

Castel Gandolfo Workshop: An Introduction to the Impact of Climate Change, the Economic Crisis, and the Increase in the Food Prices on Malnutrition^{1,2}

Martin W. Bloem,³⁻⁵ Richard D. Semba,⁶ and Klaus Kraemer^{7*}

³Nutrition and HIV/AIDS Policy, Policy, Strategy and Programme Support Division, World Food Programme, Rome 00148, Italy;

⁴Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA 02111; ⁵Bloomberg School of Public Health and

⁶Department of Ophthalmology, Johns Hopkins University, Baltimore, MD 21025; and ⁷SIGHT AND LIFE, Basel 4002, Switzerland

Abstract

The global food supply system is facing serious new challenges from economic and related crises and climate change, which directly affect the nutritional well-being of the poor by reducing their access to nutritious food. To cope, vulnerable populations prioritize consumption of calorie-rich but nutrient-poor food. Consequently, dietary quality and eventually quantity decline, increasing micronutrient malnutrition (or hidden hunger) and exacerbating preexisting vulnerabilities that lead to poorer health, lower incomes, and reduced physical and intellectual capabilities. This article introduces the series of papers in this supplement, which explore the relationships between crises and their cumulative impacts among vulnerable populations, particularly through hidden hunger. *J. Nutr.* 140: 132S–135S, 2010.

Introduction

Food, fuel, and financial crises have tipped the equilibrium of global development toward the decline of human well-being among its poorest and most vulnerable (1,2). These crises combine with the growing threat and incidence of climate change-related disruptions to both food systems and livelihoods (3) to synergistically interact with long-term inequities in food and health. Consequently, already-vulnerable populations world-

wide find themselves fast-tracked along the downward spiral of malnutrition and poverty.

From the popular press to technical and scientific journals, much has been written on climate change, the food and fuel price hikes of 2007–2008, and the global economic downturn (4–13). This vast body of literature has competed for our attention to the problems of environmental degradation and liability, commodity diversion and speculation, and financial folly and subversion. Meanwhile, decades of research have increasingly amassed evidence of the pervasive impact of food and nutrition insecurity resulting from acute and chronic crises, particularly among at-risk population groups such as infants and young children, pregnant and lactating women, and the chronically ill. Yet the relatively neglected issue of global micronutrient malnutrition, which affects 2 billion of the world's population, remains largely hidden from the blinkered gaze of mainstream global discourse, aptly deserving the name *hidden hunger* (14–16).

The Gandolfo Meeting

In early 2009, the Swiss-based humanitarian initiative, SIGHT AND LIFE, convened a gathering of key scientists from leading development and humanitarian and academic institutions at Castel Gandolfo, Italy, to map out more effective responses to the global financial and food crises that would protect the lives and future productivity of the world's poorest people. The participants highlighted the important impact of climate change, specifically in relation to its implications for crop and livestock production, and its consequences on health and nutrition as they

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* To whom correspondence should be addressed. E-mail: klaus.kraemer@sightandlife.org.

reviewed decades of data showing correlations between food prices and the nutritional status of poor populations as well as other similarly insightful findings.

The group deliberated on the accumulating evidence that improving nutrition protects health, prevents disability, boosts economic productivity, and saves lives. The returns on such an investment may be even greater than those from the billions of dollars spent to bail out the global financial sector. The group also noted that climate change is likely to aggravate existing production and consumption constraints in food-insecure countries. In support of these overarching statements, the Gandolfo scientists contributed the series of papers published in this supplement.

This supplement series brings together aspects relating to the parallel and synergistic challenges of climate change, commodity price spikes, and the global economic downturn and analyzes their consequent imprint on hidden hunger in the world today. Several key insights emerge from the discussions:

