CENTER FOR GLOBAL DEVELOPMENT

A "Diagonal" Approach to Integrating Nutrition into Health Systems

Opportunities, Challenges, and the Way Forward

ASTI SHAFIRA · JAVIER GUZMAN

Abstract

Despite decades of global efforts, nutrition remains underprioritized, siloed, and poorly integrated within health systems and universal health coverage (UHC) efforts. This persistent challenge occurs against a backdrop of health and development financing at an inflection, where there is growing recognition to rethink how nutrition-specific interventions are delivered and financed. The Global Compact for Nutrition Integration launched at the 2025 Nutrition for Growth Summit signaled strong political commitment to addressing these systemic disparities, while the operationalization requires concrete delivery pathways with greater attention to evidence-based implementation strategies.

This paper explores delivery approaches for nutrition-specific interventions, drawing from country and donor experiences across the health sector. Vertical approaches, while more direct in achieving specific outcomes, are often supported by off-budget funding and frequently result in fragmented delivery through parallel systems. Conversely, horizontal approaches are typically on-budget and systems-oriented but may lack specificity and accountability for nutrition outcomes. "Diagonal" approaches—as one strategy to achieve integration—offer a potential bridge by embedding high-impact nutrition interventions into health system strengthening efforts with clear outcome measures and accountability mechanisms.

Diagonal approaches leverage strategic overlaps across four key pathways: population targets, health system resources, service delivery platforms, and financing vehicles to maximize synergies between nutrition and broader health system goals. While it offers conceptual strength and demonstrated applications across sectors, evidence in nutrition remains relatively underexplored. Realizing the opportunities to improve resource efficiency and enhance sustainable impact through government ownership will require strong governance, aligned policy, robust financing arrangements, context-specific adaptation, and appropriate accountability systems.

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Introduction

Despite decades of global efforts, undernutrition remains a pressing challenge to global health and development. As of 2023, an estimated 148.9 million children were stunted and 45 million wasted, and only one-third of countries were on track to meet the nutrition targets included in the 2030 Sustainable Development Goals (SDGs). (1) Moreover, the COVID-19 pandemic set back progress, causing a 25 percent drop in health and nutrition service coverage in many low-income countries. (2) This setback continues to unfold against a backdrop of growing fiscal constraints, with both domestic health budgets and foreign aid under intense pressure.

A formidable barrier to progress is policy, program, and implementation fragmentation and weak accountability. Nutrition, by nature a multisectoral issue, often falls between the cracks of government responsibilities in areas that include, among others, health, agriculture, and education. Even within the health sector, nutrition remains underfunded and underprioritized, despite its proven cost effectiveness and vital role in improving child survival and development and systemwide efficiency. (3)

Nutrition-specific interventions—those that directly address the immediate causes of undernutrition—are still poorly integrated into health systems and efforts to achieve universal health coverage (UHC). They often receive limited budgetary priority and are siloed—that is, walled off—from broader health planning and decision-making processes. In 2022, only 2.2 percent of health budgets in low-income countries was allocated to nutrition-specific interventions. This amount aligns with predictions that domestic spending may not recover to pre-pandemic levels until 2030 and underscores persistent underprioritization, despite high burdens of malnutrition. (4–7)

The integration of nutrition into existing structures, policies, and programs within the health system has, therefore, become increasingly important, not just to address fundamental inefficiencies but to promote sustainability through government ownership and improve service delivery across the life cycle. While much has been published about the needs to be met by nutrition funding and the value for money of nutrition interventions (with returns as high as US$23 for every dollar invested), (4) less attention has been paid to *how* nutrition-specific interventions should be delivered and the tradeoffs between different approaches. Some donors have been laser-focused on vertical approaches (that is, targeted programs with dedicated funding, specialized workforces, and separate delivery systems), which have yielded rapid and measurable improvements in particular areas, like HIV/AIDS and immunization programs, but risk creating inefficient parallel systems. (8) Others push for horizontal approaches (investments in overall health system components, like infrastructure, workforce, and governance) that seek to improve systems more broadly but may lack the intensity and accountability required for targeted interventions and outcomes. (9)

This paper seeks to bridge this vertical-horizontal dichotomy by reviewing approaches to integrating nutrition-specific interventions into health systems. Drawing lessons from successful integration models in other health areas, it explores a "diagonal" approach as an alternative avenue for scaling up the delivery of nutrition-specific interventions within the health sector. The diagonal approach directs nutrition-specific investments toward strengthening health systems while taking advantage of the improved system capacity to advance nutrition outcomes. The analysis provides actionable recommendations for donors and governments to operationalize nutrition integration effectively.

This work comes at a critical juncture for global nutrition. The landscape is rapidly evolving: New funding mechanisms like the Child Nutrition Fund are taking shape; leading donor USAID has been shut down; the UK's Foreign, Commonwealth and Development Office (FCDO) is recalibrating its development priorities; and the recent Nutrition for Growth Summit launched the Global Compact on Nutrition Integration and secured nearly US$28 billion in commitments—a record achievement. Yet questions remain about how to translate these financial and political pledges into effective, scalable interventions. This analysis provides evidence-based guidance for navigating these shifts and offers countries and donors a clear pathway to accelerate progress toward the broader 2030 nutrition targets.

The problem

Nutrition is not adequately integrated within the health sector

Nutrition, health, and universal health coverage are inextricably linked: Achieving good nutrition outcomes requires strong health systems, while no country can achieve UHC without strengthening essential nutrition interventions across life stages. Despite being among the most cost effective in terms of health outcomes, nutrition interventions—ranging from high-impact nutrition counseling to targeted supplementation programs, like those that provide Vitamin A (see Figure 1)—remain poorly integrated into health systems. (5) Nutrition is often treated as an "add-on" to essential health service delivery platforms or a broader determinant of health, rather than an area in which clear preventive and therapeutic interventions are needed. (4,10)

FIGURE 1. Cost-effectiveness ratio of nutrition intervention across key outcomes

Intervention	Stunted Children Turning Age Five Averted	Child-Wasting Episodes Averted	Child Anemia Averted	Maternal Anemia Averted	Additional Exclusively Breastfed Children
Full package of interventions	0.180	0.057	0.022	0.006	0.018
Cash transfers	0.083				
Delayed cord clamping			0.005		
IFA food fortification			1.924	0.432	
Iron and iodine fortification of salt			0.300	0.060	
IYCN counseling	6.454	1.420			0.001
Kangaroo mother care					0.829
Micronutrients powder			0.007		
MMS	0.742	4.321		0.001	
SQ-LNS	1.098	0.051	0.548		
Vitamin A supplementation	0.114	0.018			

Notes: The cost-effectiveness ratio (CER) is a measure of the impact of an intervention relative to its cost. Cells in the table are shaded from darker green (most cost effective) to red (least cost effective) to illustrate visually the variation in value-for-money across interventions and outcomes. The CER is calculated using the Optima Nutrition tool as cost per case (in U.S. dollars) divided by impact (per thousand cases). IFA = iron and folic acid; IYCN = infant and young child nutrition; MMS = multiple micronutrient supplements; SQ-LNS = small-quantity lipid-based nutrient supplements. See the appendix for the complete original table.

Source: Calculated based on the World Bank's Investment Framework 2024.

This underprioritization is reflected in government spending patterns, with nutrition receiving only 0.2–5.2 percent of total health spending in low- and lower-middle-income countries—far less than infectious diseases and other such conditions. (11) The failure to recognize the centrality of nutrition to health also means that it is frequently excluded from UHC monitoring frameworks; that clear specifications for nutrition services are missing from health benefits packages; and that countries struggle to move beyond their vague commitments to "include nutrition" in benefits packages and schemes to bring about UHC. (3,10) This failure results partly from a lack of global consensus on nutrition—reflected in inconsistent definitions, shifting terminologies (for example, "specific" versus "direct"; "sensitive" versus "indirect"), and fragmented financing channels—and partly from insufficient guidance on when, where, and how to integrate nutrition services into broader health platforms. (3,12,13)

The challenge of prioritizing nutrition lies partly in the multifaceted nature of its outcomes—spanning stunting, wasting, anemia, and overweight—which necessitates a broader range of interventions than other health conditions. The diversity of possible interventions, each targeting different outcomes with varying levels of cost effectiveness, greatly complicates decision making; and while resources like Optima Nutrition,[1] the Lives Saved Tool,[2] and DCP3[3] analyses can help

1 https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-018-5294-z.
2 https://www.livessavedtool.org/.
3 https://www.dcp-3.org/chapter/2561/cost-effectiveness-analysis.

with priority setting, many countries find it difficult to use them effectively to determine which interventions to include in their health benefits packages and UHC schemes.

