Nutrition disparities and the global burden of malnutrition

Strategies to tackle stunting, obesity, and micronutrient deficiencies must take into account the inequities in which these diseases are rooted, argue **Rafael Perez-Escamilla and colleagues**

Social determinants of health are understood to be key to grasping why inequalities in health outcomes exist within, and between, populations. They are also implicated in the differences in dietary intake, dietary patterns, and dietary quality seen in some groups, leading to an unequal burden of disease and morbidity. Nutrition disparities are reflected in the higher prevalence of undernutrition; overweight and obesity (overnutrition); or both, in inequitable social conditions, such as poverty. They happen more often in low and middle income countries (LMICs) compared with high income countries (HICs), and also in subpopulations within these countries. The double burden of malnutrition (DBM) refers to the coexistence of under- and overnutrition that can happen at the individual, household, or population level.

Tackling the coexistence of stunting and overweight (including obesity) has been identified as a formidable challenge for LMICs, requiring integrated, multisectoral actions.^{1,2} These two DBM components have common elements rooted in the social determinants of health (SDoH). For example, household food insecurity, a condition related to poverty that limits access to a nutritious and safe diet, has been consistently associated with both undernutrition in children and overweight in women.³⁻⁵ The first 1000 days of life offer a window of opportunity to prevent both stunting and obesity, and are a worthwhile focus for strategies to tackle nutrition disparities.

The main objectives of this article are to: describe nutrition disparities in stunting in LMICs and obesity in both LMICs and HICs; discuss disparities in micronutrient malnutrition using anaemia as an example; describe the critical role of breastfeeding for maternal-child health and identify challenges to its practice; and consider whether an integrated, equity focused, multisectoral approach, focused on the SDoH, could tackle both stunting and obesity.

The maternal-child life course

Nutritional disparities and the DBM must be considered from a life course perspective. Research focusing on women of childbearing age living in socioeconomically deprived circumstances has documented the intergenerational transmission of both stunting and obesity.⁶⁻⁸ Albeit less studied, paternal excessive body weight has also been associated with increased obesity risk in children.⁹

Over 2 billion people are overweight and almost two thirds live in LMICs.^{2,10} Obesity among women of childbearing age and children is increasing globally.¹¹ Women who enter pregnancy overweight are more likely to gain excessive weight during pregnancy, develop gestational diabetes, deliver large for gestational age or premature newborns, and are less likely to breastfeed.¹¹ Children born to overweight women have increased risks of developing obesity that persist as they mature. Women then pass to their children an increased risk of obesity that persists into later life, perpetuating the cycle.^{6,12,13}

Maternal stunting, underweight, and gaining less weight than recommended during pregnancy are associated with intrauterine growth restriction, which has also been associated with increased risk of stunting.² As with obesity, stunting is transmitted from one generation to the next, possibly through epigenetic mechanisms,¹⁴ and stunting is a risk factor for the development of obesity.^{15,16} This early onset risk is difficult to reverse after infancy, underscoring the high priority for very early intervention to achieve normal weight among all women and men.

Intergenerational transmission of risk for malnutrition is heightened in the presence of social, economic, and gender

inequities.^{6,17} The challenges associated with facilitating optimal pre-conception nutrition are rooted in many societal processes and sectors. These need to be tackled by equity focused policies and systems through changes in community capacity building, advocacy, and political will^{7,18-20} (fig 1).

Patterns of nutrition disparities

To have a better understanding of socioeconomic inequities in nutrition outcomes across countries with different levels of economic development, this section first presents data on the distribution of stunting, obesity, and anaemia among LMICs, followed by the distribution of obesity in HICs as a function of family socioeconomic status.

Iron deficiency anaemia was chosen because it is the most common micronutrient deficiency related condition all over the world,²¹ there are clear inequities in its distribution, and it has proven to be difficult to tackle through simple supplementation or fortification.^{22,23}

Stunting, obesity, and anaemia in low and middle income countries

An analysis of 80 countries by world regions, as classified by UNICEF, shows that stunting and overweight are not randomly distributed within any given population. In all regions, stunting prevalence among children under 5 decreases as wealth increases (fig 2). The highest prevalence of stunting and widest wealth driven gaps are in south Asia, and the narrowest in eastern Europe and central Asia.

