Integrating nutrition services into health care systems platforms: Where are we and where do we go from here

Rafael Pérez-Escamilla1 | Cyril Engmann2,3,4

1 Department of Social and Behavioral Sciences, Yale School of Public Health, New Haven, Connecticut, USA
2 Department of Pediatrics, University of Washington School of Medicine, Seattle, Washington, USA
3 Department of Global Health, University of Washington School of Public Health, Seattle, Washington, USA
4 Maternal, Newborn, Child Health & Nutrition, PATH, Seattle, Washington, USA

Correspondence
Rafael Pérez-Escamilla, PhD, Professor, Department of Social and Behavioral Sciences, Yale School of Public Health, 135 College St, Suite 200, New Haven CT 06510, USA. Email: rafael.perez-escamilla@yale.edu

Abstract
Integrating maternal–child nutrition into health care services is a desirable but complex task that requires implementation research studies. This special supplement, entitled "How to Strengthen Nutrition into the Health Platform: Programmatic Evidence and Experience from Low- and Middle-Income Countries" presents a collection of mixed-methods research and case studies mostly conducted in sub-Saharan Africa that help us gain a better understanding of the barriers and facilitators for this integration to happen. Collectively, the evidence confirms that integrating nutrition services as part of health care systems and other platforms is feasible, but for that to be successful, there is a need to address strong barriers related to all six key health care systems building blocks identified by the World Health Organization. These include financing, health information systems, health workforce, supplies and technology, governance, and service delivery. Moving forward, it is crucial that more robust implementation science research is conducted within the rough and tumble of real-world programming to better understand how to best integrate and scale up nutrition services across health care systems and other platforms based on dynamic complex adaptive systems frameworks. This research can help better understand how the key health care systems building blocks need to interlock and communicate with each other to improve the policymakers' ability to integrate and scale up nutrition services in a more timely and cost-effective way.

KEYWORDS
complex adaptive systems, health care systems, maternal and child health, nutrition programs

1 | INTRODUCTION

The World Health Organization (WHO) has identified six key building blocks that need to be taken into account for understanding how to design, strengthen, and sustain effective health care systems. These building blocks are: financing, health information systems, health workforce, supplies and technology, governance, and service delivery (WHO, 2010). In this special issue, “How to Strengthen Nutrition into the Health Platform: Programmatic Evidence and Experience from Low- and Middle-Income Countries” (commissioned by the United States Agency for International Development's Maternal and Child Survival Program), Salam et al. build upon this WHO framework to map the current integration of nutrition services into health care systems platforms and to review the impact of integrated health and nutrition programs and their implications on diverse nutrition outcomes in low- and middle-income countries (Salam, Das, & Bhutta, 2019). In their scoping review, the authors define nutrition integration as “the extent of adoption and eventual assimilation of nutrition interventions into critical health system functions” taking heavily into account the health care systems building blocks identified by WHO. They identified various nutrition-specific interventions integrated with diverse health and social protection programmes, including Integrated Management of Childhood Illness/Integrated Community Case Management (iCCM), management of severe acute moderation (SAM) and moderate acute malnutrition (MAM), Child Health Days, immunizations, integrated early childhood development, and cash transfers.
They found service delivery and health workforce building blocks better integrated than the other four health care systems building blocks.

Their findings highlight a paucity of detailed information and yet the opportunities for integration of nutrition programming into health care platforms across all six building block domains. Integration was associated with improvements in early breastfeeding initiation, exclusive breastfeeding, night blindness as a result of vitamin A supplementation, and recovery from and reduced relapse of children with SAM and MAM. Their findings suggest a lack of systematic coordination, which undermines most efforts across health and nutrition funding streams. The authors conclude that integration is a complex task that requires careful analysis and planning to properly design strong programmes with rigorous monitoring and evaluative elements, taking into account various context-specific factors to ensure fidelity to implementation, clients’ compliance, impact, and long-term sustainability.

The research studies that follow the scoping review in this special issue confirm and expand the review findings based on both qualitative and quantitative research methodologies. An analysis of repeated nationally representative surveys found that the nationwide community-based, growth monitoring, and nutrition education integrated programme launched in Madagascar in 1999 and gradually scaled up throughout the country until 2011 led to reductions in malnutrition among children under 5 years old, but that effectiveness was weakened over time (Weber, Galasso, & Fernald, 2019). Specifically, the communities who were enrolled in the programme between 1999 and 2004 experienced improvements in mean weight-for-age and reduction in the prevalence of underweight by 2004 and this impact was sustained, albeit not as strong perhaps as a result of political instability and severe economic crises through 2011. By contrast, there was no impact of the intervention on the child nutrition outcomes of communities that were enrolled in the programme after 2004. This may have been due at least in part to a loss in motivation from frontline workers; that is, they reported increased workload and unpredictable pay during the second phase of programme expansion (2004–2011). The authors conclude that the sustained effectiveness of programmes at scale needs to emphasize a focus not only on coverage but also on programme quality, including qualified workforce development. Consistent with this recommendation, a mixed-methods pilot study found that low-literate community health workers in South Sudan were able to be trained on how to follow a simplified treatment protocol for uncomplicated SAM with high accuracy (Van Boetzelaer, Zhou, Tesfai, & Kozuki, 2019). We agree with the authors that this achievement is indeed key for increasing access to high quality acute malnutrition treatment in highly vulnerable remote communities.

