

Supplementation fervor

An editorial by Ted Greiner

I began struggling in global policy contexts against routine, universal micronutrient supplementation (needed of course in special circumstances) in 1989 when I learned in Bangladesh that it did not achieve very high coverage, thus had no public health impact, and yet gave excuses to both government and donor agencies to do nothing more sustainable and effective to address vitamin A deficiency problems in the larger community.

Several years later I was at first delighted at a meeting when UNICEF pointed out that this young child supplementation approach fails to reach deficient women (vitamin A cannot be given to them in large doses except immediately after birth) and fails to deal with the multiple micronutrient deficiencies these women typically suffer from. I assumed their next sentence would be about the need to work on developing and implementing large-scale food-based approaches. I was quickly disaffected; the lead-in was to an argument for multiple micronutrient supplementation (MMS) throughout pregnancy.

This approach has limited potential, even under the best circumstances. As a recent RCT shows (Schulze et al. 2019), if you give an individual a supplement, their status of that nutrient goes up for some time. And, since giving the RDA daily of 15 nutrients still did not solve deficiency problems in that trial, the conclusion was simply to give larger doses. Again, not to try doing anything about diets.

The original argument for multiple micronutrient supplementation in pregnancy was that it might improve fetal and newborn outcomes. If it proved to have a substantial impact, then one might argue for MMS as a short-term, stop-gap measure—as was done initially for vitamin A supplementation. In discussing MMS in pregnancy, the issue is going beyond iron and folic acid supplementation, which no one, including me, is questioning. (However, both are likely to be more effective at population level when implemented as mandatory food fortification instead.)

However, it would be naïve not to learn our lesson from what has happened with universal high-dose vitamin A supplementation for young children. The very concept of short-term stop-gap disappeared from the literature once adequate donor support was made available (and needed to be spent to ensure its budget did not in the future decline). Now it was a necessary component of primary health care alongside vaccinations, allowing it to create substantial opportunity costs by being implemented campaign-style.

Several years ago, I reviewed the literature on MMS in pregnancy (Greiner 2011) and, at the very moment when the results of the many existing studies were being touted as proof of the wonders of MMS during pregnancy (note that Schulze et al's abstract states that this approach "is said to improve birth outcomes"), what were the benefits? An average of a few grams heavier newborns was the only one visible at that time. This was then often reported as a fairly substantial reduction in low birth weight. (This was true only because so many LBW babies weigh only a few grams less than 2500g). Only a few studies had looked at birth length and one

or two found a small effect. Two studies had actually found higher neonatal mortality in mothers who were supplemented and none had found lower mortality.

A systematic review published in 2016 (Devakumar et al. 2016) covering nine controlled trials found no impact on of MMS in pregnancy on a wide range of indicators: offspring mortality, height, weight and head circumference, body composition, blood pressure, cognitive and lung function.

A meta-analysis of 17 trials (Smith et al. 2017) found no impact on “the risk of stillbirth or neonatal, 6-month, or infant mortality, neither overall or in any of the 26 examined subgroups.” However, the abstract of this Lancet report focused mainly on its apparent impact on mortality for certain subgroups when adherence was high.

The publication of this trial has added to previous increased pressure on WHO from several supplementation supportive individuals and organization to recommend the institutionalization MMS in pregnancy. For example, one BMJ paper criticizes current WHO guidance, which states, “policy-makers in populations with a high prevalence of nutritional deficiencies might consider the benefits of MMN [multiple micronutrient] supplements on maternal health to outweigh the disadvantages, and may choose to give MMN supplements that include iron and folic acid” for not being an adequately ringing endorsement (Sudfeld and Smith 2019).

Such advocacy seems to ignore that efficacy is not the same as effectiveness. Until the latter is proven, WHO would actually be remiss in recommending MMS in pregnancy to governments.

As has been true in the case of vitamin A supplementation, the real goal may be to get supplementation accepted as a routine component of primary health care. Only this can make it adequately difficult to stop supplementation once it no longer has an impact (Mason et al. 2015).

