

Reducing Child Wasting through Integrated Prevention and Treatment in Mali

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INTRODUCTION

Wasting is a persistent public health problem affecting 45.4 million children under five years of age worldwide. Wasting is responsible for the deaths of 875,000 children under the age of five every year. Children who survive often suffer long-term damage to their cognitive and physical development (WHO, UNICEF, and World Bank 2021; Black et al. 2013). Member countries of the World Health Assembly (WHA) have agreed to reduce and maintain the prevalence of wasting to less than 5 percent by 2025. Despite the commitment to tackle wasting, however, only one country in West Africa is on course to meet the WHA target. In contrast, seven countries, including Mali, have made no progress or have a worsening situation (Global Nutrition Report 2022). In Mali, estimates from 2020 show prevalence levels of 9.3 percent, with critical regional disparities (WHO, UNICEF, and World Bank 2021).

Existing programs that aim to prevent or treat child wasting exist but typically suffer from low coverage and tend to be poorly integrated. While both strengthened prevention and treatment of wasting hold the potential to impact child wasting, substantial synergies can be expected when prevention is integrated with screening, referral, and treatment services. Such integration should happen at the community level to maximize the accessibility of services for caregivers and their children. Since the introduction of Mali's national infant and young child feeding strategy in 2012 (Ministère de la Santé du Mali 2012), community care groups called Nutrition Action Support Groups (NASGs) have taken center stage in delivering preventive behavior change communication (BCC) on infant and young child feeding

(IYCF) practices and child health. However, to leverage the impact of these efforts on child wasting, NASG services need to be extended to support existing community-based treatment services and to prevent any post-treatment relapse. Further evidence is needed on the coverage and quality of implementation of these community groups, as existing evidence is scarce.

KEY MESSAGES

- Integrating preventive small-quantity lipid-based nutrient supplements (SQ-LNS), behavior change communication (BCC) or counseling, and screening for wasting:
 - Prevents child wasting, severe acute malnutrition, and anemia
 - Leads to higher screening and treatment coverage
- The distribution of **preventive** SQ-LNS should be organized so that it is not perceived as a replacement for the **treatment** of wasting.
- Leveraging community-based Nutrition Action Support Groups (NASGs) to deliver integrated prevention and screening and support treatment services is feasible, provided the workload is adapted to the time available to NASG volunteers.
- Future integrated programs relying on NASGs should:
 - Introduce more objective selection criteria for NASGs to replace community appointments
 - Offer refresher training for new NASGs
 - Design an incentive-based delivery strategy



In 2020, the International Food Policy Research Institute (IFPRI), UNICEF, AfricSanté, and World Vision Mali partnered to implement the Integrated Research on Acute Malnutrition (IRAM) study in Mali to assess the implementation and impact of interventions delivered along the continuum of care for wasting (from prevention to treatment) through community-level platforms. The main objective was to generate evidence on the reach, adoption, effectiveness, implementation, and maintenance of an integrated package of services designed to drastically reduce child wasting over a short timeframe. The study was conducted in the Koutiala region in Mali, with a companion study conducted in Chad (Becquey et al. 2023)

THE IRAM INTERVENTION

The IRAM study assessed the implementation and impact of an integrated package of interventions aimed at preventing child wasting, providing early detection, supporting outpatient treatment, and preventing post-treatment relapse. Half of the health center catchment areas in the Koutiala region received support from the existing NASGs offering preventive BCC and active screening of wasting (comparison group). The other half of the health areas (intervention group) received the IRAM intervention package, which consisted of:

- **Strengthened NASGs**

Additional NASGs were created proportional to the size of each village. NASG members were tasked with conducting monthly home visits to deliver preventive services and screen children for wasting. In addition, monthly group meetings with caregivers were held to deliver group BCC on child IYCF practices, health, and water, sanitation, and hygiene (WASH), and to organize nutrition or cooking demonstrations promoting nutrient-dense ingredients.

