

DRAFT WORKING PAPER  
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6-7 JANUARY 2009,  
SINGAPORE



Impact of the  
Economic Crisis on  
Children

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## ABBREVIATIONS

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
DHS	Demographic and Health Surveys
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GNP	Gross National Income
IFPRI	International Food Policy Research Institute
MCH	Maternal and Child Health
MICS	Multiple Indicators Cluster Survey
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization
LF	Labour Force
MeSH	Medical Subject Heading
MDG	Millennium Development Goals
PDR	People's Democratic Republic
WB	World Bank
USA	United States of America

*“If a crisis were to occur, today’s volatile and challenging financial environment will make crisis management even more difficult. Poverty and income disparity have widened over the past decade, laying the foundations for another social crisis should economic growth suddenly stall. A repeat of the Asian crisis today might hence be more long-drawn and severe than the 1997 one. Most importantly, despite reform, corruption is still endemic in many Asian countries, making a reversal of all the progress possible. Despite improved macroeconomic fundamentals, Asian economies are not out of the woods yet; more needs to be done, and more needs to be learnt, before we can say that the specter of another Asian crisis is truly remote”.<sup>1</sup>*

These were the prescient words in the winning essay of two young students in early 2007. One year on and large swathes of the world, both developed and developing countries, are engulfed in one of the worst sequential series of food, fuel and economic crises ever witnessed.

This report identifies the possible impacts of the current crisis on child health and nutrition in East Asia and the Pacific region, placing the findings in the context of a framework showing the complex cause and effect relationships of various child and maternal nutrition and health indicators as the findings from last Asian economic crisis of 1997. The report also identifies possible social security measures and remedial interventions which could help ameliorate these impacts.

## **Paper Outline**

**Section I** is an overview of the methods and materials used in the development of the paper.

**Section II** gives a brief introduction to the East Asia and the Pacific regions, its achievements of the Millennium Development Goals (MDGs) of reducing poverty and hunger, as well as related MDG 4 and 5 for child and maternal health outcomes.

**Section III** elaborates on the link of poverty, nutrition, disease and death, as well as the specific impact of economic crises and food insecurity on child health and nutrition and their consequences.

In **Section IV**, we consider a variety of macroeconomic, health and nutritional indicators and their impacts during the 1997 Asian Economic Crisis, as obtained from various data sources.

**Section V** extrapolates these finding for estimating potential impacts of the current food and economic crisis on vulnerable populations in East Asia and Pacific region.

**Section VI** discusses the role of various interventions and social safety nets, as well as the consequences and costs of not doing anything.

## Section I

### Materials and Methods

We conducted an in-depth analysis of the current food and economic crisis and its possible impacts on child health and nutrition in the selected world regions. We undertook this exercise using the following:

1. A systematic review of Pub Med and Medline for available publications using the following key words and MeSH link terms: food crisis, poverty, nutrition, 1997 economic crisis, food price hike, health and nutrition in children, impact, costs, vulnerable groups, interventions, food aid, East Asia, Pacific region, malnutrition, child health, food security, wasting, stunting, maternal anemia, maternal body mass index and maternal malnutrition.
2. A review of the available literature on the Asian Economic Crisis of 1997 and its various impacts on health and nutrition outcomes in East Asia. We reviewed the literature relating child health and nutrition impacts of the 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<sup>2</sup>, notably Indonesia, Philippines, Thailand, Vietnam and Lao PDR. There was wide disparity in available information. Indonesia, Thailand and Philippines were among the countries for which maximum data was available.
3. We reviewed historical data related to the impacts of similar food and acute poverty crises in the past especially those where health and nutrition impacts were measured. We analyzed available WHO, UNICEF, UNESCO, ADB, AusAID, FAO and World Bank reports, various published studies, as well as a wide range of sources from governmental and non-governmental organizations using Google Scholar.
4. In order to compute time trends and potential impacts of the economic and food security data, we constructed sequential data sets of macroeconomic, food security, nutrition, and health and mortality data for the fourteen East Asian countries from established data sources containing standardized and verified national data based on representative surveys. These sources include DHS, MICS or representative household food and consumption data from FAO and IFPRI databases.
5. We subdivided the fourteen countries into three groups based on their percentage change in GNI during and immediately following the 1997 crisis as follows, details of which are mentioned in **Table 1**:  
Group 1: severely affected (decrease > 18%)  
Group 2: moderately affected (decrease 10-18%)  
Group 3: least affected (decrease < 10% or increase)
6. In order to evaluate potential intervention strategies that might help ameliorate the impact of the current food and economic crises on health and nutrition outcomes, we also undertook a review of existing evidence based interventions that have been used to address various maternal, newborn, child survival and nutrition indicators. We focused on interventions that impacted delivery strategies across the continuum of care and primary

care settings, especially among poor and food insecure populations, referring to the Lancet series of Child Survival and Nutrition.<sup>3-7</sup>

7. Representative and standardized data from each country was not available, therefore we assessed the existent formal and informal social safety nets that had been put in place during the Asian Crisis of 1997, such as conditional cash transfers and supplementary feeding programs as well as other interventions. We attempted wherever possible from available data to estimate the potential impact of these interventions in ameliorating the health and nutrition outcomes. Because the impact of the food and economic crisis is not uniformly distributed within a population, we assumed no effect on the richest quintile of the population and modeled graded effect estimates on the rest of the population.

**Table 1: Categorization of Countries based on GDP change during the Asian Economic Crisis**

CATEGORIES	% CHANGE IN GDP	COUNTRIES
Most affected	-22.8%	Indonesia, Korea DPR, Lao PDR, Mongolia, Thailand
Moderately affected	-11.8%	Cambodia, Fiji, Malaysia, Papua New Guinea, Philippines
Least affected	15.5%	China, Myanmar, Timor-Leste, Vietnam

## SECTION II

### Introduction to East Asia and Pacific Regions and their state of Maternal and Child Health and Nutrition

The East Asian and Pacific regions have experienced unmatched socio-economic development over the last few decades with annual growth rates frequently exceeding 6-8%.<sup>8</sup> However, the fruits and benefits of development have not reached all sections of society uniformly and there is considerable inequity in health and nutrition outcomes. These subgroups of disadvantaged people, especially women and children, marginalized groups including elderly, disabled and unemployed are especially vulnerable to the adverse effects of the current increases in food and fuel prices that have occurred within a relatively short span of time. The situation is particularly challenging for developing countries in Asia and the Pacific, as they do not have adequate or well developed social protection systems which could ameliorate the impact of such economic shocks.

The major countries included in the East Asian and Pacific regions are: Cambodia, China, Fiji, Indonesia, Korea, Lao, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Thailand, Timor-Leste and Vietnam. All these countries have faced tremendous challenges during the last decade, notably the great Asian Economic Crisis of 1997-98, which had notable impacts on various sectors of the population.

