**MEMORANDUM**

PROJECT: Balanced energy protein (BEP) on maternal and child health outcomes

FROM: Nicole Young

DATE: 1st August 2020

RE: Documentation of the control groups of SQ-LNS trials from Das 2019 Cochrane review

**BACKGROUND**: One nutritional intervention advocated to prevent malnutrition among children is lipid-based nutrient supplements (LNS). LNS provide a range of vitamins and minerals, but unlike most other micronutrient supplements, LNS also provide energy, protein and essential fatty acids. Alternative recipes and formulations to LNS include fortified blended foods (FBF), which are foods fortified with vitamins and minerals, and micronutrient powders (MNP), which are a combination of vitamins and minerals. This is to understand what the ∆effect of the SN-LNS intervention refers to from the Das 2019 review.

**SUMMARY:**

LNS + complementary feeding compared with no intervention.

* Patient or population: children aged 6 to 23 months
* Settings: community
* Intervention: LNS plus complementary feeding
* Comparison: no intervention

Participants  
Most studies included children aged **six months to 18 months** (Adu- Afarwuah 2007; Adu-Afarwuah 2016; Ashorn 2015; Bisimwa 2012; Christian 2015; Hess 2015; Iannotti 2014; Kumwenda 2014; Mangani 2015; Matias 2017; Phuka 2008; Siega-Riz 2014). Four studies included children aged **six to 24 months** (Dewey 2017; Olney 2018; Luby

2018; Null 2018) and one study included children aged **six to 36 months** (Huybregts 2012). Four included studies **enrolled pregnant women and provided lipid-based nutrient supplements (LNS) plus complementary feeding during pregnancy and post-partum, followed by infant supplementation at six months of age** (Adu-Afarwuah 2016; Ashorn 2015; Dewey 2017; Olney 2018). However, Dewey 2017 had an intervention arm in which only children were supplemented, hence we only used the data from that arm in the analysis in this review. The other studies provided LNS plus complementary feeding to children after six months of age. \* The review conducted a sensitivity analysis by removing trials that also supplemented pregnant women with LNS in addition to children (Adu-Afarwuah 2016; Ashorn 2015), and found no significant difference in the outcome (Analysis 1.3; Analysis 1.4).

Main\_results

Thirteen studies compared LNS plus complementary feeding with no intervention. (Adu-Afarwuah 2007; Adu-Afarwuah 2016; Ashorn 2015; Christian 2015; Dewey 2017; Hess 2015; Huybregts 2012; Iannotti 2014; Kumwenda 2014; Luby 2018; Mangani 2015; Null 2018; Siega-Riz 2014). The included studies reported on one or more of the primary outcomes.

* LNS plus complementary feeding reduced the prevalence of **moderate stunting** by 7% (risk ratio **(RR) 0.93**, 95% confidence interval (CI) 0.88 to 0.98; nine studies, 13,372 participants; moderate-quality evidence),
* **severe stunting** by 15% (**RR 0.85**, 95% CI 0.74 to 0.98; five studies, 6151 participants; moderate-quality evidence),
* **moderate wasting** by 18% (**RR 0.82**, 95% CI 0.74 to 0.91; eight studies; 13,172 participants; moderate-quality evidence),
* moderate underweight by 15% (RR 0.85, 95% CI 0.80 to 0.91; eight studies, 13,073 participants; moderate-quality evidence), and
* anaemia by 21% (RR 0.79, 95% CI 0.69 to 0.90; five studies, 2332 participants; low-quality evidence).
* There was no impact of LNS plus complementary feeding on severe wasting (RR 1.27, 95% CI 0.66 to 2.46; three studies, 2329 participants) and severe underweight (RR 0.78, 95%CI 0.54 to 1.13; two studies, 1729 participants).
* Adverse effects did not differ between the groups (RR 0.86, 95% CI 0.74 to 1.01; three studies, 3382 participants).

