I think it was really an excellent discussion both in the vitamin A section and in the iron section. I have made three points here with the vitamin A, and I really didn't know so much about the vitamin A when I came to this meeting. It seems to me that vitamin A supplementation historically has been targeted to reduce morbidity and mortality. As Noel Solomons said, the paradigm of death reduction is not to reduce vitamin A deficiency, so really maybe we should now revise these recommendations based on more evidence of low vitamin A intakes or status. There seems to be good evidence at least from Asia that this universal vitamin A supplementation decreases mortality in children less than 6 months of age even when this new India study was included in the meta-analysis. There is less good information from Africa and from Mexico, where there is less vitamin A deficiency, and larger doses of vitamin A to children with no vitamin A deficiency seem to increase infections or respiratory infections and HIV and maybe also antagonize vitamin D metabolism. This was my first point.

The second point, large doses of vitamin A may specifically improve only measles outcome, so the effectiveness in measles-vaccinated children is less clear, and the effectiveness in other disease such as diarrhea may be a little bit clearer. Concerning respiratory infections in the children less than 6 months of age, there seems to be no effect of vitamin A supplementation, so maybe as Lindsay Allen was saying we should target lactation. Inconsistent results with newborns, interactions with vaccinations and perhaps universal supplementation with vitamin A should be rethought, and more evidence should be put in the area of food fortification. This would improve the quality of the diet.

With the iron absorption, ensuring adequate absorption from iron-fortified foods is not easy, it’s a challenge in addition to the iron compound inhibitors, etc. We need now to reflect on inflammation, hepcidin and decreased absorption. It’s still not clear whether efficacy is affected or whether erythropoiesis overrules inflammation. The decrease in absorption has only been demonstrated with malaria and overweight, and we need to look at other more common infections. It’s still not clear what iron requirements are in a population with widespread infections or inflammatory disorders including overweight. We need to think about that as well as fortification levels.
The last points will be on the iron supplementation. It’s accepted that with inadequate health care and not good malaria surveillance, iron supplementation to children in malaria-endemic areas can increase morbidity and mortality. The negative impacts on other infections, as Gary Brittenham said, are expected but not yet demonstrated. The most plausible mechanism is still the non-transferrin-bound iron (NTBI); at the beginning we didn't really believe it existed, but it does exist, and Noel Solomons has also reported some studies with NTBI; it is possibly coupled with the stimulation of the growth of the pathogenic organisms by the iron which goes through to the gut; the most likely explanation is the sequestration of the infected erythrocytes in the brain or the villi, and the villi could lead to the breach of the intestinal barrier and bacteremia. I think the strategy is by understanding the mechanism of this negative effect with supplementation, we should be able to confirm the safety of food fortification and hopefully also the Sprinkles.

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