Child and maternal under nutrition have remained relentless conditions in developing countries. With twenty eight per cent of children under age five being underweight, the Asian and Pacific regions are far behind their Millennium Development Goal targets of reducing hunger. In certain countries in these regions, the percentage of underweight children approaches 50%. Many of these children are also born underweight. With the continuous cycle of malnutrition, underweight and malnourished girls grow up to become undernourished mothers of underweight babies contributing to the increasing morbidity and mortality in the region.<sup>9</sup>

**Tables 2 and 3** indicate the current status of child and maternal survival, and nutrition indicators for the region in comparison with corresponding information for South Asia and Sub-Saharan Africa. These data clearly indicate that contrary to common perceptions and the huge influence of China on regional statistics, the overall health and nutrition statistics of east Asia still indicate high burden of child undernutrition, morbidity and mortality.



**Table 2: Current status of child survival, and nutrition indicators for South and East Asia and Sub Saharan Africa<sup>10</sup> (including unpublished data from State of the World's Children 2009 forthcoming)**

<b>Year 2007</b>	<b>South Asia</b>	<b>East Asia &amp; Pacific</b>	<b>Sub-Saharan Africa</b>
Under 5 Mortality rate (per thousand live births)	78	27	148
Annual number of deaths in children under 5 (million)	3.0	0.8	4.5
<b>Infants and Child Malnutrition Status (%)</b>			
LBW	27	6	15
Stunting	38	16	37
Wasting	18	7	9
Under weight	45	14	28
<b>Feeding Status of Child</b>			
Complementary feeding(6-9 months),%	53	45	68
Exclusive breast feed (<6 months),%	44	43	31
<b>Vitamin A Supplementation (%)</b>			
At least one dose	50	86	77
Two doses	50	86	60
Diarrheal Disease Treatment received (%)	35	61	31
<b>Child Immunization Status up to age 1 years</b>			
Measles	71	90	73
DPT (3 dose)	69	89	73
Hib (3 dose)	--	2	34

**Table 3: Current status of maternal survival, and nutrition indicators for South and East Asia and Sub Saharan Africa (unpublished data from State of the World's Children 2009 (forthcoming))**

<b>Year 2007</b>	<b>South Asia</b>	<b>East Asia</b>	<b>Sub-Saharan Africa</b>
Maternal mortality rate*	500	150	920
<b>Antenatal Care during Pregnancy</b>			
At least once	68	89	72
Four or more visits	34	66	42
<b>Delivery Care for Birth</b>			
Skilled birth attendants	41	87	45
Institutional deliveries	35	73	40
	68	89	72

\* Adjusted rates (year 2005)

## SECTION III

### **Biological basis for impact of food shortages and price increase on health and nutrition**

Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.<sup>11</sup> Food security is essential for sustainable human development. Nutritional status is usually associated with 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. The framework developed by WHO recognizes the basic and underlying causes of under nutrition, including the environmental, economic and sociopolitical factors, with poverty having a central role.<sup>12</sup> Across the regions of Asia and the Pacific, millions of poor and among them, the most vulnerable being children and women, continue to be malnourished. 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 per cent are stunted, 3.6 per cent are severely wasted and 20.7 per cent are underweight.<sup>3</sup> Higher food prices lead to lower caloric intake and an increase in malnutrition. This can have additional negative effects. 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.<sup>13-15</sup>

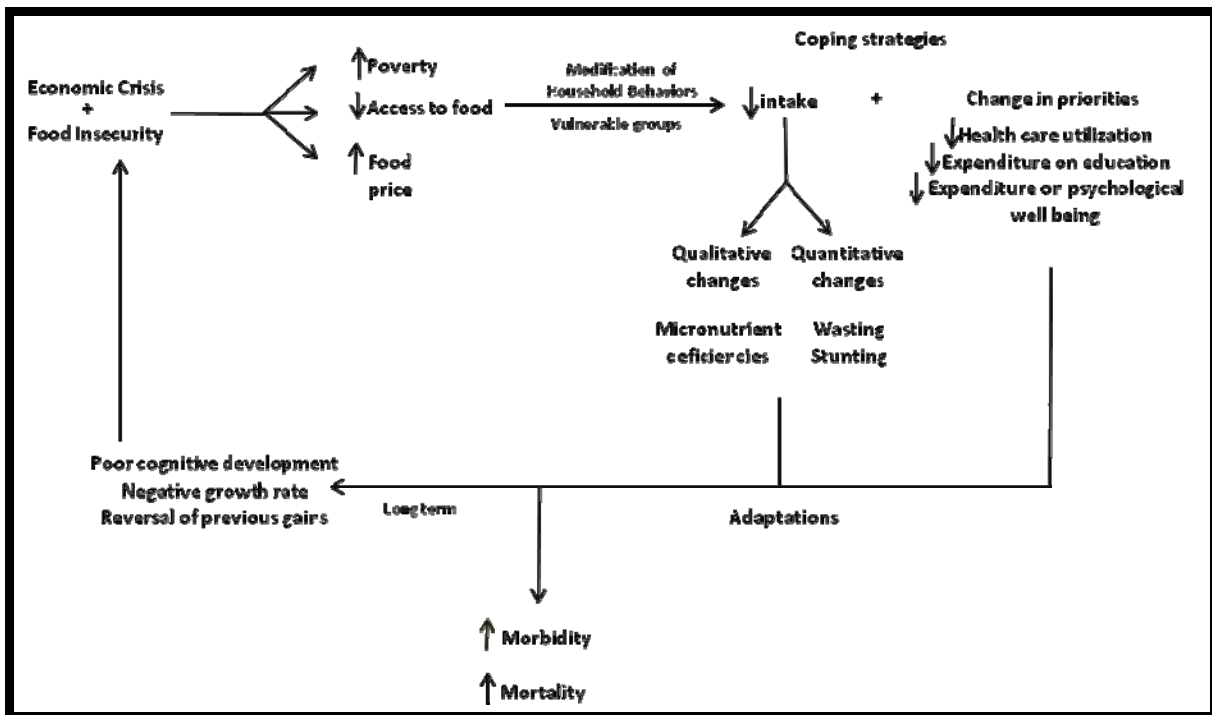
According to the World Bank, a food crisis may have a negative impact on human development in four ways; by increasing poverty and inequality, worsening nutrition, reducing utilization of education and health services, and depletion of the productive assets of the poor. Deterioration in any of these areas is difficult to reverse and may have implications for years, and in some cases generations, to come.<sup>16</sup> Shortages of food due to scarcity or food price increase and limited capacity to absorb the extra costs, can also lead to a range of outcomes outlined in following **Table 4**.<sup>17</sup>