By contrast, child overweight (fig 3) is positively associated with wealth in all regions, with west and central Africa showing the smallest gaps. However, although absolute obesity prevalences are still higher among the wealthier in LMICs, obesity rates are growing much faster among the socioeconomically vulnerable, including indigenous groups defined as the original inhabitants of a region.^{24,25}

Inequities are also present with respect to iron deficiency anaemia, which is highly prevalent among young children in LMICs. Demographic and Health Survey (DHS) data, collected between 2005 and 2016 from 52 low, lower-middle, and upper-middle countries, showed an overall

KEY MESSAGES

- As a feature of the double burden of malnutrition (DBM), child undernutrition and adult obesity coexist in low and middle income countries (LMICs)
- The DBM in LMICs and obesity in high income countries (HICs) are concentrated among the poor
- Nutrition specific interventions alone have not been able to make a significant dent on the DBM in LMICs
- Multisectoral policies that tackle the social determinants of health are needed to prevent and reduce inequities in undernutrition and obesity globally

Fig 1 | The double burden of malnutrition through the life cycle and across generations and shared drivers^{17 19}

anaemia prevalence of 54.2% among children less than 5 years old. Disparities were found as a function of both World Bank country income classification²⁶ and wealth index as defined by DHS.²⁷ The unweighted mean prevalence of anaemia was highest in the 22 lower income countries (61.7%) and lowest in the six upper-middle income countries (39.4%), and in between in 24 lower-middle income countries (51.7%). Consistent with these

findings, in all three country income groupings, children in households in the poorest quintile had the highest anaemia prevalence and those in households in the wealthiest quintile had the lowest (fig 4).

Obesity inequities in high income countries

Both maternal and child obesity are more prevalent among the poor in HICs.^{28 29} However, an initial pattern of more obesity among the wealthy is seen where

undernutrition among the poor is still the predominant problem.³⁰ As previously indicated, overweight prevalence is increasing rapidly among the poor, including in rural areas and indigenous communities.³¹ Prevalence increases with social disadvantage, as illustrated for the US and England in figs 5 and 6.^{32 33} Additionally, inequities affecting ethnic minority populations are pronounced (figs 7 and 8).^{32 33} Children in ethnic minority populations living in HICs, including the US, often experience social inequities disproportionately.³⁴

CEE: Central and eastern European countries;
CIS: Commonwealth of Independent States
For details of methods, see web annex

Fig 2 | Stunting prevalence in children under 5 years old, according to wealth quintiles by world regions ordered by prevalence in the poorest quintile

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Fig 3 | Overweight prevalence in children under 5 years according to wealth quintiles, by world regions ordered by prevalence in the poorest quintile

From the Demographic and Health Survey Stat compiler
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Fig 4 | Percentage of children less than 5 years old with anaemia (Hb < 11 g/dL) by World Bank country income classifications and Demographic and Health Surveys wealth index

Fig 5 | Association of childhood obesity with educational attainment in the US

Strategies for tackling undernutrition and overweight

Given the well established excessive stunting risk among the poor, and the growing concentration of overweight in socioeconomically vulnerable groups, it is important to explore potential solutions to the DBM in LMICs and the obesity epidemic in HICs at different levels of the socioecological model, taking into account other nutrition related problems, including anaemia (box 1).

There is increasing recognition that early life strategies to tackle undernutrition should take into account other forms of malnutrition, including obesity.^{18 35} Otherwise, solving one problem can magnify another. Global food security initiatives, for example, often promote the production and availability of specific staple crops such as grains or starchy vegetables. Such programmes have succeeded in increasing the availability of plant protein and food energy,³⁶ but have been criticised for distorting markets and potentially promoting obesity and non-communicable disease (NCD) risk by making healthier foods less affordable for consumers, leading to less varied, more energy dense diets for consumers.³⁷ International initiatives for food security are now considering balancing

Fig 6 | Association of overweight children with neighbourhood deprivation, 10-11 year old children in England

programmes focused on protein energy malnutrition and micronutrient deficiency with obesity prevention initiatives.^{5 35 38}

