



SOCIAL AND ECONOMIC POLICY
WORKING PAPER

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Ronald Mendoza

Nicholas Rees

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Ronald U. Mendoza
Economist
Division of Policy and Practice
Social and Economic Analysis Unit
UNICEF

Nicholas Rees
Consultant
Division of Policy and Practice
Policy Advocacy Unit
UNICEF

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Infant Mortality during Economic Downturns and Recovery

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Policy, Advocacy and Knowledge Management, Division of Policy and Practice
UNICEF

3 UN Plaza, NY, NY 10017

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This paper has been prepared as part of the FACIT Project which undertakes policy research on the impact of economic crises and aggregate shocks on children as well as the policy responses to help protect them.

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Executive Summary

This paper reviews the empirical literature on the impact of economic downturns on infant mortality. Drawing on this, it examines the possible impact of the presently unfolding global economic slowdown. While there is scope for further improving our understanding of the links between economic trends and infant mortality, the available empirical evidence does suggest that children face grave risks if the social impact of the global slowdown is unmitigated. There is also a risk that the global slowdown could undermine recent progress in reducing infant mortality. The analysis and evidence underscore several key areas for policy responses: a) providing humanitarian relief, including health and nutrition interventions to the most hard-hit and vulnerable groups; b) expanding social protection to the poorest and most vulnerable; and c) resuscitating growth in a way that is pro-poor and ensures that the recovery of household incomes—notably among the poor and low income households—is robust and sustained. The main message of this paper for policymakers is that, based on empirical evidence on past crises, the possible impact of the present crisis on infant mortality is nothing that cannot be mitigated by policies that protect children and women and ensure sufficient social investments in the first place.

Resumen Ejecutivo

Este artículo examina la literatura empírica sobre las repercusiones del descenso de la actividad económica en la mortalidad infantil. Sobre esta base, se examina las posibles consecuencias de la desaceleración económica mundial que se está produciendo en la actualidad. Aunque hay margen para seguir ampliando nuestra comprensión con respecto a los vínculos entre las tendencias económicas y la mortalidad infantil, las pruebas empíricas disponibles sugieren que los niños enfrentan graves riesgos si no se mitiga la repercusión social de la desaceleración mundial. Existe también el riesgo de que la desaceleración mundial socave los recientes progresos en la reducción de la mortalidad infantil. El análisis y las pruebas destacan varios aspectos clave para generar respuestas en materia de políticas: a) proporcionar ayuda humanitaria a los grupos más afectados y vulnerables, incluidas intervenciones de salud y nutrición, b) ampliar la protección social a los más pobres y vulnerables, y c) reactivar el crecimiento de una manera que sea favorable a los pobres y asegure que la recuperación de los ingresos de los hogares –sobre todo de los hogares pobres y de ingresos bajos– sea robusta y sostenida. El mensaje principal de este documento para las autoridades encargadas de elaborar políticas es que, sobre la base de las pruebas empíricas de las crisis anteriores, el posible impacto de la crisis actual sobre la mortalidad infantil se puede mitigar mediante políticas que protejan a los niños y las mujeres, y que garanticen ante todo suficientes inversiones sociales.

Résumé Analytique

Cette communication passe en revue les ouvrages qui analysent dans une perspective empirique les conséquences des crises économiques sur la mortalité des enfants. À partir de cet examen, elle considère les effets que pourrait avoir la récession qui frappe actuellement l'ensemble de la planète. Bien qu'il reste beaucoup à faire pour améliorer notre compréhension des liens entre les tendances économiques et la mortalité infantile, les données empiriques dont nous disposons laissent penser que les enfants courent des risques graves si l'on n'atténue pas les conséquences sociales du ralentissement économique mondial. Cette récession risque également de saper les progrès récemment accomplis pour faire baisser la mortalité infantile. L'analyse et les données factuelles mettent en lumière plusieurs domaines clés où des interventions seraient nécessaires : a) secours humanitaires comprenant des actions sur la santé et la nutrition au bénéfice des groupes les plus touchés et les plus vulnérables, b) élargissement de la protection sociale aux plus pauvres et aux plus vulnérables, c) relance de la croissance dans une perspective favorable aux pauvres et pour assurer qu'elle se traduise par un rétablissement vigoureux et durable du revenu des ménages – notamment pour les ménages pauvres et à bas revenus. Pour les décideurs, le principal message de cet article est que l'analyse empirique des crises précédentes montre que l'on peut atténuer les conséquences éventuelles de la présente crise sur les taux de mortalité infantile en prenant des décisions politiques qui protègent les enfants et les femmes et assurent en premier lieu un niveau d'investissement social suffisant.

Introduction

Despite important gains in recent years, the challenge of saving the lives and improving the wellbeing of newborns and mothers is still quite considerable. Drawing on various sources, its scale could be illustrated by the following facts and figures:

- Almost 8.8 million children die in 2008 before they reach the age of 5¹; and an estimated 6.1 million children die before the age of 1.²
- Globally, approximately 45 children per 1000 live births die before the age of one in 2008. This number is considerably higher in poorer countries. In least developed countries, 82 children per 1000 live births die before the age of 1, compared to industrialized countries, where 5 children per 1000 live births die before the age of 1.³
- Every year, nearly 4 million newborns die within 28 days of birth, during the neonatal period.⁴
- An estimated 25 to 45 per cent of neonatal deaths occur during the first day after birth; and around 75% of these deaths occur during the first week after birth.⁵
- Globally, there are approximately 4 million stillbirths each year.^{6, 7}
- Almost all neonatal deaths (approximately 98 percent) and maternal deaths (over 99 percent) occur in low and middle income countries. The lifetime risk of maternal death for a woman in a least developed country is more than 300 times greater than for a woman living in an industrialized country.⁸
- For every woman who dies from causes related to pregnancy or childbirth, it is estimated that there are 20 others who suffer pregnancy-related illness or experience other severe consequences.⁹
- Over 60 million women give birth without skilled care every year, and about half a million women die from complications related to pregnancy and childbirth.¹⁰

There is growing concern that the presently unfolding global economic slowdown will harm the most vulnerable segment of the developing world's population: infants and very young children. In this paper, our focus is on the gravest harm—infant mortality. Depending on its severity and

¹ See www.childinfo.org

² See www.childinfo.org

³ See www.childinfo.org

⁴ UNICEF (2008)

⁵ Zupan J, Aahman E. (2005)

⁶ Lawn and others (2005:891)

⁷ Misclassification between stillbirths and neonatal deaths is possible; and in some parts of the world, this is deliberate in order to avoid filing a death certificate which becomes necessary when a neonatal death is declared. Most neonatal deaths go unrecorded so researchers often base their analyses on estimates. For a discussion, see Lawn and others (2005).

⁸ UNICEF (2008)

⁹ UNICEF (2008)

¹⁰ UNICEF (2008)

extent, the present economic downturn threatens to undermine recent progress in reducing global infant mortality.¹¹

Infant mortality can be divided into neonatal mortality and post-natal mortality. Neonatal mortality is defined as the death of a child within the first 28 days after birth, and post-natal mortality is defined as the death of a child between 28 days and 1 year after birth. The empirical evidence suggests that infant mortality is most often associated with pre-term birth, asphyxia, severe infections, diarrhea and other complications (including from endemic diseases). To help clarify, figure 1 illustrates a possible framework for thinking about some of the main causes of infant mortality, drawing on the empirical literature.¹² Studies have shown that preterm birth can explain up to 27 percent of neonatal deaths, while sepsis/pneumonia and asphyxia can explain up to 26 percent and 23 percent, respectively, of neonatal deaths.¹³ Other factors, including tetanus, congenital malfunctions and diarrhea help account for the remaining 24 percent of neonatal deaths.¹⁴ Low birth weight—in turn also associated with poor maternal health, inadequate antenatal care and more generally, poverty—also contributes, and is a co-factor among 60-80 percent of neonatal deaths.¹⁵ Poor public goods provision, leading to inadequate access to clean water and healthcare as well as lack of information on weaning and other good infant practices, among other outcomes detrimental to health, is also a factor which can exacerbate these causes of infant mortality.¹⁶ Many of these aspects, notably those linked to poverty or lack of access to publicly provided health and other basic services, are likely to be exacerbated during an economic downturn.