**Table 4: Health and Nutrition Consequences of Stages of Household Food Insecurity<sup>17</sup>**

Increasing deterioration of household food security →								
Livelihood	Diversification/ change in livelihood activities	Reduced expenditure on non-essential or luxury items and sale of non- productive or disposable assets	Children drop out of school and out migration (rural to urban moves)	Increased use of child labor and borrowing and purchasing on credit, becoming indebted	Selling of productive assets	Selling of all assets	Reduced expenditure on essential items (food, water, etc)	Engaging in illegal or hazardous activities as last resort coping
Food related	Change to cheaper, lower quality, and less preferred foods	Reduced diversity of food, poor nutrient intake and favoring certain household members over others for consumption	Reduced size and number of meals	Consuming wild foods, immature crops, and seed stocks	Begging for food	Skippin g entire days of eating	Eating items not part of normal diet (plants and insects)	
Consequences for health and nutrition								
Health outcome	Depletion of micronutrients and lowered immunity		Appearance of clinical symptoms of micronutrient deficiencies such as night blindness, anemia and increased morbidity		Underweight ↑, Maternal weight ↓, Wasting ↑		Early childhood mortality↑	
	Increasing risk of overall mortality →							

The association between child and maternal under nutrition with human capital and risk of diseases is well established.<sup>4</sup> 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. 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 malnutrition, 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 viscous cycle of poverty, malnutrition and ‘lost economy’ continues if nothing is done to break it. **Figure 1** indicates this self perpetuating cycle of poverty, under nutrition and long term outcomes.

Figure 1: The Vicious Cycle of the Economic Crisis



There is recent evidence from developing countries which confirms that rapid increases in food prices and food insecurity lead to rapid increase 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. During the Indonesian financial crisis in 1997-98 wasting and nutritional anemia increased in Javanese women, although without increases in child undernutrition.<sup>18</sup> 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 low birth weight babies and greater levels of stunting and wasting among children.<sup>19</sup> In Zambia during the drought of 2001-02, mothers who experienced high maize prices while pregnant had reduced micronutrient status and correspondingly high stunting increased among infants.<sup>20</sup> In a randomized controlled trial, boys who benefited from a nutritional intervention in their first two years of life earned wages as adults that were 50% higher than those of non- participants. Food price shocks had the reverse effects.<sup>21</sup>

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 (milk, green leafy vegetables and fruits) 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.<sup>22</sup> Recent large scale trials of multiple micronutrient supplements suggest that these may have a small but significant impact on birth weight<sup>5,23</sup> and could also be associated with improved survival in infancy.<sup>24</sup> Other randomized controlled trials of iron-folate supplementation in non-anemic women during the latter part of pregnancy in the USA were also shown to increase mean birth weight by 100-200g.<sup>25</sup> 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.

Such nutritional insults especially if very early in pregnancy, could influence later foetal and infant growth and increase the risk of stunting among those children that survive. The risk of delivering a low-birth-weight baby seems to be set in the first 10 weeks after conception and related to the maternal circulating concentrations of a placental protein, pregnancy-associated plasma protein-A (PAPP-A).<sup>26</sup> Prospective studies during pregnancy in Guatemalan mothers has shown that whereas birth weight is more influenced by weight gain in the second half of pregnancy, birth length is most influenced by weight gain in the first half of pregnancy.<sup>27</sup> A recent prospective cohort study in the US also confirms that variation in birth weight is determined, at least in part, by fetal growth in the first 12 weeks after conception, probably through effects on timing of delivery and fetal growth velocity<sup>28</sup>. Adult height is largely determined by height at two years of age<sup>29</sup>, whereas length growth trajectory during infancy is largely set in uterus<sup>30</sup>. These epigenetic influences on long term health and nutrition outcomes via intrauterine growth may be far more important in the developmental pathway than the acute effects observed and measured during acute crises.<sup>31, 32</sup>

### **Historical evidence of the link of acute poverty and food insecurity to health and nutrition outcomes**

Over the last two decades, a large number of countries, including Indonesia, Mexico, Argentina, Russia, Peru and many African countries, experienced economic crises that led to sharp reductions in incomes and living standards. A growing literature has examined whether these crises had adversely affected maternal and child health (MCH) and nutrition outcomes.

The historical data on the impact of food shortages and economic crises on health outcomes such as survival are mixed. The major economic crisis experienced by Peru in the late 1980s, resulted in a 2.5% rise in infant mortality rate.<sup>33</sup> However, other results from poorer countries with sharper economic fluctuations have yielded mixed results. The collapse in income in many countries of the former Soviet Union in the 1990s was associated with dramatic increases in adult mortality, particularly from alcoholism and suicide, but no obvious change in child health. This could have been related to the strongly egalitarian primary care systems in place for MCH in the Soviet union and former republics. In contrast, the 1997-98 Indonesian financial crisis appears to have led to an increase in infant mortality of about 1.4 percentage points. In Latin America, the financial crisis of the late 1990s in Argentina did not affect the infant mortality rate; whereas there is evidence that the economic crises in Mexico in the 1980s and 1990s did increase mortality for the very young and the elderly.<sup>33</sup> In Mexico, the documented mortality rate was 5-7% higher in crisis years compared with the immediately preceding years.<sup>34</sup> Musgrove et al also found that infant mortality and patterns of children's disease and death were seriously worsened with a decline in economic conditions in the Caribbean.<sup>35</sup>

Food shortages are known to impact most acutely on women during pregnancy. The Dutch famine of 1944-45 showed that even in a previously well nourished population that were receiving food rations, food restriction during pregnancy resulted in significantly lower birth weight, length and head circumference. These effects were most marked among women

exposed to food shortages during the third trimester, especially if food intake dropped below allocated rations.<sup>36</sup> Although the effects of the Dutch famine on birth weight were small (about 100g), many negative consequences of constricted fetal growth appeared, but only later in life. These included increased obesity<sup>37</sup>, increased risk of schizophrenia<sup>38</sup> and behavioral problems<sup>39</sup>, and increased blood pressure and coronary heart disease.<sup>40</sup>

The relationship of food price increases in low income countries to health and nutrition outcomes are complex and depends upon social security nets and public sector response. While it has been shown that economic improvements lead to relatively slow reductions in child under nutrition rates<sup>41</sup>, the converse is not true and the impact of economic deterioration on these outcomes may be very rapid. Women are usually the last to benefit from increasing income, and among the first to be affected by deterioration in financial circumstances and food availability. This may have special consequences on children because of the critical importance of maternal nutrition both for her health and well being, as well as for the survival, growth and development of dependent children.<sup>42</sup>

## SECTION IV

### **The Asian Economic Crisis of 1997 and reported effects on maternal and child health and nutrition outcomes**

The causes and the impacts of the Asian economic crises of 1997-98 have been well studied and documented from several East Asian countries including Indonesia, Korea, Malaysia and Thailand. A detailed description of the genesis of the crisis is beyond the scope of the current review. The crisis formally erupted in April 1997 with the depreciation of the Thai baht triggering a domino effect on the currencies of Indonesia, the Republic of Korea, Malaysia and Philippines. This soon led to a region-wide economic contraction that saw the crashing down of the gross domestic product (GDP) of one country after another. Indonesia, the fourth most populous country in the world, and the Republic of Korea, the world's eleventh largest economy, were engulfed in the crisis. Inflation pressurized consumer price indexes and reduced real incomes, unemployment rates went up, poverty incidence increased, and income inequality widened.<sup>9</sup> 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 having an income below the poverty line and the unemployed.<sup>42</sup>