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| Figure 1. Moderate wasting |
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| **Study** | | | **Comparison** | | **Outcome** | | |
| **Author** | **Location** | **Age-group** | **SQ-LNS** | **Control** | **CGF outcomes** | **Timing of assessment** | **Effect size** |
| Adu-Afarwuah 20161 | Ghana | Pregnancy,  6 – 18mo | SQ-LNS during pregnancy and for the first 6 mo postpartum,  followed by supplementation for their offspring from 6 to 18 mo of age | 1. Women receive standard IFA from enrolment to delivery and placebo calcium from delivery to 6mo. | LAZ, WLZ, stunting, wasting | 18 months | Table 2 (z-score)  WLZ (IFA): -0.49 +/-1.02 (n=347)  WLZ (LNS) : -0.54 +/-1.00 (n=350)  LAZ (IFA): -0.87 +/- 0.99 (n=350)  LAZ (LNS): -0.69 +/- 1.01 (n=347)  Table 3 (dichotomous %)  WLZ<-2 (IFA) = 6.0 (3.9, 9.0) (n=350)  WLZ<-2 (LNS) = 6.3 (4.2, 9.4) (n=347)  LAZ<-2 (IFA) = 13.7 (10.5, 17.7) (n=350)  LAZ<-2 (LNS) = 8.9 (6.4, 12.4) (n=347)  \* *Values are the percentage of participants whose response was “yes” for the outcome in question (95% CIs)* |
| Ashorn 20152 | Malawi | Pregnancy,  6 – 18mo | SQ-LNS during pregnancy and for the first 6 mo postpartum,  followed by supplementation for their offspring from 6 to 18 mo of age | 1. Women receive standard IFA from enrolment to delivery and placebo calcium from delivery to 6mo   . | LAZ, WHZ, stunting, wasting | 18 months | Table 2 (z-score)  WLZ (IFA): -0.08 +/- 1.00 (n=220)  WLZ (LNS): -0.21 +/- 0.99 (n=214)  LAZ (IFA): -1.63 +/- 1.02 (n=220)  LAZ (LNS): - 1.69 +/- 1.02 (n=214)  Table 3 (dichotomous %)  *Moderate wasting*  WLZ<-2 (IFA) = 3.6 (n=220)  WLZ<-2 (LNS) = 3.3 (n=214)  *Moderate stunting*  LAZ<-2 (IFA) = 32.7 (n=220)  LAZ<-2 (LNS) = 37.9 (n=214)  *Severe stunting*  LAZ<-3 (IFA) = 9.1 (n=220)  LAZ<-3 (LNS) = 9.4 (n=214) |
| Christian 20153 | Bangladesh | 6 – 18mo | MQ-LNS (plumpy’doz at half the dose (125 kcal) when feeding  children who were 6 to 12 mo of age and the full dose (250 kcal) for between 12 and 18 mo of age) from 6mo to 18 mo + nutrition counselling | No food supplementation + nutrition counselling | LAZ, WHZ, stunting, wasting | 18 months | Table 4 (dichotomous %)  WLZ<-2 (control) = 16.4 (n=1265)  WLZ<-2 (plumpydoz) = 13.8 (n=1344)  LAZ<-2 (control) = 44.2 (n=1265)  LAZ<-2 (plumpydoz) = 40.3 (n=1344) |
| Dewey 20174 | Bangladesh | 6 – 24mo | A child-only LNS group, in which women received IFA (1 tab 60 mg Fe and 400 mg folic acid) daily during pregnancy and every  alternate day during the first 3 mo postpartum and their children received  LNS-C from 6 to 24 mo of age (**IFA-LNS group**) | Control group, in which  women received IFA (as described above) and their children received  no supplements (**IFA-Control**). |  | 18 months, 24 months | Table 5 (dichotomous %)  *18 months*  WLZ<-2 (IFA-control) = 19.1(n=816)  WLZ<-2 (IFA-LNS) = 14 (n=785)  LAZ<-2 (IFA-control) = 35.2 (n=816)  LAZ<-2 (IFA-LNS) =34.1 (n=785)  *24 months*  WLZ<-2 (IFA-control) = 15.2 (n=816)  WLZ<-2 (IFA-LNS) = 13 (n=785)  LAZ<-2 (IFA-control) = 42 (n=816)  LAZ<-2 (IFA-LNS) = 39.2 (n=785) |
| Hess 20155 | Burkina faso | 9 – 18 mo | Combined: SQ-LNS  without zinc, and placebo tablet (LNS-Zn0), 2) SQ-LNS with 5 mg zinc, and placebo tablet  (LNS-Zn5), 3) SQ-LNS with 10 mg zinc, and placebo tablet (LNS-Zn10), or 4) SQ-LNS without  zinc, and 5 mg zinc tablet (LNS-TabZn5). + malaria and diarrhoea treatment | Children in control were not supplemented nor visited by study personnel; they relied on standard care provided by the family and health system. + malaria and diarrhoea treatment |  | 18 months | Control, no intervention (n=666)  Can’t find the reported Cochrane effect size in the paper. |
| Kumwenda 20146 | Malawi | 6 – 18mo | SQ-LNS and MQ-LNS plus complementary feeding | No supplement until 18mo of age |  | 12 months | Can’t find the reported Cochrane effect size in the paper. |
| Luby 20187 | Bangladesh | 6 – 24mo | **Nutrition** arm: Counselling on exclusive breastfeeding up to 180 days; introduce diverse complementary food at 6 months; feed LNS (LNS (Nutriset, France) from 6–24 months | Control clusters of no interventions | LAZ, WHZ, stunting, wasting | 24 months | Table 6 |
| Null 20188 | Kenya | 6 – 24mo | **Nutrition** arm: Counselling on exclusive breastfeeding up to 180 days; introduce diverse complementary food at 6 months; feed LNS (LNS (Nutriset, France) from 6–24 months | Control clusters of no interventions | LAZ, WHZ, stunting, wasting | 24 months | Table 6 |
| - For trials with more than two intervention groups (multi-arm trials), we included the directly relevant arms only. If we identified trials with various relevant arms, we combined the groups to form a single pair-wise comparison (Higgins 2011b), and included the disaggregated data in the corresponding subgroup category. If the control group was shared by two or more study arms, we divided the control group (events and total population) over the number of relevant subgroup categories to avoid double counting the participants. We noted the details of all the intervention and control arms in the Characteristics of included studies tables.  - For all outcomes, we carried out analyses, as far as possible, on an intention-to-treat basis (i.e. we attempted to include all participants randomised to each group in the analyses, and all participants were analysed in the group to which they were allocated, regardless of whether or not they received the allocated intervention). The denominator for each outcome in each trial was the number randomised minus any participants whose outcomes were known to be missing. | | | | | | | |

References

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