

Analyzing the Nutritional Impact of Policies in Malawi

Reducing malnutrition, including undernutrition (insufficient calorie intake) and micronutrient deficiencies (insufficient intake of vitamins and minerals) is a high priority for Malawi and many developing country governments, closely linked to achieving the Millennium Development Goals. However, effective policy intervention requires knowing what causes malnutrition and how different development policies affect the nutritional status of the population. This brief summarizes results of a recent study by Olivier Ecker which examined the nutritional impacts of income and price policies in Malawi, using household survey data and a food demand system model.

Undernutrition and Micronutrient Deficiency are Prevalent in Malawi

Based on Ecker's research, many Malawi households are not getting the required calories and micronutrients recommended by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). Ecker used nationally representative household survey data from Malawi's Integrated Household Survey (IHS2) for 2004-05 to determine the prevalence of undernutrition and micronutrient deficiencies. Focusing on five basic food groups, subdivided into 23 food products, he estimated household consumption of calories, protein, and ten essential micronutrients from the consumption information reported by household members in the survey sample. He found that over one-third (34 percent) of households do not consume enough calories, and many households are below FAO and WHO nutrition requirements in vitamin B12 (84 percent of households), vitamin A (65 percent), zinc (53 percent), iron (46 percent), folate (37 percent), vitamin C (33 percent), and riboflavin (32 percent).

Household Income and Food Prices Affect Food Consumption

Because there is widespread food insecurity in Malawi, increases in household income are spent mainly on additional food. Results of the model show that "income elasticity" for food in Malawi, or increased demand for food when incomes rise, is 0.87 (see box). In other words, a one percent increase in household income is associated with a 0.87 percent increase in food consumption. However, this relationship differs among the five food groups studied, reflecting preferences for different foods. Animal products and meal complements, such as oil, sugar, and beverages, along with starchy foods, are most in demand when household incomes rise. In contrast, fruits and vegetables are less in demand when incomes

rise, indicating that these products are less desirable to consumers. Overall, as the income of a typical Malawian household increases, the dietary share of animal products, meal complements, and starchy foods increases, while the dietary share of fruits and vegetables declines.

High income elasticity for starchy foods, especially maize, translates into high demand for calories as well as protein, iron, zinc, and B vitamins. Protein and vitamin B12, which are abundant in animal products, are more in demand than calories. The lower demand for fruits and vegetables means lower intake of Vitamins A and C. Thus, as household incomes rise, consumption of protein and vitamin B12 increases faster than calories, and consumption of vitamins A and C increases more slowly.

Results of the study show consumption of food in Malawi is also highly responsive to food prices. Households respond to food price changes primarily by substituting different foods, depending on availability. When prices rise moderately and temporarily, households maintain their nutritional status by adjusting their food consumption patterns. Due to these substitutions, consumption of nutrients is relatively unaffected by changes in food prices. Vitamins A, B12, and C are notable exceptions because they come from food products for which there are few substitutes in Malawi. As prices of foods rich in these three vitamins rise, their consumption falls substantially.

Income and Price Policies Affect Nutrition

Income policies, which directly target household income, include direct cash transfers, food voucher programs, employment programs, and policies that stimulate economic growth. Price policies involve the manipulation of prices to make food more affordable (if consumers are the policy focus), or to make agriculture more profitable (if agricultural producers are the focus). Price policies

include agricultural input subsidies, food subsidies, and price controls.

The nutritional effects of these policies are not straightforward. Although it is widely accepted in international policy circles that hunger and undernutrition can be eliminated by income growth, in some cases, a rise in income among the poor has had little impact on the prevalence of undernutrition. Likewise, although policies targeting maize prices are particularly relevant and have been historically popular in Malawi, it is unclear what affect these policies have on nutrition. With the recent dramatic rise in world market prices for major cereals and a likelihood of more external price shocks in the future due to policy and climate factors, understanding the nutritional effects of income and price policies in developing countries is becoming ever more important.

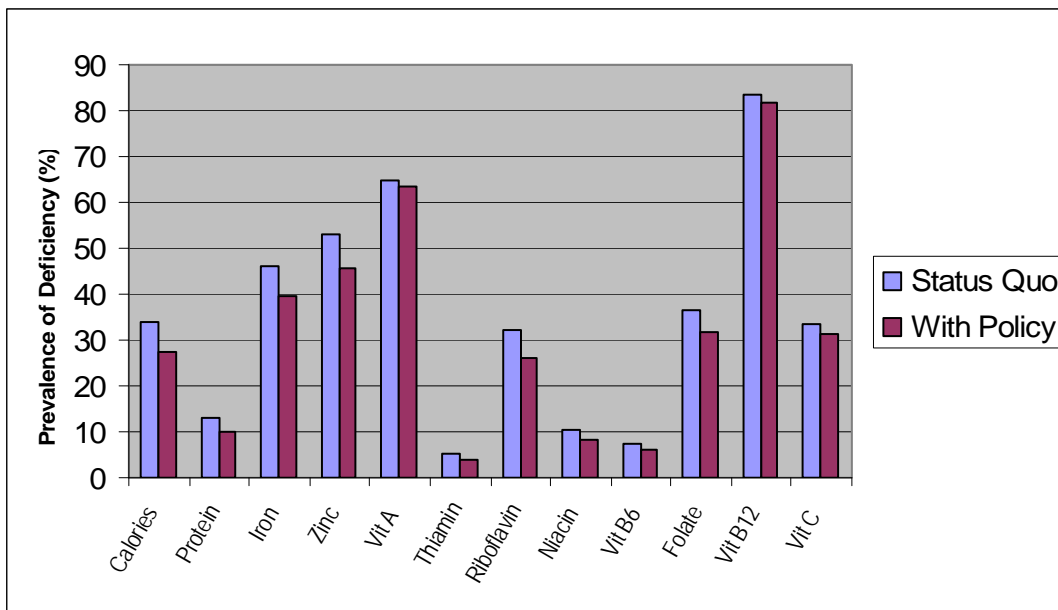
Results of the food demand system model indicate that a policy causing a 10 percent increase in per capita household income in Malawi would reduce the prevalence of all nutrient deficiencies, though modestly in the case of some nutrients (Figure 1). The smallest reductions in micronutrient deficiencies are predicted for vitamins A and C, which are found mainly in fruits and vegetables, which have low demand when incomes rise. Thus, income policies alone may be insufficient to resolve deficiencies in these vitamins, and additional strategies, such as nutrition and education programs, may be necessary.

