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**Global economic downturn, food crisis and fuel price instability:
exposures and impacts on child nutrition and health in East Asia and
Pacific regions**

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ABSTRACT: Experiences of the 1997 financial crisis in East Asia provide strong evidence that there are serious risks that the current food, fuel, economic and financial crisis will affect child health and nutrition in the region. Using information available on the 1997 crisis, this paper evaluates its effects on nutrition status, reportable diseases, immunization status, and child mortality. These results are used to model plausible estimates of the potential health and nutrition impacts of the current crisis across socio-economic strata. The model results suggest that, if unaddressed, the current crisis could increase maternal anemia rates by 10-20%, prevalence of low birth weight by 5-10%, childhood stunting by 3-7%, wasting by 8-16%, and under 5 child mortality in severely affected countries from 3-11%. The paper asserts that a range of low cost and high impact interventions exist that, if delivered in primary care settings without further delay, could mitigate or even reverse these adverse health and nutrition consequences.

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BACKGROUND

The East Asia and Pacific region includes some of the most populous countries in the world with rapid economic development. These include Cambodia, China, Fiji, Indonesia, Korea, Lao, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Thailand, Timor-Leste and Vietnam. Despite robust economies and steady growth for over a decade, many of these countries have significant inequity and wide urban rural differentials in standards of living and access to health care. It is therefore not surprising that the impact of the global rise in food prices, and subsequent economic crisis, has also been acutely felt in this region, especially among the net food importing countries. While there has been a steady increase in food prices since 2005, these have surged dramatically since 2007, led by the dairy sector registering an 80% price hike, followed by oil at 50% and grains 42%.

Though prices have since fallen from their 2008 peaks, rice prices remain high, posing great challenges to the poorest living in East Asia and Pacific. The Asian Development Bank (2009) estimates that non-fuel commodity prices will decline by 32% in 2009, and rise to 6.5% in 2010, as economies begin to recover. With as much as 40% to 75% of the population in these countries surviving on less than US\$ 2 per day, there is concern that the increase in food prices has, and will continue to, disproportionately affected the poor leading to food insecurity in a larger section of the population.

It has been estimated that the food price crisis is likely to have pushed at 130-155 million people into poverty in 2008 and erased at least four years of progress towards the Millennium Development Goal (MDG) 1 target for the reduction of poverty and hunger (Food and Agriculture Organization (FAO), 2008a; Harper et al., 2009). The economic crisis is expected to push another 65 million people into poverty, in addition to the previous figure. Significant increases in the numbers of underweight and stunted children are possible as a result of families being unable to afford to purchase even the most staple food stuffs.

As will be shown in this paper, crisis related reversion could potentially also affect MDG 4 “Reduce child mortality”, which includes measles immunization as a key causal factor. MDG 5 “Improve maternal health” includes maternal mortality and attendance of birth by skilled personnel, a key issue if the crisis results in reductions of health sector expenditures and staffing. MDG 6 “Combat HIV/AIDS, malaria and other diseases” includes key health service provisions such as access to anti-retroviral drugs and the proportion of children sleeping under insecticide treated bed nets in malarial areas. The East Asia and Pacific Region has been considered broadly on track – most countries have achieved, or were expected to achieve, most of these goals (UNICEF EAPRO Regional Analysis Report, 2008). This is no longer as certain. Future prospects now depend very much on policy maker’s responses to the crisis.

The primary focus of this paper is on childhood and maternal undernutrition, which underlie almost 35% of all child deaths. A significant number of maternal deaths are associated with maternal anaemia as well (Black et al 2008; Ezzati et al., 2002). With 28% of children under age five being underweight, the East Asia-Pacific region is already far behind other MDG hunger reduction targets. In certain countries, the percentage of underweight children approaches 50%. Many of these children are also born underweight and remain so throughout childhood. In the continuous cycle of malnutrition, underweight and malnourished girls grow up to become underweight mothers of underweight babies, contributing to the vicious cycle of undernutrition throughout the life course (ESCAP/ADB/UNDP, 2008; James et al., 1998).

The nutritional consequences of food and economic crises, as well as structural adjustment programmes implemented in many countries, have been the subject of much research. It is

recognized that undernutrition is likely to worsen during periods of economic and food crises and children are especially vulnerable to the deleterious effects of poverty and economic crises. Such disparities in health and nutrition outcomes are a recurring tragedy among poor populations in low and middle income countries. When compared to children from privileged families, poor children are born with a lower weight, are more frequently ill, more frequently undernourished and not surprisingly, have much higher mortality risk (Maclure & Stewart, 1984; Victora et al., 1987; Giugliani et al., 1987).

Nutritional status is usually associated with qualitative and quantitative food intake which, in turn, is taken to be dependent on household income. Hence poverty is regarded as a major cause of low level of nutrition. Across the East Asia-Pacific region, millions of poor continue to be undernourished and among them the most vulnerable are children and women. This makes them more susceptible to poor health and to enter a vicious cycle of poverty and illness. It also diminishes their capacity to participate effectively in economic and social development. According to recent estimates, among the fifty five million under age-five children living in the low and middle income countries of East Asia, 35.3% are stunted, 3.6% are severely wasted and 20.7% are underweight (Black et al., 2008) Higher food prices lead to lower caloric intake and an increase in undernourishment. Evidence shows that when households are faced with large negative shocks, they may sell their productive assets such as seeds and livestock, thereby jeopardizing their future earning prospects (Carter et al., 2009; Fafchamps et al., 1998; Lokshin & Ravallion, 2000).

Similarly, as indicated in a World Bank report (Ferreira and Schady, 2008), a food and economic crisis may have a negative impact on human development in four ways: by increasing poverty and inequality, worsening nutrition, reducing utilization of education and health services, and depletion of the productive assets of the poor. In contrast to developed economies, food and economic crises in poor countries of Asia and Africa can lead to reduced school enrolment, poor nutrition outcomes and an increase in infant mortality. Deterioration in any of these areas is difficult to reverse and may have implications for years, and in some cases generations, to come (FAO, 2008b). The situation is particularly challenging for countries without adequate social protection systems to ameliorate the impacts of such economic shocks. Thus the establishment of food security is essential for sustainable human development.