The origins of nutrition programming in the past also help explain its integration challenges in the present. In many countries, treatment programs, such as those for severe acute malnutrition (SAM), emerged from humanitarian responses, with international agencies implementing them directly rather than through government systems. (14) While health services may now provide screening, actual treatment often operates through separate supply chains, distinct reporting systems, and dedicated staff. The result is inefficient duplications and fragmentation. Ready-to-use therapeutic foods, for example, are frequently managed outside standard health commodity systems, with separate procurement, storage, and distribution channels. Even service delivery platforms may run in parallel, with nutrition centers operating alongside health facilities rather than within them. These parallel structures not only strain limited resources; they create a false divide between health and nutrition services, hampering comprehensive care for vulnerable populations.

Because of this fragmentation, coverage of essential nutrition services globally remains inadequate. Among pregnant women, for example, 87 percent have access to antenatal care, of whom only half receive iron and folic acid supplementation. Similarly, 84.7 percent of deliveries are attended by skilled providers, but only 46 percent of newborns are breastfed within the first hour. (15) These disparities demonstrate a troubling pattern: High coverage of primary health services does not automatically translate to adequate delivery of nutrition-specific interventions. The result is missed opportunities to take full advantage of nutrition services despite their cost effectiveness. (16)

The difficulties involved with integrating nutrition interventions are not unique. Other health interventions—such as family planning, HIV services, and immunization—have also historically been delivered through vertical programs and often excluded from national health benefit packages because of operational or financing constraints. Studies have shown that while vertical delivery may improve short-term accountability and coverage, it can hinder sustainability, equity, and system responsiveness when not linked to broader primary care reforms. These experiences offer valuable lessons for nutrition: Achieving integration requires intentional design, flexible financing, and a shift toward inclusive benefit packages that recognize the shared delivery platforms for essential services. (17,18)

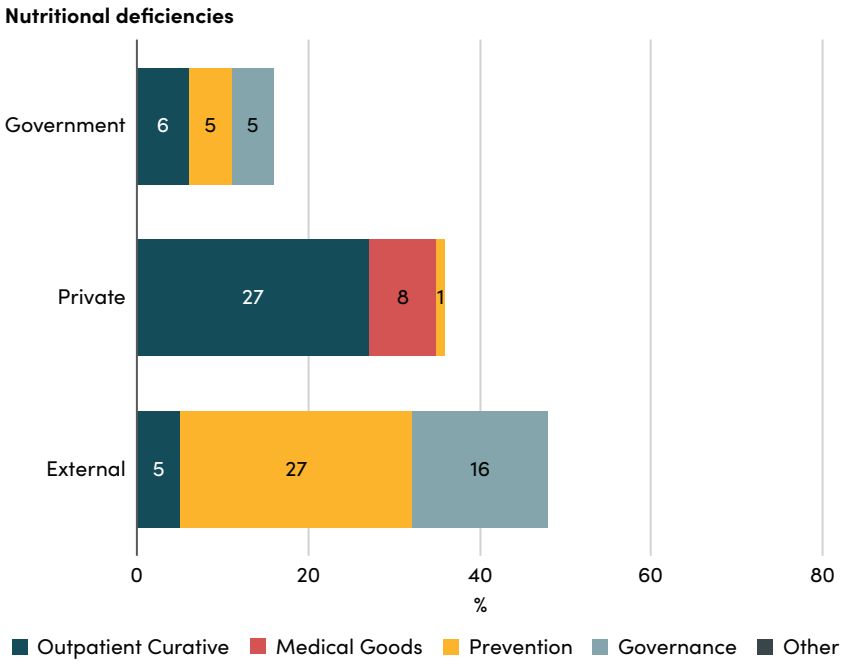
Effective priority setting is essential for maximizing investments in nutrition, particularly in resource-constrained environments. Countries must consider a variety of factors, including the epidemiological burden of different forms of malnutrition, geographical distribution, the cost effectiveness of intervention, existing delivery platforms, and scale-up capacity. (4) Unlike other programs, however, such as those to treat or prevent HIV/AIDS—which have benefited from decades of systematic integration with maternal and child health care, tuberculosis treatment, and other essential health services since the early 2000s—nutrition services must contend with great

complexity in establishing comprehensive frameworks and sustainable financing mechanisms within UHC benefits packages. (19)

Vertical approaches to nutrition-specific intervention lead to siloed delivery systems

Nutrition-specific interventions, especially in low- and lower-middle-income countries, are predominantly implemented through vertical delivery approaches that operate parallel to national health systems. This is largely driven by financing patterns; donor funding accounts for nearly half of nutrition-specific primary care spending, as compared to just 16 percent from government sources (see Figure 2). Much of this external funding is off-budget and channeled through dedicated vertical programs with separate management structures, leading to fragmented service delivery. (20)

FIGURE 2. Funding sources in primary health care spending for nutritional deficiencies



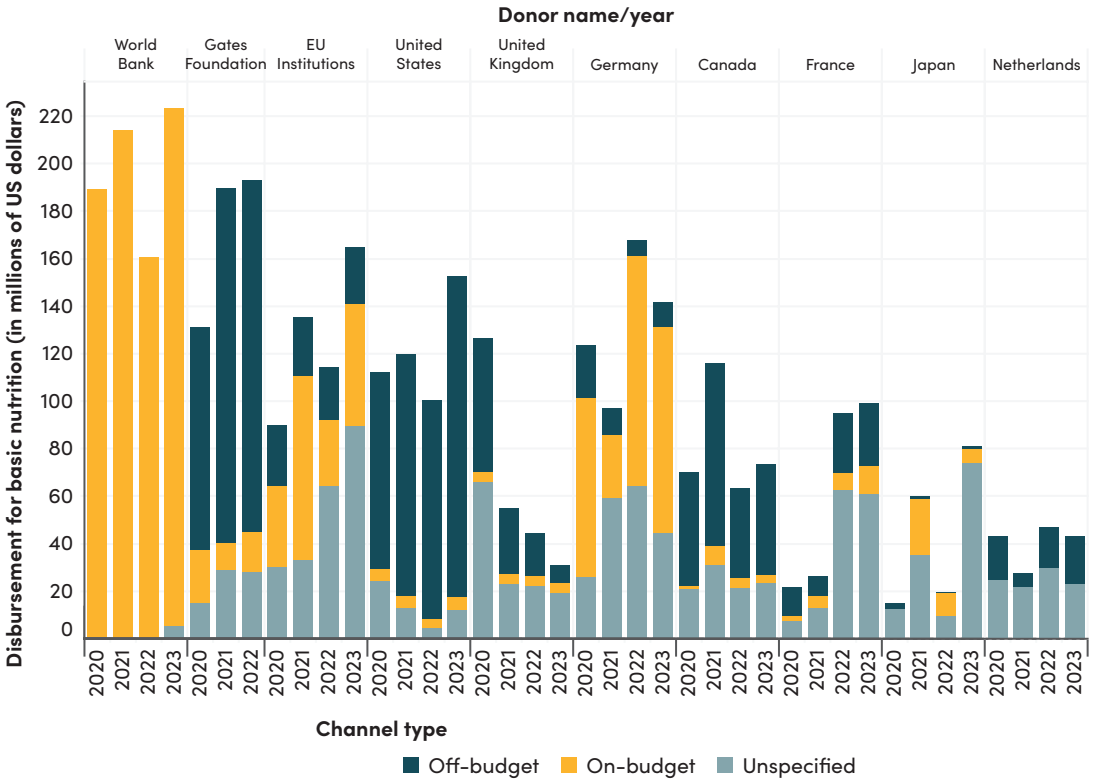
Notes: Health spending by category is analyzed based on data reported to the World Health Organization by 51 countries (17 low income, 22 lower middle income, 9 upper middle income, and 3 high income), 63 percent of which are in the WHO Africa region and carry a high burden of malnutrition. Cross-country comparability is limited by inconsistencies in functional national budget tracking and reporting, particularly for nutrition spending, which may be, first, classified differently across countries and, second, underreported when delivered through parallel systems, such as those for delivering humanitarian aid or NGO-managed wasting treatments.