A series of country specific studies based on sub national samples were commissioned by the AusAID<sup>2</sup> and report on a range of findings of the impact of the economic crisis on health and related outcomes in a standardized manner. **Table 5** summarizes the key findings from these studies and the reported direction of effects. These country case studies 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 behaviors and care seeking practices also changed leading to increased self care and increase in rates of malnourishment. Although sufficient data was not available from all countries, the available evidence indicated that maternal anemia, micronutrient deficiencies and possible mortality from causes such as tuberculosis did increase. Also, there was a continuous decline seen in malnourishment in children, despite the crisis. This was primarily because of the on going and largely uninterrupted measures taken to reach the MDGs as well as due to conscious efforts on the parts of governmental as well as non-governmental organizations to actively try to prevent the rise in malnutrition among children due to the crisis. The symbols for increase (↑), decrease (↓) and stability (↔) represent the cumulative assessments of the various studies taken into account by the AusAID.

**Table 5: Health and Nutrition Impacts of the Asian Economic Crisis of 1997-98 <sup>2</sup>**

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

We reviewed the available country specific information from peer reviewed publications and the grey literature from the development agencies on potential consequences of the 1997 economic crisis from the East Asian countries. Tables 6-10 summarize the available information from additional published literature on the reported effects from various countries in the region on health and nutrition outcomes among vulnerable sectors of the population, especially women and children. These data also support the findings from the country case studies that a range of health and nutrition outcomes were affected, especially among the poor and vulnerable populations such as the urban poor and the unemployed.



**Table 6: Reported Health and Nutrition consequences of the Asian Economic Crisis in Indonesia**

Parameters		Effect		Inequity measures
Macroeconomic <sup>43,44</sup>	GDP	↓	13.3% in 1998	
	Poverty	↑	17% to 40% of population	
	Inflation	↑	6.6% to 58.5%	
	Unemployment	↑	13.4 million workers lost jobs	
	Food Price	↑	200 to 300%	
Health <sup>2,45-49</sup>	Childhood Anemia	↑	50% to 65%	
	Maternal Anemia	↑	15% to 19%	
	Vitamin A	↓	12%	
	Health care consumption	↓	2% by Adults and 7.1% among children	private and public Both Urban and Rural
	Cost of drugs & Medical services	↑	61%	
	Public Health Expenditure	↓	21%	Provincial disparity
	Morbidity	↑	12.8% to 14.6%. ↑TB cases	Urban bias Women
	Immunization coverage	↓	For polio, DPT	
	Infant Mortality	↑	14%	
	Incidence of HIV/STD	↑	STD cases	
Nutrition <sup>50-52</sup>	<5 Malnutrition	↓	34% to 29%	Rural bias
	<5 Wasting	↑		
	Stunting	↓	By 5%	
	Micronutrient deficiency	↑		Women & children
	Adult BMI	↓	0.63%	Poor and women affected more
Others <sup>2</sup>	Political turmoil	↑	Present/ worsened	
	Natural disasters	↑	El Niño	
Government responses <sup>2</sup>	Social Safety Nets	↑	Basic Health Services, Health Card, Health services for pregnant women, Food and Nutrition Interventions	Targeted for poor
	Foreign Aid	↑	34%	

**Table 7: Reported Health and Nutrition consequences of the Asian Economic Crisis in Philippines**

Parameters		Effect		Inequity measures
Macroeconomic <sup>2,53,54</sup>	GDP	↔		
	Poverty	↑	17% to 40% of population	
	Inflation	↑	11.6%	
	Unemployment	↑	10.1%	
Health <sup>55-59</sup>	Vitamin A coverage	↑		
	Cost of drugs & Medical services	↑	By 40%	
	Public Health Expenditure	↓	By 6%	
	Morbidity	↑	Diarrhea rate in elderly doubled	
	Immunization coverage	↓	from 89.8% in 1996 to 74.9% in 1998	
	Infant Mortality	↓	48 to 36 per 1000	Heterogeneous picture with 63% of the country's 16 regions having an IMR higher than the national
Nutrition <sup>2,60</sup>	<5 Malnutrition	↓		
	Micronutrient deficiency	↑	targeted vitamin A, iodine and iron for supplementation., which fluctuated throughout the crisis	
Others <sup>2</sup>	Decentralization	↑		
	Natural disasters	↑		
Government responses <sup>2</sup>	Social Safety Nets	↑	Plan of Action for Nutrition	
	Foreign Aid	↑		

**Table 8: Reported Health and Nutrition consequences of the Asian Economic Crisis in Thailand**

Parameters		Effect		Inequity measures
Macroeconomic <sup>2,61,62</sup>	GDP	↓	-8%	
	Poverty	↑	From 11.4% to 13% of	
	Inflation	↑	8%	
	Unemployment	↑	5.3%	
	Food Price	↑		
Health <sup>2,63,64</sup>	Maternal Anemia	↑	22%	
	Health care consumption Inpatient          Outpatient	↑ esp. children	By 9% By 22%	Public and private sectors
	Household expenditure on health care	↓	By 41%	Non-poor affected more
	Cost of drugs & Medical services	↑		
	Public Health Expenditure	↓	10%	
	Immunization coverage	↔		
	HIV/STD Budget	↓	By 33%	Women and children
Nutrition <sup>2,65</sup>	<5 Malnutrition	↓		
	Low birth Weight	↑		
Others <sup>2</sup>	Natural disasters	↑		
Government responses <sup>2</sup>	Social Safety Nets	↑	Local NGOs Public Assistance and Voluntary Health Card Schemes. Reduction in	
	Foreign Aid	↑	Australia Japan And	

**Table 9: Reported Health and Nutrition consequences of the Asian Economic Crisis in North Korea**

Parameters		Effect		Inequity measures
Macroeconomic <sup>66,67</sup>	GDP	↓	-6.7%	
	Unemployment	↑	8.4%	
	Loss of real income	↑	17%	Poorest people
Health <sup>68-73</sup>	Health care consumption	↓	15.1% outpatient 5.2% inpatient	
	Public Health Expenditure	↓	8% to 7%	
	Morbidity chronic disease Morbidity acute illnesses	↑	27.1% 9.5%	
	Household health expenditure	↓	15.6%	Lowest income strata & unemploy
	Mortality	↑	18.2%	
	Suicide Rates	↑		

**Table 10: Reported Health and Nutrition consequences of the Asian Economic Crisis in Lao PDR**

Parameters		Effect		Inequity
Macroeconomic <sup>2</sup>	Inflation	↑	150%	Civil servant
Health <sup>2,74</sup>	Health care consumption	↑		
	Cost of drugs & Medical services	↑	61%	
	Public Health Expenditure	↓	21%	
	Morbidity	↔		
	Malnutrition	↔		
Nutrition <sup>2</sup>	Adult Malnutrition	↑	Prevalence 15% in	
Government responses <sup>2</sup>	Foreign Aid	↓	27 & 19% (loans & grants respectively)	