1. Climate change is already having an impact on global food production through changes in temperature, rainfall, and severe weather events such as droughts and floods, and this is expected to get worse. With increasing global demand for food and animal feed, the diversion of food crops in favor of biofuels in the US and Europe and the decline of focus on agriculture and food policy in development assistance over the last 3 decades, the global food supply system is facing serious new challenges.
2. While economic and related crises and climate change can immediately and directly affect the poor in a number of ways, food access is the main interface between their nutritional well-being and sudden shocks as well as long-term erosion of capabilities and potential resulting from such events. Food access is contingent on the twin pillars of food availability (*vis-à-vis* supply through the market or self production) and affordability (*vis-à-vis* household earnings from livelihood or employment income). The high inflation in food and fuel prices in 2008 resulted in reduced food access for many in the developing world given that these populations are predominantly net buyers of food, particularly urban poor and rural net buyers, and their purchasing power declined as a result of reduced income opportunities due to the economic downturn while food prices soared.
3. Reduced access to food meant that vulnerable populations, who were already spending up to two-thirds of household income on food, rationed consumption to prioritize calorie-rich but nutritionally poor foods. This unsustainable coping mechanism resulted in a pattern of initial decline in dietary quality followed by reduced dietary quantity as remaining resources approached depletion, heralding an increase in micronutrient malnutrition. The resulting increase in hidden hunger exacerbates preexisting vulnerabilities among those affected by the impacts of climate-related hazards, further inflation in commodity prices, and limited income opportunities as the global economic downturn continues, all of which fuel the long-term fallout of “lost” generations of children born into this debilitating cycle, whose effects follow them into adulthood in the form of poorer health, lower incomes, and reduced physical and intellectual capabilities.

Brief overview of the Gandolfo papers

With an eye to history, Webb (17) considers the drivers of the current crisis and compares these to previous crises caused by food price increases and economic recession. Through this, he explores whether the current crisis differs from those in the past on the basis that the recent price increases reflect structural changes with lasting implications. Webb’s analysis provides profound insights on a series of paradoxes concerning global poverty, agriculture, and nutrition that are set to shape future trends.

Reviewing the evidence on climate shocks and nutrition, Alderman (18) highlights the economic consequences that persist into adult life from the long-term impacts that short-term climate shocks have on childhood nutrition. Such shocks can affect households’ current earnings through food price spikes and loss of current income sources as well as reduce their future livelihood capabilities by degrading or destroying assets, resulting in irreversible consequences across generations through reduced investment in child nutrition, health, and education.

Taking a nutritional economics approach, Brinkman et al. (19) assess the impact of the current crises on food consumption, nutrition, and health through risk analysis and simulations. They apply regression analysis using the food consumption score, an analytical tool that reflects dietary quantity and diversity, to review the impact of dietary changes, anticipated as a result of the crises, on nutritional status and health. With rising food prices, they find that dietary diversity, quality, and quantity decline, placing vulnerable populations at increased risk of malnutrition.

Darnton-Hill and Cogill (20) elaborate on the impact of the global economic crisis, commodity price increases, and climate change on the poor, particularly on maternal and young child nutrition, as mediated through their effect on food prices. Like Webb, they remind us that the world has undergone similar shocks in the past, of equal or greater magnitude, and much of what went wrong recently is as much due to a serious lack of learning from past events or problems that have long been known. They describe 6 macroeconomic and other parallel shocks with the potential to affect nutrition among vulnerable groups, including climate change.

Ruel et al. (21) focus their discussion on reviewing the perceived differential impact of the food, fuel, and financial crises on the urban poor compared with the rural poor. Their review finds that more important than urbanization level, the poorest of the poor in both settings, who are already disproportionately vulnerable between crises, are the ones who are most affected. Critical to both immediate and long-term responses to support them is a deeper understanding of coping strategies these groups consistently adopt in the face of such crises, past and present.

Christian (22) reviews the impact of crises, current and past, on child mortality and elucidates the nutritional pathways underlying this. She points out that the current crises underscore the fact that large segments of the world’s population live under chronic food insecurity, leaving them disproportionately more exposed to shocks. Therefore, although addressing the nutritional needs of vulnerable populations in response to the present crisis is urgent, Christian urges a broader response that ensures these populations are also targeted with known nutritional interventions at all times to ameliorate the persistent conditions that lead to child mortality.

Thorne-Lyman et al. (23) report on data from Bangladesh, where rice prices are known to be positively associated with the prevalence of child underweight and inversely associated with

dietary quality as represented by expenditure on nongrain food. Their analysis found that there was already relatively little variety in the diet of rural households even before the recent food price crisis and global recession, and reduced dietary diversity during periods prior to such crises indicated the potential risk for increased malnutrition in Bangladesh. This analysis draws attention to the need to consider a broad definition of food security, particularly when developing policy responses to food crises.