Source: WHO Global Expenditure on Health Report, 2021. (21)

Off-budget funding—typically routed through nongovernmental organizations (NGOs), private-sector actors, or research institutions—is especially common among top funders, such as the Gates Foundation, the United States, the United Kingdom, and Canada (see Figure 3). This financing structure directly shapes the delivery of nutrition interventions as standalone programs with

multiple implementing partners, often operating in silos, duplicating efforts, and relying on parallel supply chains. Even single interventions, such as Vitamin A supplementation, can involve several implementing partners running separate projects within the same country.

FIGURE 3. Official development assistance for "basic nutrition" disbursement, 2020–22, by top donor and channel type



Notes: Data are filtered using the OECD CRS purpose codes "Basic nutrition." The disbursement channels are defined as on-budget (governments, development banks), off-budget (NGOs, private sector, research), and unspecified (UN, others).
Source: Authors' analysis of 2020–2022 data for "Basic nutrition" purpose code (12240), OECD Creditor Reporting System, accessed January 28, 2025.

While external aid has helped fill critical nutrition gaps, it can sometimes crowd out domestic financing. This mirrors broader trends in global health, where development assistance substitutes for, rather than complements, national budgets and can lead governments to deprioritize long-term investments in integrating nutrition into health systems in favor of short-term outputs to align with donor preferences. (21,22) Strengthening on-budget funding and aligning external aid with domestic priorities are essential to fostering accountability and sustainable, country-owned nutrition programs.

That said, vertical approaches are not without merit. Their emphasis on specific outcomes enables rapid, measurable progress to be made in targeted areas, while their clear, program-specific

objectives make them relatively straightforward to manage, monitor, and evaluate. Both appeal to international donors who seek measurable results within defined time frames to show their constituencies they are making concrete impacts. (23–25) Vitamin A supplementation programs, for instance, can report specific numbers of children reached and deficiency rates reduced, making them particularly attractive for resource mobilization. Other advantages of vertical programs include specialized service delivery, heightened attention to high-priority health issues, clear accountability, and the ability to achieve rapid results even in weak health systems. (25)

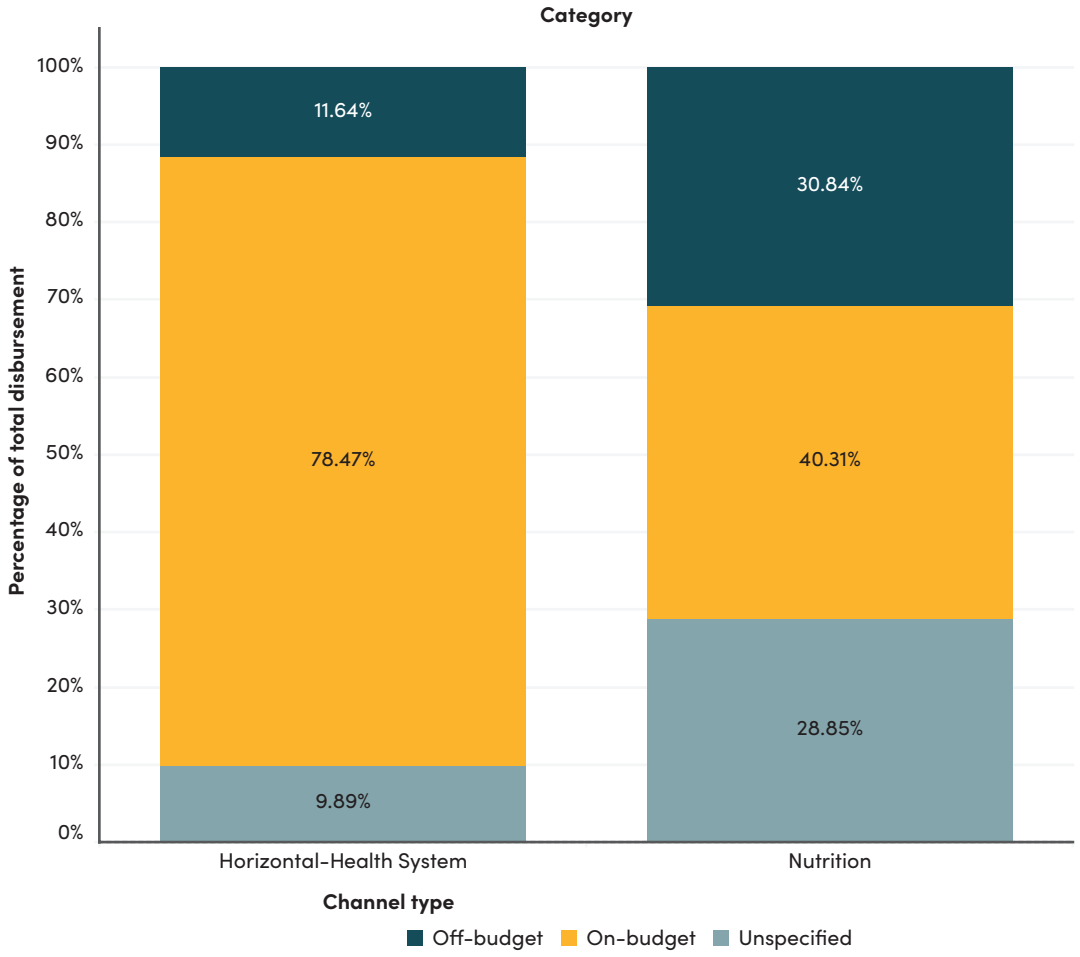
On the other hand, the very features that enable these "quick wins" can undermine long-term health system effectiveness. Off-budget vertical programs run in parallel to or outside of government financial systems, limiting visibility into government budgets, planning, and prioritization processes. These programs frequently create parallel delivery systems that operate outside routine health services, weakening country ownership and leading to fragmentation and inefficiencies in resource use. (25)

Moreover, despite having common goals, funders differ significantly in their approaches to implementing vertical nutrition programs, which creates coordination challenges at the country level. Although coordination mechanisms, such as the SUN Movement and nutrition-sector working groups, exist in principle, limited harmonization among donors often results in duplicated efforts and fragmented service delivery in practice. Integration with health systems remains particularly challenging; even when nutrition is nominally included in health benefits packages, funding streams often remain separate from routine health system financing. This disconnection is evident in supply chain management, where the provision of nutrition commodities like ready-to-use therapeutic foods operates through parallel procurement systems, with up to 90 percent of funding running off-budget and outside government systems. (26)

On-budget funding tends to support horizontal approach

Some donors take a horizontal approach to health investment, concentrating on improving the capacity, accessibility, and quality of health systems as a whole rather than targeting specific diseases or issues. This includes providing funding to strengthen essential supporting elements of a system, such as infrastructure, workforce, and supply chains, with the idea of enabling it to manage various aspects of health comprehensively. (27,28) While not an absolute dichotomy—as some donors may employ mixed approaches to financing, and implementation models could exist on a spectrum—funding to strengthen the health system is more likely to be integrated into government systems ("on-budget") than to support nutrition-specific interventions, which rely heavily on off-budget channels, such as NGOs and private-sector actors (see Figure 4). This highlights the incongruence between health system investments and nutrition programs, as the latter often remain fragmented and less aligned with national health priorities.