When confronted with food shortages in particular, families are affected in several ways largely dictated by an overarching need to maintain food intake and access to other essential commodities, especially for young children. The actual coping strategies employed by families depend on resources available and safety nets in place but include raising household income by taking loans or selling assets or reducing expenditures such as children's education and preventive health care. In rural communities, especially among subsistence farmers, there may be increased utilization and dependence on food grown or collected and reduced expenditures on purchasing expensive food items. These responses may also be coupled with reduced spare income of small holdings for agriculture investments. In urban settings where alternative options are limited and most members are daily wage earners, there is notable reduction in consumption of more expensive foods such as meats and dairy products and relatively increased consumption of basic staple foods. In general dietary quality of women and children in food insecure households deteriorates before quantity, with reduction in micronutrient intake due to reduction in the use of meats and fresh fruits and vegetables. If food crises persist and there is no succour, the intake of all food items may be affected globally, including staples (Nabarro 2008).

There is strong evidence from developing countries which confirms the above hypothesis that rapid increase in food prices and food insecurity lead to increases in maternal and child under nutrition levels. In many instances mothers act as buffers and bear the consequences of qualitative change in

dietary intake and under nutrition in an effort to protect their children. In Indonesia during the 1997-98 crisis, wasting and nutritional anaemia increased in Javanese women, although without increases in child under nutrition (Block et al., 2004). The combined effects were particularly severe for babies conceived and weaned during the crisis. The currency devaluation in the Congo in 1994 increased the price of imported staple foods resulting in increased wasting among mothers, more infants born with low birth weight and greater levels of stunting and wasting among children (Martin-Prevel et al., 2000). In Zambia during the drought of 2001-02, mothers who experienced high maize prices while pregnant had reduced micronutrient status and increased stunting among infants (Gitau et al., 2005). The long-term consequences of these short-term effects may be considerable. It has been recognized that boys who benefited from a nutritional intervention in their first two years of life subsequently earned wages as adults that were 50% higher than those of non-participants. Food price shocks had the reverse effects in terms of long-term impacts (Hoddinott et al., 2008).

Recent data on the relationship of birth weight to micronutrient intake in pregnancy also underscore the importance of dietary quality and intake. In Pune (India) intake of more expensive micronutrient rich food during pregnancy and erythrocyte folate at 28 weeks of gestation were found to be independently and positively associated with the size of the infant at birth (Margetts et al., 2001). Recent large scale trials of multiple micronutrient supplements suggest that these may improve birth weight (Haider & Bhutta, 2006; Bhutta et al, 2008) and could also be associated with improved survival in infancy (SUMMIT Study group, 2008). These studies provide evidence that small variations within the normal range in the micronutrient content of maternal diets and/or maternal micronutrient status during pregnancy are associated with small but significant differences in fetal and infant growth and that acute maternal dietary insult during periods of food insufficiency could have significant impact on birth outcomes, notably birth weight (Ruowei et al., 1998).

With regards to particular diseases and cause specific morbidity and mortality, the true magnitude of the impact of this global economic downturn on child health and nutrition in East Asia-Pacific is difficult to estimate. We hypothesized that the potential impact of the current food and economic crisis on child health and nutrition could be predicted somewhat from the past experience of the Asian economic crisis of 1997 and also provide a basis for suggesting remediable measures.

METHODS

The 1997 Asian crisis was notable because of the rapidity of onset and the number of countries rapidly engulfed in it. The current global food, fuel and financial crises have many parallels in this regard: no one could have predicted the suddenness of the food price increase in early 2008 followed soon by the rapid global financial meltdown which still continues to bring record unemployment and economic recession in its wake.

Although a large body of literature was available on the 1997 economic crisis (hereafter referred to as the 1997 crisis) the information available on the social and health impacts of the crisis was sparse. Much of this literature was either country specific or specific to certain areas within a particular country and thus non-representative. We therefore devised a strategy to undertake a systematic review of available data and time sensitive information on various health and nutrition indicators.

Data sources

We undertook a systematic review of the electronic libraries (PubMed, ExtraMed, Scopus and Lilacs) using key search words and strings including 'Asian Economic Crisis', 'Child Health' and 'Nutrition', using the Boolean command 'AND' between these words. Altogether over 375 electronic hits and 87 articles/publications were identified. Of these, 36 studies pertained to our area of interest. We also searched Google Scholar and the websites of FAO, the Asian Development Bank (ADB) and research organizations using several key words and combinations related to the

impact of the Asian Economic Crisis. We also evaluated special studies undertaken during the course of the crisis and its aftermath in several South Asian countries under the auspices of AusAID (Macfarlane Burnet Centre for Medical Research, 2000), notably Indonesia, Philippines, Thailand, Vietnam and Lao PDR. We found remarkable paucity of data from many low income countries in the region with most of the information available from three countries (Indonesia, Thailand and Philippines).

We developed a time series of information from various countries affected by the crisis using cross-sectional information from leading multilateral agencies and non-governmental organizations. These included the data from Macro-Demographic Health Surveys, WHO Statistics, UNICEF, ADB, FAO, International Food Policy Research Institute (IFPRI) and Helen Keller Institute and developed a pooled data set representing the fourteen East Asia-Pacific countries. We also obtained the infant and child mortality and health indicators profiles for the respective State of the World's Children Reports from UNICEF for the period spanning 1995 to 2007. The major indicators of our interest included infant mortality, child mortality, immunization coverage, food deprivation and undernutrition. We selected those child health and nutrition indicators were selected as variables that were comparable across the various databases. Additional macroeconomic indicators were obtained from the International Monetary Fund (2008) and the World Bank (2008). Specifically, we estimated the gross domestic produce (GDP) change per capita, and gross national income (GNI) change, and related that to available health and nutrition indicators.

Variable definitions

Standard definitions were used for nutrition and micronutrient deficiency indicators. Given the interest in acute undernutrition, we largely focused on underweight and wasting, recognizing though that stunting had been recommended as the main child undernutrition indicator (Black et al., 2008). The prevalence of underweight and wasting was defined as the proportion of children with weight-for-age and weight for height two standard deviations (SDs) or more below the median of the NCHS/CDC/WHO international reference populations, including the new WHO growth reference standards where available.