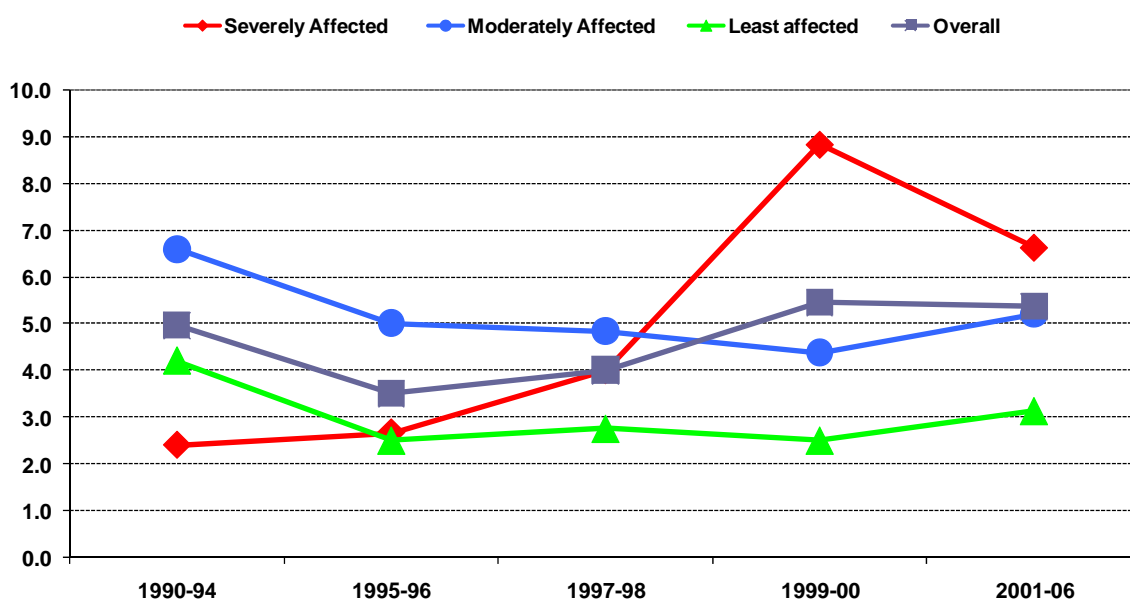
In addition to the above estimates from the available literature, we also estimated relative time trends from available sequential data from the regions. Since all countries were not uniformly affected by the crisis, the affected countries were **categorized into three pre-specified bands according to the estimated impact of the economic crisis on per capita income** (ranging from no economic impact to those which encountered > 18% reduction in income). **Table 11** details the overall effects on income observed during the acute crisis most affected by the 1997-98 economic crises on East Asian countries.

**Table 11: Macroeconomic changes (% Change from 1995-96 to 1997-98)**

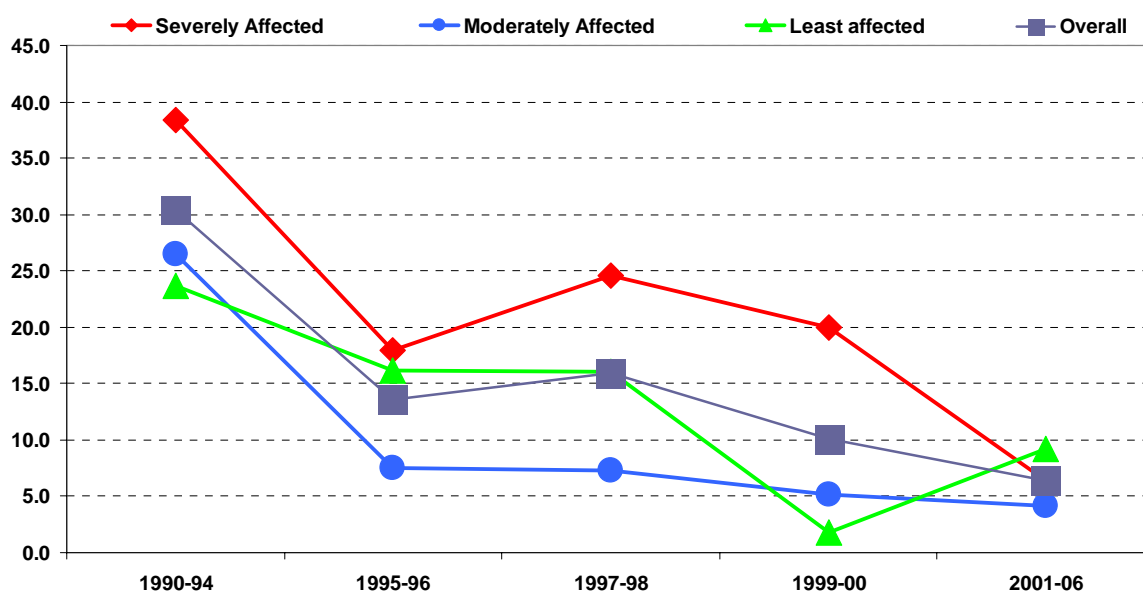
<b>All Countries</b>	<b>GDP/capita</b>	<b>GNI/capita</b>	<b>Inflation</b>	<b>Unemployment (% of total LF)</b>
Cambodia	-10.9%	1.8%	33.1%	
China	22.1%	30.5%	-92.1%	0.0%
Fiji	-10.1%	-5.3%	76.4%	
Indonesia	-29.4%	-16.0%	290.9%	50.0%
Korea	-19.9%		27.1%	
Lao	-20.5%	-8.0%	187.0%	
Malaysia	-13.0%	-3.3%	19.0%	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%
<b>Mean</b>	-9.7%	0.6%	36.2%	32.5%
<b>S.D</b>	16.3%	16.2%	104.7%	37.9%
<b>S.E</b>	4.5%	4.9%	29.0%	15.5%
<b>C.I (Upper)</b>	-0.9%	10.2%	93.1%	62.8%
<b>C.I (Lower)</b>	-18.6%	-8.9%	-20.7%	2.2%

The corresponding trends for unemployment rates and inflation are given in **Figures 2 and 3**

