SQ-LNS CASE STUDY

UCDAVIS Institute for Global Nutrition

Integrating the provision of SQ-LNS for prevention of wasting into a wasting screening program: Case study of the PROMIS Project

SQ-LNS Task Force Secretariat*, Rolf Klemm, Lieven Huybregts, Elodie Becquey

This case study is the first in a three-part series that highlights the integration of SQ-LNS into different delivery platforms.

Introduction

The estimated global prevalence of wasting among children under five years of age was 6.6% in 2024, though the true burden is likely far higher (1-3). Despite a global target to reduce child wasting to less than 3% by 2030, current progress indicates the world is not on track to meet this goal. Children under the age of two years are particularly vulnerable to wasting, and the developmental consequences of wasting during this early stage of life can be long-lasting (4).

Key messages

SQ-LNS is a strong incentive:
There was high demand for SQ-LNS in Burkina Faso and Mali which led to an increase in wasting screening program participation and coverage. This could be leveraged for participation and utilization of other health services.

Programmatic adjustments:
Implementers utilizing this platform should ideally provide co-localization of services and products for acute malnutrition (AM) treatment, and incorporate a system that monitors whether children identified as having AM enroll into a treatment program and receive post-treatment follow-up.

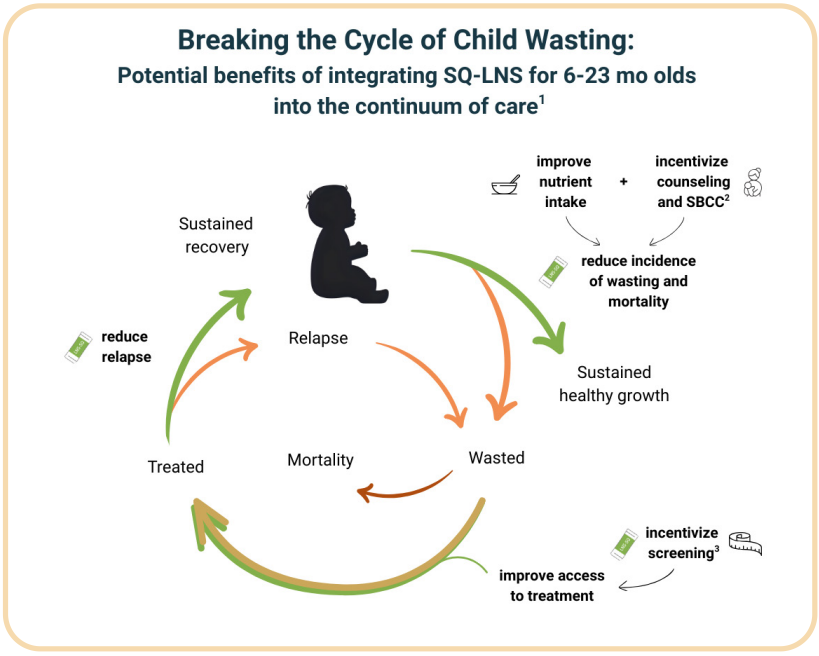
Balancing fidelity and accessibility:
This case study showed that while a decentralized platform is more convenient for caregivers and increases program accessibility, it is more challenging to ensure that the intervention is delivered in accordance with the program protocol. Flexible, high-access delivery platforms should be paired with systems that emphasize strong program supervision.

Overall, global funding for child wasting has been directed primarily towards treatment programs, with less attention on strategies for wasting prevention. However, the innovation of small-quantity lipid-based nutrient supplements (SQ-LNS)** has the potential to revolutionize wasting management programs. SQ-LNS was created to prevent child wasting and other forms of malnutrition among children 6-23 months old. Containing over 20 essential vitamins and minerals, as well as protein and healthy fatty acids, SQ-LNS has been shown to reduce the prevalence of wasting by 14%, severe wasting by 31%, severe stunting by 17%, and all-cause mortality by 27% in vulnerable populations (5-7). Additionally, SQ-LNS and medium-quantity LNS (MQ-LNS) are the only interventions with enough positive evidence to warrant a recommendation for wasting prevention in the 2023 WHO guidelines for prevention and management of wasting in young children (8). When paired with a core package of other essential actions such as infant and young child feeding (IYCF) counseling and the promotion of diverse, nutrient-rich diets, SQ-LNS has great potential to break the cycle of child wasting (**Figure 1**).

*This brief received approval from members of the Steering Committee representing the following organizations: Eleanor Crook Foundation, Gates Foundation, Helen Keller International, UNICEF, University of California, World Bank Group, World Food Programme.