What's really going on may be part of a larger neoliberal agenda involving the privatization or corporate capture of was formerly regarded as public space. This vision replaces the formerly agreed to process of international multilateralism (putting decision-making into the hands of accountable states) with multistakeholderism (giving the private sector a seat at the policymaking table). (See:

<https://www.cognitofirms.com/MultistakeholderismActionGroup/CorporateCaptureOfGlobalGovernanceTheWorldEconomicForumWEFUNPartnershipAgreementIsADangerousThreatToUN?fbclid=IwAR0jaqd3fdz2NI3ndISI-fbR1mIMwMESKTDX5SlwtN-kwY3eLfQAFq71ujM>) In the nutrition case, promotion of the products made by DSM, BASF, and other multinational vitamin companies is the main entry point. This is suggested by the way arguments take extraordinary efforts to avoid talking about dietary intervention, even when the number of deficiencies is high and there are likely deficiencies we don't know about and cannot accurately or cost-effectively assess at population level. We also know that these same nutrient deficient people often have diets that lead to obesity and NCDs and that contribute to cancer. All of these problems could be addressed simultaneously by focusing on improving diets. But on the other hand, corporate profits don't make themselves!

References

- Devakumar, Delan, Caroline H. D. Fall, Harshpal Singh Sachdev, Barrie M. Margetts, Clive Osmond, Jonathan C. K. Wells, Anthony Costello, and David Osrin. 2016. "Maternal antenatal multiple micronutrient supplementation for long-term health benefits in children: a systematic review and meta-analysis." *BMC Medicine* 14 (1):90. doi: 10.1186/s12916-016-0633-3.
- Greiner, Ted. 2011. "Vitamins and minerals for women: recent programs and intervention trials." *Nutrition research and practice* 5 (1):3-10.
- Mason, J., T. Greiner, R. Shrimpton, D. Sanders, and J. Yukich. 2015. "Vitamin A policies need rethinking." *Int J Epidemiol* 44 (1):283-92. doi: 10.1093/ije/dyu194.
- Schulze, K. J., S. Mehra, S. Shaikh, H. Ali, A. A. Shamim, L. S. Wu, M. Mitra, M. A. Arguello, B. Kmush, P. Sungpuag, E. Udomkesmelee, R. Merrill, R. D. W. Klemm, B. Ullah, A. B. Labrique, K. P. West, and P. Christian. 2019. "Antenatal Multiple Micronutrient Supplementation Compared to Iron-Folic Acid Affects Micronutrient Status but Does Not Eliminate Deficiencies in a Randomized Controlled Trial among Pregnant Women of Rural Bangladesh." *J Nutr*. doi: 10.1093/jn/nxz046.
- Smith, Emily R., Anuraj H. Shankar, Lee S. F. Wu, Said Aboud, Seth Adu-Afarwuah, Hasmat Ali, Rina Agustina, Shams Arifeen, Per Ashorn, Zulfiqar A. Bhutta, Parul Christian, Delanjathan Devakumar, Kathryn G. Dewey, Henrik Friis, Exnevia Gomo, Piyush Gupta, Pernille Kæstel, Patrick Kolsteren, Hermann Lanou, Kenneth Maleta, Aissa Mamadoultaiou, Gernard Msamanga, David Osrin, Lars-Åke Persson, Usha Ramakrishnan, Juan A. Rivera, Arjumand Rizvi, H. P. S. Sachdev, Willy Urassa, Keith P. West, Noel Zagre, Lingxia Zeng, Zhonghai Zhu, Wafaie W. Fawzi, and Christopher R. Sudfeld. 2017. "Modifiers of the effect of maternal multiple micronutrient supplementation on stillbirth, birth outcomes, and infant mortality: a meta-analysis of individual patient data from 17 randomised trials in low-income and middle-income countries." *The Lancet Global Health* 5 (11):e1090-e1100. doi: [https://doi.org/10.1016/S2214-109X\(17\)30371-6](https://doi.org/10.1016/S2214-109X(17)30371-6).
- Sudfeld, Christopher R, and Emily R Smith. 2019. "New Evidence Should Inform WHO Guidelines on Multiple Micronutrient Supplementation in Pregnancy." *The Journal of Nutrition* 149 (3):359-361. doi: 10.1093/jn/nxy279.