What could be the impact of the present global economic downturn on infant mortality, and what could be done to help blunt this? This paper addresses these questions by reviewing empirical evidence in order to provide indicative calculations of the impact of economic contractions on infant mortality. According to one set of estimates, the additional infant mortality in 2009 could be between approximately 56,000 and 138,000 for a sample of 57 developing countries. Taking this into account and factoring in the average annual reduction in infant deaths in recent years, the global downturn could result in either a smaller net reduction in infant mortality of 36,000 in 2009, or an increase in net infant mortality of 46,000 in those 57 developing countries. Although for a larger sample of countries, earlier projections by the World Bank arrive at even higher estimates than the ones arrived at here (see World Bank 2009b). There is a large range of estimated impact based on the available studies, signaling that there is still scope to further sharpen the estimates and evidence in this area. While primarily illustrative, these calculations nevertheless signal the grave risks faced by children during the present downturn.

¹¹ For further information on recent preliminary estimates of the progress in reducing infant mortality, see http://www.unicef.org/media/media_51087.html.

¹² Infant mortality is typically reported in the form of the infant mortality rate (IMR), i.e. the number of children who die before the age of 1 per 1000 births. IMR is highly correlated with the under 5 mortality rate (U5MR). In practice, data on U5MR is often used to estimate IMR where national data sources are not available. For further information on the methodologies for compiling IMR and U5MR, see Hill and Amouzou (2006).

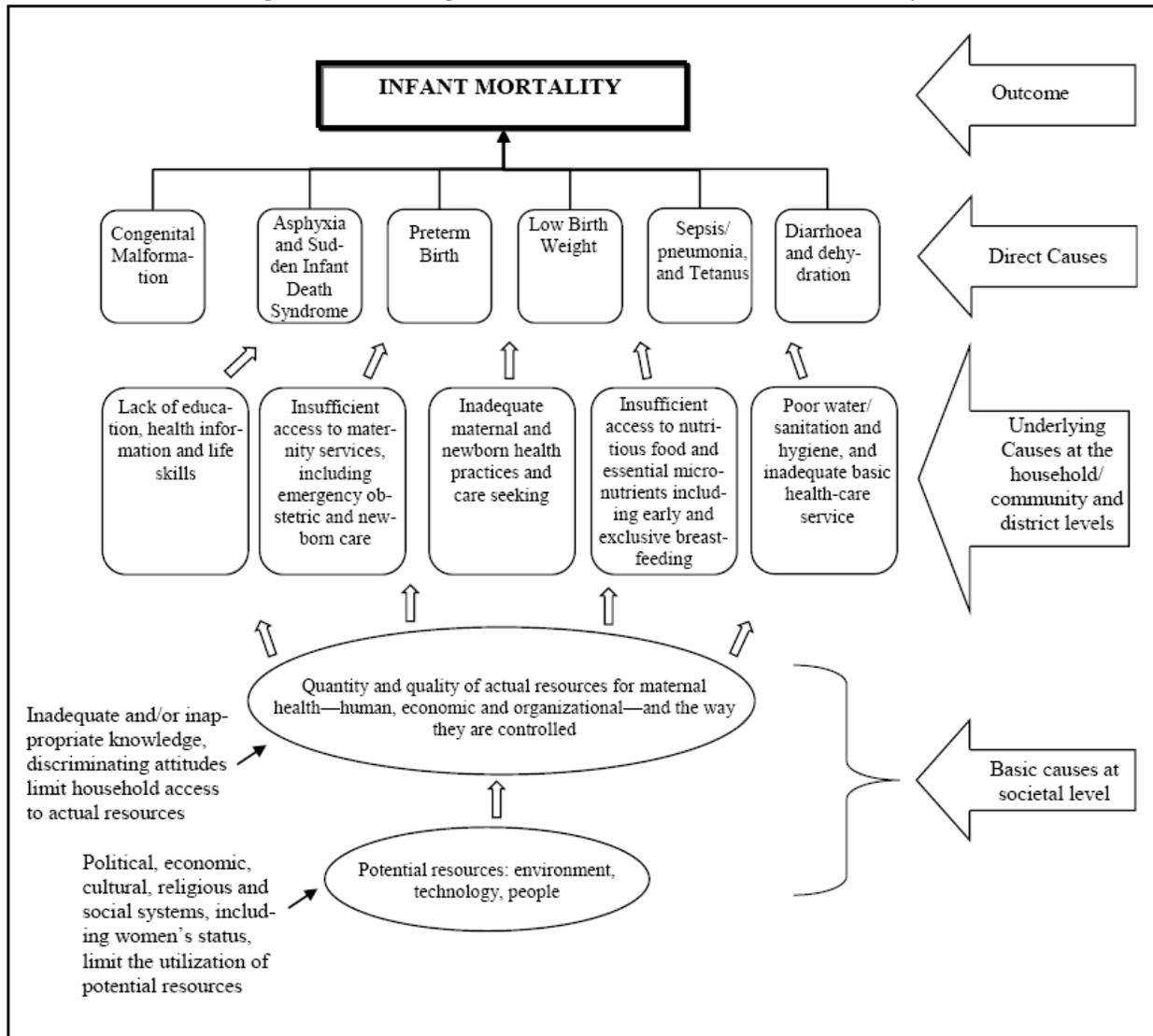
¹³ Lawn and others (2005:895)

¹⁴ Lawn and others (2005:895)

¹⁵ UNICEF (2008:15).

¹⁶ See Alderman and Behrman (2004), Bhutta and others (2008), Chopra and others (2009), Lawn and others (2005) and UNICEF (2008).

Figure 1. Tracing the Main Causes of Infant Mortality



Source: Based on extracts from UNICEF (2008: 15–17), and information from Lawn and others (2005), and Tinker and others (2005).

This paper also briefly reviews empirical studies of the potential effectiveness of social protection and other policies that could help to mitigate the adverse social impact of the global downturn. The evidence points to three key areas for policy responses: a) providing humanitarian relief to the most severely affected countries and population groups; b) expanding social protection to the poorest and most vulnerable in order to mitigate the worst implications of the crisis on children and women, blunting their protracted ill-effects and harm that, if unaddressed, could outlive the crisis itself; and c) resuscitating growth in a way that is pro-poor and ensures that the recovery of household incomes—notably among the poor and low income households—is robust and sustained.

In what follows, Section 1 briefly reviews the empirical evidence on the impact of crises on children and women, notably focusing on infant mortality. Section 2 draws on empirical studies in order to estimate the possible impact of an economic downturn on infant mortality, and

Section 3 examines the potential effectiveness of policy responses to help mitigate this adverse impact. A brief conclusion reiterates the main messages of this paper for policymakers.

1. A Brief Review of the Empirical Literature on Economic Downturns and Infant Mortality

Aggregate shocks—like those that precipitated the presently unfolding global economic slowdown—can cause severe harm to children and other vulnerable groups, through at least two main channels.¹⁷ First, these types of shocks typically lead to dramatically lower household purchasing power, as a result of job loss, asset depletion, tighter credit conditions, and other factors, which in turn lead to lower spending and investments for the health and wellbeing of children and pregnant women. It should be noted here that even in cases where public services may be free, there are other costs to seeking healthcare that might become much more acute during severe economic periods. As household incomes decline, for example, the opportunity cost of time spent to access these services could be very high. Second, these shocks could also lead to more limited access to public services due to tighter government budgets, diminished social spending and inadequate public goods provision. Combined, these are the factors that could contribute to lower birth weights of infants, inadequate pre-natal care, and lower chances of skilled medical attendance and adequate hygienic environment during the delivery of infants. It follows from these that there is a risk of rising infant mortality.

Nevertheless, the empirical evidence on the countercyclicality of infant mortality is mixed. Here, we may be able to draw on a recent analysis by Ferreira and Schady (Forthcoming) to help outline some of the main factors behind these mixed results. A recession could create a substitution effect by pushing households along the demand curve for human capital investments, implying more schooling and health-promoting behavior, as a result of the falling child and adult wages. Focusing on the health aspect for example, mothers may begin to engage more in time-intensive activities at home such as those that promote health. These include travelling to distant health facilities to secure medicine and vaccines, receive antenatal medicines (for pregnant women) and get checkups for children, or spending more time collecting cleaner water from longer distances, breastfeeding and cooking healthy meals. On the other hand, a recession could also create an income effect which is an inward shift in the entire demand curve toward less schooling and less health-promoting behavior and consumption, (at any given child and adult wage). Formal credit and insurance markets are missing or imperfect in much of the developing world, thus preventing poor households from smoothing their consumption through

¹⁷ Aggregate shocks include those that affect: a) aggregate or macroeconomic variables (e.g. GDP, current account, exchange rate); and b) a large group of people within a country. In most cases, the two parts of this definition overlap; but it is framed in this way to cover aggregate shocks more broadly understood. These shocks vary in their nature, severity, distributional impact, length, and other aspects. Clearly, the channels through which these shocks will affect countries, and within them, poor households will vary. No claim is made here that these are the only ones worth considering. For further elaboration, see for example Mendoza (2009b).