Statistical analysis & modelling

Among the various economic indicators, we chose GDP per capita (in current prices, US\$) to estimate change over various time periods as a reflection of annual economic change. Table 6 indicates the specific estimates used to derive the relative change over time. It was evident that all countries were not uniformly affected by the crisis in both direction and magnitude and trend data for Timor-Leste was unavailable. We categorized countries into three pre-specified bands according to the estimated impact of the economic crisis on GDP (ranging from no economic impact to those which encountered > 18% reduction over the 1995/96 to 1997/98 period), as severely affected, moderately affected and least affected (IMF World Economic Outlook Database, 2008).

No information was available to assess the impact of the crisis across various economic bands within these countries, although several sub national studies did indicate that the impact was greatest among the rural and urban poor and also among female led households (Nabarro, 2008). The impact estimates and ranges for the impact of the economic crisis on health and nutrition indicators were derived from different studies conducted in representative countries over the period of crisis. Because it is anticipated that the impact of the crisis on these outcomes would not be uniformly distributed across income bands, we sought literature on differential effects across income quintiles, and found no reports representing short term affects. We thus modelled the upper impact range as potential impacts on the poorest two quintiles with the lower estimates affecting the next two quintiles (Table 6). We considered that the rich in the richest quintile band would be relatively resilient to the income and food shocks and modelled no affect on this category. Current prevalence

rates of low birth weight, stunting and wasting was taken from the State of the World's Children (SOWC 2009) (UNICEF, 2009) and prevalence of anaemia from WHO global database on anaemia (WHO 2008) and were used to estimate potential increase in undernutrition rates and mortality across these categories. The impact estimates on child mortality were derived from annual UNICEF reports and while it is recognized that these represent survey findings from previous years and time points, we used these reports as standardized reports for the years specified in the surveys.

We modelled the potential benefit of various interventions on mitigating the effects of the crisis on health and nutrition outcomes. We chose a mix of maternal, newborn, child and nutrition interventions on the basis of the evidence of benefit and impact from recent systematic reviews (Stein & Susser, 1975; Watts, 1998; Park et al., 2003; Kim et al., 2004; Knowles et al., 1999; Kerber et al., 2007; Bhutta et al., 2008b; Lagrade et al., 2007). In particular, we chose interventions that could be delivered in primary care settings and affect mortality through several pathways (Bhutta et al., 2008b). We modelled the effect of a pragmatic stepwise increase in coverage with these interventions and their potential impacts using the formula

$$\% \text{ of under nutrition prevented} = \frac{I \times (P_1 - P_0)}{1 - I \times P_0}$$

where I is efficacy of intervention (% by which intervention reduce undernutrition or mortality), P₀ is existing coverage and P₁ is target coverage of intervention.

We evaluated two levels of targeted coverage, a pragmatic increase in coverage from current levels by 20% (as expected within a short time frame) as well as universal coverage (99%) as the maximal achievable coverage. The latter coverage estimate was used to assess maximally achievable and aspired targets. The impacts of interventions were estimated separately for poorest two quintiles and next two (excluding richest) income quintiles. No impact was estimated for the richest quintile of the population. Based on available data from global distribution of deaths, the relative distribution of under-age 5 deaths between wealth quintiles was taken as 53% in lowest two quintiles, 36% in next two quintiles and 10% in the highest one (Moser et al., 2005).

RESULTS

The estimated impact of the crisis on GDP per capita change in various countries in the immediate aftermath of the economic crisis is depicted in Figure 1. The most severely affected countries were found to be Indonesia, with a 29% decrease in GDP, Thailand (26% decrease), Korea DPR (20% decrease), Lao PDR (20% decrease) and Mongolia (18% decrease). The countries that were categorized as moderately affected included Papua New Guinea, Malaysia, Cambodia, Fiji and Philippines. The least affected countries were found to be Vietnam (with a 23% rise in GDP), China, Myanmar and Timor-Leste. For the same countries, estimates of unemployment rates and inflation gave corresponding trends reflecting the period of crisis (Table 1). In depth assessment of the impact of the crisis on subpopulations was available from special multi-country studies commissioned by AUSAID (Macfarlane Burnet Centre for Medical Research 2000) and indicated that a range of health and nutrition indicators and care seeking behaviours were affected by the economic crisis (Table 2).

Comparatively little information was available on dietary intake estimates. The FAO provides information on dietary intake on the basis of nutrient intake and defines “undernourishment” as a condition where “*dietary energy consumption is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out a light physical activity*” (FAO 2004,

2008). The FAO estimates these rates from available household level food consumption data and energy requirements for body weight maintenance, light work and in case of children, growth. These trend estimates over time were available and used to compute pooled estimates for the countries affected by the economic crisis. Figure 3 summarizes the time trends for undernourishment for various affected countries and confirms that the observed changes reflected corresponding economic change.

The corresponding impacts on overt maternal and child under nutrition for these time periods are limited to smaller samples available, but wherever studied, do suggest that the crisis increased rates of under nutrition. It was also noted that the crisis affected mothers earlier than children, possibly because of parental behavioural protection of children, including breast feeding. Because few countries have regular, nationally representative nutrition surveys spanning specific time periods, we gathered little information on national impacts of the Asian economic crisis on childhood stunting, wasting and underweight prevalence. Data on health and morbidity outcomes were even scantier. Much of this information was only available from smaller studies and sub national samples and indicates that the Asian crisis did affect a range of indicators such as micronutrient status, immunization coverage rates and health care expenditures. Table 3 summarizes some of the available information on trends in health indicators over the crisis period based on national survey data and the data sources summarized above. Our estimates suggest that if unaddressed the recent crisis could increase rates of maternal anaemia by 10-20% and prevalence of low birth weight by 5-10%. In addition rates of childhood stunting could increase by 3-7% and wasting by 8-16%. While accurate estimates were difficult to come by, trend data suggest that if unaddressed through preventive measures, overall under age-5 child mortality in severely affected East Asia-Pacific countries could increase by 3-11%. The trends in annual reports of infant and child mortality for the period spanning the economic crisis also indicates an increase in under-5 mortality among the most affected countries (Figure 2).