Undernutrition

Stunting

Prevention of child stunting through nutrition specific interventions, such as lipid based nutrient spreads (LNSs), has been suggested, but effectiveness trials have had mixed results.³⁹⁻⁴¹ A recent review found that small quantity (SQ)-LNS are generally well accepted but remain unproven for efficacy in improving linear growth or preventing growth faltering.³⁹ These findings are consistent with an expert review of eight pregnancy and early childhood randomised controlled trials (RCTs) conducted in Asia, Africa, the Caribbean, and Latin America.⁴¹ Thus, drawing on insights from the social ecological model, which postulates that health behaviours are shaped by the interactions of people with their larger social, cultural, economic, and environmental contexts,⁴² tackling stunting simply as a food problem to be solved with nutrition specific interventions in the absence of tackling SDoH is not enough.⁴³

As described above, stunting in children is more concentrated in LMICs where living standards are suboptimal—these environments are characterised by

poor environmental sanitation, poverty, food insecurity and hunger, and lack of access to quality healthcare and education. Countries like Brazil, Chile, and Peru have been successful at tackling chronic malnutrition through more equitable social and economic policies.⁴⁴⁻⁴⁶ The case study of Brazil illustrates the value of nutrition sensitive interventions in concert with those focused on SDoH (box 2). Tackling stunting does require effective and equitable policies and civil society participation in governance structures that facilitate inclusive, equitable, and sustainable economic growth: multisectoral strategies that tackle cultural diversity, eating styles, and both local and global food systems,⁴⁷ as well as access to clean water and sanitation, healthcare, and education.⁴⁸

Anaemia

Systematic reviews of several RCTs of micronutrient powders (MNPs) in Africa, Asia, and the Caribbean have found a reduction in the risk of anaemia and iron deficiency of around 30% and 50%, respectively.^{49 50} A recent Cochrane review that included 13 RCTs from Africa, Asia, and Latin America found that provision of MNPs (containing between 2 and 18 vitamins and minerals) to young children led to lower risk of anaemia and iron deficiency.⁵¹ However, although MNP interventions were overall well accepted, adherence was context specific and in several studies comparable to the same benefit as using standard iron supplementation interventions.⁵⁰ In addition, the effect of MNPs on diarrhoea risk needs to be further examined.⁵¹ LNS interventions have also reduced anaemia prevalence^{40 41} although it is unclear if either MNPs or LNSs provide benefits above and beyond standard approaches.⁵⁰ As with stunting,⁴⁸ sustainable reductions in anaemia prevalence require well coordinated, effective, multisectoral policies that include health, nutrition, agriculture, water and sanitation, education, and social protection sectors.⁵²

Fig 7 | Obesity prevalence among US children from diverse racial groups

Fig 8 | Prevalence of child overweight among 4-5 year olds in diverse ethnic groups in England

Box 1: Nutrition disparities: where do we go from here?**Context**

- Poverty and other social inequities are associated with poor nutrition in both LMICs and HICs, also among certain population subgroups within countries
- The double burden of malnutrition (DBM), defined as the coexistence of undernutrition (for example, stunting) and overnutrition (overweight or obesity) at the population, family, or individual level, is highly prevalent in LMICs
- HICs are experiencing a major obesity epidemic. Socioeconomic inequities have been associated with both under- and overnutrition within HICs

What is known

- In all regions where LMICs are located, stunting prevalence among children under 5 is inversely associated with family wealth
- The prevalence of adult obesity continues to concentrate more among the poor in LMICs and in the US
- The obesity epidemic continues to be unabated in HICs. Multisectoral life course strategies are needed to tackle it
- DBM occurs in the context of widespread micronutrient deficiencies
- LMICs do not have well coordinated strategies to effectively tackle the DBM

Areas of consensus

- Tackling inequities in the distribution of the DBM in LMICs and the obesity epidemic in HICs requires also tackling the social determinants of health, including access to food security, healthcare, education, and jobs that pay reasonable wages
- Nutrition specific interventions during the first 1000 days of life including pre-conceptual nutrition, nutrition during pregnancy, and optimal breastfeeding and complementary feeding are key for tackling the prevention of infectious diseases and non-communicable diseases globally.
- The DBM requires avoiding strategies that solve one nutrition problem while magnifying another one such as the use of sugar as a vehicle for micronutrient fortification.

Areas of controversy

- We don't know if micronutrient specific interventions such as lipid nutrient supplements reduce the risk of stunting in low income countries
- It's unclear how to improve access to social determinants of health in different contexts given that this requires equitable and sustainable economic growth which is lacking among the populations that are most vulnerable to experiencing nutrition inequities

Future directions in this field

- Implementation of science research based on complex systems frameworks is needed for understanding how to scale up cost effective, multisectoral interventions that can simultaneously tackle stunting, overweight, and micronutrient deficiencies

Box 2: How did Brazil reduce levels of stunting and change breastfeeding practices?