these shocks.¹⁸ Hence, the net impact will depend on which effect dominates, and the final implication on schooling and health outcomes is therefore an empirical matter.¹⁹

Studies have shown that child education, health and wellbeing indicators could exhibit either countercyclical or pro-cyclical patterns depending on the interplay between substitution and income effects on households' behavior. These findings, however, tend to show-up in middle-income country settings where households may still have some space to adjust to income shocks. Adverse education and health outcomes tend to be more pro-cyclical in poorer countries: aggregate shocks are followed by increases in infant mortality, and declines in school enrollment and nutrition. In middle-income countries in Latin America, the results are more nuanced: health outcomes are generally pro-cyclical, and education outcomes countercyclical. This is unsurprising because in poorer countries, governments tend to be more cash-strapped, and there are many more households that live closer to subsistence and with less means to cope. Thus in some of the poorest countries any negative shock on income could translate more easily to lower social and household spending and investments, in turn leading to worse child welfare outcomes.²⁰

For instance, Cutler and others (2002) found that as a result of Mexico's economic crises in 1995-96, child and elderly mortality rates increased substantially compared to the years prior to the crisis. Using mortality data which were derived from national statistics and population estimates produced by the Mexican Secretary of Health, the National Statistical Agency (INEGI) and the National Council on Population (CONAPO), these authors examined trends in mortality at the national level from 1980-1996 and at the state level from 1982-1996. Their analysis thus covered major economic crises in 1982-1983, 1986-1987, and 1994-1995. Using a difference-in-differences methodology, they found evidence that children aged 0 to 4 were especially vulnerable during crises—the increases in their mortality rates during crises were between 6.9 and 10.3 percent which was the highest among the potentially affected groups. Further, these estimates translated to about 7000 additional deaths among children aged 0-4 in 1990 alone (*ibid*:291-292).²¹ They also found evidence that a reduction in income and an increase in the burdens on the medical sector could play very important roles in determining the level of child mortality. Out-of-pocket health expenditures declined during the crisis from 3.9 percent of GDP in 1994 to 3.1 percent of GDP in 1995. Using regressions to examine the factors behind age-specific mortality rates, they also found that the inverse association between the number of public sector physicians and mortality rates among children and child-bearing women was statistically significant—a reduction of 1 percent in public sector physicians led to a 0.4 percent

¹⁸ Formal credit and insurance markets also typically do not produce financial services that cater to the poor's needs. While the poor may turn to informal credit markets and other risk management methods, these are likely to face their natural limits in the presence of an aggregate shock which affects the entire risk pool. The interested reader may wish to turn to Armendariz de Aghion and Morduch (2005) and Mendoza (Forthcoming).

¹⁹ Other factors also come into play, including fertility decisions, as will be discussed later.

²⁰ For a broader review of the literature, see Ferreira and Schady (Forthcoming) and Mendoza (2009b).

²¹ A potential caveat in this study is that it used infants and the elderly as the potentially affected groups and males aged 30-44 as the potentially unaffected group. It is not clear to what extent such an approach provides an appropriate control group, considering that crises could also directly affect males through job losses and coping through other behavioral changes. (For example, less income and food in the households could spur adult males to eat less or work more, with some possible impact on their health status.)

increase in mortality rates among child-bearing women and a 0.25 percent increase in mortality rates among children aged 0 to 4 (ibid:298).

Similarly, using Demographic and Health Surveys (DHS) conducted in Peru, Paxson and Schady (2005:220) constructed a time-series on the infant mortality rate (IMR) before, during and after the late 1980s economic crisis in Peru, in order to examine the crisis impact on the evolution of infant mortality. This particular crisis was characterized by a sharp economic contraction (a 30 percent decline in GDP) and precipitous fall in real wages (by over 80 percent in the capital city of Lima, Peru) (ibid:203). Public sector spending on health also fell by 58 percent between 1985 and 1990, and declined from 4.3 percent to 3.0 percent of the government budget during that period (ibid:211). They estimated linear regressions of infant mortality expressed as a function of maternal characteristics and other controls for each year of birth from 1978 to 1999. In order to explore possible selection issues (i.e. more at-risk women giving birth), they used the parameter estimates to decompose changes in the mortality rate between years, enabling them to analyze changes in the characteristics of mothers giving birth. Paxson and Schady found that the infant mortality rate increased by 2.5 percentage points during the crisis period—roughly translating to 17,000 more infant deaths (ibid:220). Further examining how different sub-groups of women fared, they also found that infant mortality is highest among uneducated, younger (and older) and poorer rural women. Infant mortality also increased across all groups of mothers, suggesting that selection alone was not behind the increase in infant mortality.

In addition, Bhalotra (Forthcoming) investigated the impact of macroeconomic shocks on infant mortality in India, by constructing a rich dataset on infant mortality and other indicators for about 150,000 children born between 1970 and 1997 drawn from India's National Family Health Survey. She tried to address a number of weaknesses of past studies, such as by including state specific trends (minimizing problems of omitting trends that vary by state) and by examining possible forms of heterogeneity in the income effect, such as those linked to rural-urban differences, as well as the differing age and education, among other characteristics, of the mothers. She also developed a novel identification strategy by examining linked siblings, i.e. children born to the same mother but under different economic conditions, allowing her to address selection issues among mothers giving birth. She found that a recession involving a one standard deviation change in the log of income raised infant mortality risk by 1.2 percentage points. Based on this estimate, and using the UN estimate of 26.3 million live births in India in 1990, Bhalotra estimated that an additional 320,000 infant deaths occurred as a result of macroeconomic shocks (ibid:12). The results also suggested that most of these infant deaths are accounted for by mothers in rural areas who tend to be younger and less educated, further confirming the results of earlier studies in other crisis contexts (e.g. Paxson and Schady, 2005).

On the other hand, studies examining micro-level data in other countries have found mixed results (e.g. on Indonesia see Block and others, 2004; Frankenberg and others, 1999; and Rukumnuaykit, 2003) or very little evidence that crises are associated with worsening child health indicators and higher infant mortality (e.g. on Brazil see Costa and others, 2003). Some even find a positive and procyclical relationship. Miller and Urdinola (2007), for example, use the 1993 Colombian population census and a special household survey conducted to evaluate the Familias en Accion conditional cash transfer program, in order to examine how coffee price shocks affect child mortality. In order to improve on the identification strategy of past studies, they construct a novel measure of coffee shocks in Colombia during the period 1970-2000 by

reflecting both the internal coffee price changes and the economic importance of coffee in the child's county of birth. In a first step, they empirically examine how birth cohort size (in each county in the country) is affected by the coffee shock measure.²² They then proceed to examine how various labor market outcome indicators (e.g. work the week prior to the survey, hours of work in past month, log of wages) are associated with the shock. Their empirical findings suggest that time appears more important than current income in child health production in Colombia during the period examined—child mortality increased (decreased) as coffee prices rose (declined). The largest price decreases (increases) during the period 1970-2000 (i.e. approximately 40 percent of the long-run mean) are accompanied by a 15 percent increase (decrease) in child survival to age 5 (ibid: 3).²³

While the above literature helps to illustrate the impact of economic and income shocks on infant mortality in specific countries, these studies do not allow for generalizable inferences across countries. Cross-country empirical analyses are required for this. A number of multi-country studies also provide evidence that poorer economic performance is typically associated with higher infant mortality. For instance, Pritchett and Summers (1996) examined bi-decennial child mortality statistics for 58 developing countries during the period 1960-1985. They examined the log of infant mortality as a function of the log of GDP per capita (variable of interest), other conditioning variables (e.g. schooling), plus country- and time-specific effects (e.g. time specific intercept allows over-all mortality to change due to diffusion of or improvements in health technology.) Instrumental variables were also used to address potential reverse causality issues. Drawing insights from the growth literature, the authors used instruments which could help explain growth but would not necessarily be linked to health outcomes, i.e. the terms of trade shock, investment to GDP ratio, black market premium, and deviation of official exchange rate from purchasing power parity level.²⁴ Their findings suggest that the long run income elasticity of infant and child mortality in developing countries lies between -0.2 and -0.4 (ibid: 850).²⁵ Using these estimates, the authors calculated that about 450,000 infant deaths and over a million child deaths in the developing world in the year 1990 alone could have been averted had developing countries been able to maintain the same rate of growth in the 1980s as in the period 1960-1980 (ibid:863).