**Abbreviations: small-quantity lipid-based nutrient supplements (SQ-LNS), medium-quantity lipid-based nutrient supplements (MQ-LNS), acute malnutrition (AM), moderate acute malnutrition (MAM), severe acute malnutrition (SAM), community-based management of acute malnutrition (CMAM), mid-upper arm circumference (MUAC), behavior change communication (BCC), community health workers (CHWs), community health volunteers (CHVs), infant and young child feeding (IYCF), weight-for-length z-score (WLZ), International Food Policy Research Institute (IFPRI), Helen Keller International (HKI).

FIGURE 1 . Breaking the cycle of child wasting



[1] This figure depicts the potential benefits of integrating SQ-LNS for the prevention of wasting into existing wasting treatment programs.
[2] SBCC: Social and behavior change communication.
[3] In the PROMIS programs in Burkina Faso and Mali, incorporating SQ-LNS into monthly community-level screenings for acute malnutrition improved screening coverage (18, 19).

With the growing use of SQ-LNS, a variety of platforms have emerged for its delivery, although only a few have been documented. Some of these include the integration of SQ-LNS into community growth monitoring and promotion programs and community-based management of acute malnutrition (CMAM) programs (9,10), child immunization programs, and social protection programs (11). It is valuable to study the programs into which SQ-LNS has been integrated to identify lessons learned, as well as the challenges and enabling factors behind the programs' results.

This case study on the PROMIS project will highlight the integration of SQ-LNS into wasting screening programs. It will also explore a classic dilemma within program implementation - balancing the trade-offs between program access and fidelity.

Integrating SQ-LNS into programs that screen and treat child wasting: Overview of the PROMIS project

The Innovative Approaches for the Prevention of Childhood Undernutrition project, or the PROMIS project, was carried out in Burkina Faso and Mali. These countries in West Africa have persistently high prevalences of child wasting at 7.7% and 9.3%, respectively. The prevalence of child stunting among children under 5 years of age in Burkina Faso and Mali is 19% and 22%, and the prevalence of anemia among children 6-59 months of age is 77% and 79%, respectively (12-15). Although both countries have national policies on child wasting and IYCF messaging, the national programs focus mostly on treatment rather than prevention, largely utilizing the CMAM model (16,17).

The goal of the PROMIS project was to integrate preventive interventions into wasting screening and treatment programs designed to identify acute malnutrition (AM)* cases using a combination of approaches including behavior change communication (BCC) on nutrition, health, and hygiene, and the provision of SQ-LNS (18-21). This is one of the first multi-country efforts to establish a continuum of care from prevention to treatment through a single program. The PROMIS team hypothesized that integrating these approaches would increase coverage of wasting screening and treatment, thereby reducing the prevalence of wasting overall. Of note, the two study sites were geographically close, which aids in the ability to compare and contrast experiences and results (**Figure 2**). The PROMIS project was conceptualized by the International Food Policy Research Institute (IFPRI) and its rigorous study design was implemented by Helen Keller International (HKI) along with local partners.

Box 1

Identified local government and community collaborators:

Burkina Faso:
Local administration (high commission, prefects, mayors), health authorities (North Regional Health Directorate and Gourcy Health District), community opinion leaders (religious leaders, traditional chiefs).

Mali:
Local administration of San and Bla districts, health authorities (National Directorate of Health and Public Hygiene, Regional Directorate of Health, Health district of San and Bla).

*The WHO defines wasting as a child under 5 with a weight-for-height or weight-for-length z-score below -2 standard deviations (SD) of the WHO child growth standards median. Acute malnutrition (AM) is defined by the WHO as a child under 5 with a weight-for-height or weight-for-length z-score below -2 SD of the WHO child growth standards median ***or*** having nutritional oedema. See reference 8 for more information.

FIGURE 2. Map of study sites

[1]This figure depicts a map of Burkina Faso and Mali and their two respective study sites, Ségou Region and Zondoma Province represented by stars.