Brazil has shown impressive improvements in stunting levels and breastfeeding practices since the mid-1970s.^{46 109} Stunting prevalence among children younger than 5 years has dropped from 37% in 1975 to 19% in 1989 and to 7% in 2007. Exclusive breastfeeding (< 6 months) underwent a remarkable improvement from 4.7% in 1986 to 37% in 2006 and relative stabilisation between 2006 and 2013¹⁰⁹; during the same period, the median duration of breastfeeding increased from around 2.5 months to 14 months.⁴⁶

This progress is derived from a strong political commitment in reducing malnutrition and corresponding inequities following a socioecological approach. Up to the mid-2010s, Brazil had tackled three key components of social determinants of health and nutrition through well thought out multisectoral policies⁴⁶ reflected in: more equitable wealth distribution; improved social protection and public health programmes (for example, conditional cash transfer programme Bolsa Familia and improvements in water and sanitation); restructuring and strengthening of the health sector by expanding coverage and quality of public health programmes (promotion of breastfeeding, oral rehydration, and immunisations), universal healthcare coverage, and implementing multiple national and state-wide effective maternal and child health and nutrition programmes and policies, including paid maternity leave.

This case study illustrates that improving breastfeeding and reducing stunting require both nutrition sensitive and nutrition specific approaches delivered through a socioecological, multisectoral, well coordinated framework.^{79ss}

Overweight

The social ecological model has also widened our understanding of the causes of obesity beyond biomedical or psychological paradigms. Population level obesity is recognised as the result of the complex, multilevel interplay of biology, behaviour, and environments.⁵³ For management of obesity and prevention in high risk groups, there is a role for individual level intervention in clinical and community settings. However, relative increases in inequities associated with social disadvantage indicate that current individually focused obesity prevention efforts in the absence of structural changes to facilitate behaviour changes may be doing harm by widening wealth driven inequities.¹² To be broadly effective, population level obesity prevention must account for the wider social and environmental contexts in which people make food choices.⁵⁴ Specifically, obesity prevention requires collectively tackling behavioural, biological, environmental, social, and demographic drivers from the individual level to the population level, paying strong attention to equity (fig 1).

Consumer oriented policies are an important focus of strategies to tackle obesity. In HICs, reconciling the roles and responsibilities of individuals, communities, governments, and markets has been a major challenge.⁵⁵ Although there is consensus that tackling unhealthy eating behaviours is fundamental for curbing the obesity and NCDs epidemics,^{1056 57} there is limited agreement on how this should be achieved. The dominant paradigm of placing responsibility with the consumer, exemplified by individually focused education, is now shifting to population level consumer information based interventions, such as menu labels in restaurants,⁵⁸ labels on manufactured foods,⁵⁹ and nutrition oriented shelf labels in supermarkets.⁶⁰ The impact of informational approaches has been limited, in part because the majority of food related decisions are not the result of rational reflection and deliberation, but rather automatic and habitual behaviours, cued by the food retailing environment and reinforced by cultural norms.⁶¹ Moreover, information based approaches can potentially widen inequalities, because they generally work best in higher socioeconomic status populations, which have more psychosocial and material resources to act upon health related information.⁶² This reinforces the importance of tackling these epidemics through multisectoral policies that tackle the SDoH.³⁸

Critical role of breastfeeding

Whereas above we discussed the highly specific micronutrient fortification

interventions as a way to tackle anaemia, it is important to also take into account that there are key nutrition specific interventions, such as breastfeeding, that involve complex maternal-infant behaviours and their interactions within the context of their surrounding social, economic, and cultural environments. Breastfeeding is an example of an early life nutrition behaviour that has implications for both undernutrition and infectious diseases, as well as obesity and chronic diseases in the child, and also offers major health benefits to the mother.