**Figure 2: Unemployment rate (% of work force)**

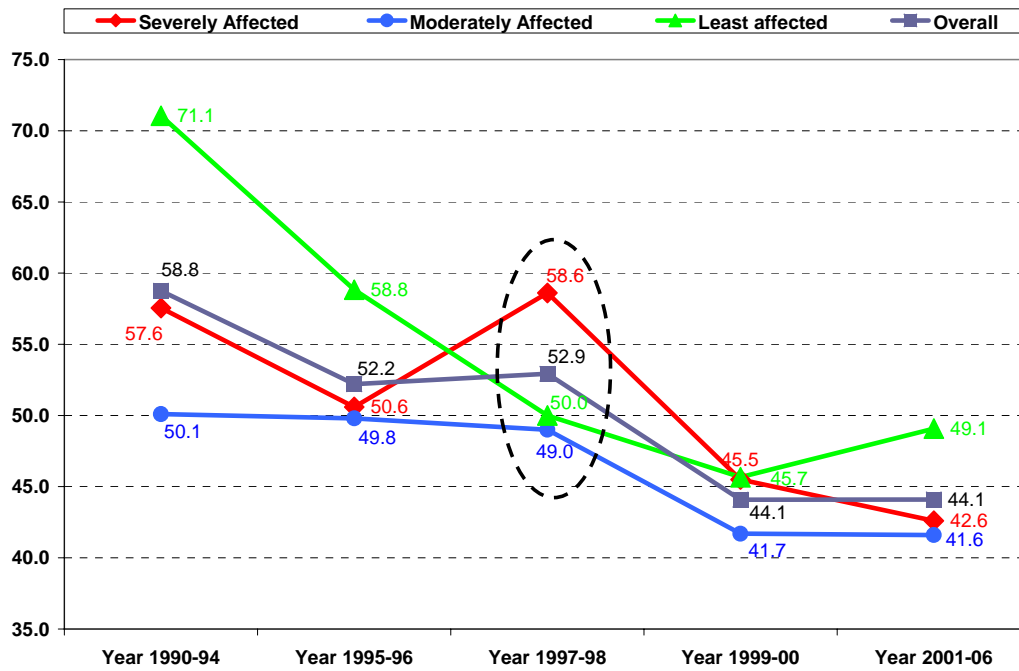


**Figure 3: Inflation rates (%)**

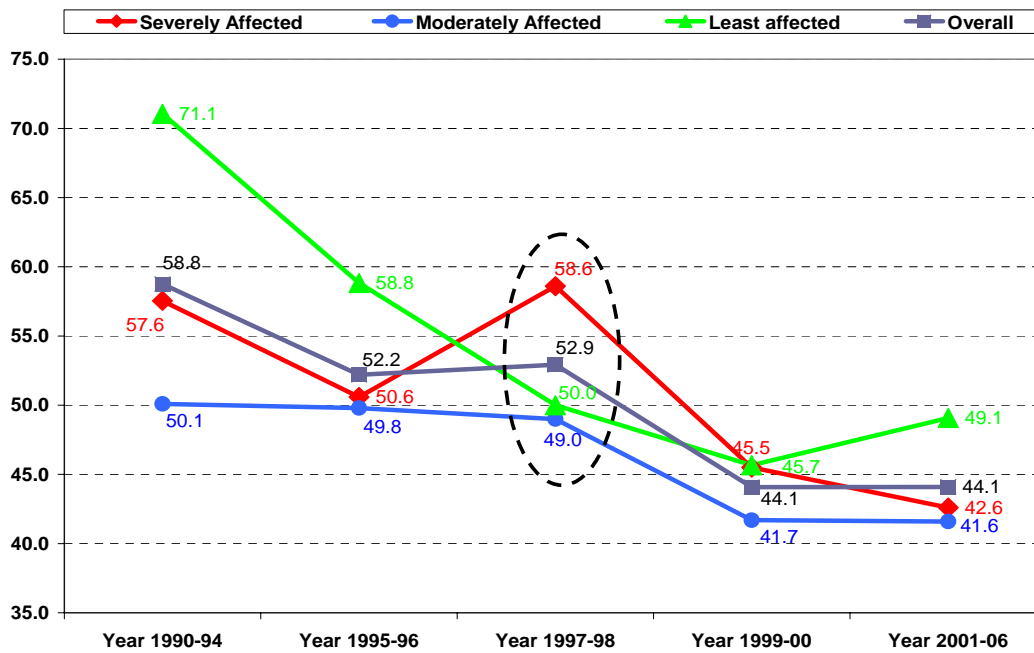


We also estimated the respective changes in infant and under 5 mortality rates over time in the entire range of countries spanning the period of economic crisis (**Figures 4 and 5**).

**Figure 4: Infant Mortality Rates (Infant deaths/ 1000 live births)**

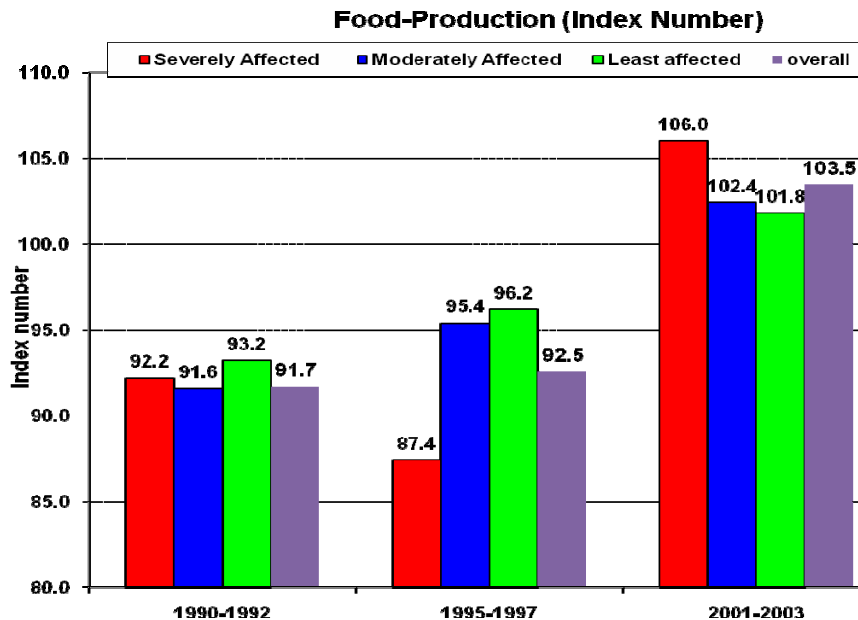


**Figure 5: Under 5 Mortality Rates (per 1000 live births)**



Corresponding information on food production in the countries of the region, defined as a food production index, is indicated in **Figure 6**. The latter estimation is based on production quantities of each commodity weighted by 1999-2001 average international commodity prices and summed for each year.

