

Small-quantity lipid nutrient supplementation

This note last updated: November 2022

Current status: No further work planned

Acute malnutrition in children is associated with heightened risks of mortality and morbidity.¹ Small-quantity lipid-based nutrient supplements (SQ-LNS) are designed to prevent malnutrition and thereby reduce morbidity and mortality.² It provides "multiple micronutrients embedded in a food base that also provides energy [100–120 kcal/day³], protein, and essential fatty acids."⁴ As a preventative product, it is designed to be consumed in addition to breastmilk and local food as soon as a baby begins consuming foods other than breastmilk (around six months) and continuing through two years of age.⁵ In this short note, we model programs with weekly or monthly rations distributed by community health workers or other health extension agents together with some infant and young child feeding (IYCF) counseling.⁶

We conducted a light literature review and produced a preliminary cost-effectiveness analysis to assess whether lipid nutrient supplementation programs could be as cost-effective as programs we would be willing to consider funding.⁷ We modeled the primary benefits of the program as a reduction in all-cause mortality and an increase in earnings when these children become

¹ - "Restricted growth as a result of inadequate nutrition and infections is an important cause of morbidity and mortality in infants and children worldwide. . . . Several prospective studies have shown associations of undernutrition with increased risk of various disease outcomes, and reduced survival, in children." [Olofin et al. 2013](#), Introduction.

- "All degrees of underweight, stunting and wasting were associated with significantly higher mortality. The strength of association increased monotonically as Z scores decreased. Pooled mortality HR was 1.52 (95% Confidence Interval 1.28, 1.81) for mild underweight; 2.63 (2.20, 3.14) for moderate underweight; and 9.40 (8.02, 11.03) for severe underweight. Wasting was a stronger determinant of mortality than stunting or underweight." [Olofin et al. 2013](#), Abstract.

² "Lipid-based nutrient supplements (LNS) are available in various quantities and formulations for the prevention or treatment of malnutrition and are designed to provide multiple micronutrients embedded in a food base that also provides energy, protein, and essential fatty acids. Large-quantity LNS are typically used for treatment of severe acute malnutrition and provided in dosages of ≥ 500 kcal/d. Medium-quantity LNS are generally offered as ready-to-use supplementary food for the treatment of moderate acute malnutrition in dosages of 250–500 kcal/d, and small-quantity LNS are generally given as 100–120 kcal/d for the prevention of undernutrition." [Stewart et al. 2020](#), Introduction.

³ "Lipid-based nutrient supplements (LNS) are available in various quantities and formulations for the prevention or treatment of malnutrition and are designed to provide multiple micronutrients embedded in a food base that also provides energy, protein, and essential fatty acids. . . . [S]mall-quantity LNS are generally given as 100–120 kcal/d for the prevention of undernutrition." [Stewart et al. 2020](#), Introduction.

⁴ [Stewart et al. 2020](#), p. 207.

⁵ "To avoid displacement of breast milk and of available local foods, iLiNS 20 g supplements provide 118 kcal day¹, or approximately one-half of the complementary food energy requirements of healthy infants 6–8 months of age, approximately one-third for infants 9–11 months, and one-fifth of the complementary food energy required at 12–23 months." [Arimond et al. 2016](#).

⁶ "The majority of trials used similar LNS distribution mechanisms [e.g., weekly or monthly rations provided by study staff, community health workers, or other health extension agents together with some infant and young child feeding (IYCF) counseling] and used similar formulations of LNS, specifically peanut- and milk-based products providing ~1 RDA of most micronutrients." [Stewart et al. 2020](#), p. 209.

⁷ See GiveWell, [Small-quantity lipid nutrient supplementation BOTEC](#), 2022.

adults.⁸ Our best guess is that SQ-LNS reduces child mortality⁹ and increases earnings.¹⁰ However, due to a combination of high commodity and delivery costs,¹¹ the program is relatively expensive compared to other programs with similar benefits.¹² Therefore, we estimate that the cost-effectiveness of small-quantity lipid nutrient supplementation is below the range of cost-effectiveness of programs we would consider directing funding to.¹³

Due to low estimated cost-effectiveness, we do not plan to prioritize further work on this program.

⁸ "First, growth is a broad measure of the quality of the developmental environment that integrates the impact of many stressors such as infection, undernutrition, and malnutrition. Second, physical size and robustness are probably important determinants of earning potential, particularly in low-income settings where the most common employment opportunities are manual." GiveWell, [A method for estimating adult consumption effects of interventions for which we do not have direct evidence](#), 2020, p. 4.

⁹ "These results suggest that LNS supplementation for a minimum of 6 mo among children aged 6–24 mo may reduce the risk of mortality. The estimated reduction of 27% in all-cause mortality between 6 and 24 mo of age in the primary analysis, based on data from 13 trials with 34,051 children, was robust to the inclusion of interventions combined with maternal LNS supplementation or to the exclusion of alternative formulations of LNS." [Stewart et al. 2020](#), p. 210. See also p. 216, Figure 5, for more detail.

¹⁰ This is a speculative guess based on this reasoning: "First, growth is a broad measure of the quality of the developmental environment that integrates the impact of many stressors such as infection, undernutrition, and malnutrition. Second, physical size and robustness are probably important determinants of earning potential, particularly in low-income settings where the most common employment opportunities are manual." GiveWell, [A method for estimating adult consumption effects of interventions for which we do not have direct evidence](#), 2020, p. 4.

¹¹ Our best guess is that the program costs [\\$100 per child-year](#), of which [approximately \\$50](#) are commodity costs. See GiveWell, [Small-quantity lipid nutrient supplementation BOTEC](#), 2022.

¹² See, for example, our cost-effectiveness analysis for the Against Malaria Foundation. GiveWell, [Cost-effectiveness analysis – version 5](#), 2022.

¹³ Our rough cost-effectiveness analysis estimates that small-quantity lipid nutrient supplementation might be about [two times as cost-effective](#) as GiveDirectly's unconditional cash transfer program. As of the writing of this page, we are primarily looking to recommend grants for funding opportunities that we estimate are ten or more times as cost-effective as [GiveDirectly's unconditional cash transfer program](#). For examples of the cost-effectiveness of our recommendations, see [here](#).