There are also exclusive breastfeeding inequities that need to be tackled through the socioecological model lens.⁶³ Sufficient duration of breastfeeding is critical for maternal and child health⁶⁴ and also facilitates obesity prevention, especially for children at high biological risk of excess weight gain.⁶⁵⁻⁶⁷ Breastfeeding may also help to break the cycle of intergenerational transmission by facilitating maternal postpartum weight loss,⁶⁸⁻⁷⁰ decreasing the mother's risk of being more overweight in a subsequent pregnancy. This applies especially in HICs but is becoming relevant to those LMICs where the majority of women of reproductive age are overweight or obese.⁶⁹⁻⁷¹ Overall, breastfeeding prevalence and duration are lower and obesity rates higher in HICs than in LMICs⁶⁴⁻⁶⁸⁻⁷²; obesity is more common among women in low income and ethnic minority populations in HICs³²⁻⁷³; and breastfeeding is less common among women with obesity.⁶⁸⁻⁷⁴

Breastfeeding traditions in some indigenous and established or new immigrant racial or ethnic minorities in HICs may be associated with higher breastfeeding prevalence compared with the host population but may not be sustained with continued exposure to contexts that favour formula feeding.⁷⁵ Breastfeeding promotion involves "baby friendly" initiatives in hospitals and various education and counselling approaches to motivate and support breastfeeding in community and family settings.⁷⁶ Studies in diverse countries indicate that such interventions typically improve one or more key breastfeeding outcomes—initiation, duration, or exclusivity⁷⁷—in some cases with relatively larger effects among women in less educated or ethnic minority populations that have especially low breastfeeding rates.⁷⁶ Breastfeeding in LMICs tends to last longer among poorer and rural women than in the rest of the population, and breastfeeding is one of the few healthy behaviours that are more common among the poor. However, in several middle income countries breastfeeding rates are increasing among

high income women while declining among low income and indigenous women.⁷⁸

Improving breastfeeding duration and exclusivity require policy based interventions that empower women and their families.⁷⁶⁻⁷⁹ Relevant policy targets include: infant formula marketing regulation through enforcement of the international code of marketing of breastmilk substitutes and subsequent relevant World Health Assembly resolutions⁸⁰; pre-service breastfeeding education and training in medical, nursing, and allied health schools; breast pump access; family leave policies; flexibility of work hours or locations, and protections for women in informal work sectors; and accommodations for breastfeeding mothers in workplaces and childcare settings.⁷⁴⁻⁷⁹ Empirical evidence for the effectiveness of such policy approaches relies primarily on observational studies but is consistent with the underlying known structural factors affecting breastfeeding.⁷⁹⁻⁸¹ The case of Brazil illustrates how nutrition sensitive and nutrition specific interventions through a social ecological, multisectoral, well coordinated framework can have an impact on improving breastfeeding outcomes⁷⁹ (box 2).

Tackling the social determinants of health

Given the central role that social determinants of health play in nutrition and health outcomes across the life course, strategies that tackle social determinants will be key to tackling the DBM in LMICs and the obesity epidemic in HICs. The social ecological model has been used to understand the aetiology of child undernutrition⁸² and overweight across the life course,⁴²⁻⁸³ without recognising that both may have common structural determinants. The common pathways suggest the potential for integrated SDoH strategies.¹³⁵⁻⁸⁴ The recent trend of tackling economic and environmental determinants of unhealthy diets will likely result in greater equity in obesity prevention in HICs and may also be effective for tackling obesity in LMICs.⁶⁶ In these countries, rising consumption of processed food products high in sugar, salt, and fats has been attributed largely to structural factors stemming from economic development, particularly rising incomes, urbanisation, and globalising economies enabling foreign investment, and imports of cheap, processed foods.¹⁰³⁻⁸⁵⁻⁸⁶ Food consumption is inherently an economic activity, with implications for the political economy of the food system, and the interests of powerful stakeholders within it. In the long term, agriculture sector policies that prioritise commodity crops that provide a cheap and steady source of starch, fat, and sugar in the food supply will need to change consist-

ent with public health goals.⁸⁷ Fiscal incentives for the production of a variety of fruits, vegetables, and sustainable protein sources should be considered.⁵⁷⁻⁸⁸

Fiscal, demand side interventions are also important for tackling undernutrition in LMICs, but unintended consequences may arise. Conditional cash transfer programmes (CCTs), which provide cash to poor households that agree to participate in education and health promotion activities, have reduced child stunting in some settings and population subgroups.⁸⁹⁻⁹¹ However, CCTs have also been associated with increased risk of obesity and greater intake of sugar and sugar sweetened drinks among adults.⁸⁹⁻⁹²⁻⁹³ CCTs are designed to supplement the incomes of low income families and can be used for anything the family needs or wants, not only food, as long as they meet the programme conditions (participation in education and health services). Studies have shown, however, that CCT funds do help reduce food insecurity in target families.⁹¹