A mixed-methods implementation research study conducted in Malawi documented how the Baby Friendly Hospital Initiative (BFHI) was revitalized nationally after it had been heavily weakened since its introduction in 1993 because of lack of funding (Kavle, Welch, et al., 2019). The scaling-up effort was relatively successful, which the authors attribute in part to the engagement of local leadership at the community, district, and national levels. The authors conclude that greater integration of BFHI into Malawi’s health system is needed, paying special attention to the BFHI pre-service training, and integration of BFHI into national clinical guidelines, protocols, and nutrition and health policies, both of which will require increased country investments in BFHI. They also acknowledge the need of strengthening breastfeeding support at the community level and to have adequate process and impact monitoring systems in place. A study in Kenya examined barriers and facilitators of the Baby-Friendly Community Initiative (BFCI), which represented an activity related to the 10th step of BFHI. Coverage for BFCI activities varied across counties from 20% to 60% and was sustained 3 months post implementation (Kavle, Ahoya, et al., 2019). This level of coverage may have been enough to positively influence infant-feeding outcomes although these findings need to be interpreted with caution because of the potential for social desirability bias given that the providers of the services were the ones collecting the infant-feeding outcomes data. The following challenges were identified to improve the sustainability of BFCI moving forward: ensure that a pipeline with a critical mass of master trainers remains throughout, develop nutrition counselling competencies among health providers, and strengthen implementation tracking information systems.

Another mixed-methods implementation research study in the Democratic Republic of Congo was designed to understand how to best integrate nutrition-specific actions into iCCM (Kavle, Pacqué, et al., 2019). This was done by identifying cultural beliefs, family/community influences, and perceptions of infant and young child feeding and child illness. The study also examined the points of view and knowledge of facility- and community-based health providers on nutrition and iCCM and the influence of key family and community members. Study findings identified gaps and opportunities available to strengthen service delivery for integration of nutrition actions into iCCM at the health facility and community level taking into account the social and cultural context of the target population. For example, perceived insufficient milk associated to child/maternal illness and maternal diet were commonly reported. Complementary feeding knowledge and practices were identified as being suboptimal with regards to dietary diversity and meal frequency. Maternal work in the field was reported as a reason for the premature interruption of exclusive breastfeeding. With regards to the health care system, traditional healers were identified as the most trusted source of information for

**Key messages**

- Integrating nutrition services into health care systems is feasible, but structural barriers need to be addressed.
- Policy makers need to better understand how the key health care systems building blocks need to interlock to effectively integrate and scale up nutrition services.
- Mixed methods implementation research is key for understanding how to improve the efficiency of integration of nutrition into health care.
- Scaling up of nutrition services across health care systems and other platforms can be improved using dynamic complex adaptive systems implementation science research.
families on certain child illnesses and perceived insufficient milk. Furthermore, even though community health workers often accompanied families to the health centres and assisted with provision of basic care, findings showed that they hardly ever provide nutrition counselling in the community, perhaps as a result of lack of proper training.

A formative research study conducted in Tanzania sought to inform the development of an integrated approach to improve uptake of nutrition (breastfeeding in particular) and family planning services (Cooper et al., 2019). This qualitative study elicited input from multiple stakeholders including mothers of infants less than 1 year, fathers, grandmothers, health providers, traditional birth attendants, community health workers, and community leaders. Findings identified suboptimal breastfeeding practices since birth. As in previous studies, perceived insufficient milk was commonly reported and linked with inadequate maternal nutrition. Mothers were not aware of the lactation amenorrhea family planning method (LAM) but rather believed that breastfeeding is protective against pregnancy, regardless of the frequency or duration of breastfeeding. This was not surprising as it was found that health providers rarely counsel mothers and families on LAM, as postpartum family planning services coverage is very low. Mothers reported discussing family planning with their partner, indicating the need to include the fathers in efforts to further integrate nutrition and family planning programmes in Tanzania. Consistent findings were reported from a quasi-experimental study conducted in Vietnam to find out if promoting fathers’ involvement could help improve breastfeeding outcomes (Bich, Long, & Hoa, 2019). The intervention consisted of providing fathers with breastfeeding education and counselling services in health facilities and at home visits during the antenatal, delivery, and post-partum periods; and breastfeeding peer education and social exchanges were provided through fathers’ clubs. After 1 year, mothers in the intervention group were significantly more likely to initiate breastfeeding early and to have substantially higher rates of exclusive breastfeeding at 1, 3, and 6 months post-partum.