- **Preventive services**

The preventive package included individual counseling offered during home visits and group BCC during group meetings on child IYCF, child health, and WASH. During the meetings, caregivers with children 6–17 months of age received a monthly ration of 30 sachets (20g) of small-quantity lipid-based nutrient supplements (SQ-

LNS). These peanut-based supplements represent a daily caloric dose of 118 kcal and are fortified with 20 micronutrients. Recent meta-analyses have shown that SQ-LNS reduces child stunting, wasting, and anemia and promotes early child development (Dewey et al. 2021; Wessells et al. 2021; Prado et al. 2021). The intervention protocol prescribed that caregivers of children identified as having wasting were not to be given SQ-LNS but instead be referred to existing outpatient treatment programs (OTP) for moderate (MAM) and severe (SAM) acute malnutrition offered by first-line health services and community health workers.

- **Screening for wasting**

During interactions with caregivers, NASG members were tasked with screening children for wasting using mid-upper arm circumference (MUAC) tapes. In addition, NASGs introduced the family-led MUAC screening approach to ensure regular screening of children 6 to 59 months of age by family members. Child caregivers and any other interested family members were provided with MUAC tapes and trained in their use by NASG members during home visits and monthly group meetings. NASG members also explained the interpretation of the MUAC colors and advised caregivers to go to the nearest health center or community health worker to enroll the child in SAM or MAM OTP if the MUAC measurement was yellow or red.

- **Support to the national protocol for SAM and MAM OTP**

The national OTP protocols for uncomplicated SAM and MAM were followed in both study groups. In the intervention group, NASG members were tasked with conducting at least two home visits every month to the households of children enrolled in the MAM/SAM OTP. These visits served to encourage caregivers to adhere to the treatment protocol and to prevent default from treatment. In both study groups, community health workers were trained to implement SAM and MAM OTP in addition to the existing OTP services delivered by first-line health services.