Another fiscal demand side intervention indicates that subsidies for healthy foods in the form of vouchers or discounts ranging from 10% to 50% can have beneficial effects on food purchasing in LMICs.⁶⁶⁻⁹⁴⁻⁹⁷ Targeted food taxes may also be effective. The tax on sugar sweetened beverages and energy dense snack foods in Mexico⁹⁸ has reduced the purchase of these products, with effects strongest in lowest income households.⁶⁶ Likewise, Hungary's tax, which is partly determined by sugar content of food and drink, has resulted in a substantial decline in consumption of the taxed products.⁹⁹ Preliminary evaluations of more recently implemented taxes on sugar sweetened drinks in Chile,¹⁰⁰ Barbados,¹⁰¹ South Africa, and some US municipalities are showing promising results.¹⁰²

Implications for dietary guidelines

Tackling the DBM requires taking into account food systems in the context of socioeconomic inequities. Therefore, it is key for influential policy instruments, such as government issued dietary guidelines, to take these inequities into account when selecting evidence based policies and programmes. The DBM demands a new strategy for dietary guidelines that seek to simultaneously curb the stunting, obesity, and micronutrient deficiency epidemics while taking into account the profound inequities upon which they are rooted. Food based dietary guidelines are needed not only for consumers but also for providers across sectors and for the development of evidence based policies and programmes.¹⁰³⁻¹⁰⁵ Dietary guidelines and ancillary products are being issued

globally^{106 107} but few tackle the importance of the first 1000 days for stunting and obesity prevention. Likewise, very few are grounded on the principles of responsive parenting and feeding which has been shown to be crucial for childhood obesity prevention.¹⁰⁷ Future guidelines will need to take this knowledge into account as well as the increasing evidence on effective policies to implement the WHO code on marketing of breastmilk substitutes⁸⁰ and subsequent relevant World Health Assembly resolutions, and to limit consumption of unhealthy foods and drinks, provide consumers with more information, and encourage product reformulation to reduce or eliminate added sugars and trans fats.⁶⁴

Conclusions

Can an integrated multisector strategy can be designed to prevent both stunting and obesity in LMICs? International development agencies have identified the development of multicomponent strategies to tackle the coexistence of contrasting forms of malnutrition across the life course as a priority. This should be possible because, as the evidence presented here highlights, common drivers of the food and nutritional components of the DBM, and the obesity epidemic in HICs, are: intergenerational transmission; environmental and socioeconomic influences (for example, the ability to access nutritious foods and adopt healthier nutrition habits and behaviours); and a lack of shared multisectoral delivery platforms (fig 1). Common platforms for delivering actions can offer an opportunity for alignment and coordination of cost effective integrated actions and can be a catalyst for tackling policy challenges beyond health—including reducing health and social inequities within populations and raising educational attainment.³⁵ It is important to acknowledge that, even though multisectoral coordination is needed for delivery of effective programmes to prevent stunting, obesity, and micronutrient deficiencies through common interventions, recovery from stunting and obesity does require different sets of interventions once these conditions are established.

Our conclusions are congruent with the “double duty actions” recently proposed by WHO.³⁵ These actions call for policies and programmes that can simultaneously reduce the risk or burden of both undernutrition and overweight, obesity, or diet related to NCDs through common interventions following three levels of recommended actions^{35 108}: ensuring that current interventions, policies, and programmes designed to tackle one form of malnutrition do not inadvertently increase the risk of another (for example,

sugar fortification with micronutrients, or agricultural policies that foster the consumption of energy dense foods and sugar sweetened beverages); leveraging existing actions designed to tackle one type of malnutrition to simultaneously reduce other types, especially maternal-child nutrition programmes during the first 1000 days; and identifying the shared upstream nutrition sensitive drivers between different forms of malnutrition (such as food systems). Tackling the double burden of malnutrition through double duty equitable actions will be of critical importance in achieving both the ambitions of the UN’s Decade of Action on Nutrition and the Sustainable Development Goals.¹⁰⁸ Implementation science research based on complex systems frameworks is needed for understanding how to scale up cost effective, multisectoral interventions that can simultaneously tackle stunting, overweight, and micronutrient deficiencies.

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