The role of non-governmental organizations (NGOs) on assisting with the integration of nutrition services into health and social platforms was recently explored in India (Chanani et al., 2019). This study used a single-group pre-post design to assess the impact of an NGO-government partnership to prevent and treat wasting among children under age 3 years old in peri-urban and informal settlements of Mumbai. The community-based child nutrition programme based on growth monitoring and corresponding referrals was implemented by an NGO in partnership with Integrated Child Development Services and Mumbai’s Municipality. Declines in severe and moderate wasting were associated with participation in the programme. However, the authors concluded that there is room for improvement in impact. Indeed, their findings indicate the need for strong implementation research to find out how best to improve the integration of nutrition services through well-coordinated NGO-public partnerships across health and social platforms.

This special issue includes two case studies that help understand how to improve nutrition services integration at scale in Kenya and Mozambique. The case study from western Kenya applied the Trials of Improved Practices formative research technique using a participatory approach to test actual complementary feeding practices and to develop culturally appropriate recipes consistent with national guidance. The authors were able to identify opportunities for improving and monitoring complementary feeding into existing health platforms based on the development of local recipes that took into account mothers’ needs and wants. Cooking demonstrations were carried out by community volunteers through mother-to-mother support groups hosted by the government-endorsed BFCl. In addition, key hygiene actions were integrated with complementary feeding messages through the BFCl platform. This case study demonstrates that it is feasible to integrate complementary feeding hands-on learning interventions targeting nutrition and food safety through an existing health care systems platform, in this instance, BFCl. It is noteworthy how the integration of the nutrition programme into the BFCl platform allowed for routine monitoring of complementary feeding indicators on a monthly basis at local levels, although the use of administrative data for complementary feeding programme evaluation still needs validation (Ahoya, Kavle, Straubinger, & Gathi, 2019). The second case study conducted in Mozambique identified opportunities for improved planning, implementation, and monitoring and evaluation of vitamin A and iron interventions targeting children under 5 years old through integration with complementary multisectorial interventions. The study that built upon an extensive grey literature review as well as expert consultations, found that it is imperative to generate updated information on the prevalence of micronutrient deficiencies in the target population, and on the interventions’ costs, cost-effectiveness, feasibility, and acceptability in the context of Mozambique (Picolo et al., 2019). Without this evidence, it is indeed not possible to properly design and target the needed interventions. The authors further identify the need for a national integrated multisectoral strategy to address vitamin A and iron deficiency in Mozambique that includes the development of standard operation procedures guidelines, a well thought out monitoring and evaluation strategy to assess coverage and quality, and less reliance on foreign aid for financing.

Collectively, the evidence presented in this special issue confirms that integrating nutrition services as part of health care systems and other platforms is feasible, but for that to be successful, there is a need to address all six building blocks identified by WHO (Salam et al., 2019). Although leadership/governance per se were not the single focus of any of the studies, it is clear that the engagement of the target communities (including children’s fathers) and civil society organizations (e.g., NGOs) provides a powerful demand-generation component to health/nutrition efforts (Engmann, Khan, Moyer, Coffey, & Bhutta, 2016) and are central to the proper design and delivery of these services in partnership with governments (Segura-Pérez, Grajeda, & Pérez-Escamilla, 2016). Governments, at the end of the day, need to provide strong leadership and facilitate the implementation of efficient, transparent, and accountable multisectoral governance structures (Pérez-Escamilla, 2012). Ideally, such leadership should provide an enabling environment that promotes the engagement of the private sector. The mixed-methods implementation research evidence presented, also highlights the need for adequate and systematic financing of well-planned integrated nutrition programmes that are ideally built and scaled up based on strong formative research, monitoring, and evaluation. Several studies indicated that there is a need to validate the use of administrative programme
data to monitor and evaluate the integrated nutrition services. As
demonstrated in Malawi for the case of micronutrient status (Rhodes et al., 2019) further research is needed to find out how to better inte-
grate and find synergies across different ongoing data collection activ-
ities that are measuring maternal-child-nutritional status in the same 
populations. In the future, it will be important for intelligent health 
information systems to allow timely communication across sectors 
from the national to the local level and vice versa, and that help 
strengthen the links across systems that span the facility to commu-
nity continuum. This is central for achieving a major theme that cuts 
across studies, which is that effective integration and scale up of nutri-
tion services needs to be based on attaining both a critical mass of 
coverage as well as quality. The studies also emphasize that this can-
not happen unless there is adequate development of a well-trained 
health workforce that is motivated to remain on board to prevent 
the very high turnover of front line personnel identified in this special 
issue; the programmes have access to the needed supplies and 
technology; and there is demand for service delivery. These findings 
are highly consistent with previous analyses, identifying key elements 
for integrating breastfeeding services across health and social plat-
forms (Hromi-Fiedler, dos Santos Bucini, Gabert, Doucet, & Pérez-
Escamilla, 2018; Pérez-Escamilla, Curry, Minhas, Taylor, & Bradley, 
2012), integrating kangaroo mother care into health systems 
(Engmann, Wall, Darmstadt, Valsangkar, & Claeson, 2013; Seidman et al., 2015), integrating micronutrient powders into health care plat-
forms (Nyhus Dhillon et al., 2017), integrating early childhood develop-
ment services including nutrition (Pérez-Escamilla, Cavallera, 
Tomlinson, & Dua, 2018), and integrating family planning into nutrition 
(Kavle et al., 2018). Findings are also highly consistent with best prac-
tices recommended for the effective scaling up of nutrition programmes across platforms (Gillespie, Menon, & Kennedy, 2015; 
Glandon, Paina, Alonge, Peters, & Bennett, 2017; Kung’u et al., 2018).