EFFECTS AND INTERVENTIONS TO ADDRESS MATERNAL & CHILD HEALTH AND NUTRITION

Over the last decade, there has been considerable improvement in our understanding of various interventions that can make a difference to major health and nutrition outcomes in various subsets of a population, including pregnant women and children (Bhutta et al., 2008a, b). They include: iron and folate supplementation, balanced energy protein supplementation, multiple micronutrient supplements during pregnancy, complementary feeding promotion through community education in food secure populations, complementary feeding support including education plus provision of food supplements or conditional cash transfers in food insecure populations, sprinkles (a blend of micronutrients in powder form to prevent and treat iron deficiencies) for home fortification, preventive zinc supplementation, universal salt iodization and universal child immunization. These interventions can impact health and nutrition outcomes among women, newborn infants, children and work through a range of mechanisms.

We estimated the potential impact of these interventions on the prevention of excess nutritional deficits among mothers and children (including excess mortality among susceptible groups) due to the impact of food price increases and food insecurity. We also estimated the potential impact of health and nutrition interventions on child mortality (both predicted excess as well as current) in these East Asia-Pacific countries by implementing a range of health and nutrition interventions detailed above in primary care settings (Table 4). Preliminary modelling of potential pragmatic stepwise increase in these interventions indicate that close to 20% of child deaths could be prevented, more than offsetting the impact of the food price crisis. Providing these interventions universally could reduce the burden of mortality by more than 50%. Of the interventions considered and delivered in our estimates, a significant proportion involves nutrition or related interventions.

DISCUSSION

Several limitations must be recognized in considering our data and their extrapolation to the potential impact of the current crisis. There was little empirical data available from nationally representative studies in Asia to accurately estimate the short and intermediate term impacts of the economic crisis of 1997, especially among various income quintiles. Even less nationally representative information was available on the urban rural differentials and costs of the crisis. We have therefore had to rely heavily on sub-national samples and estimated impacts, some of which have wide confidence bounds. The model applying differential effect size estimates among population subgroups allows us to assess the burden of the current crisis on susceptible populations.

a) Effects and Interventions:

The relationship between economic crisis and food insecurity and health and nutrition outcomes is not linear. Although the direction of anticipated effects on reduced food intake (both quantitative and qualitative), is sound, these effects can be mitigated by many factors, including limited spending for health care and potential increase in the burden of disease and undernutrition. These main strategic directions may include social protection systems, which will be discussed in the following section, and also access to home grown foods and alternatives.

Notwithstanding such measures, the impact of energy, protein and micronutrient intakes in susceptible populations, especially pregnant women and young infants is significant. Women led households bear the brunt of the effects of food insecurity and poverty associated poor health care. A recent study on the data from 123 Demographic and Household Survey (DHS) covering 59 countries – including 14 from Asia – reported that “infant girls may experience almost three times higher increased mortality than boys for a given change in per capita GDP,” a significant variation by any measure (World Bank, 2009b).

The impacts of the 1997 Asian crisis provide a reasonable basis for estimation of potential impacts of the current global food and economic crisis on child health and nutrition in East Asia. Indonesia, the fourth most populous country in the world, and the Republic of Korea, the world’s eleventh largest economy, were engulfed in the 1997 crisis. Inflation caused consumer price indexes to rise and reduced real incomes, unemployment rates went up, poverty incidence increased and income inequality widened (ESCAP/ADB/UNDP 2008). In other instances, the impact on physical health, particularly on children, was more apparent. The proportions of underweight schoolchildren and low birth weight newborns rose, particularly among the people living below the poverty line and the unemployed (Thavornvanchai & Wongkongkathep, 1999).

We found the country case studies (Macfarlane Burnet Centre for Medical Research 2000) extremely helpful especially as they provided qualitative information from representative samples and indicated that the crisis had indeed affected a range of public sector responses such as health sector spending and costs of drugs. In addition, household behaviours and care seeking practices also changed leading to increased self care, reduced care seeking and rise in rates of undernutrition. Although sufficient data was not available from all countries, the available evidence indicates that maternal anaemia, micronutrient deficiencies and possible mortality from causes such as tuberculosis did increase in its wake. Although trend data on wasting and stunting were not available, despite the crisis affecting the entire region, there was a continued decline in rates of undernourishment in the region, except among the most affected countries (FAO 2008). This resilience was primarily because of the ongoing and largely uninterrupted measures taken to reach the Millennium Development Goals as well as conscious efforts on the parts of

governmental as well as non-governmental organizations to actively try to prevent the rise in undernutrition among children during the crisis. These findings are indirect evidence that large scale evidence based interventions and effective policies can mitigate the effects of an economic crisis.

These measures can have benefits that extend well beyond the short-term. The association between child and maternal under nutrition with human capital and risk of diseases is well established (Victora et al., 2008). Fetal under nutrition and low birth weight are associated with reduced human capital and impairments that could affect future generations. Chronic diseases are especially common in undernourished children. Recent rises in food prices have been dramatic, hitting the poor hardest. As government expenditure on food subsidies decline, undernutrition worsens and young children suffer the most. If people must pay for health care and education and also buy food from the same budget, health care and education will be foregone, resulting in higher infant and maternal mortality ratios; lost opportunities for children, in particular, to be educated; stunted mental and physical development of children due to undernutrition; and a less healthy and productive workforce. Lost economic productivity results in, microcosmically, low-to-no chance of improvement of personal socioeconomic conditions, and on a macrocosmic scale, perpetuation of the economic crisis. On both levels, it ensures the vicious cycle of poverty, undernutrition and 'lost economy' continues if nothing is done to break it.

Various systematic reviews provide sufficient evidence that there are interventions that can address maternal, newborn and child health and survival in primary care settings and affect mortality through several pathways including prevention of micronutrient deficiencies, low birth weight, stunting and acute wasting.