FIGURE 4. On-budget and off-budget funding for nutrition versus horizontal health system investments, 2022



Notes: Data are filtered using the OECD CRS purpose codes. "Basic nutrition" is classified under "nutrition," while "health policy and administrative management" and "health personnel development" fall under "horizontal health system." The disbursement channels are defined as on-budget (governments, development banks), off-budget (NGOs, private sector, research), and unspecified (UN, others).

Source: Authors' analysis of OECD Creditor Reporting System 2022 data, accessed January 28, 2025.

Systemwide horizontal approaches offer several benefits. Strengthening service delivery platforms, for instance, particularly at the primary care level, can enable more comprehensive and integrated care delivery if appropriately funded with adequate capacity and governance arrangements. Countries like Thailand have shown how UHC reforms can enhance both service access and financial protection while improving health equity. The country's Universal Coverage Scheme, introduced in 2001, provides a comprehensive health benefits package to citizens at zero cost; in 2012, it achieved 98 percent population coverage at just US$80 per beneficiary. The scheme significantly reduced infant mortality while protecting households from catastrophic health expenditures, demonstrating the potential of systemwide investments. (29) Also advantageous are the foundational capabilities,

benefiting many health programs, that are created by investments in cross-cutting functions like health workforce development and information systems. (24)

With their emphasis on systemwide benefits, however, these horizontal approaches come with tradeoffs. Implementation challenges are also particularly acute in resource-constrained settings, where limited budgets must be spread across multiple health system functions. Low-income countries that try to strengthen primary health care platforms often struggle to maintain adequate staffing, supplies, and infrastructure across all facilities.

Additionally, the broad scope of horizontal approaches can sometimes dilute their impact; without clear accountability mechanisms and specific outcome tracking, resources may not reach the populations or health conditions requiring urgent attention. (30) Even defining these approaches and measuring their effects presents a challenge. These limitations suggest that while horizontal approaches are essential for long-term health system sustainability, they may need to be complemented in certain contexts by more targeted interventions. In some countries, for example, even when ANC 4+[4] coverage is high, that of iron–folic acid supplementation is substantially lower—by 72 percent, in some cases—highlighting the disparity between access and care delivered. (31) This illustrates a key limitation of horizontal approaches: Getting women into facilities is not enough unless they receive the appropriate package of care.

Furthermore, purely horizontal approaches often lack clear prioritization mechanisms, leading to inefficiencies in resource allocation. (28) A notable risk is overinvesting in tertiary hospitals and specialist care—expensive services that primarily benefit wealthier urban populations—while underfunding high-impact, cost-effective interventions, like primary care and community-based nutrition programs. An alternative approach is then needed to mitigate these issues by ensuring systemwide investments are strategically directed, with measurable outcomes.

A potential solution: The diagonal approach

The diagonal approach, early conceptualized as a bridge between vertical and horizontal approaches, can be defined either as a method to strengthen health systems while scaling up disease control programs or a way to achieve disease-specific results through improved health system functioning. (32,33) The diagonal approach offers a more comprehensive and sustainable path for donors to provide external financing than the vertical or horizontal approach alone. (34) Box 1 presents in detail an explanation of the diagonal approach and reviews the current evidence in support of its effectiveness.

4 ANC 4+ is the proportion of pregnant women receiving four or more antenatal care visits.

BOX 1. Current evidence on the diagonal approach

The following summarizes the conceptual basis and recent developments around the diagonal approach, a framework that has gained traction in global health for balancing targeted outcomes with systemwide improvements.

What is the diagonal approach?

The global health field has traditionally categorized program approaches as either "vertical" (program-specific interventions) or "horizontal" (strengthening of the broader health system). (35) While this dichotomy has shaped financing and implementation strategies, the categories are not mutually exclusive in terms of addressing the complexities of global health challenges. (36) The diagonal approach has lately emerged as a pragmatic middle ground for achieving disease-specific outcomes by investing in health system strengthening while maintaining focused objectives.

To be characterized as diagonal, an approach to health investment must not only involve the integration of interventions into health systems but should incorporate elements that strengthen the systems while achieving health-specific outcomes. Elements that comprise a diagonal approach may include supply chains, strategies to generate demand for services, a skilled workforce, governance and accountability mechanisms, financing models, integrated health information systems, and delivery platforms. While evidence of its effectiveness varies across contexts, the diagonal approach represents a promising route.

What is the current evidence?

The concept of the diagonal approach was first introduced by Sepulveda and Frenk during Mexico's health system reform in 2006 with the objective of improving child survival. (33) Since then, the approach has been explored in a variety of contexts, including chronic illnesses (such as breast cancer and diabetes), (37,38) other aspects of Mexico's health system reform, (34) HIV/AIDS programs, (39) initiatives for female sex workers in Mozambique, (40,41) and financing mechanisms, like the Global Fund. (42) Although the diagonal approach is not new, evidence of its cost effectiveness remains limited, with some studies showing promising results.

The cost per quality-adjusted life year (QALY) or disability-adjusted life year (DALY) gained through integrated approaches, for example, was reported in some cases to be below US$5,000. In addition, average service delivery costs dropped from US$35 to US$28 under integrated models compared to standalone program implementation. These findings suggest efficiency gains but also point to the need for further research and evaluation.

Because the diagonal approach combines both the vertical and horizontal strategies, evaluating its effectiveness presents unique challenges. Vertical approaches are relatively straightforward to assess, as they target specific outcomes and defined population groups, allowing for clear measurement of costs and benefits. (42,43) Because horizontal approaches involve making systemic improvements to, for example, workforce capacity, governance, or infrastructure that create indirect and dynamic impacts, evaluating them is more complex and less direct. (44) The diagonal approach compounds this complexity, as it requires assessing both the direct outcomes of disease-specific interventions and the broader, often interdependent effects of health system strengthening efforts. Kirwin (2022) explores a framework for evaluation that considers spillover effects, dynamic returns to scale, and the interplay between interventions across time and platforms. (44) Evidence is limited, however, of specific cases in which this framework has been used for program evaluation.

How about evidence on global health nutrition?

Applications of and evidence from the diagonal approach to nutrition are emerging but remain underexplored compared to other health areas, like HIV/AIDS or maternal health. While recognition is growing of the importance of integrating nutrition-specific outcomes into health system strengthening, (13,45–47) the specific framing of the diagonal approach in nutrition still receives less emphasis than the more traditional approaches in academic and grey literature.

This lack of attention may stem from several challenges. Unlike large-scale vertical funding mechanisms, such as the Global Fund for HIV/AIDS, nutrition relies on smaller proportions of the funding from bilateral and multilateral initiatives like the World Bank and UNICEF, as well as USAID and FCDO—both of which are currently scaling back nutrition funding or shifting priorities, making the financial landscape more fragile and uncertain. This uncertainty may provide an opportunity to advance diagonal approaches to nutrition by making use of innovative funding strategies, strengthening health systems, and addressing persistent deficiencies in efforts supported by evidence in the broader global health context. With more frequent and intensive evaluations, targeted investments, and improved mechanisms, the diagonal approach could contribute significantly to global nutrition goals.