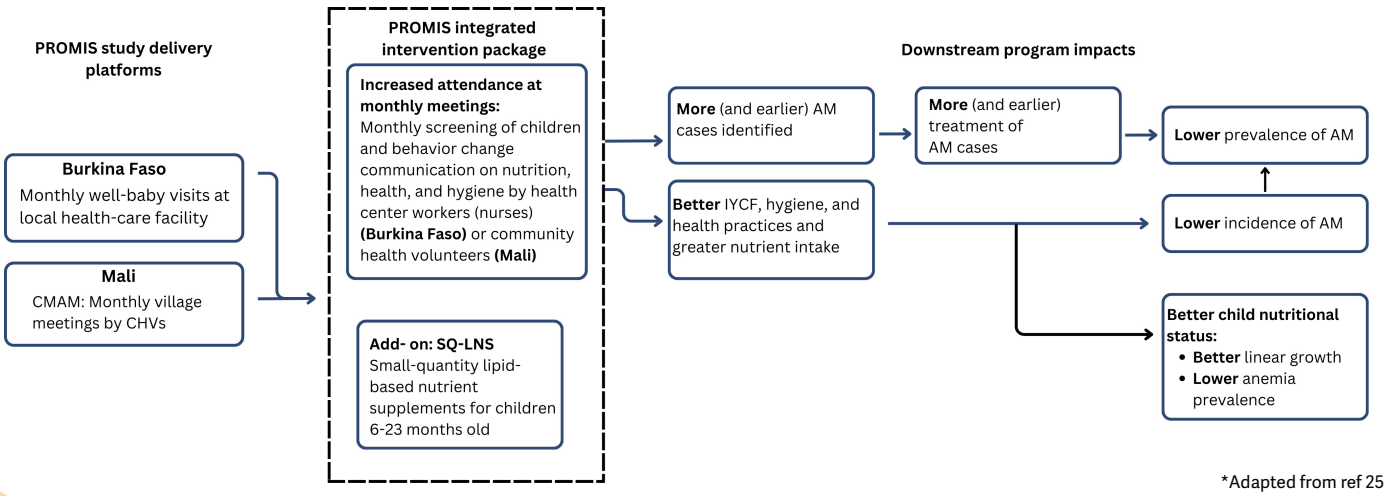
Implementation

The target population for SQ-LNS in both countries was children 6-23.9 months of age, but the delivery strategies differed. In Burkina Faso, SQ-LNS was delivered through a health care facility, utilizing monthly well-baby clinic consultations conducted by nurses with support from community health workers (CHWs). In Mali, it was delivered through a community-based screening platform that was organized by community health volunteers (CHVs). In both countries, receipt of a monthly supply of 20-g sachets of SQ-LNS was conditional, albeit softly, upon participation in screening for wasting (no one was ever refused SQ-LNS). **Table 1** highlights the similarities and differences in program implementation in the two countries. Despite their differences, both study delivery platforms were carefully chosen to have the same projected downstream impacts on the prevalence of child wasting, as can be seen in the PROMIS project impact pathway (**Figure 3**)(18).

TABLE 1. A summary of the program implementation in Burkina Faso and Mali

	Burkina Faso	Mali
Target Population	• Children aged 6–23.9 months attending well-baby visits.	
Product Distributed	• Monthly supply of 20-g sachets of SQ-LNS (Nutributter, Nutriset) intended for daily use until 24 months of age.	
Delivery Platform	• Facility-based integration into monthly well-baby clinic consultations held at health centers. • Built into the existing preventive service package (growth monitoring, vaccination, vitamin A supplementation, wasting screening, counseling, occasional BCC).	• Community-based integration into monthly village meetings for wasting screening organized by Community Health Volunteers (CHVs). • Built onto existing CMAM structured wasting screening programs, creating nutrition support groups of 8 opinion leaders to mobilize caregivers for screening and BCC.
Frontline Service Delivery Actors	• Professional health staff (nurses and health workers) at health centers with support from CHWs. • Health centers received a monetary incentive to run PROMIS on a monthly basis.	• Community Health Volunteers (CHVs) trained by HKI staff, supervised by health center staff or HKI field workers. • Although they were volunteers, CHVs received small monthly cash incentives.
Screening and Referral Mechanism	• Trained health care staff conducted wasting screening as part of the well-baby clinic's health package. Health centers had existing passive wasting screening during other child health services which utilized full anthropometric assessments (weight, length/height, MUAC, and edema). • Receipt of SQ-LNS and BCC was conditional upon participation in monthly wasting screening at well-baby clinics, however no one was ever refused SQ-LNS.	• CHVs conducted wasting screening using only MUAC and edema checks during monthly meetings. Referred children with AM to health centers. • Receipt of SQ-LNS and BCC was conditional upon participation in monthly wasting screening at well-baby clinics, however no one was ever refused SQ-LNS.
Behavior Change Communication (BCC)	• BCC sessions led by nurses or CHWs during well-baby visits; emphasized proper SQ-LNS use (as supplement, not food replacement).	• BCC sessions conducted by CHVs during village meetings; emphasized proper SQ-LNS use (as supplement, not food replacement).