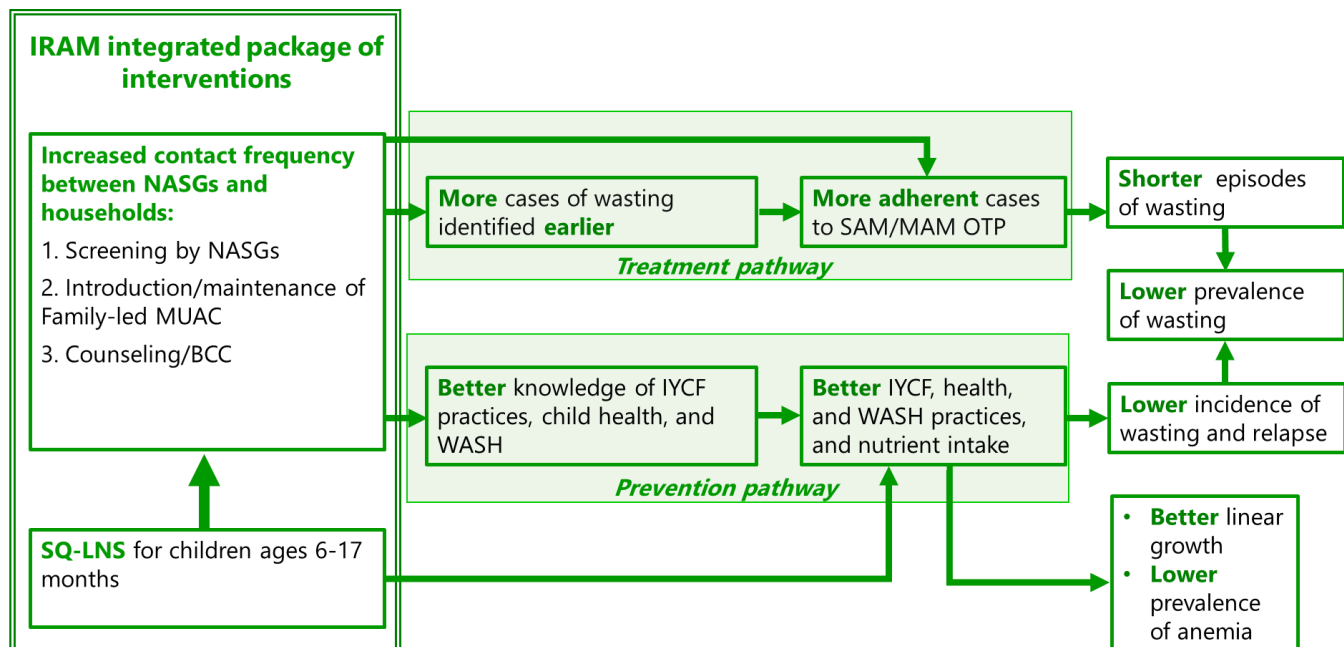
THEORY OF CHANGE

The IRAM program aimed to reduce the prevalence of child wasting through two distinct pathways, as shown in **Figure 1**. Along the first pathway—the "treatment pathway"—increased contacts between NASGs and caregivers and the introduction of family-led MUAC were expected to lead to higher screening coverage, which would allow for early detection of more SAM and MAM cases and more subsequent referral and treatment. Furthermore, the additional home visits to previous referrals and children admitted to SAM or MAM OTP were expected to result in better treatment adherence and compliance. More frequent screening, early case detection and referral, and better adherence to wasting treatment would lead to shorter wasting episodes and thus a lower prevalence of wasting. Along the second impact pathway—the "prevention pathway"—frequent caregiver exposure to individual

counseling and group BCC and the provision of SQ-LNS to their children were expected to lead to better IYCF, health, and WASH practices and more adequate dietary intake. As a result, the intervention was expected to lower the number of incident cases of wasting. Improved IYCF and health practices, as well as improved dietary intake through SQ-LNS, would also positively impact child linear growth and anemia.

A key element in this theory of change is the integration of SQ-LNS distribution in the monthly interactions between caregivers and NASG members. Caregivers in the IRAM study group received SQ-LNS after their child was screened for wasting (if they did not need referral) and after counseling or BCC was delivered. As such, the provision of SQ-LNS was designed to serve as both an incentive facilitating the contact between caregivers and NASG and as a nutritional supplement to improve children's complementary feeding.

Figure 1 Impact pathways of the IRAM package of interventions



Note: IRAM=Integrated Research on Acute Malnutrition, NASGs=Nutrition Action Support Groups, MUAC=mid-upper arm circumference, BCC=behavior change communication, SQ-LNS=small-quantity lipid-based nutrient supplements, IYCF=infant and young child feeding practices, WASH=water, sanitation, and hygiene, SAM/MAM OTP=Severe acute malnutrition/moderate acute malnutrition outpatient therapeutic program

EVALUATION OF THE INTERVENTION

A two-arm, cluster-randomized, nonblinded effectiveness study was conducted in the Koutiala region to generate rigorous evidence on the effectiveness of these integrated interventions in reducing wasting among young children. A population-representative longitudinal study design was used to enroll children ages 6 to 6.9 months from May 2021 until November 2021. In addition, a second cohort comprising all children admitted to MAM and SAM OTP was delivered by first-line health centers and community health workers from May 2021 until February 2022.

KEY FINDINGS

Coverage

Only about 10 percent of households received monthly home visits by NASG members. The main barriers for NASGs were the lack of time to conduct the home visits and the lack of financial incentives. As a result, screenings for wasting, SQ-LNS distribution, and BCC delivery were largely organized during monthly group meetings. Program implementation suffered from a five-month lag before reaching saturation at 60–70 percent screening and SQ-LNS coverage toward the end of the program. Active screening by NASG members was the most important contributor to screening coverage (45 percent), followed by family-led MUAC (20 percent). Only about 14 percent of caregivers were exposed to monthly BCC or counseling, likely due to the low coverage of home visits and the often large groups of caregivers (40–70 per session) attending the group meetings, which overwhelmed the NASG group.