More recently, and using a fairly extensive dataset covering 136 countries across 10 quinquennia (1960-2005), Cornia, Rosignoli and Tiberti (2008) turned to a panel fixed effects model to try and examine the possible factors behind life expectancy at birth, IMR and U5MR. The

²² Their birth cohort size approach is useful to the extent that it avoids problems of underreporting and other data quality issues in Colombia's household data, it captures fetal deaths, it is complete and captures the entire population and it captures cumulative mortality.

²³ Studies examining infant mortality in the United States find a similar procyclical effect. Infant mortality declines during recessions, due to factors such as changes in fertility decisions, maternal behavior changes (possibly including more child health promoting behavior) and reductions in pollution (see for example Dehejia and Lleras-Muney, 2004).

²⁴ Robustness tests revealed that all but the black market premium indicator appeared to be acceptable instrumental variables.

²⁵ These estimates are very similar to those of Rajkumar and Swaroop (2008) who use annual data (1990, 1997 and 2003) for 91 countries in order to study the role of public spending, governance and income per capita in determining health outcomes. These authors find that a one percentage point increase in per capita GDP at the margin is associated with a 0.42 percent reduction in child mortality (ibid:101).

explanatory variables they used included dummies for each regional grouping (i.e. helps account for region-specific effects), female literacy (i.e. expected to have positive effects on child health), inequality (i.e. signals skewed access to resources for investing in health), immunization (i.e. a measure of healthcare access), output volatility (i.e. reflecting economic and income instability) and the log of GDP per capita, the main variable of interest. They found evidence that a 1 percent increase in GDP per capita is associated with a decline in IMR and U5MR, respectively, by about 14 points and 22 points. Their empirical analysis also suggests that a reduction in average female illiteracy by 10 percentage points is linked to a reduction in IMR and U5MR, respectively, by about 5 and 8 points (ibid:23-4).²⁶

It might be possible to improve further on this study in several ways. For instance, both GDP growth and income inequality could be determined by the quality of institutions, and there was no attempt to account for the latter in the empirical analysis. Furthermore, the second part of the study tried to analyze the impact of globalization on health outcomes indirectly by studying the impact of policy reform on the determinants of health, e.g. GDP per capita, income inequality and volatility. Because policies are endogenously selected, a regression of growth or other policy outcomes on the left hand side and policy indicators on the right hand side essentially tells us nothing about the effectiveness of policies (Rodrik, 2005).²⁷

Nevertheless, cross-country studies generally face a number of limitations, including constraints inherent to the data on infant mortality and other child wellbeing indicators. The IMR is typically reported in a bi-decennial manner, with missing information filled in using extra- or intrapolation methods. The impact of shocks is also likely to be smoothed out when examining datasets of this nature precisely because of the methods of collecting and reporting (usually averaged) figures. This makes a study using these figures less informative for examining crisis impact, and perhaps more useful for analyzing long term structural relationships between income and child health outcomes.

A recent study by Baird and others (2007) found a way around this by setting up a cross-country empirical analysis while at the same time using data on IMR with higher (at least annual) frequency. These authors used data from 123 Demographic and Health Surveys (DHS) conducted over the period 1986-2004 covering 59 developing countries²⁸ and 1.7 million births, in order to examine the effects of aggregate income shocks on infant mortality in the developing world. They turned to several econometric methodologies in order to examine the link between aggregate economic shocks and infant mortality. One approach involved collapsing the unit data

²⁶ A recent United Nations (2008) study of 30 countries in Asia tracking their progress towards achieving the Millennium Development Goals (MDGs) also found evidence that appears consistent with the abovementioned studies. This study calculated the “MDG elasticity” or the percent change in different MDG indicators for each 1 percent increase in growth. It found that—an increase in 1 percent of GDP is associated with: a) a 0.3 percent fall in maternal mortality, b) a 0.43 percent fall in under 5 mortality and c) a 0.46 percent fall in infant mortality (ibid:41).

²⁷ To try to confirm the sensitivity of the results by Cornia, Rosignoli and Tiberti (2008), Hu and Mendoza (Forthcoming) build on their dataset and analyze the impact of public spending, indicators of governance and GDP per capita on infant mortality. Their initial results differ slightly, but appear broadly consistent with a broader review of estimates of the income elasticity of infant mortality. A similar study of U5MR by Rajkumar and Swaroop (2008) arrives at broadly similar results.

²⁸ The data set is drawn from countries in Africa (33 countries, 68 surveys), Latin America (12 countries, 31 surveys), and Asia (14 countries, 27 surveys).

to the level of the country-year observation. The authors then employed a model specification in first differences to address a possible spurious correlation arising from relating two trending series and supplemented this with lagged levels of per capita GDP and the infant mortality rate. They also explored an alternative approach, which assumed that the series are stationary but follow deterministic trends. The authors then used specifications in which linear, quadratic, or cubic trends are removed from the data.²⁹ In order to account for the possibility that households respond differently to growth and recession periods, the authors also turned to spline regressions, allowing the coefficient for a downturn to vary from that of an upturn. Based on the results from various model specifications, the authors concluded that a one-percent increase in per capita GDP is associated with a decrease in infant mortality within the range of approximately 0.18 to 0.44 deaths per thousand children born (ibid:34).

To complement these main results, the authors also empirically examined unit data in order to control for mother- or child- specific covariates, as well as country-specific deterministic trends, and to inspect possible heterogeneity in the relationship between GDP and infant survival. They found that changes in the composition of mothers giving birth did not change the results. As part of a battery of checks, these authors also examined possible omitted variables bias, such as those resulting from conflict (including civil war) and weather shocks (e.g. droughts and floods). The specification checks suggest that these also had little effect on their results. Nevertheless, due to the wide array of factors that could influence infant mortality, it is unlikely that this problem is really eliminated, as is well recognized in the literature.³⁰ Finally, the authors also explored possible heterogeneity in the relationship between crises and infant mortality, focusing on differences by the gender of a child, the education and age of the mother, place of residence, and birth parity. They find that a one log-unit change in per capita GDP changes the mortality of boys by approximately 28 percent, and that of girls by approximately 77 percent, suggesting that girls are more adversely affected by crises as compared to boys (ibid:23).

In a related paper, Friedman and Schady (2009:7) restricted the dataset in Baird, Friedman and Schady (2007) to cover only the Sub-Saharan African countries and found further evidence of adverse effects on girls due to aggregate shocks—one set of estimates suggested that a one percent negative deviation in GDP is associated with an increase in infant mortality of 0.25 per 1000 boy births and 0.90 per 1000 girl births. Put differently, they found that a negative shock lowering GDP per capita by 10 percentage points would be associated with 22 more deaths per thousand girls born, but have no impact on boy mortality. Drawing on their findings, they estimated that there could be 30,000 to 50,000 excess deaths in Africa in 2009, with most deaths accounted for by girls (ibid:8).

Empirical evidence on the disproportionately larger adverse impact of household income shocks on the health of girls can be found in some parts of the developing world. Bengtsson (Forthcoming), for example, turned to Tanzanian rural household data to examine the response of children's body weight to transitory changes in household income, using weather variation (rainfall) as an instrument for income. He found that female children experienced a 0.4 kilo

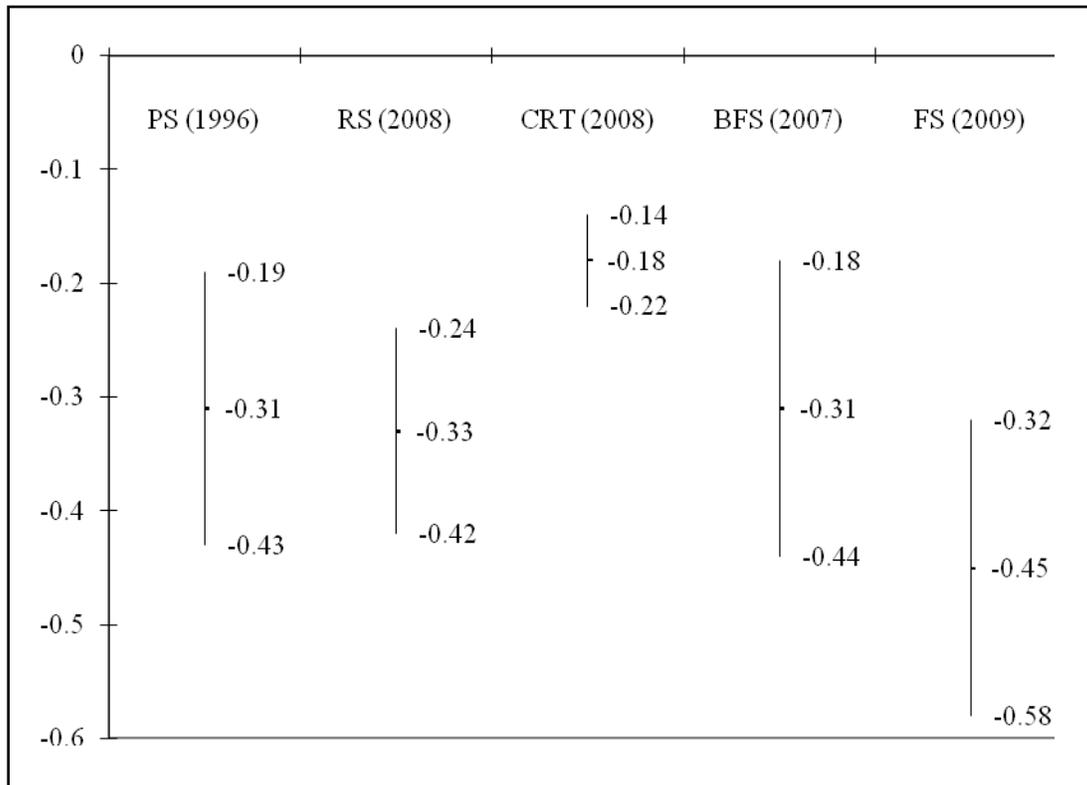
²⁹ They also employ Hodrick-Prescott and Baxter-King filters as possible ways to remove low- and medium-frequencies from the data series.