FIGURE 3. PROMIS impact pathway

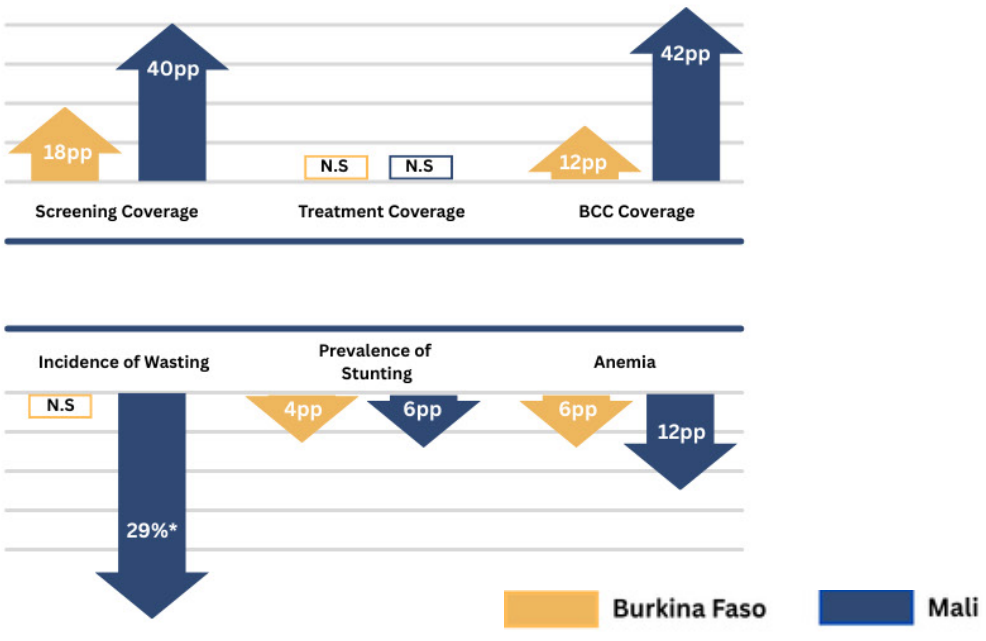


*Adapted from ref 25

Key results, facilitators, and barriers to success

The PROMIS project was designed as a cluster randomized controlled trial, consisting of a repeated cross-sectional study designed to assess the overall population impact after two years of the intervention, and a longitudinal study with an intervention and control arm. The main results from the PROMIS project are summarized in **Figure 4** (22). Highlights include a large, significant improvement in wasting screening coverage in both Burkina Faso and Mali, along with increases in child length-for-age-z-score and decreases in stunting and anemia. Mali also saw a significant increase in weight-for-length-z-score. There was a decrease in the incidence and prevalence of wasting in Mali but not in Burkina Faso. There was no effect on wasting treatment coverage in either country.

FIGURE 4. Summary of key results



[1] Results shown are from both the cross-sectional study and longitudinal study in each site. N.S represent results that were not significant, with all other displayed results being statistically significant. (pp) represents results as percentage points.
[2] *Incidence of wasting is represented as a total percent reduction rather than as percentage points.

The large increase in screening coverage in both countries indicated that the provision of SQ-LNS served as a major incentive for caregivers to take their children in for screenings. Caregivers seemed aware of the value of SQ-LNS and were highly motivated to acquire it for their children (18). Other aspects of implementation differed between countries (**Table 3**). In Mali, access to SQ-LNS was high, as it was directly available within the local communities, resulting in high coverage rates of both SQ-LNS and screening participation (21). However, in Burkina Faso, traveling long distances to the health center and the time cost to caregivers were major barriers to participation. These factors contributed to a lower coverage of SQ-LNS in Burkina Faso. Distance and time costs are well-documented barriers when integrating programs into more centralized facilities (23,24). A second challenge in Burkina Faso was the implementation of BCC, due to limited personnel capacity at health clinics. While CHWs were hired specifically for BCC support, most of their time was spent assisting with screenings and SQ-LNS distribution.

While accessibility and coverage of SQ-LNS were higher in Mali than Burkina Faso (63% vs. 48% coverage), there was lower fidelity, or the degree to which the program was implemented as originally planned. In Mali, there was considerable deviation in the way that the study protocol was implemented, as CHVs often distributed SQ-LNS to children who were identified as having AM while also referring them for treatment. When surveyed, 53% of caregivers of children diagnosed with AM reported receiving SQ-LNS (19). These caregivers of children diagnosed with AM did not receive the BCC component because BCC was only provided as part of the preventative program. Around one fifth of CHVs reported distributing the supplements at their own home or during home visits, with the BCC component also missing in this context. The average BCC coverage was 58% in the intervention group and 17% in the comparison group. Additionally, CHVs in Mali were not supervised closely and had less authority within the community in comparison to health clinic staff, which led to a softening in the conditionality of screening for receipt of SQ-LNS. This "soft conditionality" was intentionally built into the program to avoid penalizing caregivers- a choice that, unsurprisingly, came with some predictable trade-offs for program fidelity. This may offer insight into why the coverage of SQ-LNS was higher in Mali than in Burkina Faso.