The benefits of evidence based low cost interventions to improve maternal and child undernutrition and health outcomes has been extensively reviewed recently (Bhutta et al., 2005; Darmstadt et al., 2005; Kerber et al., 2007; Bhutta et al., 2008a). In particular, it is recognized that appropriate delivery strategies in primary care settings, employing a range of health workers can reduce morbidity and mortality (Bhutta et al., 2008b). Thus maternal micronutrient supplements coupled with balanced energy protein foods for undernourished, food insecure women may sustain health and nutrition during pregnancy and reduce anaemia rates. Similar benefits may accrue from adjunctive deworming therapy during pregnancy. The benefits of promoting immediate and exclusive breastfeeding on newborn and young infant survival are well established and must be a focus within community education and outreach programmes. Although challenging, addressing optimal infant and young child feeding strategies in food insecure households through food supplements and conditional cash transfers has shown remarkable benefits in many food insecure populations (Bhutta et al., 2008a). These specific nutrition interventions must be coupled with appropriate recognition and case management of common illnesses in health system settings so as to mitigate the negative impact of increased susceptibility to respiratory infections and diarrhoea as well as key preventive programmes such as child immunization. Ensuring that outreach programmes at primary care facilities have well trained staff, established protocols and essential commodities such as oral rehydration solution, zinc supplements and antibiotics are key elements in the response to crises and humanitarian disasters.

b) Social Policy Implications:

A focus on the evidence based interventions outlined above must go hand in hand with government efforts to reduce disparities in access to healthcare to holistically mitigate the impacts of the crisis on health and nutrition. Maintaining demand and access to healthcare

among vulnerable and poorer populations assumes added significance during a crisis. This requires an active commitment on the part of governments throughout the region to implement and continue with healthcare schemes which make this possible; particularly so in a region where most countries are still grappling with the issue of access to primary healthcare. A number of effective schemes from within the region show that this is possible.

The system of free universal coverage of healthcare in Thailand and the policy to provide free healthcare to children under six years of age in Vietnam are excellent examples of social protection schemes that help maintain access of children in poor families to health care, even during times of crises. These schemes are complemented by supply side interventions such as universal child immunization and salt iodization to cushion the overall impact of crises on child health and nutrition. Similarly, for low-income countries, the Child Money Program in Mongolia is a good example of a targeted conditional cash transfer scheme for children. Through his program, children aged 0-18 years are provided with cash transfers of US\$ 2.60 per child each month, conditioned on mandatory immunizations, living with parents, not being engaged in intolerable forms of child labour, and enrolling in schools (World Bank, 2006).

The other channel through which the global economic meltdown will impact healthcare provision in poorer East Asian Countries will be through reduced development aid and assistance, thus making it likely that social sector spending and consequent health and nutrition outcomes may be significantly affected. When a poor country is asked to further economize or undergo fiscal austerity measures, it may not have much excess to squeeze which results in reduced expenditure on health, education, and social services. While such constraints to fiscal space are unavoidable during times of crisis, lessons from the 1997 Asian economic crisis provide evidence of how catastrophic effects on health and nutrition were averted due to the active commitments on the part of East Asian governments to minimize the impacts on healthcare spending. Indonesia's Health Care Subsidies program which offered a number of free services to card holders (such as prenatal care and birth assistance, among others) was somewhat effective in increasing the utilization of public health services. Constraints in fiscal space also led to innovative solutions to cope with this. The Thai government launched its "Good Health at Low Cost" strategy in 1997 which cut the capital costs of healthcare from 38.7 % of the total budget in 1997 to 11.5 % in 2003. But budgets for essential services and programs were maintained in doing so (World Bank, 2009b).

Given these implications, the critical issue is one of recognition of the risk of these issues, preparedness and institution of social safety nets with evidence based interventions targeting susceptible women and children. A range of delivery strategies exist which can be used to address the health and nutrition consequences of food price increases and economic crises in both the short and long term. But most importantly, with respect to interventions as well as social policy schemes for healthcare, government commitment is crucial in mitigating adverse impacts of exogenous shocks on the health and nutrition outcomes of women and children.

CONCLUSIONS

Notwithstanding the limitations considered above, our analysis and review indicate that food and economic crises have the clear propensity to lead to significant deterioration of the health and nutrition of mothers and children in poor communities in the short term, as the experience of the 1997 Asian financial crisis indicates. It is also evident that not all sectors or countries were affected equally and several countries appear to have escaped significant financial and social sector impacts. However, an analysis of available data from specific sub-national studies and trends of health and nutrition indicators suggest that the impact was significant in several moderate to severely affected

countries. Systematic reviews provide sufficient evidence that there are interventions that can address maternal, newborn and child health and survival in primary care settings. Appropriate social protection health policy frameworks prioritizing low-cost, high impact measures such as universal child immunization, breastfeeding, salt iodization, and provision of Vitamin A supplements can mitigate or eliminate adverse child health, nutrition and mortality effects of a crisis.

Progress towards achieving the MDGs may be stalled in many countries. Disease specific initiatives have weakened health systems and limited efforts to improve maternal and child health. As we enter this era of scarce resources, there is a need to return to the foundations of the Alma Ata Declaration signed thirty years ago with the goal of providing universal access to primary healthcare.

But despite an increased risk of reversion in progress towards achieving the MDGs because of these crises, it is worth remembering that association is not causality. A drop in GDP per capita does not necessitate a deterioration of health outcomes such as child mortality nor an increase in undernutrition, stunting, and wasting. The use of appropriate, cost effective policies can protect children from the adverse health and nutrition consequences of the economic downturn. These low cost policies - such as immunization, micro-nutrient supplementation (iodised salt, vitamin A and zinc for children, and iron folate for pregnant and lactating women), behavioural change programmes such as knowledge of the “Facts for Life” including the importance of breast feeding oral rehydration during episodes of diarrhoea, and sleeping under bed nets in malarial areas – are very well know and have been extensively described elsewhere (WHO/UNICEF 2006). The onset of the crisis greatly accentuates the importance of their rapid universal implementation an urgent social priority.

AUTHORS’ CONTRIBUTIONS

ZB & MP conceived of the study and assisted FB in the literature review and analysis. The manuscript was written by all three and SJT with additional statistical analysis by AF & AR.