In taking a diagonal approach, donors and countries would purposefully use nutrition-specific interventions to strengthen broader health systems while simultaneously utilizing health system platforms to enhance delivery and outcomes for nutrition services. The diagonal approach includes these characteristics:

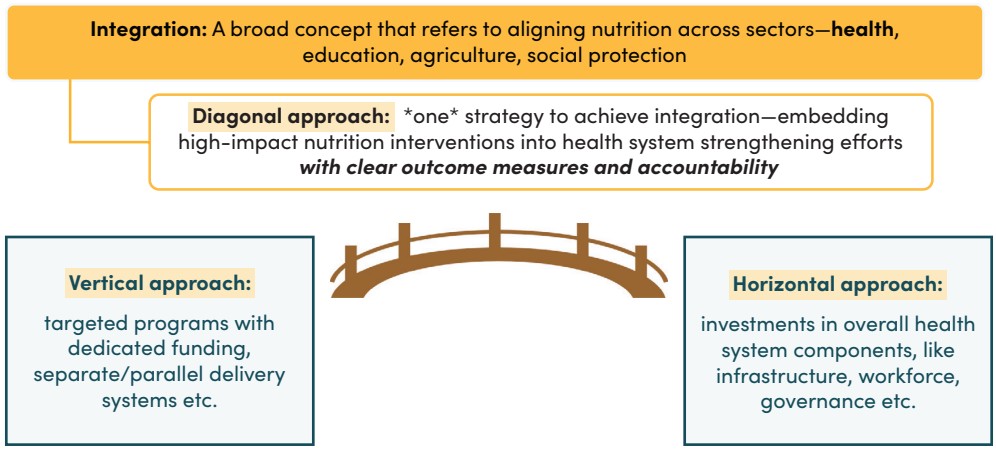
1. It emphasizes the **simultaneous pursuit of targeted health outcomes and overall system improvements**.
2. It typically involves **making use of integrated delivery platforms to address multiple health challenges concurrently**.

3. It emphasizes the importance of **bridging different levels of care, from community-based interventions to clinical services**, to create comprehensive health solutions.

Nutrition interventions have their own important characteristics that naturally align with this approach: They typically require regular touch points with the population throughout the life cycle, from pregnancy and early childhood through adolescence, adulthood, and older age; they depend on both specialized delivery mechanisms (such as therapeutic feeding programs) and routine health services (such as growth monitoring in primary care); and they often share delivery platforms with other health services (such as by combining Vitamin A supplementation with immunization campaigns).

Nutrition outcomes are inextricably linked with broader health system performance. Effective nutrition service delivery requires functional supply chains, trained health workers, active quality assurance systems, and robust community outreach—the very elements diagonal approaches seek to strengthen. (48) Moreover, progress in nutrition serves as both a marker of health system functionality and a catalyst for broader health gains. Higher breastfeeding rates, for example, indicate stronger connections between health workers and mothers while reducing infant illness and mortality; better coverage of wasting treatment reflects robust community health systems while preventing child deaths from associated conditions like tuberculosis and malaria; and so on. This bidirectional relationship makes nutrition integration particularly strategic for health system strengthening.

FIGURE 5. Concepts of service delivery approaches



Why now?

The present moment presents a vital opportunity to transform how nutrition-specific interventions are financed and delivered. While models of integration have been tested, a dual challenge remains: First, further testing and evaluation is needed of diagonal approaches in different nutrition contexts

to build a stronger evidence base for their effectiveness; and, second, these approaches have to be scaled up to achieve widespread impact. Given current resource constraints, which are likely to lead to funding cuts or forced integration, it is essential to be intentional and to present integrated models as the most effective way going forward. While well-designed integrated approaches could help optimize resource use, their success in improving outcomes depends heavily on the quality and context of their implementation. Evidence from successful programs suggests that integration, when coupled with strong accountability mechanisms and clear outcome targets, can enhance service delivery efficiency. (49) Commitments made at the Nutrition for Growth Summit in 2025 offers a timely platform for mobilizing action, examining the challenges, and helping identify conditions that enable integration to succeed—particularly as countries seek more sustainable ways to deliver essential nutrition services.

Operationalizing the diagonal approach

Before outlining implementation pathways, it is important to distinguish the diagonal approach from other integration models. While various forms of integration exist—from simple colocation of services to full health system integration—the diagonal approach in the case of nutrition is characterized by its dual emphasis on maintaining strong nutrition-specific outcomes while strategically making use of health system platforms. Unlike other types of integration, this approach requires **clear accountability mechanisms** and **explicit outcome measures**. (50)

For this new model to succeed, funders must gradually but decisively integrate their nutrition-specific programs into broader health systems, while recipient governments work to create the enabling conditions necessary for this approach to be both effective and sustainable. When planning integration, funders should carefully consider timing and methods that ensure a smooth and effective transition.

Funders could benefit from understanding WHEN and HOW to integrate

Donors could make gradual transitions toward the diagonal integration of nutrition-specific interventions by identifying and taking advantage of natural overlaps across three dimensions: population targets, resources, and the characteristics of service delivery. These overlaps offer opportunities to combine nutrition interventions efficiently with existing health services while strengthening overall system capacity. Integration could be further advanced by taking advantage of a fourth overlap—between funding vehicles—by harmonizing funding streams through on-budget mechanisms that utilize government systems or through off-budget approaches.

These four pathways are explored in greater detail below.

Overlaps in population targets: Ensuring continuum of care

The diagonal approach can capitalize on shared population targets across nutrition and broader health interventions. This can follow the continuum of care or life cycle approach. Children in early life, for example, often require various nutritional interventions aligning with primary health care services, such as immunizations or growth monitoring. Vitamin A supplementation, for instance, could be offered alongside routine immunizations or growth assessments in child health visits, making it easy to reach young children at a crucial period in their development.

The integration of Vitamin A supplementation (VAS) with immunization has been implemented across a number of countries, although in a scattered and low-scale manner. Studies from the Philippines, India, Mali, and Sierra Leone show successful implementation in the context of both routine services and health campaigns. In Sierra Leone, integrating VAS into six-month immunization visits improved coverage of both services. (51) In Orissa, India, studies confirmed that codelivery was not only operationally feasible but safe, with no adverse impacts on vaccine seroconversion. (52)

The integration of VAS with immunization works particularly well as a result of several factors: compatible delivery modalities (VAS takes only about two minutes to administer); overlapping target age groups (6–59 months); similar logistical requirements, with nutrition services incorporated into established immunization systems; and high acceptability from both providers and communities. A report by Gavi, the Vaccine Alliance, and the Eleanor Crook Foundation points out that the integration of VAS with immunization represents what could be called a "natural fit" in terms of operational compatibility, making it one of the best-documented successes in nutrition–immunization integration. (47)

Looking ahead, the VAS–immunization experience offers valuable lessons. The success factors identified—particularly regarding operational compatibility and a clear overlap in target population—provide a framework for assessing other possible integrations. Data on cost effectiveness are limited, however, and while VAS integration has proved operationally successful, a more robust economic evaluation would help inform the scaling up of this and other integrated approaches. (53)

Many more opportunities exist for integration by target population (see Table 1). While many such integrations are already happening at small scale, the challenge lies in systematically scaling them up. In addition to Vitamin A supplementation campaigns, early childhood interventions might include therapeutic feeding programs for severe acute malnutrition and targeted food and micronutrient supplementation programs, each with its own delivery platform and supply chain.

TABLE 1. Nutrition vertical interventions by target population

Target Population	Nutrition Interventions	Non-Nutrition Interventions	Vertical Vehicles
Pregnant women	– Micronutrient supplementation – Iron/folic acid supplementation (IFA) – Balanced protein energy supplementation – Antenatal breastfeeding counseling	– Antenatal care (ANC) – Maternal immunizations (tetanus, flu) – Malaria prevention (IPTp, ITNs) – HIV/STI screening	– **UNICEF**, **USAID**, **MCHIP** for micronutrient delivery – **PMNCH** for ANC – **UNFPA** for maternal health
Infants	– Delayed cord clamping – Early initiation of breastfeeding – Kangaroo mother care (KMC) – Low-birthweight care	– Newborn care (thermal regulation, early skin-to-skin) – Routine immunizations (BCG, polio) – Infectious disease prevention	– **UNICEF**, **USAID**, **WHO** for breastfeeding and newborn care – **Gavi** for immunizations
Children under age 5	– Vitamin A supplementation – Iron supplementation – Growth monitoring – Ready-to-use therapeutic foods (RUTF) – Complementary feeding counseling	– IMCI (diarrhea, pneumonia, malaria) – WASH (water, sanitation, hygiene) – Developmental screening – Deworming	– **GAVA** for Vitamin A – **Global Fund** for malaria and child health – **UNICEF** for ready-to-use therapeutic foods – **Save the Children** and **USAID** for growth monitoring
Adolescents	– Iron-folic acid supplementation – Nutrition education promoting healthy diets	– HPV vaccination – Menstrual health education – Mental health support	**UNICEF**, **WHO**, **USAID**, **FCDO**, and other bilateral donors supporting adolescent health
Emergency settings	– Standardized nutrition in emergencies (e.g., CMAM) – Micronutrient supplementation – Breastfeeding and complementary feeding support	– Safe water and sanitation – Infectious disease prevention (cholera) – Psychosocial (and humanitarian) support	– **WFP** and **UNICEF** for emergency nutrition – **WHO** for outbreak response – **UNHCR** and **Red Cross** for emergency support

