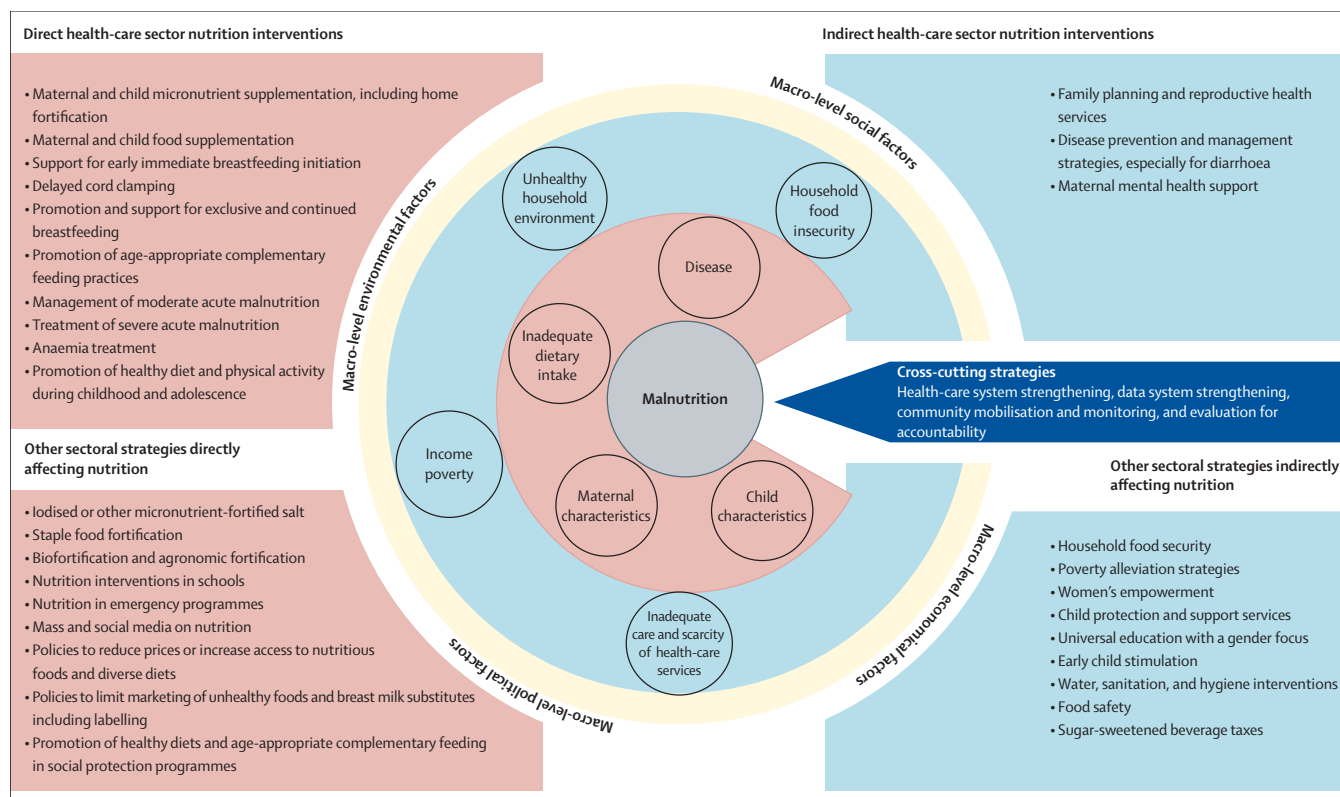
*Emily C Keats, Jai K Das, Rehana A Salam, Zohra S Lassi, Aamer Imdad, Robert E Black, Zulfiqar A Bhutta (Lancet Child Adolesc Health 2021)*

