An Economic Model for Optimizing Effective Coverage of MN interventions: A Case Study of Cameroon

Stephen Vosti1*, Reina Engle-Stone1, Justin Kagin2, Joanne Arsenault1, Robert Hijmans1, Ryan Murphy1, Erica Rettig1, Ann Tarini3 and Kenneth H. Brown1

1 UC Davis, Davis, CA, USA.
2 Kagins Consulting, Vacaville, CA, USA.
3 Helen Keller International, Yaounde, Cameroon.

Abstract

Objectives: Micronutrient (MN) interventions are generally undertaken at national scale. New spatially disaggregated data on MN deficiencies in Cameroon suggest that subnational strategies may be more efficient, but methods to choose among alternative interventions are needed. We developed a tool to plan and manage sub-national MN interventions for Cameroon.

Methods: Data from a nationally representative multi-stage cluster survey were used to determine the spatial distribution of MN deficiencies among population sub-groups at greatest risk. Macroregion-specific data (North, South, Douala/Yaoundé) on food intake were used to predict the effects of alternative MN intervention strategies on the prevalence of inadequate MN intake and absorption. MN supplements, fortified and biofortified foods, deworming and behavioral change communication to promote breastfeeding are among the interventions examined. Costs of alternative interventions were prepared. The costs and nutritional benefits of alternative interventions are included in an economic optimization model that chooses the best combination of MN interventions to ensure adequate MN intake, at regional level, over a ten-year planning horizon, given funding and other constraints.

Results: Preliminary results indicate large spatial differences in MN deficiencies, e.g., estimated
prevalence of vitamin A deficiency varied from ~62% (North region) to ~22% (Northwest region). Consumption of VA-rich foods and fortifiable foods also varies spatially. Hence, program efficiency may be enhanced by adopting targeted sub-national MN intervention strategies.

**Conclusions:** Given spatial patterns in MN deficiencies, diet-driven effectiveness of alternative MN interventions, and costs of these interventions, sub-national MN interventions may offer efficiency gains that exceed the costs of planning and implementing them.