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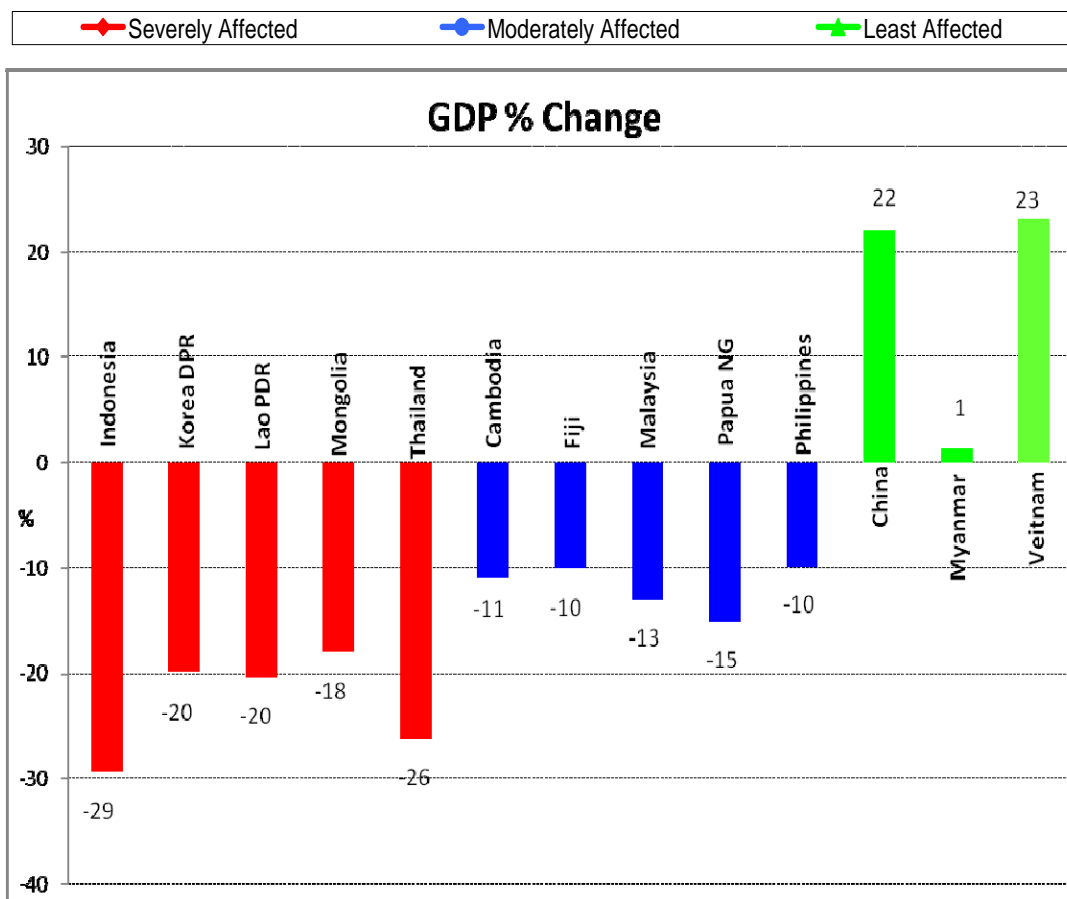
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Figure 1: Categorization of the various countries based on GDP per capita (current prices, US\$) change during the 1997-98 crisis



Source: IMF World Economic Outlook Database, 2008

Figure 2: Under 5 Mortality Rates (per 1000 live births)

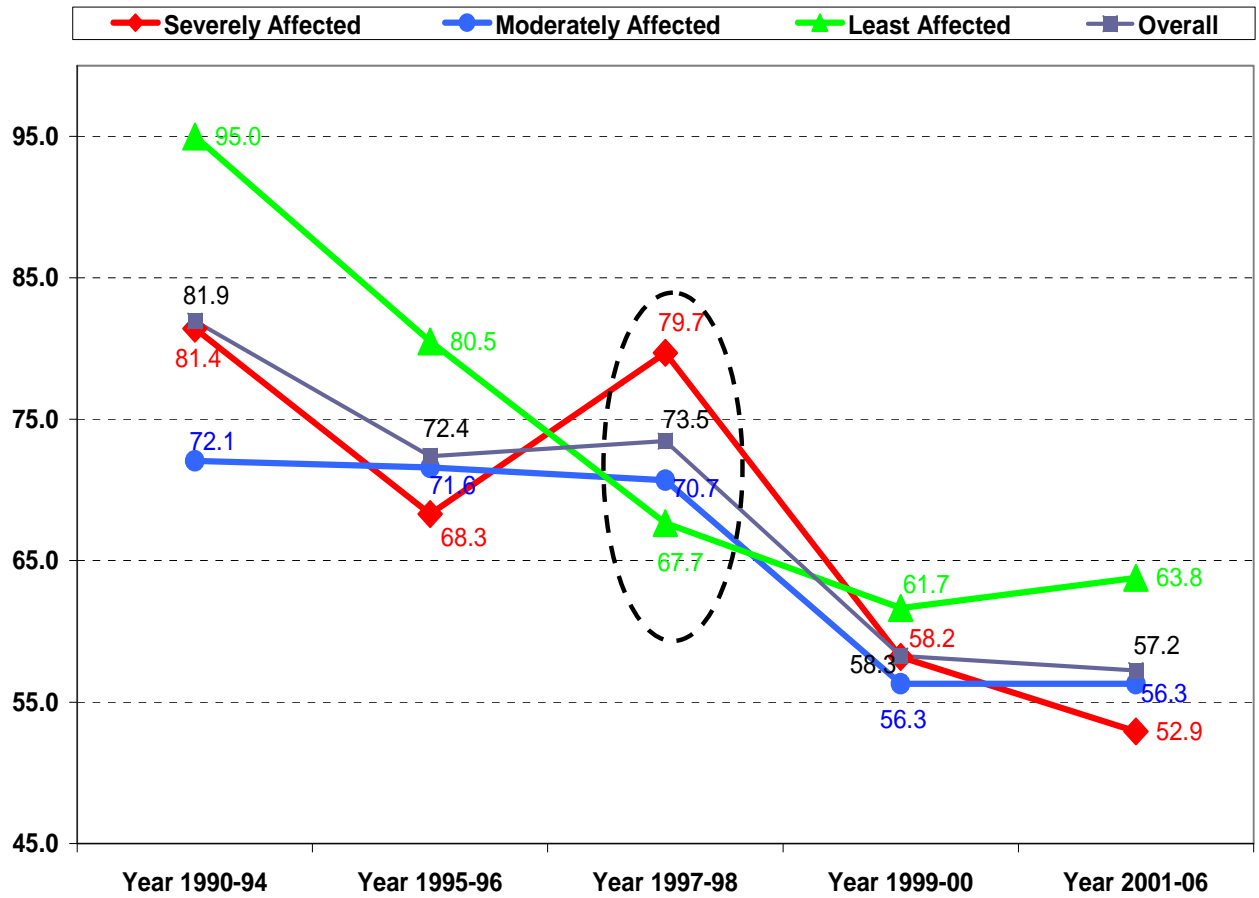


Figure 3: Undernourishment trends in East Asia and Pacific regions [Adapted from FAO 2008]

