

Assessing Food Consumption, Micronutrient Intakes, and the Contribution of Large-Scale Food Fortification to Micronutrient Adequacy using Tanzania Household Consumption and Expenditure Survey Data

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Analysis of household consumption and expenditure survey data reveals widespread inadequate intakes of multiple micronutrients in Tanzania, some of which might remain despite current large-scale food fortification programs.

BACKGROUND

Large-scale food fortification (LSFF) may play an important role in helping to alleviate micronutrient deficiencies in Tanzania. However, data on fortifiable food consumption and the prevalence and magnitude of micronutrient inadequacies are necessary to inform policy and program design. Tanzania does not have recent nationally representative individual-level dietary recall data, and collecting such data is time consuming and costly. However, household consumption and expenditure surveys (HCES) generate data on foods consumed at the household level, which might provide a proxy measure of consumption at the family level. This study reports findings from a collaborative project between the Tanzania Food and Nutrition Centre, Micronutrient Action Policy Support project, and USAID Advancing Nutrition, to strengthen capacity for nutrition policy development.

METHODS

Using nationally representative household food consumption data from the Tanzania National Panel Survey (2014–2015) Wave 4, we estimated the apparent consumption of fortified food items and the prevalence of micronutrient inadequacy, using the adult female equivalent approach. Findings from a national food fortification survey¹ were used to estimate the proportion of food items fortified to standards. We explored the effectiveness of fortification using three scenarios: no fortification, status quo (current situation best estimate, assuming formal food industries produced the vehicles fortified to standards), and full fortification coverage (where all currently fortified food items meet legislated standards). We stratified the results by urban and rural areas to provide equity insights and identify the population groups most likely to require complementary strategies.

FINDINGS

Consumption of foods currently subject to fortification legislation was high. Many households reported consuming cooking oil (86.2 percent), and maize flour (82.1 percent). However, the survey did not differentiate fortifiable (i.e., manufactured by formal industries) products. One in five households consumed wheat flour (21.5 percent, not including consumption of wheat flour in processed foods such as bread).

Under the no fortification scenario, 92 percent of households had inadequate dietary supplies of vitamin A, 75 percent had insufficient riboflavin intake, 64 percent lacked sufficient iron, and 51 percent had insufficient vitamin B12. Dietary zinc supplies were inadequate in 46 percent of households, while 26 percent had diets inadequate

in niacin. Rural areas showed a higher prevalence of vitamin A and B12 inadequacies than urban areas, whereas urban areas showed a higher prevalence of iron, zinc, thiamine, niacin, and folate inadequacies than rural areas.

The prevalence of inadequate dietary supplies of vitamin A reduced under the status quo scenario in urban areas (from 88 percent to 64 percent) and rural areas (94 percent to 85 percent). Further reductions could be achieved under a full fortification scenario, particularly for vitamin A, zinc, iron, folate, and vitamin B12 inadequacies; however, riboflavin, thiamine, and niacin remained almost constant across scenarios. Addition of these micronutrients to flours is voluntary, and it is not widely practiced.

Table 1. Percentage of Households Consuming Food Fortification Vehicles (being Fortifiable or Not) and the Median Consumption Quantity among Consumers (in grams/day per adult female equivalent)*

| | Cooking Oils | | Maize Flour | | Wheat Flour | |
|----------|--------------|------------------|-------------|---------------------|-------------|------------------|
| | % | Median | % | Median | % | Median |
| National | 86.2 | 17.0 (9.9–28.2) | 82.1 | 214.5 (120.9–351.3) | 21.5 | 49.7 (32.0–85.4) |
| Urban | 91.6 | 21.9 (14.1–33.2) | 82.6 | 153.5 (93.9–247.0) | 33.0 | 48.3 (31.0–80.9) |
| Rural | 82.5 | 13.9 (8.3–22.6) | 81.7 | 268.5 (157.0–425.0) | 13.5 | 52.0 (35.7–92.4) |

*Interquartile range

Figure 1. Prevalence of Inadequate Micronutrient Intake (%) Nationally and by Residence