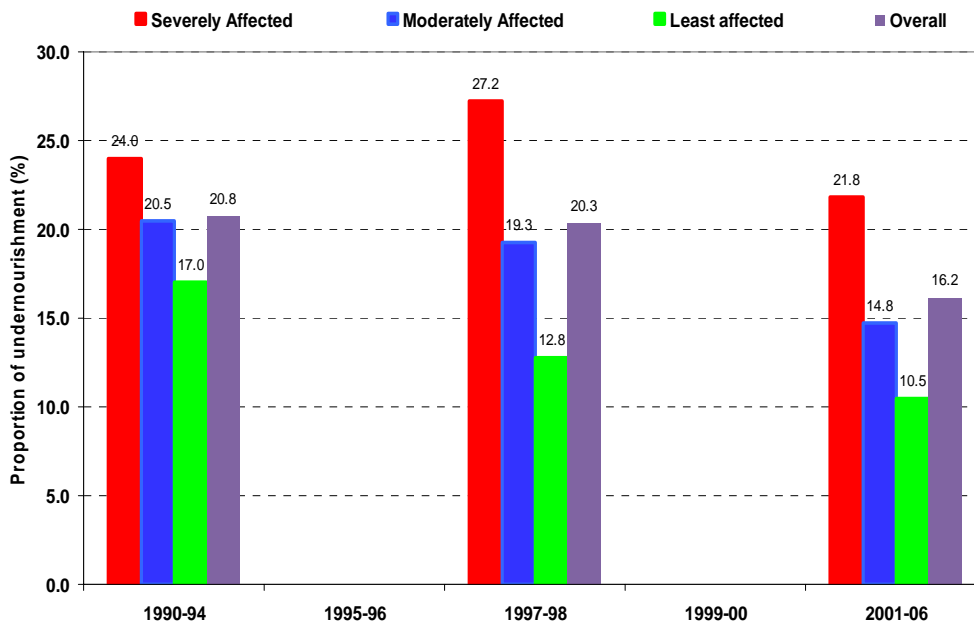
**Figure 6: Food Production (Index Number)**



The FAO defines undernourishment affected populations 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*” and 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. The corresponding impacts on overt maternal and child under nutrition for these time periods are limited to smaller samples, but wherever studied, do suggest that the crisis increased rates of under nutrition and affected mothers earlier than children (probably because of buffering). Poorer sections of the population were affected more than others. A composite measure of undernourishment is indicated in **Figure 7** below.



**Figure 7: Undernourishment trends in East Asia and Pacific regions**



Because few countries have regular nationally representative nutrition surveys spanning specific time spans, we have little information on national impacts of the Asian economic crisis on childhood stunting, wasting and underweight prevalence. Data on health and morbidity outcomes is even scantier. Much of this information is 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 12** summarizes some of the available information on trends in health indicators over the crisis period based on national survey data.

**Table 12: Health impact of economic crisis (% change between 1995 and 1998)**

<b>All Countries</b>	<b>Immunization coverage, BCG(% of one-year-old children)</b>	<b>Immunization coverage, Polio 3(% of one-year-old children)</b>	<b>Immunization, DPT (% of children ages 12-23 months)</b>	<b>Immunization, measles (% of children ages 12-23 months)</b>	<b>Infant Mortality</b>	<b>Mortality rate, under-5 (per 1,000)</b>
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%	-23.7%	-30.8%
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%
<b>Mean</b>	-0.5%	0.6%	-0.3%	2.6%	1.4%	1.7%
<b>S.D</b>	5.6%	14.0%	11.4%	22.7%	27.7%	33.7%
<b>S.E</b>	1.5%	3.7%	3.0%	6.1%	7.7%	9.3%
<b>C.I (Upper)</b>	2.4%	8.0%	5.7%	14.5%	16.4%	19.9%
<b>C.I (Lower)</b>	-3.5%	-6.7%	-6.2%	-9.3%	-13.7%	-16.6%

We estimated the potential impact of the current crisis on a combination of these composite data on mortality and the information summarized above from special studies conducted in representative countries over this time period. There was sufficiently robust and plausible evidence to indicate that the effects were more marked among the poor, vulnerable and marginalized populations. We thus estimated the range of impacts documented in the studies and used these boundaries to estimate potential impacts on susceptible populations (**Table 13**). For simplicity, the upper impact estimate was applied to the poorest two quintiles while we assumed that the lower bound would apply to the upper three quintiles of the population.

**Table 13: Estimated impact of food crises on mortality and nutrition indicators (if unaddressed)**

Indicators	% increase after crisis
Maternal Anemia	10% - 20%
Low birth weight	5% - 10%
Stunting	3% - 7%
Wasting	8% - 16%
Child Mortality	3% - 15%

These estimates suggest that if unaddressed, the food price increase and economic crisis can have a significant impact on health and nutrition outcomes in the short term. Some estimates as to the effects on health and nutrition outcomes in the selected Eastern countries are given in **Table 14** below:

**Table 14: Estimated impact of food price crisis and insecurity on health and nutrition outcomes**

Nutrition & Mortality Indicators	Excess following crisis (%)	Estimated impact in lowest income quintiles (%)	Estimated impact in upper income quintiles (%)
Maternal Anemia	10.5	12.0	8.4
Low birth weight	35.7	45.0	19.6
Stunting	22.4	8.0	9.7
Wasting	49	79.0	25.3

## SECTION V

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 children. These interventions can impact health and nutrition outcomes among women, newborn infants, children and work through a range of mechanisms. A detailed discussion of various interventions that can work is beyond the scope of this paper as these have been summarized in several recent reviews and publications.<sup>5-7, 75-76</sup> **Table 15** lists some of the pathways for action and impacts of nutrition interventions that can revolutionize health and nutrition outcomes.

**Table15: Pathways of interventions for prevention of under nutrition**

	LBW/IUGR births	Stunting	Mal nourishment	Anemia	Current Coverage
Iron folate supplementation					49%
Balanced Energy Protein supplements and nutrition counseling					Almost nil
Multiple micronutrient supplements during pregnancy					Almost nil
Complementary feeding promotion through community education in food secure populations					~ 40%
Complementary feeding support including education plus provision of food supplements or CCTs in food insecure populations					Almost nil
Sprinkles for home fortification					Almost nil
Preventive Zinc Supplementation					Nil
Universal salt iodization					66%

Some of the evidence based interventions that can address MNCH and nutrition outcomes at primary care level are summarized in **Table 16** with the nutrition interventions highlighted.

**Table 16: Interventions Package for prevention of MNCH and mortality outcomes** <sup>36, 71-77</sup>

Maternal	Newborn(0-1 month)	Child(1-59 months)
Balanced Energy Protein supplements and nutrition counseling Iron folate supplementation during pregnancy Multiple micronutrient supplements during pregnancy	Immediate breastfeeding Exclusive breastfeeding Periconceptual folic acid suppl.  Tetanus toxoid immunization  Routine postnatal care and care of LBW infants  Antibiotics for PPROM Cord care and clean delivery Kit Antenatal steroids Neonatal resuscitation Emergency Obstetric care Emergency neonatal care (for prematurity, post asphyxial care) Oral AB: pneumonia Injectible AB: sepsis	Exclusive breast feeding <6 months  Continued breastfeeding beyond 6 months Complementary feeding promotion through community education Complementary feeding support including education plus provision of food supplements or CCTs Vitamin A supplementation Sprinkles for home fortification Zinc Supplementation  Universal salt iodization Insecticide treated Bed nets for Malaria Prophylaxis EPI(excluding Hib)  Hib Vaccine Antimalarials Zinc for diarrhea treatment ORS use  Oral Antibiotics: for pneumonia Promotion of WASH strategies Pneumococcal Vaccine  Anti-retroviral treatment