Notes: ANC = antenatal care; BCG = Bacillus Calmette–Guérin; CMAM = community-based management of acute malnutrition; FCDO = Foreign, Commonwealth and Development Office; GAVA = Global Alliance for Vitamin A; HIV/STI = human immunodeficiency virus/sexually transmitted infections; IMCI = Integrated Management of Childhood Illness; IPTp = intermittent preventive treatment in pregnancy; ITNs = insecticide-treated nets; KMC = kangaroo mother care; MCHIP = Maternal and Child Health Integrated Program; MMS = multiple micronutrient supplements; PMNCH = Partnership for Maternal, Newborn & Child Health; RUTF = ready-to-use therapeutic foods; UNFPA = United Nations Population Fund; UNHCR = United Nations High Commissioner for Refugees; USAID = United States Agency for International Development; WASH = water, sanitation and hygiene; WFP = World Food Programme; WHO = World Health Organization.

Overlaps in resources: Maximizing health system components

By utilizing existing health system components, the diagonal approach reduces duplication of efforts and creates efficiency. Important elements include such shared resources as infrastructure, human resources, supply chain management, and financing systems. Maintaining separate groups of community health workers (CHWs), for instance, for different programs, each with its own distinct payment structure and reporting lines, could lead to workforce fragmentation, uneven service quality, and inefficient resource use. These parallel structures often create unnecessary competition between programs while burdening the CHWs with multiple reporting requirements and competing priorities.

The diagonal approach, in contrast, supports the harmonization of community health systems. This may involve standardizing training, aligning incentive structures, and integrating service delivery protocols across programs, while maintaining specialized expertise where needed. Such rationalization not only improves efficiency but reduces the burden on both workers and communities.

Another component whose usefulness could be maximized through integration is the health information system. Although, for instance, 48 of the 57 SUN countries assessed track Vitamin A supplementation, only 18 routinely collect data on iron and folic acid supplementation during pregnancy. This deficiency may reflect the stronger global infrastructure for Vitamin A monitoring (as exemplified by UNICEF's biannual campaign tracking) as compared to that for iron/folic acid (IFA) programs, which often rely on fragmented health system reporting. (54) The inadequate monitoring of nutrition outcomes limits both individual care delivery and population-level planning. Some middle-income countries demonstrate the feasibility of better integration; Guatemala and Peru, for example, have successfully developed annually updated health information systems that incorporate comprehensive nutrition data. (5) Their experience shows that integrating nutrition metrics into existing maternal and child health data systems can support consistent monitoring while reducing the burden of parallel reporting structures.

Initiatives like the National Information Platforms for Nutrition (NIPN) and DataDENT have shown promise in transforming data availability and use by strengthening assessment tools and advocating for systemwide integration. Another initiative emerging as an important platform is the District Health Information Software 2 (DHIS2). Used in 80 low- and middle-income countries, DHIS2 demonstrates how integrated platforms can transform the collection and use of nutrition data. Rather than tracking nutrition metrics separately, it enables countries to integrate nutrition indicators into their existing health information systems through standardized modules that record both monthly nutrition data elements and yearly follow-up information. This innovation supports consistent monitoring while reducing parallel reporting structures—exactly the kind of efficiency the diagonal approach aims to achieve.

The challenge now is scaling up these integration efforts, particularly in resource-constrained settings. Rather than creating separate nutrition monitoring systems, countries should make use of their existing health data platforms for the purpose while strengthening their capacity to capture key nutrition indicators. (55) This approach not only improves efficiency but enables better targeting of interventions and more effective resource allocation across both nutrition and broader health services.

Overlaps in service delivery: Integrating preventive and primary care services

The diagonal approach also takes advantage of overlaps in the delivery of services, particularly those having to do with preventive care. Both primary health care and nutrition interventions, for instance, often emphasize preventive measures to improve long-term health outcomes. Integrating nutrition counseling with primary health care visits allows health workers to provide guidance on balanced diets, breastfeeding, and complementary feeding alongside routine care.

The Integrated Management of Childhood Illness (IMCI) strategy is an example of a diagonal approach with overlaps in service delivery, although its effectiveness varies, and uneven and incomplete implementation makes it difficult to assess. (56) Launched by the World Health Organization and UNICEF in the mid-1990s, IMCI transformed the delivery of child health services by integrating previously vertical interventions—including treatment for major childhood illnesses (such as diarrhea, malaria, and measles), routine immunization (for diseases such as tuberculosis and polio), nutrition services (such as vitamin A supplementation and growth monitoring), and other essential child health needs—into routine primary care.

The approach operates across several levels of the health system—from first-level health facilities to referral hospitals—and includes both curative and preventive elements. (57) In Tanzania, districts implementing IMCI achieved a 13 percent reduction in child mortality compared to non-IMCI districts while improving nutrition service coverage. In Bangladesh, health facilities implementing IMCI were twice as likely to identify correctly and treat severe malnutrition than non-IMCI facilities, demonstrating how integration can enhance both service quality and nutrition outcomes. (58)

Several features of IMCI exemplify diagonal integration. First, the strategy builds nutrition screening and counseling into routine child health visits rather than creating separate nutrition service points. Second, it strengthens overall health system capacity through standardized training and supervision that covers both nutrition and other child health interventions. Third, it introduces integrated monitoring tools that track both nutrition and health indicators, creating efficiencies in data collection and use. Together, these elements demonstrate how nutrition services can be effectively woven into broader health system strengthening efforts. (59)

Although IMCI offered strong potential as a diagonal strategy—integrating nutrition into routine child health services—its implementation held both promise and persistent challenges. The holistic design of the strategy and its integration of preventive and curative care contributed to reductions in child mortality and improved nutrition outcomes in several countries. Yet uneven implementation, inadequate health system support, and donor dependence limited its impact. In regions like Central Asia and Europe, IMCI faltered as a result of competing economic priorities, weak supervision, and limited uptake. Health workers were also constrained by insufficient training, resource shortages, conflicting responsibilities, and other such difficulties. These experiences demonstrate that diagonal efforts come with a caveat: To achieve sustained and equitable nutrition integration, they require aligned financing, continuous training, supportive supervision, and strong political and community ownership. (60–62)

Overlaps in financing vehicles: Harmonizing funding streams

The diagonal approach strategically aligns different funding mechanisms to reduce fragmentation and enhance sustainability in nutrition financing. Rather than operating parallel funding streams, it pools nutrition-specific donor funds with broader health system financing while maintaining clear accountability for nutrition outcomes. Existing financing mechanisms like the Global Financing Facility (GFF), for example, and newer approaches like the Child Nutrition Fund (CNF) work to align external financing with government budgets. The GFF aims to integrate with government-funded platforms specific to Reproductive, Maternal, Newborn, Child, Adolescent Health and Nutrition (RMNCAH+N) care, while the CNF plans to use its "Match Window" to create more sustainable pathways for financing essential services to prevent and treat wasting. Box 2 goes into further detail on GFF as a use case.

Other initiatives, such as the Salud Mesoamérica Initiative (SMI), exemplify how targeted financing can drive both nutrition-specific outcomes and broader health system improvements. Launched in 2011, SMI is a public-private partnership involving the Inter-American Development Bank (IDB), the Bill & Melinda Gates Foundation, the Carlos Slim Foundation, and the governments of Canada and Spain. The initiative mobilized a total of US$150 million, with each major donor contributing US$50 million. (63) SMI employs a results-based financing (RBF) model, wherein countries cofinance projects, matching donor funds to implement evidence-based interventions in maternal, neonatal, and child health for the poorest populations. (64) Funding is contingent upon achieving specific health outcomes, with independent evaluations determining the disbursement of performance-based incentives. This approach not only harmonizes funding streams from donors but aligns them with national resources, ensuring investments are directly linked to measurable improvements in health equity and system performance.