TABLE 3. Implementation differences between Burkina Faso and Mali

	Burkina Faso	Mali
Program Reach and Accessibility	• Well-baby clinics served as a "one-stop shop" where caregivers could access SQ-LNS along with a variety of preventive and curative clinical services. • Low overall coverage due to access constraints. Fewer than half of eligible caregivers regularly attended well-baby clinics to receive SQ-LNS (37% longitudinal coverage). • Caregivers cited the distance to the health center and high opportunity costs (lack of time) of frequent visits as major barriers to participation.	• Proximity to the community facilitated attendance and participation in wasting screening program (coverage increased by 28-40 percentage points). • SQ-LNS distribution coverage was high (60-73% longitudinal coverage).
Protocol Fidelity	• High fidelity was maintained by professional health staff who distributed SQ-LNS primarily to non-malnourished children ≥ 6 months and correctly diagnosed children with AM.	• Low fidelity due to serious protocol deviation: CHVs sometimes provided preventive SQ-LNS to children who had screened positive for AM: 53% of caregivers of AM children reported receiving SQ-LNS. • CHVs relied on MUAC and edema only for screening, meaning approximately 29% of AM cases were potentially missed (those detectable only by WLZ).
Cost	• Total costs were high ($96 per child-year), primarily due to low distribution coverage (37%) and fixed overhead.	• Total costs were $56 per child-year.

In Burkina Faso, there was high program fidelity. Professional health staff (e.g., nurses) implemented the program and distributed SQ-LNS only to caregivers who brought their children to well-baby visits, where they also had access to a range of preventive and curative services. As a result, 93% of non-AM children ≥6 months old received SQ-LNS during these visits, consistent with the program protocol (18). It is important to note that the health care staff in Burkina Faso had access to all necessary tools to accurately diagnose cases of AM, whereas in Mali the CHVs screened based on MUAC and edema alone, as described in **Table 1**. This resulted in approximately 29% of AM cases being missed in Mali (19). Another issue in Mali was that while SQ-LNS was integrated into screening programs to reduce barriers to treatment, there were no tools to allow CHVs to assess whether mothers enrolled their children into treatment once diagnosed with AM; CHVs were not tasked with following up children with AM who had been referred previously.

When it came to cost, Mali had reasonable programmatic costs of $56 per child compared to Burkina Faso's $96 per child, with CHV distribution of SQ-LNS accounting for some of the savings (21). A critical but often under-appreciated facilitator of the PROMIS model was the dedicated supply chain support provided by HKI. In both countries, HKI played an active role in ensuring that SQ-LNS stocks reached health facilities and community platforms reliably, including coordinating monthly meetings between clinic staff and CHVs and troubleshooting distribution bottlenecks before they resulted in stock outs. This consistent supply chain backbone was essential to maintaining caregiver trust and program continuity. For countries considering replication, the PROMIS experience underscores that reliable last-mile delivery systems do not emerge automatically — they require intentional investment, coordination, and ongoing support.

Conclusions

The PROMIS project provided a valuable opportunity to examine SQ-LNS integration into programs that screen for child wasting and glean knowledge that will allow for more impactful implementation into future programs. This case study led to **three main conclusions**:

1. **SQ-LNS served as a strong incentive for participation** in the program across both countries, which led to a considerable increase in coverage of wasting screening in both settings. This is encouraging, as it shows that there is a high demand for SQ-LNS which could be leveraged for participation and utilization of other health services.

2. **Programmatic adjustments are needed to improve implementation**. If feasible, co-location of services and products for AM is ideal, so that the platform distributing the SQ-LNS also offers the treatment products. Systems should be introduced that assess whether children identified as having AM by CHVs were enrolled into a treatment program and received the treatment, as well as providing a post-treatment follow-up to detect possible relapse.

3. **Programs need to consider balancing the accessibility of SQ-LNS with program fidelity.** While a decentralized platform is more convenient for caregivers and increases accessibility, it is more challenging to ensure that the intervention is delivered in accordance with the protocol. While flexible, high-access delivery should be prioritized particularly when considering delivery platforms for remote populations, future program models should emphasize strong supervision and effective feedback systems.

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