³⁰ Public health expenditures and foreign aid, are among other factors that may also figure into health outcomes during a crisis period. It is possible that these will be highly correlated with the crisis event itself, however.

decline in bodyweight for every 10 percent decrease in household income. On the other hand, a similar income shock only results in only a 0.2 kilo decline for boys (ibid:3). In rural India, there is also empirical evidence that favorable rainfall patterns increase the likelihood of girls' survival more than boys (Rose, 1999). Evidence of sex-based distribution of food during droughts and crises in northern Somalia and rural Bangladesh are discussed by Bairagi (1986). This author also found evidence that food crises in rural Bangladesh resulted in disproportionately worse health outcomes for female children belonging to poorer families.

In order to help summarize the main findings of the empirical literature, figure 2 illustrates the main range of estimates for the income elasticity of infant mortality. The estimates are sensitive to the underlying data used as well as the model specifications. Most studies also fail to cover much of the developing world, due to lack of data. Nevertheless, the available studies provide an over-all snapshot of the present state of empirical evidence on this topic. And the evidence does suggest that within a certain (negative) range there is some convergence in the estimated elasticity. If we take the median estimate in each study noted in figure 2, the range spans from -0.18 and -0.45. Incidentally, this is also close to the range of coefficients estimated by Baird and others (2007).

Figure 2. Estimates of the Income Elasticity of Infant Mortality Drawn from Selected Studies



Note: All refer to the income elasticity of infant mortality except for Rajkumar and Swaroop (2008) who use the U5MR. We note here that U5MR is correlated with IMR. In addition, we assume that the average infant mortality rate is 100 in order to arrive at the estimated elasticities for Cornia, Rosignoli and Tiberti (2008).

Sources: Pritchett and Summers (1996), Rajkumar and Swaroop (2008), Cornia, Rosignoli and Tiberti (2008), Baird, Friedman and Schady (2007) and Friedman and Schady (2009).

2. Impact of the Current Global Economic Slowdown on Infant Mortality

How will the presently unfolding global economic slowdown affect infant mortality? Notwithstanding possible substitution effects towards health-promoting behavior in a few developing countries, the downturn does entail significant risks for the poorest populations in all developing countries and for the least developed countries. If unmitigated, the presently unfolding economic downturn could harm children and women in the developing world in ways that might be similar to past episodes of economic crises and severe contractions. An illustrative guesstimate might be possible if we draw on the empirical literature examining past crises. In particular, we turn to the findings from Baird and others (2007), which is one of the few studies that lend itself to such a calculation. In particular, it uses a multi-country sample which enables the study to examine income and health links in various contexts across time; and it also uses higher frequency data which allows for a richer set of controls and analyses not possible in other cross-country datasets. Furthermore, this is the only multi-country study so far that has explicitly focused on analyzing the short-run impact of a economic crises and downturns on child health outcomes. Since the focus here is on the global downturn and not the structural and long-term determinants of infant mortality, the study by Baird and others seems appropriate to use. That the median estimates from other studies reviewed earlier also coheres with this range gives us slightly more comfort, even as we acknowledge that the evidence base in this area could be improved further.

Several of the main caveats to this exercise need to be stated upfront. First, the calculations here assume that the empirical relationships from past crises are informative of the present global slowdown. While past events are informative to some extent, it is important to emphasize that circumstances might potentially be different for the present situation. For example, policy responses—including possible expansion of social protection and other types of interventions in 2008 and 2009—could help mitigate its impact. The estimates, therefore, suggest the risks related to a lack of policy responses to help blunt the adverse impact—they do not imply that this impact is inevitable. Second, it should be noted that these authors studied episodes of deep economic contractions, which may not necessarily be the case for all countries in the presently unfolding crisis. Evidence of the heterogeneous impact of the slowdown across countries is well documented in the array of crisis reports and initial assessments.³¹ Third, the calculations rely on preliminary growth estimates and forecasts. These calculations explicitly assume the counterfactual that, had the economic global slowdown not occurred, the 2008 growth forecasts for 2009 would have approximated this counterfactual scenario. Fourth, the way in which the impact of the slowdown is estimated does not reflect the initial level of IMR, but rather the total number of live births. As noted earlier, IMR is caused by a variety of factors, and many of these could be exacerbated during an economic downturn. Countries with higher initial levels of IMR are likely to possess the types of vulnerabilities that make them more likely to face a disproportionately larger adverse impact. For example, challenges related to already meager access to public health services could be made more acute by a severe cut in household incomes and government revenues (and public spending on health) brought about by an economic

³¹ See various issues of the IMF's *World Economic Outlook*, the World Bank's *Global Economic Prospects* and the United Nations' *World Economic Situation and Prospects* for late 2008 and into 2009.

downturn. Countries with comparatively higher disease burdens, already poor hygienic and sanitary conditions and sparse health professionals on a per capita basis will likely be much more vulnerable to a worsening of health and human development outcomes, including an abrupt rise in IMR. Finally, and as noted earlier, fertility decisions could also confound both the data and the empirical analysis, given that economic difficulties could cause people to postpone marriage, or even use contraception to avoid pregnancy as a reaction to hardship.

That said, it is possible to illustrate the potential scale of an increase in infant mortality due to a global economic slowdown—and put differently, this will also be an illustration of the infant mortality prevented by an economic recovery that provides strong benefits for the poorest and most vulnerable. In what follows, we describe the impact on infant mortality based on different scenarios of growth contractions, and then turn to a more specific calculation based on reported revisions in growth forecasts. The intention here is not to forecast the impact of the global slowdown on infant mortality—this would be impossible given that the global economic situation is still unfolding and so are policy responses to it. Rather, the goal is to illustrate using empirical evidence on past crises what risks infants and mothers may be facing in the present context.

Drawing on Baird and others (2007:11), a one percent decrease in real per capita GDP is, on average, expected to result in an increase in infant mortality of between 0.18 (lower bound) and 0.44 (upper bound) deaths per 1000 children born. Based on this estimated empirical relationship and assuming three scenarios of real per capita GDP contraction (growth) of 1, 5 and 10 percent, the increase (decrease) in infant mortality in the set of 59 developing countries analyzed by Baird and others (2007) are indicated below:³²

- Scenario 1: About 15,000 to 38,000 increase (decrease) in infant mortality based on a 1 percent real GDP per capita contraction (growth). For comparison, Brazil experienced a 2 percent and a 1 percent real GDP per capita contraction in 1998 and 1999 when it experienced financial instability in these years.
- Scenario 2: About 77,000 to 189,000 increase (decrease) in infant mortality based on a 5 percent real GDP per capita contraction (growth). For comparison, the Russian Federation experienced a 5 percent real GDP per capita contraction at the time of its currency crisis in 1998.
- Scenario 3: About 155,000 to 378,000 increase (decrease) in infant mortality based on a 10 percent real GDP per capita contraction (growth). For comparison, Indonesia, Thailand and Malaysia each experienced a real GDP per capita decline of over 10 percent in 1998 during the Asian financial crisis. Argentina also suffered an over 10 percent contraction in real GDP per capita in 2002 during its debt crisis.³³

The above calculations allude to different growth scenarios. But what about the actual growth slowdown that is expected in 2009? We draw on the difference between the World Bank's

³² Even if we cannot focus on all developing countries due to data limitations, these 59 countries account for well over 70 percent of the global total infant mortality.