This harmonization of funding streams extends beyond simple pooling. Performance-based financing mechanisms can be designed to reward both nutrition-specific outcomes and health system improvements, encouraging integration at the service delivery level. (65) Matching fund arrangements, in which donor resources are combined with domestic financing, help build country ownership while maintaining dedicated nutrition resources. (66)

BOX 2. GFF as a use case: Aligning funding for impact

The Global Financing Facility (GFF) offers insights into both the potential and limitations of diagonal approaches in nutrition financing. As a country-led partnership, the GFF links grant financing with on-budget resources of the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) to catalyze and align nutrition investments within the strengthening of health systems. In Rwanda, where the investment case focuses heavily on improving nutrition, the GFF has supported nutrition budget tagging across sectors, helping the government improve its estimates of total allocations to nutrition programs and link financing with early childhood development initiatives. Indonesia has completed a similar cycle of budget tagging, tracking, and evaluation of nutrition spending with GFF support.

The GFF's experience shows how two factors are important to the success of diagonal nutrition financing. First, providing support to countries in mobilizing domestic resources for nutrition financing helps create more sustainable funding pathways. Second, the use of results-based mechanisms that reward both nutrition-specific outcomes and system reforms helps align incentives at the service delivery level. The GFF, for example, helps countries design performance-based financing that provides incentive both to reduce stunting and strengthen community health platforms. (67)

While the GFF model shows promise, it also illustrates some inherent challenges of diagonal approaches. Integrating nutrition within broader RMNCAH+N investments can sometimes make it difficult to track nutrition-specific financing flows—a complexity that, while consistent with the model's integrated approach, requires careful monitoring. Additionally, building a country's capacity to manage integrated approaches takes time and sustained commitment. (68)

These lessons suggest the diagonal approach, when strategically deployed, has the potential to enhance the effectiveness of nutrition financing. Clear accountability for nutrition outcomes can be maintained while system efficiency is enhanced through careful attention to incentives and country context. As global nutrition financing evolves, this nuanced approach offers a promising path forward—one that reduces fragmentation while preserving the targeting needed for nutrition interventions.

TABLE 2. Diagonal approach models for nutrition integration

Model	Integration Approach	Illustrative Examples
Overlaps in population targets	Combines nutrition interventions with existing health services based on life stages (e.g., child, maternal)	– Children: Vitamin A supplementation provided with routine immunizations and growth monitoring – Pregnant women: Multiple micronutrient supplementation (MMS) integrated into antenatal care (ANC) visits
Overlaps in resources (health system components)	Utilizes shared infrastructure, workforce, and information systems to streamline operations	– Community health workers: Reach of nutrition programs expanded without separate distribution channels
Overlaps in service delivery (preventive and primary care services)	Aligns nutrition counseling and education with preventive health care visits	– Primary care visits: Nutrition counseling on breastfeeding provided along with complementary feeding – Maternal and child health programs: Preventive nutrition education integrated into ANC and postnatal care
Overlaps in financing vehicles	Aligns donor and domestic funds to create sustainable, harmonized financing for nutrition within health systems	– Nutrition covered by national insurance – Matching fund arrangements: Donor and local funds combined

Governments could facilitate integration by strengthening the enabling factors

Successful integration of nutrition into health systems through the diagonal approach requires coordinated action using many policy levers—such as laws, funding mechanisms, and regulatory frameworks—that shape governance and service delivery. While each country's path will differ based on context and capabilities, evidence suggests governments play a very important role in supporting diagonal approaches by addressing four enabling factors: governance and policy alignment, financing arrangements to reward integrated outcomes, service delivery platforms, and evaluation to ensure accountability. While effectiveness in each area may require adjustments to existing policies and financing structures, the benefits include improved nutrition outcomes and more sustainable, on-budget resource flows rather than fragmented, parallel systems. The following section outlines "enablers" and recommendations for governments, especially in low- and middle-income countries, for the successful integration of nutrition into health systems.

Governance and policy alignment

Effective integration begins with policy frameworks that position nutrition as a core component of health system goals rather than treating it as an add-on. Governments must move beyond vague commitments to "include nutrition" by explicitly embedding it within national health strategies, universal health care frameworks, and essential service packages. Governance arrangements should clearly define accountability for nutrition outcomes at all levels of the health system while creating

incentives to reward integration. Thailand, for example, has successfully reduced malnutrition by incorporating nutrition indicators into its UHC monitoring framework, fostering systemwide accountability for nutrition improvement. It is important to note, however, that Thailand's success cannot be attributed to monitoring alone. A combination of sustained political commitment, sound public financing, civil society engagement, and a systematic, evidence-based process for prioritizing services was essential. (10,69)

Financing arrangements to reward integrated outcomes

Governments can link funding to measurable progress on both nutrition-specific and health system strengthening indicators. They can, for instance, allocate a portion of funding to districts and facilities based on performance metrics, such as attendance to antenatal care, that include nutrition components. Performance-based financing (PBF) frameworks could also give facilities incentive to achieve outcomes across multiple sectors, encouraging stronger integration of nutrition and health system interventions. (70) Countries should establish robust data collection systems to monitor these indicators, ensuring accountability and enabling iterative improvements in financial arrangements. Additionally, aligning financial incentives with local government priorities and capacity can strengthen implementation at the subnational level. (71)

Indonesia provides a compelling example of performance-based budgeting (PBB) to drive progress toward achieving integrated health and nutrition outcomes. The government linked district-level budgets to measurable targets for reducing stunting, giving local governments incentive to prioritize interventions that combine health and nutrition services. Implementation of this approach was supported by multisectoral collaboration, with agencies in the Ministry of Finance and Planning providing clear guidelines for the utilization of funds. By using stunting reduction as a key metric, Indonesia ensured funds were directed toward interventions with high potential for impact, such as community-based health services and nutrition counseling. Regular evaluations of district performance are conducted and funding adjustments are made based on results, creating a cycle of accountability and evidence-driven resource allocation. (72) This model demonstrates how performance-based budgeting can align financial incentives with broader health and nutrition goals.

While financing mechanisms like PBB offer strong incentives for integrated outcomes, they come with tradeoffs. Evidence shows that such approaches can improve accountability and align priorities across sectors, but their effectiveness depends heavily on context. Weak data systems, limited fiscal autonomy, or unclear indicators, for instance, can hinder implementation and even create perverse incentives. (73) At the same time, highly targeted financing comes with the risk of fragmenting efforts or sidelining broader systems strengthening if not carefully balanced. These tradeoffs underscore that no single financing modality is universally optimal; rather, choices must be tailored to local capacity, governance structures, and reform maturity. As countries consider how to integrate nutrition more effectively, selecting and sequencing financing modalities will shape not only what gets delivered, but how sustainably, equitably, and accountably it is delivered.

Service delivery platforms

Integration ultimately succeeds or fails at the service delivery level, where theoretical frameworks meet practical implementation challenges. Using existing health system contact points—such as primary care facilities and community health worker networks—as platforms for delivering nutrition services is key. This requires strengthening core health system building blocks: Information systems must track both nutrition and health outcomes, supply chains must integrate nutrition commodities with essential medicines, and the health workforce must be trained to deliver integrated protocols. Bangladesh's mainstreaming of nutrition services into its community clinic system exemplifies how this approach can enhance reach and efficiency. (74,75)

Evaluation to ensure accountability

Governments should establish measurable benchmarks for integrated outcomes, tracking both nutrition-specific results (such as reduction of stunting) and systemwide improvements (such as strengthened supply chains). Putting into place measurement frameworks to ensure accountability includes examining both process and outcomes systematically to assess both immediate impacts and systemwide changes. Such frameworks offer an alternative to the evaluation approaches traditionally used by external funders, which narrowly define success in terms of vertical approaches.