Nutrition interventions are highlighted in blue, CCT = Conditional cash transfers

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. These impacts tabulated as **tables 17 a and b**, were modeled at two levels of coverage:

1. A pragmatic increase in coverage of interventions by 20% per annum over baseline
2. Universal coverage (at 99%) coverage assuming rapid and comprehensive scale up

**Table 17(a): Effect of nutrition interventions on prevention of maternal and child under nutrition**

Nutrition Indicators	Inflated prevalence following crises (%)	Impact of nutrition interventions at pragmatic coverage		Impact of nutrition interventions at Universal coverage	
		Reduction factor (%)	Prevalence (%)	Reduction factor (%)	Prevalence (%)
Maternal Anemia	49.0	6.2	46.4	34.8	32.2
Low birth weight	10.5	7.5	9.7	42.0	6.1
Stunting	35.7	25.0	26.8	66.5	12.0
Wasting	8.0	13.3	6.9	31.8	5.5

**Table 17(b): 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 (%)
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	8.1	9.7	18.1	6.6	13.2	8.4	35.9	5.2	18.4	7.9

We also estimated the potential impact of health and nutrition interventions on child mortality (both predicted excess as well as current) in these East Asian & Pacific countries by implementing a range of health and nutrition interventions detailed above. We evaluated these impacts at the aforementioned two levels of coverage (pragmatic and universal). **Tables 18 a and b** detail the projected impacts of these packages of interventions on newborn and child mortality if they were implemented in the primary care settings.

**Table 18 a: Preventable under 5 deaths by wealth quintiles**

Death Type	Inflated Deaths following crises ('000)		Preventable deaths at pragmatic coverage				Preventable deaths 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)	
			N ('000)	(%)	N ('000)	(%)	N ('000)	(%)	N ('000)	(%)
Neonatal (0-1month)	326	198	42	13.0	39	19.8	180	55.2	77	39.0
Child(1-59 months)	149	90	33	22.0	25	27.9	77	51.4	39	43.8
<b>Total under 5 deaths</b>	<b>475</b>	<b>289</b>	<b>75</b>	<b>16.0</b>	<b>64</b>	<b>22.2</b>	<b>257</b>	<b>54.0</b>	<b>116</b>	<b>40.7</b>

The impacts of interventions were estimated separately for poorest and next two (excluding richest) income quintiles. Based on available data from global distribution of deaths, the relative distribution of under 5 deaths between wealth quintiles was taken as 53% in lowest two quintiles 36% in next two quintiles and 10% in the highest one.<sup>78</sup>

Table 18b: Preventable cause specific deaths by wealth quintiles

Causes of death	Inflated Under 5 deaths ('000)		Preventable under 5 deaths at pragmatic coverage				Preventable under 5 deaths at universal coverage('000)			
	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)	
			Number ('000)	(%)	Number('000)	(%)	Number('000)	(%)	Number('000)	(%)
<b>Neonatal Causes</b>										
Preterm	111	68	9.0	8.1%	12.0	17.8%	64.1	57.5%	25.7	38.0%
Birth Asphyxia	77	47	4.5	5.8%	6.5	14.0%	43.1	55.9%	17.9	38.3%
Congenital	29	18	0.5	1.6%	0.3	1.6%	2.3	7.9%	1.2	6.8%
Infections	72	44	24.8	34.2%	17.8	40.6%	62.3	86.1%	28.3	64.4%
Diarrhea	5	3	0.5	9.9%	0.3	8.4%	1.4	26.1%	0.9	28.1%
Tetanus	7	5	3.0	40.3%	2.2	47.5%	6.8	90.6%	3.2	71.3%
HIV/AIDS	3	2	0.4	15.9%	0.4	28.6%	2.0	79.2%	1.1	75.2%
Diarrhea	38	23	16.1	42.4%	11.4	50.0%	31.9	84.1%	16.7	73.0%
Measles	5	3	2.0	40.3%	1.2	40.3%	4.5	89.0%	1.8	58.1%
Malaria	3	2	0.6	23.4%	0.4	24.6%	2.3	90.6%	1.4	89.4%
Pneumonia	38	23	13.5	35.7%	11.5	50.4%	34.9	92.2%	18.0	78.7%
Injuries	10	6	0.2	2.0%	0.1	1.6%	1.0	9.9%	0.4	6.6%

Of the interventions considered and delivered above, a significant proportion involve nutrition or related interventions. **Table 19** below details the specific nutrition interventions and their preventive potential on reducing child mortality.



**Table 19: Under 5 deaths prevented alone by nutrition interventions**

Interventions	Preventable deaths at pragmatic coverage				Preventable deaths at Universal coverage			
	Poorest two income quintiles		Next two quintiles (excluding highest)		Poorest two income quintiles		Next two quintiles (excluding highest)	
	N (‘000)	(%)	N (‘000)	(%)	N (‘000)	(%)	N (‘000)	(%)
Immediate breastfeeding	3.1	0.6%	1.5	0.5%	8.3	1.7%	4.7	1.6%
Exclusive breast feeding <6 months	6.1	1.3%	4.1	1.4%	18.7	3.9%	13.1	4.5%
Periconceptual folic acid suppl.	0.5	0.1%	0.3	0.1%	2.3	0.5%	1.2	0.3%
Continued breastfeeding beyond 6 months	1	0.2%	0.4	0.1%	6	1.2%	0.8	0.3%
Complementary feeding promotion through community education	1	0.2%	1	0.3%	3	0.7%	2	0.7%
Vitamin A supplementation	3	0.7%	1	0.7%	14	2.8%	3	1.0%
<b>Total</b>	<b>14.7</b>	<b>3.1%</b>	<b>8.3</b>	<b>2.9%</b>	<b>52.3</b>	<b>11.1%</b>	<b>24.8</b>	<b>8.5%</b>

In summary, this review and data synthesis indicates 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. These effects are especially marked among susceptible sectors of the population, the marginalized poor, especially those in urban settings who cannot resort to subsistence farming like their rural counterparts, nor have social support networks. The effects are also especially notable among women who act as buffers for children by bearing the brunt of acute food shortages or price increase. However, this capacity is limited during acute food price and economic crises and as the experience of the 1997 Asian financial crisis indicates, can have significant impact on health and nutrition outcomes for both maternal and child outcomes. It is also evident from the experience of the 1997 Asian crisis 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 trend of health and nutrition indicators suggest that the impact was significant in several moderate to severely affected countries.

The recent global food price and financial crisis has had fiscal impacts of comparable magnitudes in many parts of the developing world. The global economic meltdown also

indicates that development aid and assistance may also not be available at the same level as before, thus making it likely that social sector spending and consequent health and nutrition outcomes may be significantly affected. Our estimates suggest that if unaddressed the recent crisis could increase rates of maternal anemia 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 5 child mortality in severely affected countries of East Asia & Pacific regions could increase by 3-11%.

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. Preliminary modeling 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%. 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 increase in both short and long term. What is needed is the political will to institute these measures at scale.

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