Intervention impact

The IRAM intervention strengthened the prevention impact pathway, reducing the risk of developing wasting (incidence) by 20 percent and SAM by 29 percent (**Figure 2**). The intervention also led to fewer cases of child anemia at the end of the study (by 12 percentage points [pp]). However, these impacts proved

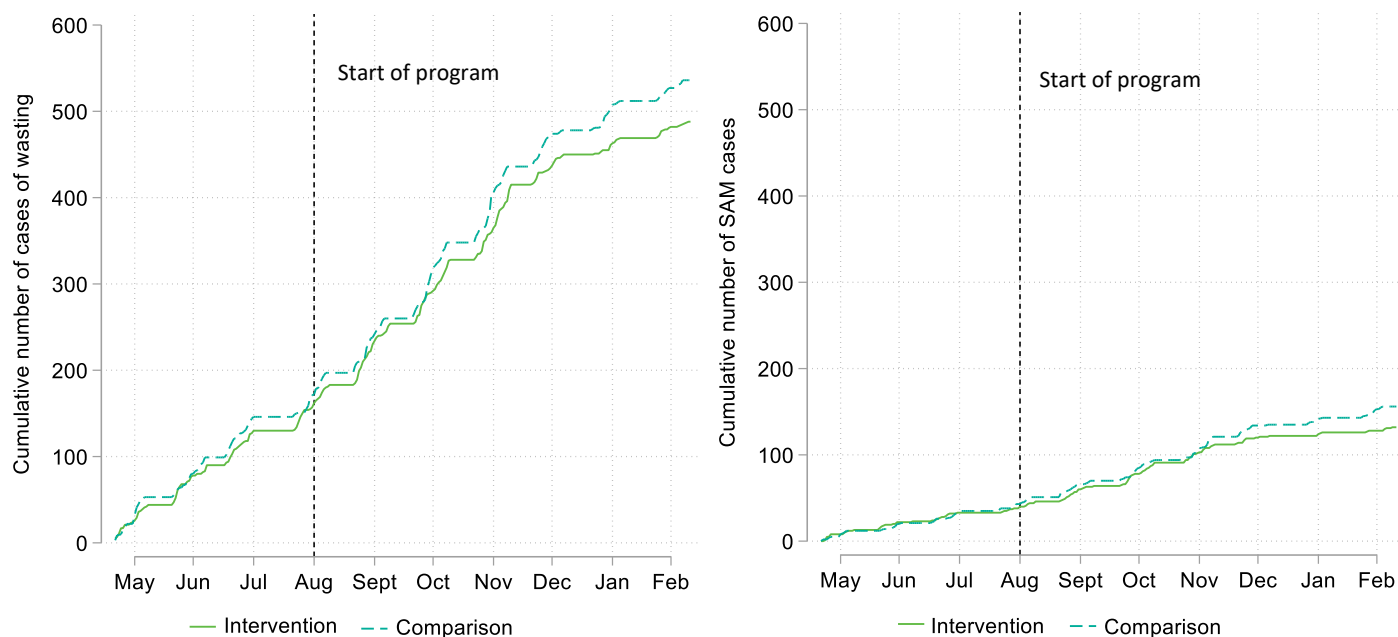
insufficient to drastically lower the overall prevalence of wasting during a short program of seven months. The study found that the IRAM intervention had no impact on caregiver knowledge of IYCF, child health, or WASH, demonstrating the weak impact of the BCC intervention component. Not surprisingly, no improvements in IYCF practices were found.

The impact of the IRAM intervention on the treatment pathway generated mixed results. Coupling the introduction of family-led MUAC and active screening of wasting with SQ-LNS distribution led to significantly higher screening coverage, which increased the treatment coverage for wasting by 17 pp and SAM by 29 pp in the final month of the study. However, IRAM did not lead to caregivers adhering more strongly to the treatment schedule or to improved recovery rates for SAM and MAM OTP. Finally, the intervention did not significantly reduce post-treatment relapse rates, a finding possibly related to the fact that NASG volunteers did not increase home visits to this vulnerable subgroup of children, as initially planned by the program.

Unintended consequences

We observed that among children whom NASG identified as having wasting during the distribution of SQ-LNS, a large proportion (93 percent) received SQ-LNS despite not being enrolled in a treatment program. In the subgroup of children identified with wasting and enrolled in treatment, only 20 percent received SQ-LNS. These findings suggest a possible undesirable substitution effect of treating wasting with preventive SQ-LNS. It is likely that NASGs were unable to refuse to distribute SQ-LNS to caregivers with children suffering from wasting and to refer them empty-handed to treatment services. This observation demonstrates the need to further integrate the prevention and treatment of wasting into the same community-based platform in order to either avoid referral or make treatment significantly more accessible.