A policy that lowers maize prices by 50 percent would also have mixed effects on household nutrition in Malawi (Figure 2). The prevalence of deficiencies for calories, protein, and most nutrients is predicted to decrease, but the prevalence of deficiencies for vitamins A, B12, C, and folate would increase. These different effects of price policy can be explained by food substitution. When the price of maize falls, households increase their maize consumption and reduce intake of other foods, such as animal products, fruits, and vegetables. The new diet is higher in calories and in the nutrients abundant in maize, but lower in the nutrients found primarily in the eliminated foods.

Conclusion

The results of Ecker’s study indicate that policies targeting household income are more effective at reducing micronutrient deficiencies than policies targeting food prices. Specifically, simulation results suggest that policies which reduce maize prices involve nutritional tradeoffs: calorie and mineral deficiencies decrease, but vitamin deficiencies increase. The predicted impact of income policies is more favorable: increasing household budgets reduces nutritional deficiencies across the board, although modestly in some cases. However, effective nutrition intervention through policies that reduce food prices or increase household incomes must be implemented with caution, in combination with other programs that encourage the consumption of a variety of necessary micronutrients.

Figure 1. Nutritional impacts of a 10% increase in per capita household income

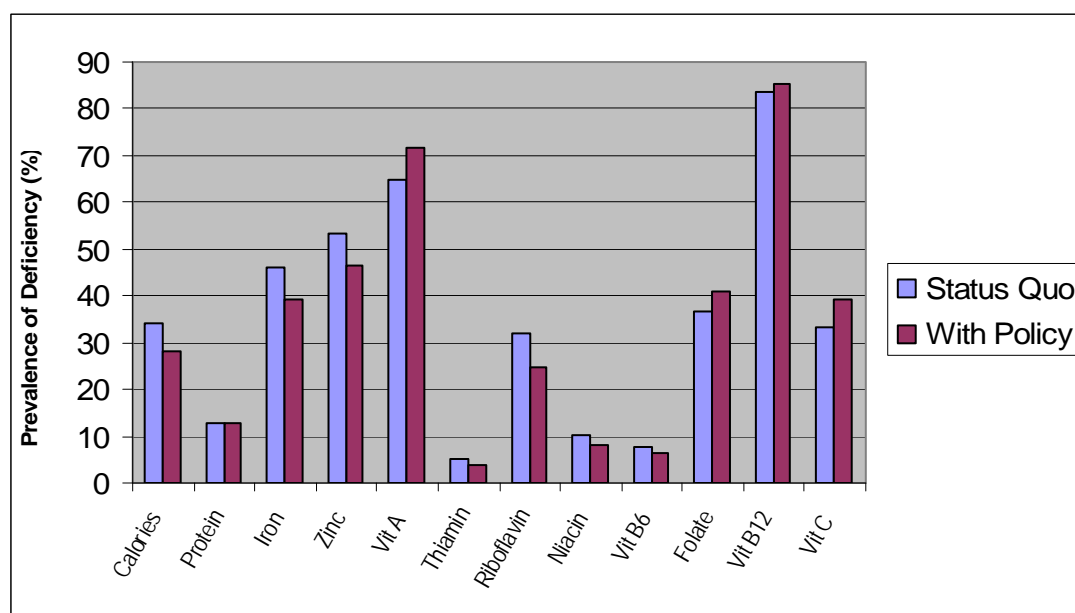


Source: Derived from Ecker (2009).

Elasticity

Elasticity is a unitless measure of the percent change in one variable resulting from a one percent change in another. Two types of elasticity are important in the context of food demand. *Income elasticity* measures the percent change in quantity demand for a food product when *income* increases by one percent. *Price elasticity* measures the percent change in quantity demand for a food product when a *price* increases by one percent. The shifting price can be the price of the food product in question (own-price elasticity) or of another product (cross-price elasticity). Income elasticity is generally positive, i.e., increased income leads to higher consumption for most goods. In the food demand system model developed for Malawi, the income elasticities all have positive values. Own-price elasticity is typically negative, i.e., an increase in the price of a product leads to a reduction in the quantity demanded. Cross-price elasticity can be positive or negative, depending on whether the two products in question are substitutes or complements.

Figure 2. Nutritional impacts of a 50% decrease in the price of maize



Source: Derived from Ecker (2009).

This brief was prepared by Edward Stone (Oregon State University), Monica Fisher, and Olivier Ecker, based on the Doctoral Dissertation of IFPRI visiting postdoctoral researcher Olivier Ecker (Ecker, O., 2009. *Economics of Micronutrient Malnutrition: The Demand for Nutrients in Sub-Saharan Africa*. Peter Lang Verlag: Frankfurt a.M.). This brief is intended to promote discussion; it has not been formally peer reviewed but has been reviewed by at least one internal and/or external reviewer.

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