



Note. Fitted results were derived from an autoregressive integrated moving average (ARIMA; 1,0,0) model ($\phi=0.2$ [$P < .05$]; constant=91.8 [$P < .001$]) that produced white noise residuals ($\sigma^2=27.3$ at 24 lags).

^aGradual, permanent heart rate change modeled with a first-order transfer function applied to a step variable. The denominator was constrained to 0.7.

^bAbrupt, temporary heart rate change modeled with a first-order transfer function applied to a pulse variable. The denominator was constrained to 0.7.

* $P < .05$.

FIGURE 1—Interviewer heart rates (actual and fitted) during a 150-minute interview trip from campus to a respondent's home and back: 2009.

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Human Participant Protection

The study reported on in this letter was approved by the institutional review board of the University of Pennsylvania.

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GOVERNMENT LEADERSHIP NEEDED FOR FOOD FORTIFICATION IN SUB-SAHARAN AFRICA

Sub-Saharan African countries suffer from massive and increasing vitamin and mineral deficiency conditions among their citizens, more than in any other region of the world, and they are failing to meet the Millennium Development Goals targets, especially those related to maternal and child health.¹ In a recent *Journal* article, Yach et al.² placed great emphasis on the role of the food industry in

combating undernutrition in developing countries, including through fortification of staple foods.

In sub-Saharan Africa, urban and rural populations increasingly consume processed foods such as commercial baked goods, flour, oil, sugar, and salt. Common fortification combinations, which have proven successful in other areas, are well within the technical capacity of local industry. These include fortification of salt with iodine, flour with iron and B-complex vitamins (including folic acid), and others, such as sugar with vitamin A and zinc (as done in Latin America), in keeping with the 2006 World Health Organization Guidelines for Fortification of Basic Foods.³

Eliminating widespread vitamin and mineral deficiencies will not happen without effective governmental public health policies and leadership, not only to fortify basic foods but also to provide supplements for at-risk groups.^{4,5}

Nigeria's mandatory salt iodization program provides one example of such policy-making that has enjoyed great success.^{6,7} Public health professionals and policymakers in state and local government, with the support of international agencies, have a moral responsibility to promote aggressive national nutrition policies. Even in more developed societies, such as all countries in Europe, government leadership is needed to mandate

fortification of flour with folic acid to prevent neural tube defects.⁸ ■

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YACH ET AL. RESPOND

We agree with Addo et al. that strong government leadership is needed for progress to be made in preventing micronutrient deficiencies in populations. However, the last 60 years has shown that without widespread and active collaboration with the food industry, government regulations and recommendations do not achieve their desired impact.¹

For example, a recent review of factors leading to successful implementation of a salt iodization program in South Africa highlighted the importance of engaging all salt retailers and processed food manufacturers and of paying detailed attention to monitoring and quality control across the iodine supply chain and to outcome assessment.²

In contrast to the success achieved in iodine deficiency, researchers highlight how, despite government regulations, equivalent progress has not been made in reducing iron deficiency through fortification of brown bread. Manufacturers were inadequately involved in the implementation process, which led to both the level and type of iron fortificant used being inappropriate.³ Closer interaction between food companies and government regulators is required to address the many practical aspects of fortification if the desired public health goals are to be met.

In many developing countries, considerable challenges hamper rapid progress. Some issues could be addressed through stronger private–public alliances of the type recommended by the Global Alliance for Improved Nutrition, World Health Organization, and the United Nations Standing Committee on Nutrition.^{4,5} These partnerships tend to mainly involve major multinationals despite the fact that in most developing countries the contribution of the informal sector to the total volume of food

sold far exceeds that sold by multinational corporations and often exceeds sales generated by the total formal sector.

The food industry in many countries is led by small-to-medium companies, such as the 1000 or more mid-sized food producers in Mexico,⁶ as well as small enterprises in India that dominate national food production, accounting for 75% of food output.⁷ The informal sector also accounts for 74% of Nigeria's food purchased, while mid-sized supermarkets account for 60% of Brazil's retail market. These sections of the food industry are clearly too significant to be ignored,^{8,9} especially because they reach the poorest communities most in need of micronutrients. Engaging them will require innovative national strategies supported by government and encouraged by the entire food sector. ■

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