Figure 2 Cumulative number of incident cases of wasting (left panel) and SAM (right panel) for the IRAM intervention group and the comparison group between May 2021 and February 2022



LESSONS LEARNED

NASG volunteering model

Half of the NASG members resigned after the training and were replaced by new untrained members. The main reasons for these dropouts were insufficient time to cover the proposed workload and the lack of financial compensation. It was also noted that one-third of NASG members was illiterate, which made it difficult for them to read counseling cards and fill out NASG monitoring tools/registers.

Very few home visits were conducted because this activity was perceived as unrealistic by NASGs given their limited time availability and the lack of incentives. Instead, the NASG volunteers preferred to organize monthly group meetings to gather large groups of caregivers, screen their children, and distribute SQ-LNS. However, delivering quality BCC in such settings proved difficult, and often only smaller subgroups of caregivers were exposed to the BCC and nutrition or cooking demonstrations. Therefore, the overall reach of BCC/counseling remained very poor, which explains the lack of impact on caregiver knowledge and IYCF practices.

Family-led MUAC

MUAC tapes were provided more slowly to the beneficiary households than was SQ-LNS. Reach remained below expectations as caregivers admitted that they did not always screen their children consistently. Also, very few household members besides the main child caregiver were involved in measuring the child's MUAC. Caregivers noted that they did not conduct the MUAC screening because of a lack of confidence in their ability to measure MUAC and a lack of time due to housework. Caregivers could measure the MUAC of their children adequately, but often did not enroll their child in available treatment services when needed (about 40 percent). Future family-led MUAC screening programs need to develop strategies to involve other household members in the family-led MUAC approach to create sufficient social support. In addition, households need to be sensitized more thoroughly on the importance of treating children suffering from wasting. More generally, context-specific barriers to care seeking need to be addressed.

SQ-LNS distribution

The SQ-LNS was well accepted by beneficiaries and served as a critical demand-side incentive (also shown by previous research by Becquey et al., 2019 and Huybregts et al., 2019) that can strengthen participation in other services such as screening and BCC. However, NASGs appeared to distribute SQ-LNS to caregivers of children whom they identified with untreated MAM or SAM, instead of referring them for treatment. Such observation entails a possibly important negative side effect.

Strengthening SAM and MAM OTP adherence by NASG

Contrary to the program's intentions, children with wasting or who were under treatment were less likely to receive a home visit compared to healthy children. During in-depth interviews, a few NASG members shared that children with wasting do not need to be followed by NASG, which points to a poor understanding of the NASG role in supporting community management of acute malnutrition (CMAM) services. As such, no impact was observed on treatment adherence or recovery rates of SAM and MAM OTP. The observed increase in overall CMAM treatment coverage is probably related to the strong impact on screening coverage rather than to more frequent follow-up of cases by NASG members. Besides stressing the need to focus on households with children with wasting, the integrated community care management referral and counter-referral system should be extended to community care groups like NASG. Such a system would allow NASG members to focus their efforts on households with children suffering from wasting. Caregiver treatment cards

handed out by CMAM services at admission of new SAM or MAM cases could be a possible means of information, allowing NASGs to assess treatment adherence or default of caregivers. Early detection of poor adherence or default by NASGs creates an opportunity for NASG to encourage caregivers to continue treatment until recovery.

CONCLUSION AND POLICY IMPLICATIONS

The IRAM study shows that the NASG volunteer model can be a suitable platform for integrating wasting prevention, screening, and treatment support services and achieve important impacts on child wasting and anemia. The preventive package, which included SQ-LNS (achieving large coverage) and BCC delivered by NASGs (achieving a much lower coverage) reduced the incidence of new cases of wasting. The positive impact on screening coverage by NASGs and caregivers translated into more children with wasting enrolled in SAM/MAM OTP. NASG interventions can be more effective when NASG members are selected based on their motivation to work as a volunteer rather than relying on more subjective appointments by community leaders. Offering more frequent refresher training and designing an appropriate incentive-based strategy are also warranted.

