

Estimating Dietary Mineral Intakes from Non-staple Foods in Malawi: a Comparison of Food Balance Sheets and Dietary Recall Surveys

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Background

Mineral micronutrients are essential for normal human physiological functioning. Calcium (Ca), magnesium (Mg) and zinc (Zn), for example, are cofactors of enzymes, constituents of the skeleton, and are required for metabolism (WHO & FAO 2004). Weighted Estimated Average Requirements (WtdEAR) for Ca, Mg and Zn for Malawi population in 2011 were 635, 153, and 10.3 mg *capita*⁻¹ d⁻¹ respectively (Kumssa *et al.* 2015 a & b). Most micronutrients are obtained from dietary sources. Here, intakes of these nutrients from staple and non-staple dietary sources were estimated for Malawi population using two food supply datasets, namely, Food and Agriculture Organization Food Balance Sheet (FBS) (FAO 2014) and the 2010-11 Malawi third Integrated Household Survey (IHS3) seven days dietary recall (NSO 2014). Food composition data from USDA (2013) and Joy *et al.* (2015 a) were applied to FBS and IHS3 respectively to estimate the dietary intake of Ca, Mg and Zn in Malawi in 2011. Information about the adequacy of micronutrient intakes helps to plan public health/nutrition interventions.

Results

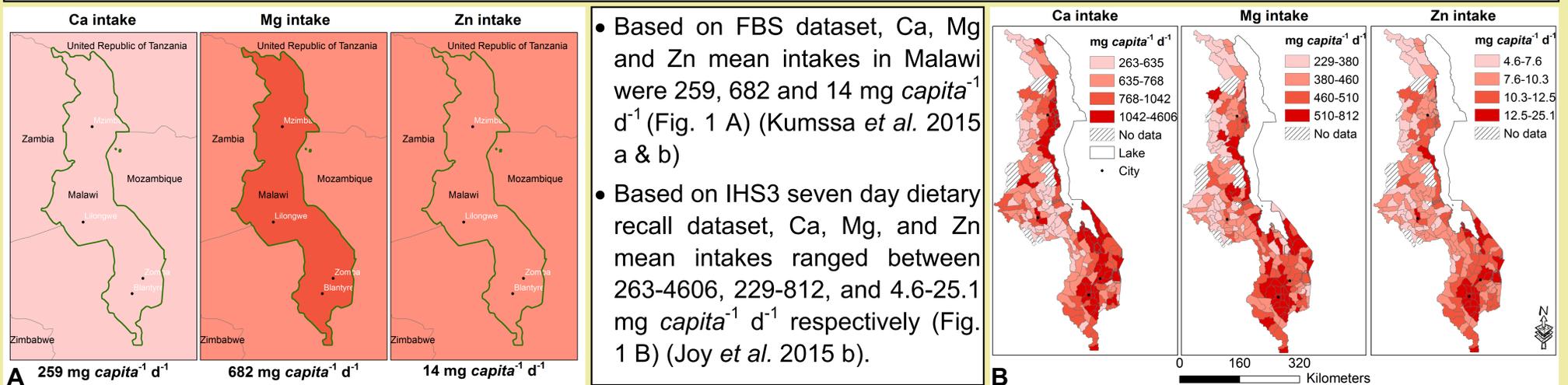


Fig. 1. *Per capita* dietary Ca, Mg, and Zn daily intakes for Malawi. Estimates based on (A) FBS data in 2011, (B) IHS3 at Extension Planning Area (EPA) level. Countries theme colour in (A) indicate neighbouring country's nutrient supply as compared to Malawi.

- Based on FBS, 82, 37 and 32 % of Ca, Mg and Zn originate from non-staple foods respectively (Fig. 2 A) (Kumssa *et al.* 2015 a & b).
- Based on IHS3 94, 48, and 47 % of Ca, Mg and Zn come from non-staple foods respectively (Fig. 2 B) (Joy *et al.* 2015 b).

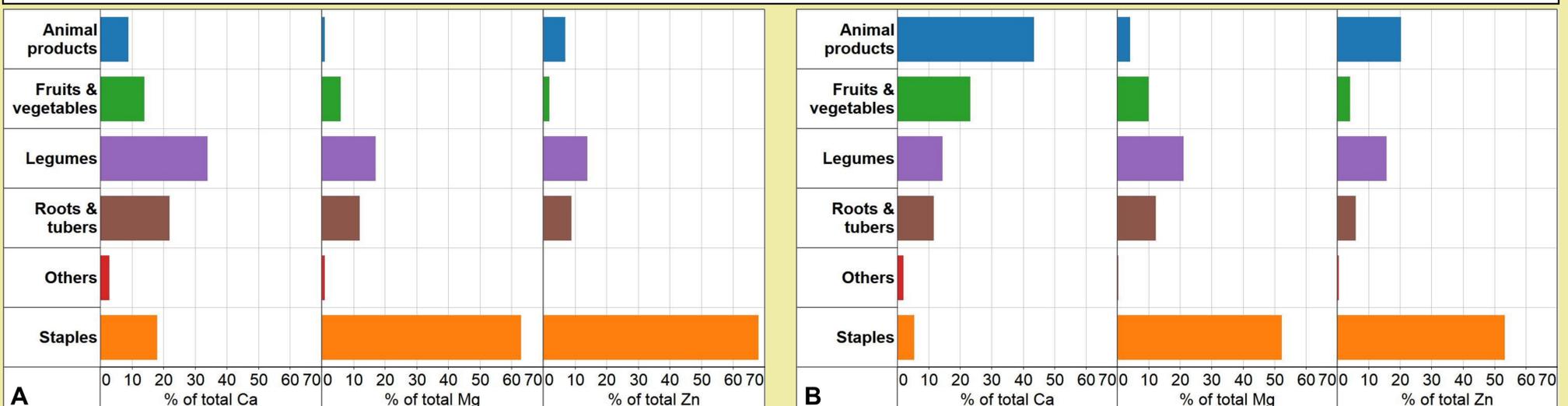


Fig. 2. Staple and non-staple dietary sources of Ca, Mg, and Zn in Malawi. Estimates of percentage contribution of food groups based on (A) FBS data in 2011, (B) IHS3 seven days dietary recall. Staples refer to cereal and cereal-derived foods.

Conclusion

FBS based Ca, Mg, and Zn intake estimates provide a single national level daily *per capita* intake averaged across year, while IHS3 based estimates provide high resolution sub-national level daily intakes at EPA level, although, survey based dietary nutrition intake estimates are susceptible to misreporting. The numerical differences between the two methods in estimates of the proportional nutritional contribution of staple and non-staple food groups can be attributed to the difference in the methodological approach in data collection, and use of different food composition data. People living close to cities and the lake have better intakes of Ca, Mg, and Zn (Fig. 1 B) due to better access to fish and other foods. In general, it is evident that non-staple foods are important sources of dietary mineral nutrients. Hence, future agricultural research and development to improve public nutrition in Malawi need to pay attention not only to staple cereal crops but also to fruits, vegetables, legumes, roots and tubers, and other underutilized crops (for example, *Moringa spp.*).

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Acknowledgements

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