Malnutrition—consisting of undernutrition, overweight and obesity, and micronutrient deficiencies—continues to afflict millions of women and children, particularly in low-income and middle-income countries (LMICs). Since the 2013 *Lancet* Series on Maternal and Child Nutrition, evidence on the ten recommended interventions has increased, along with evidence of newer interventions. Evidence on the effectiveness of antenatal multiple micronutrient supplementation in reducing the risk of stillbirths, low birthweight, and babies born small-for-gestational age has strengthened. Evidence continues to support the provision of supplementary food in food-insecure settings and community-based approaches with the use of locally produced supplementary and therapeutic food to manage children with acute malnutrition. Some emerging interventions, such as preventive small-quantity lipid-based nutrient supplements for children aged 6–23 months, have shown positive effects on child growth. For the prevention and management of childhood obesity, integrated interventions (eg, diet, exercise, and behavioural therapy) are most effective, although there is little evidence from LMICs. Lastly, indirect nutrition strategies, such as malaria prevention, preconception care, water, sanitation, and hygiene promotion, delivered inside and outside the health-care sector also provide important nutritional benefits. Looking forward, greater effort is required to improve intervention coverage, especially for the most vulnerable, and there is a crucial need to address the growing double burden of malnutrition (undernutrition, and overweight and obesity) in LMICs.

### Key messages

- Evidence-based interventions for improving maternal and child nutrition continue to be a combination of interventions that are direct (eg, delayed cord clamping and micronutrient supplementation, breastfeeding promotion, and counselling) and indirect (eg, malaria prevention, and water, sanitation, and hygiene promotion)

- Nutritional interventions delivered within and outside the health-care sector are equally crucial for preventing and managing malnutrition
- New evidence supports the use of preventive lipid-based nutrient supplementation for reducing childhood stunting, wasting, and underweight, and the use of antenatal multiple micronutrient supplementation for preventing adverse pregnancy and birth outcomes
- Evidence gaps remain for strategies to address malnutrition among schoolchildren and adolescents
- The drivers of undernutrition are diverse, and novel evidence synthesis methods underscore the need for multisectoral action and coordination



### Revised framework for the classification of nutrition actions

Strong evidence for implementation	<ul style="list-style-type: none"> <li>• Multiple micronutrient supplementation in pregnancy</li> <li>• Kangaroo mother care for preterm and low birthweight newborn babies</li> <li>• Delayed cord clamping for preterm newborn babies</li> <li>• Breastfeeding promotion and counselling</li> <li>• Complementary feeding education with and without food provision in food insecure populations</li> <li>• Vitamin A supplementation for children in vitamin A-deficient contexts</li> <li>• Therapeutic zinc supplementation for diarrhoea management</li> <li>• Small-quantity lipid-based nutrient supplements for growth among children</li> <li>• Ready-to-use supplementary food for management of acute malnutrition</li> <li>• Family planning and birth spacing*</li> <li>• Insecticide-treated bednets for the control of malaria*</li> <li>• Large-scale food fortification for the prevention of micronutrient deficiencies†</li> <li>• Water, sanitation, and hygiene interventions‡</li> </ul>
Moderate evidence for implementation	<ul style="list-style-type: none"> <li>• Calcium supplementation in pregnancy in low intake populations</li> <li>• Balanced-energy protein supplementation in pregnancy for women who are undernourished</li> <li>• Complementary feeding education without food provision in food secure populations</li> <li>• Preventive zinc supplementation to reduce diarrhoea incidence</li> <li>• Micronutrient powders to reduce iron deficiency and anaemia among children</li> </ul>
Weak evidence for implementation	<ul style="list-style-type: none"> <li>• Food distribution programmes during pregnancy</li> <li>• Kangaroo mother care for term newborn babies</li> </ul>
Emerging evidence	<ul style="list-style-type: none"> <li>• Probiotics for preterm and low birthweight newborns</li> <li>• Emollient use (ie, coconut oil) for preterm and low birthweight newborns</li> </ul>

**Recommended evidence-based interventions to address malnutrition, according to strength of evidence**

# Mobilising evidence, data, and resources to achieve global maternal and child undernutrition targets and the Sustainable Development Goals: an agenda for action