Still focusing on data from Bangladesh, Campbell et al. (24) analyze household expenditure on rice and nonrice foods, and find that households that spent more on nonrice foods and less on rice had a lower prevalence of maternal and child malnutrition and vice versa. When food prices increase, per capita rice consumption does not change, but there is a proportionate increase in rice expenditure while less money is spent on nonrice foods that add quality to the diet. Hence, globalized food prices subject child and maternal nutrition in developing countries to market swings.

Sari et al. (25) undertake a similar analysis on data from Indonesia as Campbell et al., above. Their findings are in line with those from Bangladesh, confirming strong relationships between high food prices, increased expenditure on rice, and reduced expenditure on nonrice foods, which led to the decreasing quality and eventually quantity of the diet, and increased odds of child stunting. The authors suggest the current food, fuel, and financial crises will likely undo much of the progress toward achieving the Millennium Development Goals.

West and Mehra (26) discuss dietary quality and diversity as a reflection of the adequacy of vitamin A intake among populations. Both can deteriorate in response to economic crises and past studies of diet, status, and socioeconomic standing under chronic and acute deprivation suggest dietary quality and vitamin A status decline in mothers and young children when diets shift to include less preformed vitamin A-rich animal source foods and vegetables and fruits. Even after food prices waned in later 2008, the prevalence of vitamin A deficiency, night blindness, and other related disorders may have increased and not necessarily recovered. Nonetheless, the authors argue that vitamin A deficiency should still be preventable through breast-feeding promotion, vitamin A supplementation, targeted food fortification, and homestead food production even during times of financial crisis.

Semba et al. (27) outline the urgency of improving the poor coverage of the vitamin A supplementation program in India to help protect preschool children from morbidity, mortality, and blindness. Despite having one of the world's fastest growing economies, the country also ranks highest based on the total number of preschool child deaths and an estimated 52,000 Indian children go blind each year from vitamin A deficiency. The poor coverage of the vitamin A program has been implicated in its lack of progress in reducing child mortality. The authors contend that the combination of increased food prices and decreased income in the present economic downturn may increase vitamin A deficiency and related child mortality among poor families in India.

Approaching the issue from the aspect of the chronically ill, Sztam et al. (28) highlight the synergistic relationship between HIV and malnutrition and review the effect of food prices on HIV treatment programs, which must deal with the impact of malnutrition on immunity and of HIV on nutritional status. Increased food prices have the potential to adversely affect both child and adult nutritional status, worsen HIV outcomes by affecting BMI at the start of antiretroviral treatment, and make macronutrient interventions essential. The authors call for the

establishment of a basic nutritional standard of care in HIV treatment, through which a more comprehensive set of services can be integrated into programs.

Timmer (29) closes the series with a discussion that takes a historical tour of the drivers of and trends in food policy decision making over the last decades. Reaffirming that food crises have important short- and long-term consequences for the welfare of the poor, he suggests that markets are crucial in the medium to long run, as no other form of institutional organization has evolved that is capable of processing vast amounts of information each day to generate price signals to all participants for making efficient allocation and investment decisions that are ultimately critical to meeting society's needs. Timmer's veteran insight lays the foundation for a deeper understanding of how the interconnected global food system works and how it would respond to external shocks, technical change, and policy initiatives.

In conclusion, calamities and conflicts will inevitably entail great costs in both human and economic terms throughout the continuum ranging from their immediate wake to their long-term aftermath. How those costs are recognized and anticipated is as essential a part of their mitigation as the solutions that are deployed, as such solutions are only as good as their inherent problem definitions. Long-term impacts from climate change and development problems, critical among which are those that erode human well-being and long-term capabilities through nutritional pathways, both exacerbate and are further aggravated by sudden shocks resulting from economic, political, or environmental upheaval, extending the human and economic costs well beyond the originating events to seed potential future crises. The quality of life among those who survive the worst of shock events will be decided by the actions taken by governments, donors, aid agencies, NGOs, the private sector, health professionals and volunteers, and all other stakeholders to ameliorate hidden hunger, which is both cause and effect in the poverty and vulnerability of populations.

The series of articles in this supplement aims to inform global recognition and anticipation of the mechanisms that underlie the relationships between crises and their cumulative impacts among the most vulnerable populations, particularly through hidden hunger. Through this, the Gandolfo authors, among whom are key figures from the world's leading development and humanitarian institutions, stand on common ground in calling for greater attention to the pervasive and persistent human and economic costs of hidden hunger and greater investment in solutions to mitigate them.

Other articles in this supplement include (30–32).

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