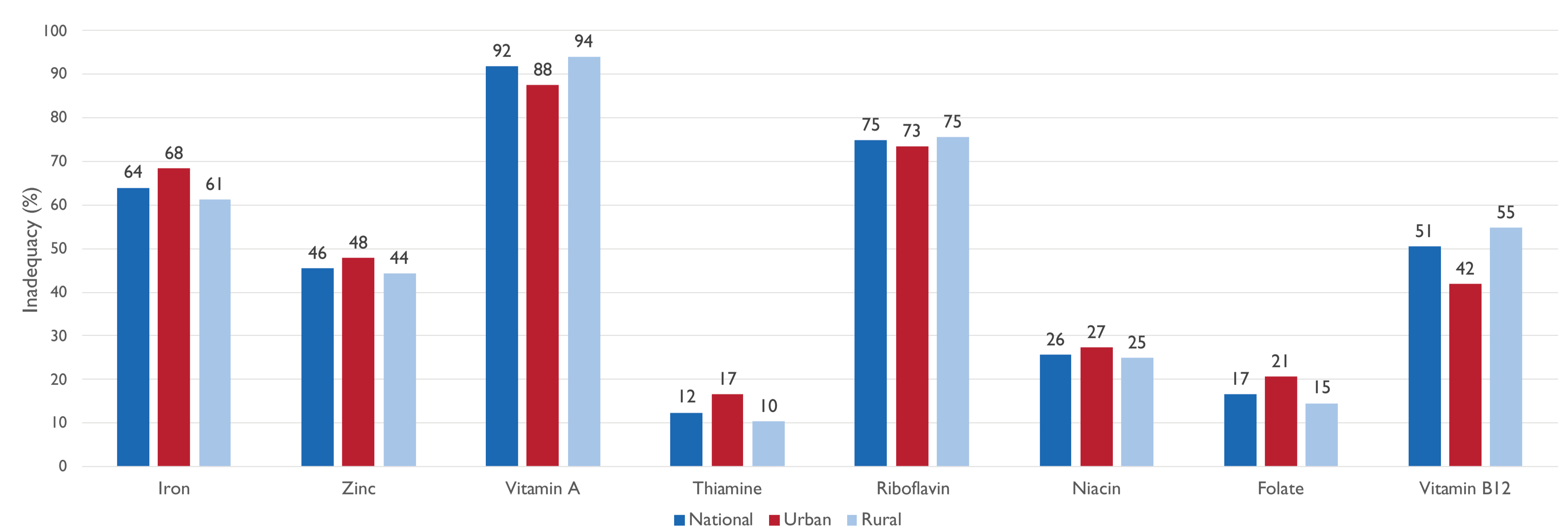
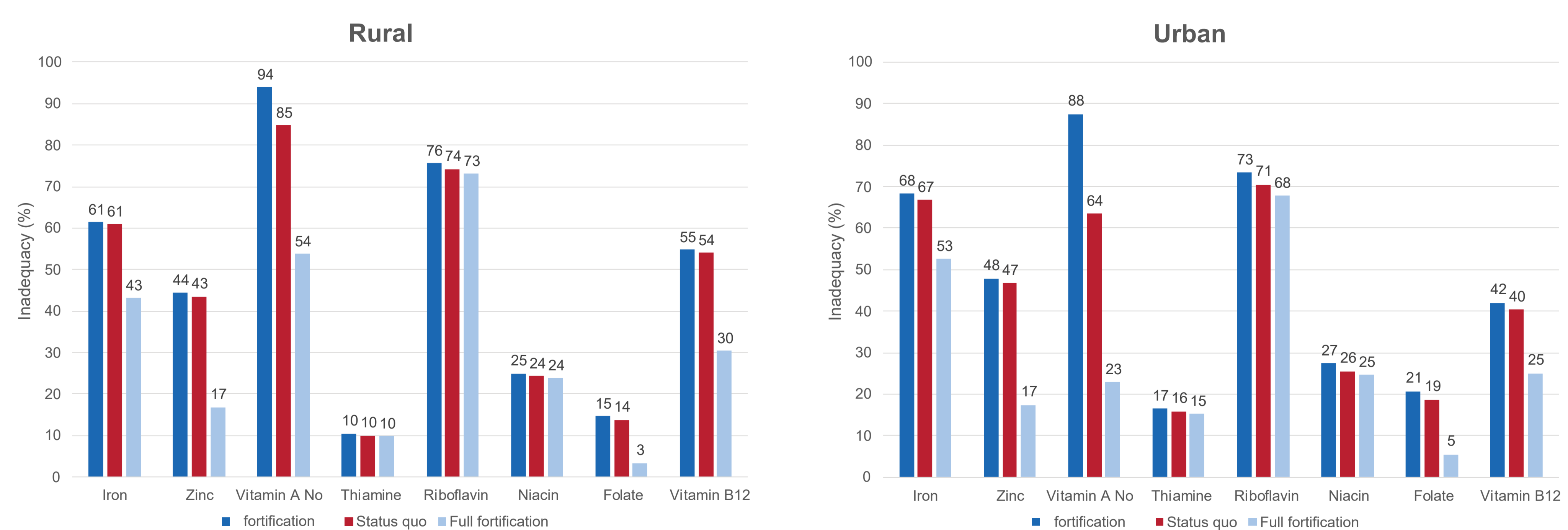


Figure 2. Potential Prevalence of Micronutrient Inadequacy Based on Three LSFF Scenarios: a) no fortification, b) status quo, and c) full fortification coverage by Residence. The full fortification scenario assumes all food vehicles are fortifiable (i.e., produced by suitably-equipped facilities).



CONCLUSION

Analysis of national HCES data provides valuable dietary insights for the design of food fortification policies. Our findings indicate that the current food fortification programme is likely to play an important role in reducing the prevalence of vitamin A inadequacy. Increasing compliance could deliver substantial further improvements in the

supply of multiple nutrients. However, although this is an ideal scenario, the prominence of small-scale processing facilities, particularly maize mills, limits this theoretical benefit. Complementary strategies including dietary diversification and biofortification will remain important.

¹ Global Alliance for Improved Nutrition (GAIN), PO-RALG (President's Office, Regional Administration and Local Government). 2021. *Market Level Assessment of the Fortification Status of Food Vehicles*. Arusha, Tanzania: GAIN.



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