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As the world counts down to the 2025 World Health Assembly nutrition targets and the 2030 Sustainable Development Goals, millions of women, children, and adolescents worldwide remain undernourished (underweight, stunted, and deficient in micronutrients), despite evidence on effective interventions and increasing political commitment to, and financial investment in, nutrition. The COVID-19 pandemic has crippled health systems, exacerbated household food insecurity, and reversed economic growth, which together could set back improvements in undernutrition across low-income and middle-income countries. This paper highlights how the evidence base for nutrition, health, food systems, social protection, and water, sanitation, and hygiene interventions have evolved since the 2013 *Lancet* Series on maternal and child nutrition and identifies the priority actions needed to regain and accelerate progress within the next decade. Policies and interventions targeting the first 1000 days of life, including some newly identified since 2013, require renewed commitment, implementation research, and increased funding from both domestic and global actors. A new body of evidence from national and state-level success stories in stunting reduction reinforces the crucial importance of multisectoral actions to address the underlying determinants of undernutrition and identifies key features of enabling political environments. To support these actions, well-resourced nutrition data and information systems are essential. The paper concludes with a call to action for the 2021 Nutrition for Growth Summit to unite global and national nutrition stakeholders around common priorities to tackle a large, unfinished undernutrition agenda—now amplified by the COVID-19 crisis.

## Key messages

- The evidence base for direct and indirect health, agriculture and food systems, social protection, and water, sanitation, and hygiene (WASH) interventions to reduce undernutrition has grown substantially since the 2013 *Lancet* Series on maternal and child nutrition. However, information about the costs and cost-effectiveness of interventions delivered across sectors has not kept pace and remains a barrier to effective planning by governments.
- The available evidence reaffirms key priorities for undernutrition, including an emphasis on the first 1000 days (early pregnancy up until the first 2 years of child life). Interventions and actions targeting this age window require renewed commitment, new insights from implementation research, and fast-tracked funding to increase coverage and improve quality of service delivery.
- Several direct nutrition interventions are ready for scaling up in health systems and others appear promising; these policies should be considered for inclusion in national plans. Greater specificity about what direct and indirect actions health, agriculture and food systems, education, WASH, social protection, and other sectors should prioritise, in different contexts, is needed.
- A new body of evidence from in-depth analyses of successful stunting reduction at the national or subnational level reaffirms the need for a range of sectoral actions, especially those that address the underlying determinants of undernutrition, and the need to foster enabling environments.
- Nutrition data and accountability have improved since 2013, but more action is needed to ensure that global goals and commitments can be tracked and, more importantly, that national and subnational actions across sectors are tailored to each specific context and reach the most vulnerable groups.
- A 2017 global Investment Framework for Nutrition estimated that, on average, an additional US\$7 billion per year is required to reach global maternal and child undernutrition targets—a cost that will increase

given setbacks due to COVID-19. Donors increased spending on priority interventions between 2015 and 2017, but more funds are still needed. Data on domestic spending for nutrition show a decline for many countries during the same period.

- There is no time to lose. For both the pandemic response and the rapidly approaching global target deadlines, nutrition actors at global and national levels must respond to the call to action to bring together resources, leadership, and coordination, along with data and evidence, to address the large remaining burden of undernutrition worldwide.

## **Call to action to address the unfinished undernutrition agenda**

In the lead up to the Nutrition for Growth (N4G) Summit in 2021, we call for:

1 Acceleration of financial commitments by governments, donors, and others to deliver on the unfinished maternal and child undernutrition agenda that has been hampered by the COVID-19 pandemic. There is simply no time to lose.

1.1 Financing commitments by all parties should prioritise addressing bottlenecks to the expansion of coverage, quality, and delivery of proven interventions outlined in this Series. Mechanisms for tracking progress and holding stakeholders accountable for delivering on their specific, measurable, achievable, relevant, and time-bound financial commitments is a necessity.

1.2 Governments need to substantially accelerate domestic investments in nutrition, which could include ensuring that nutrition goals are reflected in actions by health, food, and social protection systems to mitigate the impacts of the COVID-19 pandemic. Development partners need to continue ramping up financial support to countries in the near term.

1.3 National costed strategic plans for nutrition data across sectors are needed. These plans should address each link of the data value chain, including data on priority indicators at a subnational level. Plans should improve capacity, adopt tools for analysis and evidence translation, and foster a culture of data use among decision makers at all levels.

2 National and subnational governments must rapidly scale up, with quality, the interventions with evidence of impact in the first 1000 days of life that derive from a context-specific, strategic priority-setting process (see point 3 below). At present, coverage is too variable and too inequitable to deliver impacts without concerted action.

2.1 Governments must take action to address low coverage and quality of nutrition services within health systems. Closing the gap between health services and nutrition coverage is a priority.