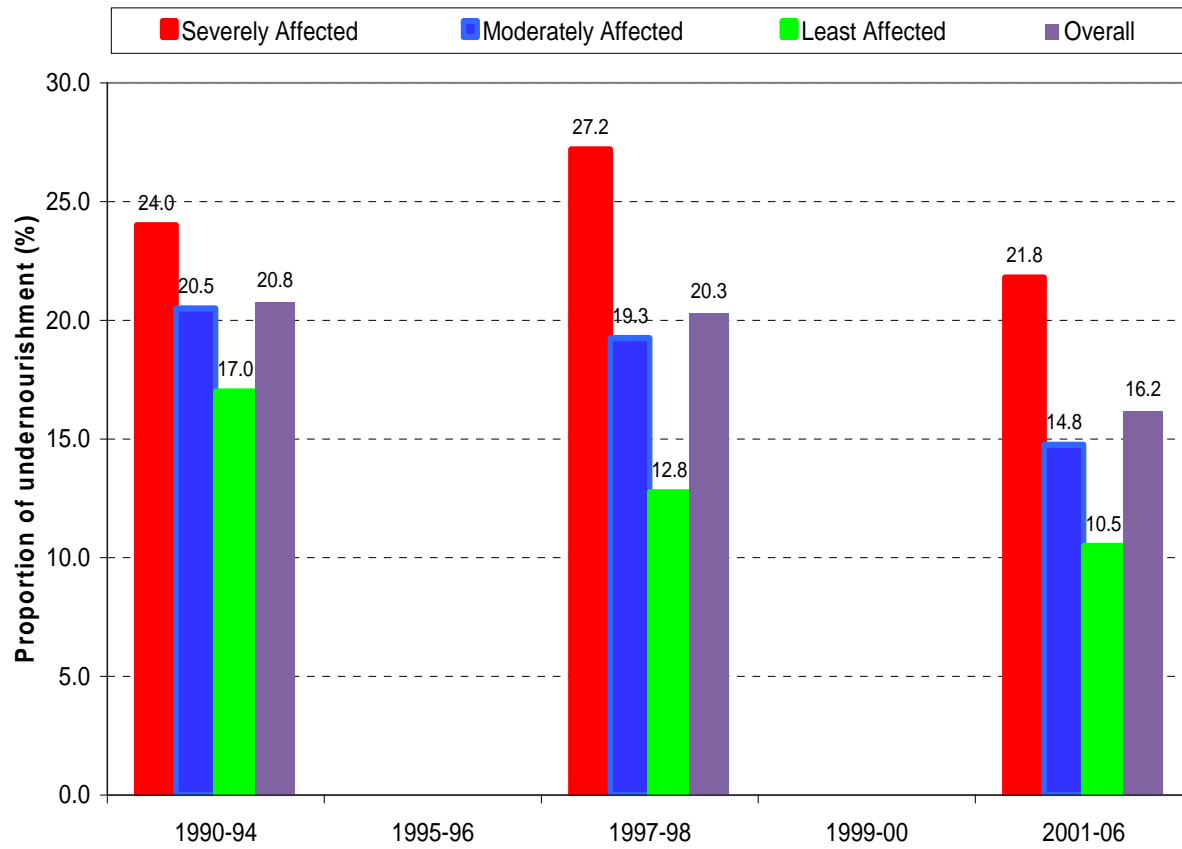


Table 1: Macroeconomic changes (% Change between 1995-96 and 1997-98)

All Countries	GDP/capita (current prices, US\$)	GNI/capita (current, prices US\$)	Inflation	Unemployment (% of total LF)
Cambodia	-10.9%	1.8%	33.1%	
China	22.1%	30.5%	-92.1%	0.0%
Fiji	-10.1%	-5.3%	76.4%	
Indonesia	-29.4%	-16.0%	290.9%	50.0%
Korea	-19.9%		27.1%	
Lao	-20.5%	-8.0%	187.0%	
Malaysia	-13.0%	-3.3%	19.0%	0.0%
Mongolia	-18.0%	11.5%	-55.7%	
Myanmar	1.3%		69.7%	
Papua NG	-15.2%	-17.0%	-39.4%	
Philippines	-10.0%	3.6%	-11.2%	20.0%
Thailand	-26.2%	-16.2%	17.3%	100.0%
Timor-Leste				
Vietnam	23.2%	25.5%	-51.2%	25.0%
Mean	-9.7%	0.6%	36.2%	32.5%
S.D	16.3%	16.2%	104.7%	37.9%
S.E	4.5%	4.9%	29.0%	15.5%
C.I (Upper)	-0.9%	10.2%	93.1%	62.8%
C.I (Lower)	-18.6%	-8.9%	-20.7%	2.2%

Source: IMF World Economic Outlook Database, 2008

Table 2: Health and Nutrition Impacts of the Asian Economic Crisis of 1997-98 (Macfarlane Burnet Centre for Medical Research 2000)

Parameter	Thailand	Philippines	Vietnam	Indonesia	Lao PDR
Food Price	↑	↑	↔	↑(200-300 times)	↑ (5-10 times)
Anemia in pregnant females	↑	-	-	-	-
Malnourishment in children	↓	↓	↓	↓	↔
Micronutrient deficiency	-	-	-	↑	-
Wasting in poor women	-	-	-	↑	-
Morbidity & Mortality	-	↑ in TB*	↑ in TB*	↑ in TB*	-
Cost of drugs	↑	↑	↔	↑ by 61%	↑ by 100-300%
Utilization of Public Health Care Facilities	↑Utilization by 15% Introduction of Health Card Scheme ↓Budget for HIV/AIDS by 24.7%	Budget for HIV/AIDS stable	↑Utilization 10% drop in health budget ↑Immunization coverage	↓Utilization ↓HIV budget by 50% ↔Immunization coverage	↑Utilization ↓Immunization coverage
Health care consumption	↑	↔	↓In patient admissions ↑OPD consultations ↓trend among poor (both private and public)	↓ use of both private and public health care ↑ Self or non-treatment	↑OPD and in-patient visits in both private and public sectors