³³ For ease of reference, annex 1 presents data on the real GDP per capita declines during past episodes of economic and financial crises for selected countries, regions and the world.

January 2008 (World Bank 2008a) and June 2009 (World Bank 2009a) forecasts for economic growth in 2009, and we focus on a slightly reduced sample of 57 developing countries due to the lack of growth forecasts for Liberia and Trinidad and Tobago. The calculations suggest that approximately 56,000 to 138,000 more infant deaths could occur in these countries in comparison to the situation in which earlier predicted growth would have continued.^{34,35} Suffice to say that there is a large range of estimated impact based on the available evidence, signaling further scope to sharpen the evidence base in this area.

It would nevertheless be interesting to compare these infant mortality estimates to the trend of reduced infant deaths in recent years. If we continue to focus on the 57 developing countries, total infant deaths have dropped each year by about 92,000 infant deaths on average since 2000.³⁶ This is due to a variety of factors, such as reduced fertility, socio-economic development, and enhanced access to healthcare services and vaccines for immunizations. Taking this 92,000 figure into account and given the estimated additional 56,000 to 138,000 infant deaths, the global slowdown could result in either a smaller net reduction in infant mortality of 36,000 in 2009, or an increase in net infant mortality of 46,000 in those 57 developing countries. Even if we consider these figures to be partial and preliminary, the available evidence does suggest a grave risk to children. If the effects of the global economic slowdown are unmitigated, these could not only set the world back in terms of reaching the Millennium Development Goals (MDGs), these may even erode gains in previous years.

It is also possible to blunt the impact of the present global economic slowdown through a more robust policy response by implementing countercyclical and pro-poor macroeconomic policies, and by bolstering social budgets and increasing and expanding social protection interventions. Countries accounting for the bulk of the infant mortality figures are presently accessing multilateral financing to boost social spending and investments (see box 1 later for examples) and/or taking decisive steps to try and boost their social protection systems. Thus the total number of infant deaths could be lower than the calculations illustrate.³⁷

As such, the effectiveness of these policy interventions, as well as the nature of the recovery itself, will both be critical in determining the extent to which the poorest and most vulnerable actually find immediate relief. The empirical evidence from past crises suggest that the poor and low income population often face lingering and protracted effects from crises—their lack of resilience is part and parcel of their limited coping strategies and inherent vulnerability to

³⁴ Another approach is to base the calculation on the difference between the forecasted growth and the trend or baseline growth path. We opted for the approach here in order to capture the revision in growth expectations which can be considered to contain information on the evolving severity of the crisis. Alternatively, 2007 estimates (World Bank 2007) could also be used as the comparison year for ‘normal’ growth levels. This approach would yield slightly less conservative estimates, as the crisis had already begun in 2008, when the projections for 2009 were calculated.

³⁵ As a robustness check, we also calculated the figures for April 2008 IMF calculations and October 2009 IMF calculations on growth forecast for 2009, and the figures are roughly the same order of magnitude.

³⁶ To arrive at this figure, the difference between the infant mortality rate for 2007 and 2000 was annualized. This was then applied to the 2007 live births.

³⁷ Over 56 percent of the total infant mortality calculated for the 57 country sample is accounted for by only 5 countries: India, Pakistan, Nigeria, Mexico, and Brazil. 20 countries account for 90 percent of the total figure, i.e. India, Pakistan, Nigeria, Mexico, Brazil, Philippines, Turkey, Indonesia, Thailand, South Africa, Vietnam, Egypt, Sudan, Bangladesh, Colombia, Ethiopia, Kenya, Tanzania, Kazakhstan and Madagascar.

aggregate shocks in the first place. For example, productive assets sold during an economic downturn, or debt that has become unmanageable, may hamper the household's recovery. Children pulled out of school may not necessarily be able to return to school even as the economy recovers. Infants and children suffering from malnutrition and lack of healthcare could face long-lived physical and psychological harm.³⁸

3. Policy Responses to the Global Economic Slowdown

The evidence suggests that the risks to infants and pregnant mothers are real and imminent. An important challenge for national authorities and the international community is to break from past, largely inadequate policy responses, by prioritizing policy interventions designed specifically to help vulnerable families so that the impact of the global slowdown on their purchasing power is less severe (either by strengthening public services or directly transferring resources to families). This might also help to prevent poor families from turning to detrimental coping and other strategies that undermine child and maternal health and wellbeing. Three main sets of responses are key: a) providing humanitarian relief, including health and nutrition interventions, to the most hard-hit and vulnerable groups. b) Expanding and enhancing social protection systems; and c) Ensuring pro-poor growth, employment and recovery.

3.1. Health and nutrition interventions

Despite declining since their peak levels in 2008, food and fuel prices have remained much higher relative to their long-term trends. Nutrition and health security, therefore, continues to be at risk in the current global economic slowdown, as families increasingly face the compounded effects of lower employment, decreased government spending, and still high prices of basic goods and services. Providing health and nutrition interventions to populations that might be at risk of entering into a humanitarian crisis is essential. This is especially true for younger children. Medical practitioners note that the most nutritionally vulnerable period of a child's life is the first 18 months of life (Shrimpton and others, 2001). Lack of nutritional investments for children (and also pre-natal care and nutrition for mothers) could have dramatic adverse consequences not just on the child's health status, but also creating knock-on effects on the child's cognitive and broader capabilities later on in life.

In many cases, health and nutrition interventions provided to a large part of the population can have the greatest effect on mitigating the negative effects of crises, particularly in countries where the capacity to implement social protection programs is very low. Other health-related program investments and interventions focusing on the prevention, treatment, and control of major causes of infant mortality (including pneumonia, diarrhea, malaria, and deaths during the neonatal period) should also be emphasized to prevent increases in infant and child mortality.

UNICEF, for example, identified 45 countries where children were at severe risk and allocated over \$50 million of its resources towards programs to provide an immediate response to the earlier food crisis and enhance nutritional security. UNICEF also allocated an additional US\$2.6 million to enhance national monitoring systems in 15 countries where, due to the recent global

³⁸ See Dercon (2005) and Lustig (2000a,b).

food price crisis, there are signs of a deteriorating situation or concerns around the wellbeing of marginalized populations.

3.2. Social protection

One set of policy interventions for which strong empirical evidence of success is available has to do with expanding social protection to poor and vulnerable families, with a focus on supporting investments in the health, education and wellbeing of children. Social protection programs in a growing number of countries have since incorporated elements that provide resource transfers specifically targeted at women, and conditional on their children's school enrollment, and their participation in healthcare monitoring and food supplementation programs. To help illustrate, table 1 lists the programs in 19 countries, including the nutrition and health related aspects of each program.³⁹

There is evidence that expanding and strengthening social protection systems, which may include components like those for Mexico's Oportunidades (earlier named Progresa), could help lower the risks that the global slowdown will harm children and women. There is a growing literature in this area, but our focus here is on the impact of these programs on infant mortality. An empirical study of the Progresa program by Barham (2006), for example, provides empirical evidence that this social protection program has helped decrease infant mortality. Her study used a non-experimental method and exploited the phase-in of the program which was first introduced in 2,578 localities in 7 of 32 Mexican states in 1997. She turned to 1991-2001 vital statistics data, including on mortality from the Mexican Ministry of Health and on live births from the Mexican Statistical Agency, INEGI (excluding the state of Oaxaca in 2000). She used the percent of rural households in a municipality receiving Progresa benefits as a measure of the intensity of program treatment. The model specification included the infant mortality rate in each municipality for each year as the dependent variable; and the Progresa intensity measure, year and municipality fixed effects and time varying municipality characteristics as independent variables. This study found that the average treatment effect obtained from the program is a 5 percent reduction in the rural infant mortality rate in Mexico. (At the municipal level, program coverage reached about half of the rural households.) This impact could reach over 10 percent if the program is better targeted at poor households (ibid:17).⁴⁰ Clearly, the impact of these programs will depend on a variety of factors, including the country and time context, as well as the exact features of the program itself.

³⁹ Empirical evidence on the impact of social protection programs suggest that they could help increase school enrollment, improve child nutrition and maternal health and, as mentioned in this paper, mitigate infant mortality. For a review of these programs and a discussion of the empirical evidence on their impact on health seeking, investments in children and improvements in health outcomes for children and mothers, see for example Bassett (2008), Barrientos and Hulme (2008), De Janvry and others (2006), Fiszbein and others (2009), Galasso and Ravallion (2004), Gertler (2004) and Grosh and others (2008).