2.2 Nutrition-focused actors must work collaboratively across sectors to strengthen common delivery platforms including those at the community level. Implementation research should be used to identify and address context-specific operational, utilisation, and compliance barriers to universal coverage of high-quality nutrition programmes and interventions.

2.3. Several food and health sector strategies exist to reduce micronutrient deficiencies in children and women of reproductive age, including staple food fortification, and these need to be scaled up.

2.4 Immediate scaling and routine coverage measurement for multiple micronutrient supplements during pregnancy, as well as intensified efforts to develop the implementation-related evidence required to scale up calcium and balanced energy protein supplements in settings with low dietary intakes of these nutrients and a high prevalence of maternal undernutrition are also a priority.

2.5 Immediate scaling and routine coverage measurement for newborn interventions, including those that support delayed cord clamping, kangaroo mother care for low birthweight infants, and the ten steps to successful breastfeeding are an urgent priority.

2.6 Coordinated strategies supported by contextualised implementation research are needed to ensure that other interventions, such as micronutrient powders, small-quantity lipid-based nutrient supplementation, and counselling-based strategies to improve diet quality and enhance micronutrient intakes in children 6–23 months of age, are used in complementary and cost-effective ways within both national and subnational programmes.

2.7 Global guidelines for provision of small-quantity lipid-based nutrient supplementation to children 6–23 months of age should be developed, based on compelling evidence of their impact on growth, anaemia, and all-cause mortality.

2.8 New approaches for streamlining acute malnutrition treatment under a unified protocol are promising in terms of feasibility of implementation and outcomes, but we need more data on cost of scale-up to address the substantial burden of moderate malnutrition before changing recommendations and guidelines.

3 National and subnational efforts must address context-specific gaps in immediate and underlying social determinants to accelerate progress in maternal and child undernutrition. Successful countries and subnational entities have consistently done this.

3.1 In view of the growing evidence for policies and programmes that can address both immediate and underlying or social determinants of undernutrition, we must provide clearer and more specific recommendations for the direct and indirect actions that health; agriculture and food systems; education; water, sanitation, and hygiene interventions; social protection; and other sectors can take given their context and goals.

3.2 Countries must set their own strategic priorities regarding the mix of direct and indirect actions that they use within and across sectors, target populations, subnational areas, and delivery platforms, taking into account the specific nature of their nutrition problems, and gaps in achieving adequate income, education, food security, healthy diets for their population, and delivery infrastructure systems. Actions to generate the evidence, data, and analytical tools to support prioritisation are described in subsequent points in this panel.

4 An enabling political and regulatory environment for effective and cost-effective nutrition-relevant action needs to be cultivated and sustained.

4.1 This enabling environment includes high-level political and donor commitment; leadership in mainstreaming nutrition and ensuring cross-sectoral and vertical policy and programme coherence; and investment in subnational data and capacity to monitor progress.

4.2 Poor policy coherence across sectors can backfire on the efforts of food systems to address undernutrition, such as diversifying production and including biofortified and fortified foods. Actions are, therefore, imperative to restrict inappropriate marketing and promotion of unhealthy foods and beverages, as well as breastmilk substitutes.

5 National and subnational entities must monitor and learn so they can calibrate actions consistently and continuously to ensure women or children are not left behind, especially those in the most vulnerable households and communities.

5.1 Accountability initiatives at global and national levels should ensure that they have a clear theory of change guiding their engagement strategies and use of scorecards, dashboards, indexes, profiles, and other data visualisation tools to promote specific actions. Global initiatives should work together to ensure metrics are harmonised and to avoid potential confusion.

5.2 Development partners and donors need to accelerate global efforts to develop and disseminate guidance on nutrition data and information systems to countries, including core indicators and recommended methods for household and administrative data collection and analysis, as well as develop analytical tools to support planning across all sectors.

5.3 In addition to continuing to evaluate what works to improve nutrition across sectoral platforms and to affect the underlying determinants of undernutrition, we need to understand the marginal costs of delivering services that improve nutrition and the marginal benefits expected by doing so, some of which can go beyond nutrition. Funders and countries will need to support this research agenda, while researchers align on standardised methods and protocols.

5.4 Continue to develop the evidence base for effective actions among adolescents and in fragile states and conflict settings, including investing in more rigorous evaluations where programmes are being implemented.