* May be because of improved case finding

- No representative data available

Table 3: Impact of economic crisis on childhood immunization coverage and mortality rates (% change between 1995 and 1998)

All Countries	Immunization coverage, BCG(% of one-year-old children)	Immunization coverage, Polio 3(% of one-year-old children)	Immunization, DPT (% of children ages 12-23 months)	Immunization, measles (% of children ages 12-23 months)	Infant Mortality	Mortality rate, under-5 (per 1,000)
Cambodia	-0.7%	26.4%	14.6%	-13.6%	-3.7%	-4.1%
China	1.8%	3.0%	4.3%	1.8%	0.0%	0.0%
Fiji	-4.0%	-11.1%	-11.3%	-20.2%	-2.5%	-2.1%
Indonesia	2.4%	0.0%	4.3%	7.0%	-12.4%	-15.1%
Korea	-14.2%	-7.1%	-29.8%	-29.1%	0.0%	0.0%
Lao	-7.3%	3.0%	2.7%	-2.1%	1.0%	-9.2%
Malaysia	-0.5%	-0.5%	0.5%	0.0%	-13.6%	-19.2%
Mongolia	2.7%	6.3%	4.5%	6.4%	87.5%	106.9%
Myanmar	3.8%	5.3%	4.7%	5.4%	-23.3%	-24.3%
Papua NG	0.6%	-34.1%	-11.0%	68.2%	8.2%	8.2%
Philippines	8.3%	15.6%	11.0%	7.4%	-11.1%	-6.6%
Thailand	1.0%	1.1%	1.1%	2.2%	5.2%	7.1%
Vietnam	-1.0%	0.5%	1.1%	0.5%	-6.0%	-4.5%
Mean	-0.5%	0.6%	-0.3%	2.6%	2.3%	2.9%
S.D	5.6%	14.0%	11.4%	22.7%	27.0%	32.7%
S.E	1.5%	3.7%	3.0%	6.1%	7.5%	9.1%
C.I (Upper)	2.4%	8.0%	5.7%	14.5%	16.9%	20.6%
C.I (Lower)	-3.5%	-6.7%	-6.2%	-9.3%	-12.4%	-14.9%

Table 4: Effect of nutrition interventions on under nutrition by wealth quintiles

Nutrition Indicators	Inflated prevalence following crises (%)		Impact of nutrition interventions at pragmatic coverage				Impact of nutrition interventions at Universal coverage			
	Poorest two income quintiles	Next two quintiles (excluding highest)	Poorest two income quintiles		Next two quintiles (excluding highest)		Poorest two income quintiles		Next two quintiles (excluding highest)	
			Reduction factor (%)	Prevalence (%)	Reduction factor (%)	Prevalence (%)	Reduction factor (%)	Prevalence (%)	Reduction factor (%)	Prevalence (%)
Undernutrition Prevalence										
Maternal anemia (%)	79	25.3	11.7	69.9	8.8	23.1	38.6	48.6	30.5	17.6
Low birth weight (%)	12.1	8.4	14.4	10.4	10.4	7.5	47.5	6.4	36.0	5.4
Stunting (%)	44.9	19.6	25.6	33.4	10.8	17.5	66.9	14.9	69.9	5.9
Wasting (%)	10.0	6.5	18.1	8.2	13.2	5.6	35.9	6.5	18.4	5.3
Impact on child mortality										
Neonatal mortality rate *	326	198	42	13.0	39	19.8	180	55.2	77	39.0
Post-neonatal under 5 mortality rate*	149	90	33	22.0	25	27.9	77	51.4	39	43.8
Total under 5 mortality rate*	475	289	75	16.0	64	22.2	257	54.0	116	40.7

Table 5: GDP per capita change

Country	1995	1996	1997	1998	1999	2000
Cambodia	304.832	300.893	284.712	254.812	281.177	288.125
China	601.008	699.41	770.59	817.147	861.212	945.597
Fiji	2,592.56	2,715.26	2,694.90	2,076.75	2,321.54	2,069.87
Indonesia	1,143.72	1,264.35	1,184.03	516.014	745.792	806.898
Korea, DPR	11,469.77	12,257.77	11,473.81	7,528.45	9,557.89	10,890.91
Lao People's Democratic Republic	382.103	388.132	357.497	255.216	285.6	328.711
Malaysia	4,358.45	4,836.12	4,693.25	3,303.27	3,537.53	3,991.92
Myanmar	122.631	108.742	100.349	134.125	172.742	177.64
Mongolia	631.015	597.893	527.518	480.073	441.295	455.634
Papua New Guinea	1,025.69	1,111.15	1,036.94	776.075	694.59	686.44
Philippines	1,104.99	1,206.14	1,170.32	910.436	1,018.88	994.291
Thailand	2,825.74	3,037.52	2,496.14	1,828.67	1,984.94	1,966.75
Timor-Leste, Dem. Rep. of	n/a	n/a	n/a	n/a	342.806	384.111
Vietnam	288.032	337.073	379.174	390.646	378.65	401.38
International Monetary Fund, World Economic Outlook Database, October 2008						

Source: IMF World Economic Outlook Database, 2008

Table 6: Modelled impact of food price crisis and insecurity on health and nutrition outcomes

Nutrition & Mortality Indicators	Baseline (Year 2006)	Increased after crises if un addressed	%Impact in poorest quintiles if un addressed	%Impact in richest quintiles if un addressed
Maternal anemia	43.0%	15%	20%	10%
Low birth weight	10.0%	7%	10%	5%
Stunting	34.0%	5%	7%	3%
Wasting	6.0%	12%	16%	8%
Under 5 mortality rate	62	9%	15%	3%