Moving forward, it is crucial that more robust implementation sci-
ence research is conducted within the rough and tumble of real-world 
programming to better understand how to best integrate and scale up 
up nutrition services across health care systems and other platforms 
based on dynamic complex adaptive systems frameworks (Bradley et al., 2012; Paina & Peters, 2011). This research is fundamental to 
better understand how the key building blocks of health systems need 
to interlock and communicate with each other to improve the 
policymakers’ ability to integrate programmes and scale them up in a 
more timely and cost-effective way (Alonge, Lin, Igusa, & Peters, 
2017; Pérez-Escamilla & Hall Moran, 2016). This research is also nec-
essary to address the need for reaching consensus on standardized 
global health and nutrition definitions, and to provide a high-resolution 
framework that includes minimum standards for integrating nutrition-
specific interventions into health service delivery (Salam et al., 2019).

ACKNOWLEDGEMENTS

The authors served as guest editors for the special issue on “How to 
Strengthen Nutrition into the Health Platform: Programmatic evidence 
and experience from Low and Middle-Income Countries.” They did not 
receive any compensation for the writing of this article, did not partici-

cate in the implementation or writing of any of the articles they

REFERENCES

progress for complementary feeding in Kenya: Key government actions 
https://doi.org/10.1111/mcn.12723

systems performance in low-and middle-income countries: A system 
dynamics model of the pay-for-performance initiative in Afghanistan. 
Health Policy and Planning, 32(10), 1417–1426. https://doi.org/ 
10.1093/heapol/czx122

education intervention on breastfeeding practice—Results of a quasi-
https://doi.org/10.1111/mcn.12705

Bradley, E. H., Curry, L. A., Taylor, L. A., Pallas, S. W., Talbert-Slagle, K., 
Yuan, C., ... Pérez-Escamilla, R. (2012). A model for scale up of family 
health innovations in low-income and middle-income settings: A mixed 
methods study. BMJ Open, 2(4), e000987. https://doi.org/10.1136/ 
bmjopen-2012-000987

Chanani, S., Waingankar, A., Shah More, N., Pantvaidya, S., Fernandez, A., 
to prevent and treat child wasting in urban India. Maternal & Child 

Cooper, C. M., Kavle, J. A., Nyoni, J., Drake, M., Lemwayi, R., Mabuga, L., 
& Pfitzer, A. (2019). Perspectives on maternal, infant, and young child 
nutrition and family planning: Considerations for rollout of integrated 
services in Mara and Kagera, Tanzania. Maternal & Child Nutrition, 
15(Suppl 1), e12735. https://doi.org/10.1111/mcn.12735

Consensus on kangaroo mother care acceleration. The Lancet. 
382(9907), e26–e27. https://doi.org/10.1016/S0140-6736(13) 
62293-X

Transformative innovations in reproductive, maternal, newborn, and 
child health over the next 20 years. PLoS Medicine, 13(3), e1001969. 
https://doi.org/10.1371/journal.pmed.1001969

Gillespie, S., Menon, P., & Kennedy, A. L. (2015). Scaling up impact on nutrition: 
doi.org/10.3945/an.115.008276

Best resources for community engagement in implementation 
org/10.1093/heapol/czx123


**How to cite this article**: Pérez-Escamilla R, Engmann C. Integrating nutrition services into health care systems platforms: Where are we and where do we go from here. *Matern Child Nutr*. 2019;15(S1):e12743. https://doi.org/10.1111/mcn.12743