⁴⁰ Nevertheless, two caveats in Barham (2006) are the non-measurement of possible spillover effects from program treatment (i.e. program impact could be overestimated due to the inability to exclude non-eligibles from benefiting from the improved health service supply or other program spillover effects) and possible underreporting of births and deaths (i.e. program impact could be overestimated if reporting of births is affected by the availability of the program).

Table 1. Nutrition and Health Related Components of Social Protection Programs in 19 Developing Countries

Country	Program	Health Check-ups	Growth Monitoring*	Education Workshops	Micronutrient Supplementation
Argentina	Programa Familias	✓ children & pregnant women			
Brazil	Bolsa Alimentação	✓ children 0-15 & pregnant women	✓	✓	
	Bolsa Familia	✓ children 0-6 & pregnant women	✓		
Chile	Subsidio Unitario Familiar	✓ children 0-6			
Colombia	Familias en Acción	✓ children 0-6	✓	✓ encouraged, but not required	
Dominican Republic	Solidaridad	✓ children 0-5	✓		
Ecuador	Bono de Desarrollo Humano	✓ children 0-5	✓		
El Salvador	Red Solidaria	✓ children 0-5 & pregnant women	✓	✓	
Honduras	PRAF II	✓ children & pregnant women	✓		
Indonesia	Program Keluarga Harapan	✓ children 0-6 & pregnant women			
Jamaica	PATH	✓ children 0-6 & pregnant women			
Kenya	Cash Transfer for OVC	✓ children 0-5	✓		✓ (vitamin A)
Mexico	Oportunidades	✓ children & adults	✓	✓	✓ (iron & papilla nutritional supplement)
Nicaragua	Red de Protección Social	✓ children 0-5	✓	✓	✓ (iron)
Panama	Red de Oportunidades	✓ children 0-5			
Paraguay	Tekopora Program	✓ children 0-14 & pregnant women	✓		
Peru	Juntos	✓ children 0-5 & pregnant women	planned	✓ (hhs with children 6-36 mos)	
Philippines	Ahon Familyang Pilipino	✓ children 0-5 & pregnant women			
Turkey	Social Risk Mitigation Project	✓ children 0-6 & pregnant women			
Uganda	Cash Transfer pilot	✓ infants			

*Indicates growth monitoring with or without counseling.

Source: Basset (2008:18).

Cash transfer programs are not the only possible forms of social protection and policy interventions that could be appropriate across different country contexts. For instance, community-based primary care programs—such as the *Programa Saude da Familia* (PSF) program in Brazil—could also help to mitigate infant mortality. A decentralized approach to providing core primary care to Brazil’s families, PSF involves, among other features, first-contact access for new health needs, healthcare over the lifecourse, coordination of care between different providers and types of health services and family and community-oriented health promotion initiatives. The roots of PSF trace back to the community health agents program initiated in the Brazilian state of Ceara in the early 1990s. By 2007, the program had grown considerably, covering 26,730 community based teams providing primary care to over 85 million people making PSF one of the largest community based primary care systems in the world.

As for evidence on the impact of PSF on infant mortality, a recent study by Macinko and others (2007) used panel data covering all 557 Brazilian micro-regions over a 6 year period (1999-2004) in order to examine the impact of PSF coverage on infant mortality, neonatal mortality and post-neonatal mortality. The study also controlled for other possible factors that could affect infant and child health, e.g. measures of physicians and hospital beds, Hepatitis vaccine coverage, share of women without prenatal care and with no formal education, low birth weights, population size and poverty rates. This study found evidence that a 10 percent increase in PSF coverage was associated with a 0.45 percent decrease in IMR, a 0.6 percent decline in post-neonatal mortality, and a 1 percent decline in diarrhea-related mortality (ibid:2075).

Clearly social protection programs differ in their design as well as context, emphasizing that there is no single best approach.⁴¹ *Oportunidades* costs about 0.4 percent of Mexico's GDP and covers about 5 million households, or about 23 percent of the total population.⁴² Program coverage in other countries could be much lower than this. For example, Peru's *Juntos* program, which costs about 0.1 percent of GDP, covers slightly over 330,000 households representing 5.3 percent of the population.⁴³ (For comparison, over 50 percent of Peru's population falls under the national poverty line.⁴⁴) Similarly, Jamaica's *Program of Advancement through Health and Education* (PATH) costs about 0.16 percent of GDP and covers about 8 percent of the population.⁴⁵ (About 19 percent of Jamaicans fall under the national poverty line.⁴⁶) Both program coverage and benefits are among the areas where social protection could be further enhanced (Lustig, 2000b; Mendoza, 2009).

Implementing some elements of social protection programs—notably cash transfers—may be difficult to do quickly during an economic downturn or a crisis situation. This is particularly the case in the least developed countries. These types of programs require planning and time to establish targeting and monitoring mechanisms (Soares, 2009). However, social protection is a much broader concept than just cash transfers, and it includes a variety of non-cash elements to protect the most vulnerable populations, as evidenced by programs like PSF.

Where social protection programs already exist, it might be possible to augment and expand these, as was the case of Brazil and Mexico in their response to the presently unfolding economic downturn. Nevertheless, for many least developed countries where social protection systems are less well developed, other elements may need to be advanced, e.g. school feeding and nutrition supplementation, healthcare and social services, and guaranteed work programs, etc.

It is also critical to address certain context-specific challenges in the design of social protection systems in different parts of the world. Where pre-existing biases against girls exist, the

⁴¹ As noted earlier, infant mortality itself is due to a number of factors, each linked to different stages of vulnerability within the first year of an infant's life. Program components that include prenatal care and adequate nutrition are crucial even before birth. On the other hand, health-worker attendance and hospital care if needed could be critical at the time of birth. Furthermore, adequate postnatal care, good hygiene and sanitation as well as education on good infant care practices are likely to be important from the time of birth onwards.

⁴² Grosh and others (2008:499-500).

⁴³ Grosh and others (2008:501).

⁴⁴ UNDP (2007:238).

⁴⁵ Grosh and others (2008:499).

⁴⁶ UNDP (2007:239).

empirical evidence suggests that crises may exacerbate these. Different programs may result in different relative outcomes across boys and girls, depending in part on how households perceive the cash- or in-kind transfer, as well as how they view investments in the health and education of boys and girls (Quisumbing, 2003). In some parts of the world, boys are seen as economic assets who could enhance the income of the household, whereas girls are seen as liabilities as they will eventually marry into a different household (Bairagi, 1986).

In this policy area, UNICEF is working with national governments in over 20 countries, including Malawi, Kyrgyzstan and Mexico, to support child- and gender-sensitive social protection, such as health financing schemes and advancing existing cash transfer programs which will help to ensure children are protected during the downturn. UNICEF is also working to ensure that stable social protection schemes replace temporary emergency responses to the food price shocks (such as price control policies) in several countries, such as Cambodia, China, Indonesia, Maldives, Nepal, Philippines, Thailand and Vietnam.

3.3. Pro-poor countercyclical policy

Clearly, mitigating the downturn itself and ensuring that the economic recovery is pro-poor are critical components of the over-all policy response. Empirical evidence on past crises that were reviewed earlier suggest that boosting households' purchasing power and income earning capacity could be key to preventing some of the harmful coping strategies as well as stimulating the types of health-promoting behavior and consumption that could improve child and maternal health. Thus, stimulus packages designed to hasten the economic recovery could also help to alleviate the situation for poor and low income families, but the nature of this recovery—whether it is pro-poor and benefits the low-income and poor families harmed by the slowdown—will be critical. Just as crises tend to have distributional consequences, possibly creating most harm to those that are least equipped to cope, so too will economic recovery, tending to benefit those that may have stronger capacity and means to take advantage of economic opportunities. Both ways, poor and low-income people may be at a relative disadvantage, facing great harm during the downturn and benefiting very little during the upturn.

The impact of economic growth on poverty alleviation and human development depends not just on the size and persistence of economic growth episodes, but also its nature, and notably its composition, i.e. which sectors benefit most. Empirical evidence suggests that poverty reduction is most successful when the unskilled and labor intensive sectors (e.g. agriculture, construction and manufacturing) are driving growth (Loayza and Raddatz, Forthcoming). Studies have also shown that economic growth is slow to bring about improvements in child wellbeing such as reduction in child malnutrition. For example, one recent study of over 160 spells of change in chronic malnutrition by Heltberg (2009) found that an average country with 30 percent children stunted and income growth per capita of 10 percent, faced a very marginal improvement in stunting reduction: from 30 percent to 29.4 percent.⁴⁷ Past empirical studies confirm that the elasticity of economic growth and child indicators like malnutrition is small—and typically much

⁴⁷ In this study, a spell is the change between any 2 years for which a given country has observations on both malnutrition and income per capita, drawing on the World Bank's *World Development Indicators* database. Of this total, the study covers 45 positive (meaning increasing malnutrition), 118 negative and 3 zero spells (Heltberg, 2009:S83).

smaller than the elasticity of growth and poverty reduction (Heltberg, 2009; Haddad and others, 2003). Some have used this evidence to help justify a more targeted approach to alleviating child malnutrition, among other deprivations, given that growth alone is unlikely to deliver rapid and sustained gains.