The study shows the importance of offering a demand-side incentive, such as SQ-LNS, to ensure caregiver participation in preventive BCC and counseling, on the condition that NASGs have sufficient training, capacity, and time to deliver high-quality BCC to larger groups.

REFERENCES

- Becquey, E., Huybregts, L., Zongrone, A., Le Port, A., Leroy, J.L., Rawat, R., Touré, M., Ruel, M.T. 2019. "Impact on child acute malnutrition of integrating a preventive nutrition package into facility-based screening for acute malnutrition during well-baby consultation: A cluster-randomized controlled trial in Burkina Faso." *Public Library of Science Medicine* 16(8): e1002877
- Becquey, E., Touré, M., Djoufouna, A.D., Affenou, A., Barba, F., Diatta, A.D., Dione, M., Sawadogo, A., and Huybregts, L. 2023. "Community Volunteers Deliver Integrated Prevention and Treatment Services to Reduce Child Wasting in Chad." IFPRI Policy Note. Washington, DC: International Food Policy Research Institute.
- Black, R.E., Victora, C.G., Walker, S.P., Bhutta, Z.A., Christian, P., De Onis, M., Ezzati, M. et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *The Lancet* 382 (9890): 427–451.
- Dewey, K.G., Wessells, K.R., Arnold, C.D., Prado, E.L. et al. 2021. "Characteristics that Modify the Effect of Small-Quantity Lipid-based Nutrient Supplementation on Child Growth: An Individual Participant Data Meta-Analysis of Randomized Controlled Trials." *American Journal of Clinical Nutrition* 114: 15S–42S.
- Global Nutrition Report. 2023 "Country Nutrition Profiles: Western Africa." <https://globalnutritionreport.org/resources/nutrition-profiles/africa/western-africa> [Accessed on April 12th, 2023]
- Huybregts, L., Le Port, A., Becquey, E., Zongrone, A., Barba, F.M., Rawat, R., Leroy, J.L., Ruel, M.T. 2019. "Impact on child acute malnutrition of integrating small-quantity lipid-based nutrient supplements into community-level screening for acute malnutrition: A cluster-randomized controlled trial in Mali." *Public Library of Science Medicine* 16(8): e1002892
- Ministère de la Santé du Mali. 2012. *Stratégie Nationale pour l'alimentation du nourrisson et du jeune enfant*. Bamako, Mali.
- Prado, E.L., Arnold, C.D., Wessells, K.R., Stewart, C.P., et al. 2021. "Small-Quantity Lipid-based Nutrient Supplements for Children Age 6–24 Months: A Systematic Review and Individual Participant Data Meta-Analysis of Effects on Developmental Outcomes and Effect Modifiers." *American Journal of Clinical Nutrition* 114:43S–67S.
- Wessells, K.R., Arnold, C.D., Stewart, C.P., Prado, E.L. et al. 2021. "Characteristics that Modify the Effect of Small-Quantity Lipid-based Nutrient Supplementation on Child Anemia and Micronutrient Status: An Individual Participant Data Meta-Analysis of Randomized Controlled Trials." *American Journal of Clinical Nutrition* 114:68S–94S.
- WHO (World Health Organization), UNICEF, and World Bank. 2021. *Levels and Trends in Child Malnutrition. Joint Child Malnutrition Estimates: Key Findings of the 2021 Edition*. Geneva: World Health Organization. <https://apps.who.int/iris/handle/10665/341135> [Accessed on April 10th, 2023]

ACKNOWLEDGEMENTS

This publication has been prepared as an output of the IRAM project and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI.

This operations research was made possible by a grant from The Implementer-Led Design, Evidence, Analysis and Learning (IDEAL) Activity. The IDEAL Small Grants Program is made possible by the generous support and contribution of the American people through the United States Agency for International Development (USAID). The contents of materials produced through the IDEAL Small Grants Program do not necessarily reflect the views of IDEAL, USAID, or the United States Government.

The program implementation and the impact study were made possible by a grant from the Foreign, Commonwealth & Development Office of the United Kingdom (FCDO) through UNICEF. The content of the documents produced does not necessarily reflect the views of FCDO or UNICEF.

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