While ultimate outcomes like stunting reduction are important, they are influenced by broader social and economic factors, and health systems cannot be held accountable for them alone. More appropriate and actionable is to hold health systems accountable for proximal indicators, such as service coverage, quality, and equity. Fragmented data systems and a lack of harmonized monitoring tools across vertical programs also stand in the way of accountability. One possible remedy is a robust monitoring and evaluation (M&E) framework that can support integration without compromising specificity. When thoughtfully designed, accountability can move beyond compliance to drive real improvements in service delivery, governance, and health outcomes.

Successful integration should demonstrate improvements across three dimensions:

- First, integrated service delivery should show better nutrition outcomes than vertical approaches, measured through standard indicators like reduced stunting rates or improved dietary diversity.
- Second, cost-effectiveness analysis should reveal efficiency gains from shared platforms and reduced duplication; Ethiopia's integrated community health program, for example, showed cost savings of 40 percent while maintaining service quality. (76)
- Third, evaluation must discern system-level improvements in capacity and resilience, such as strengthened supply chains or improved data systems that benefit multiple health programs.

Together, these measures will provide a comprehensive picture of whether diagonal integration is achieving its dual goals of better nutrition outcomes and stronger health systems. (44) Implementing the evaluation frameworks that use them presents challenges, however. Methodologically, governments need to move beyond traditional linear evaluation models that fail to capture the complex interplay between targeted interventions and systemwide improvements. Structurally, countries must address limitations in health systems that are traditionally designed to manage disease-specific programs and outcomes, which makes implementing and evaluating integrated approaches more difficult. Overcoming these barriers will be vital to ensuring the success and sustainability of diagonal integration.

FIGURE 6. Opportunities and challenges of diagonal approaches

Opportunities

- **Improved efficiency:** Shared platforms can reduce duplication and optimize resource use.
- **Greater sustainability:** Integrated models can promote stronger government ownership and long-term commitment.
- **Enhanced impact:** Targeted interventions delivered through stronger systems can yield broader health gains.

Challenges

- **Coordination complexity:** Financing streams and delivery systems need to be aligned across implementing partners.
- **Measurement gaps:** System-wide effects are harder to track using conventional evaluation methods.
- **Contextual fit:** Models must be tailored to diverse country contexts and existing health system capacities.

The way forward

The pressing challenge of global undernutrition, compounded by increasing fiscal constraints and declining health service coverage, demands new approaches to delivering nutrition services. Although both vertical and horizontal approaches have demonstrated value, a move beyond this dichotomy through diagonal approaches offers a more sustainable path forward.

To be successful, however, implementation requires coordinated action from both funders and governments. External funders must gradually shift from purely vertical approaches toward integrated programming that strengthens health systems. This includes aligning nutrition investments with national strategies, supporting integrated delivery platforms, and harmonizing reporting requirements. At the same time, governments must create enabling conditions by embedding nutrition within health benefits packages, strengthening implementation capacity, and establishing clear accountability frameworks.

Looking ahead, several priorities emerge:

- Ensuring nutrition remains central to universal health coverage reforms
- Developing robust frameworks for evaluating integrated approaches that move beyond traditional metrics to capture both nutrition outcomes and systemwide improvements
- Building evidence on the cost effectiveness of different integration models to inform scaling decisions
- Strengthening mechanisms for coordination between donors and governments to reduce fragmentation

The recent 2025 Nutrition for Growth Summit offered an invaluable opportunity to mobilize commitments to these priorities for the transformation. By embracing diagonal approaches now, the global nutrition and broader health community can help build more resilient health systems while ensuring the sustainable delivery of essential nutrition services.

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Appendix

Cost-effectiveness of interventions based on World Bank Nutrition Investment Framework Using Lives Saved Tool (2024)

Intervention	Child deaths averted	Stunted children turning age five averted	Child wasting episodes averted*	Child anemia averted	Maternal anemia averted	Maternal deaths averted	Additional exclusively breastfed children
Full package of interventions							
Cost per case ($)	20,700	4,800	2,700	1,700	890	702,900	1,500
Impact (thousand cases)	6,192	26,682	47,093	76,798	144,201	182	85,060
Calcium supplementation							
Cost per case ($)	8,400	22,900					
Impact (thousand cases)	510	187	—	—	—	—	—
Cash transfers†							
Cost per case ($)	22,700	377					
Impact (thousand cases)	76	4,559	—	—	—	—	—
Delayed cord clamping							
Cost per case ($)				17			
Impact (thousand cases)	—	—	—	3,199	—	—	—
IFA food fortification							
Cost per case ($)	39,900			3,200	1,500	1,193,000	
Impact (thousand cases)	135	—	—	1,663	3,473	5	
IPTp							
Cost per case ($)	2,700	1,800			124	58,700	
Impact (thousand cases)	133	200	—	—	2,911	6	
Iron and iodine fortification of salt							
Cost per case ($)				721	300	247,700	
Impact (thousand cases)	—	—	—	2,407	5,008	7	—

(continued)

Intervention	Child deaths averted	Stunted children turning age five averted	Child wasting episodes averted*	Child anemia averted	Maternal anemia averted	Maternal deaths averted	Additional exclusively breastfed children
IYCN counseling							
Cost per case ($)	16,700	7,300	3,400				97
Impact (thousand cases)	493	1,131	2,394	—	—	—	84,334
KMC							
Cost per case ($)	349						716
Impact (thousand cases)	1,775	—	—	—	—	—	864
Micronutrient powders							
Cost per case ($)				375			
Impact (thousand cases)	—	—	—	54,537	—	—	—
MMS							
Cost per case ($)	8,300	3,500	8,400		125	101,200	
Impact (thousand cases)	1,974	4,715	1,944	—	131,238	162	—
SQ-LNS							
Cost per case ($)	68,600	4,300	921	3,000			
Impact (thousand cases)	243	3,916	18,100	5,470	—	—	—
Treatment of SAM							
Cost per case ($)	123,100						
Impact (thousand cases)	315	—	—	—	—	—	—
Vitamin A supplementation							
Cost per case ($)	13,800	508	204				
Impact (thousand cases)	163	4,444	11,064	—	—	—	—

(continued)

Intervention	Child deaths averted	Stunted children turning age five averted	Child wasting episodes averted*	Child anemia averted	Maternal anemia averted	Maternal deaths averted	Additional exclusively breastfed children
Zinc + ORS for treatment of diarrhea							
Cost per case ($)	4,000						
Impact (thousand cases)	106	—	—	—	—	—	—
Zinc supplementation							
Cost per case ($)	89,500	1,700	690				
Impact (thousand cases)	118	6,348	15,331	—	—	—	—

Note: Attributable impacts were estimated by comparing the scale-up scenario with and without the intervention. This table is a simplified version of a more detailed cost-effectiveness table, with total costs per intervention, available in table 7E.1 of annex 7E. Cost per case values are presented in full numerical amounts. Dashes indicate that the intervention does not affect the corresponding outcome or the impact was not assessed as part of this analysis. KMC = kangaroo mother care; IFA = iron–folic acid; IPTp = intermittent preventive treatment of malaria in pregnancy; IYCN = infant and young child nutrition; MMS = multiple micronutrient supplements; ORS = oral rehydration solution; SAM = severe acute malnutrition; SQ-LNS = small-quantity lipid-based nutrient supplements.

* The Optima Nutrition model tracks the prevalence of wasting and anemia among children each year rather than by incidence; person-years of wasting and anemia averted from model outputs were converted to episodes and cases averted, respectively, by assuming a wasting relapse rate of 2.6 times per year and that anemia in children persists for the entire younger-than-age-five period.

† Cash transfers have a relatively high cost-effectiveness because the only costs included here are the additional requirements for IYCN communication campaigns to make cash transfers conditional or accompany cash transfers with nutrition messaging, with the assumption that cash transfers are instituted primarily for poverty reduction and therefore financed from other budgets.