Similarly, it should not be taken for granted that the benefits from an economic recovery process are necessarily going to automatically trickle-down to the poor (Mendoza, 2009; Ravallion, 2008). There are a variety of measures to help ensure this, and all are germane to the design of the policy interventions—notably the countercyclical responses (or lack thereof)—of the government. The social and economic impacts of stabilization programs themselves are checkered.⁴⁸ In past crises, the social sectors were typically among the ones that remained stagnant or were retrenched, at precisely the time when more people were falling into poverty and already existing poor were falling deeper into destitution. A strong case could be made to break from these past policies, and instead try to emphasize pro-poor stabilization policies, or put differently, “countercyclical safety nets” (Alderman and Haque, 2006).

The pro-poor countercyclical response could take the form of a surge in social sector spending at precisely the time of the slowdown, when the sector’s needs are most acute. China’s recent decision to expand its spending in its education and health sectors is an important step in this direction. Another example is Brazil’s recent decision to devote more public resources in order to expand its *Bolsa Familia* social protection program, by including an additional 1.3 million poor families, in response to global slowdown. Indeed, the government identified this as a key aspect in their policy response, noting how cash transfer programs not only rescue millions of people from extreme poverty, but also turns them into consumers, helping to stimulate local and regional economies (ILO, 2009). Some—though not all—countries have taken decisive steps to try and boost their social sectors and bolster their social protection systems, reflecting efforts to scale up existing systems or undertake more ambitious reforms. Box 1 further provides information on the first few countries that have already accessed multilateral financing for these purposes.

Finally, stimulus programs could also be designed in ways that have broader and more immediate benefits reaching the poor and low income people. Investments in infrastructure, for example, could prioritize rural areas, and form part of the country’s over-all strategy to boost the productivity in the agricultural sector, as well as improve the country’s resilience to climate and other types of shocks. The quality of the recovery, the preservation and strengthening of the country’s human capital (and thus also the minimization of social and economic costs), and the resulting resilience (or continued vulnerability) of the country to future shocks will hinge on these investments strategies.

⁴⁸ For a detailed discussion, see for example Vreeland (2006) and the evaluations produced by the Independent Evaluation Office (IEO) of the International Monetary Fund (<http://www.ieo-imf.org/>).

Box 1. Examples of Loans Taken Out by Developing Countries to Boost Social Sector Investments and Social Protection in Response to the Global Economic Slowdown

The following provides a selective review of recent multilateral loans undertaken by developing countries in order to boost spending and investments in the social sectors and provide more resources towards scaling up or instituting further reforms in their social protection systems.

Argentina:

- \$US450 million World Bank loan to increase the effectiveness of Argentina's income transfer programs for the unemployed and families with children, by improving design features, transparency and accountability in two core social protection programs and transferring beneficiaries from other, less effective schemes to them. The project includes the following three components: (i) improvements in Seguro, an employment benefit and training program (formerly Jefes) (ii) improvement in the Familias, a family allowances Conditional Cash Transfer program and (iii) a Technical Assistance component for monitoring and evaluation of social protection programs.
- \$US850 million Inter-American Development Bank (IDB) loan for a program aimed at providing better access to education and healthcare to vulnerable families in Argentina, improving their living conditions and human capital formation. The Bank financing operation will help define a social protection policy that coordinates action of conditional cash transfer (CCT) programs within the standards of existing sector policies. The loan will also help realign the CCT programs currently operating in Argentina, and finance the design, implementation, and consolidation of a new system to detect and monitor social risks in households covered by Families Program (Programa Familias, in Spanish), the largest of its kind in the country. Families Program was launched in October 2005 with the support of a \$700 million loan from the IDB, and by January 2009 it had assisted more than 600,000 families.

Dominican Republic:

- \$US70 million IDB loan for a program to improve nutrition and provide better access to education and healthcare of poor families in the Dominican Republic, by protecting and improving their human capital investments. This loan represents the first phase of a \$300 million multiphase program. To achieve this goal, the IDB financing will help the country's conditional cash transfer program, Solidaridad, transition to a new system that places greater emphasis on promoting increases in human capital accumulation of its beneficiaries, and doing so more efficiently. Solidaridad, created in 2005, provides cash transfers to poor households provided that they improve the investments they make in education, health and nutrition. Eligible families receive between \$20 and \$40 per month if they attend nutrition training courses, have their children immunized and ensure they go to school. Some 460,000 families are covered by Solidaridad, approximately 74 percent of the population living in poverty in the Dominican Republic. The program will also strengthen the management capacity of Solidaridad, as well as

the country's beneficiaries identification system (*Sistema Único de Beneficiarios*, SIUBEN), and its social subsidies administration office (*Administradora de Subsidios Sociales*, ADESS).

El Salvador:

- \$US500 million social policy support program to strengthen the safety net for the very poor and improve medium- and long-term policies for poverty reduction. The program is a two-tranche IDB loan for \$200 million in 2008 and \$300 million in 2009. It will center on three areas of action: the macroeconomic environment, strategic actions in the social sectors, and budget protection for priority social programs. Social policy actions supported by the operation focus on strengthening the quality and coverage of the social safety net in the poorest municipalities and households in El Salvador. They include the systematization, strengthening, and consolidation of the Solidarity Network's targeting tools; establishment and improvements of the interagency and cross-sector mechanisms for coordinating the social sector ministries and institutions; community participation mechanisms; monitoring and evaluation systems for the network, and the design of interventions to tackle urban poverty. This program consists of a policy-based loan (PBL), a mechanism designed by the IDB to support reforms that require sequenced actions for implementation. El Salvador has a strong interest in protecting the budgets of priority social programs in particular during a period of fiscal and financial uncertainty.

Guatemala:

- US\$350 million IDB loan to finance a conditional cash transfer program called Mi Familia Progresá (My Family is Making Progress) targeting chronic malnutrition and truancy in priority municipalities. Mi Familia Progresá is currently providing a monthly health and nutrition transfer of 150 quetzales (US\$20) to families with children under age six, and 300 quetzales for education to families with at least one child between 6 and 15 attending primary school or preschool. Payments are made to families twice a month. Families are responsible for visiting health care centers and, if the family composition includes a pregnant woman and/or children under age six, receiving a basic package of nutritional and preventive maternal-child health care services. Participants with school-age children must also certify regular attendance to classes. The conditional cash transfer program is expected to cover 45 priority municipalities in 2008 and 125 of the country's 333 municipalities by the end of 2009. The IDB financing consists of a US\$139 million loan for a 20-year term, with a five-year grace period, at a variable interest rate. A parallel concessional financing includes two loans for a total of US\$61 million. The Ministry of Public Finance will carry out this program.

Honduras:

- \$20 million concessional IDB loan for a program to support the social safety net and conditional cash transfers to improve health and education conditions in poor families. The first loan will focus on the program's four targeted departments-- Lempira, Intibucá, La Paz, and Santa Bárbara, plus some of the country's poorest urban quarters. Its main goal will be to help support and expand PRAF's activities, boost

coordination with social safety nets, ensure the program's financial sustainability, and encourage household participation in order to improve health services and education. A \$7.7 million conditional cash transfer component, including education and health vouchers and non-conditional nutrition transfers, will distribute resources three times a year to thousands of families, covering also bank fees. In response to the limited access of this target population group to basic services, the program also supports improved education and health services through community-based strategies executed by local education and health associations, with the help of non-governmental organizations specialized in these fields.

Macedonia:

- US\$25 million World Bank Specific Investment Loan to boost the effectiveness and efficiency of Macedonia's social safety net through the introduction of conditional cash transfers and improvements in the administration of social assistance transfers. The project's main components are: (i) implementation of a CCT program for poor families with children in secondary education and of a pilot CCT for peri-natal and post-natal care; (ii) strengthening of the overall safety net efficiency and effectiveness through improved administration and oversight, service delivery, and monitoring and evaluation, including further improvements in the Cash Benefits Information System and capacity building for program management at the ministerial level; (iii) support for the design of an information and dissemination campaign to inform all prospective beneficiaries (including Roma populations) of their eligibility for the CCT benefits and the requirements of the application process.

Mexico:

- \$US1.5 billion World Bank Sector Investment loan to finance the continuation of Mexico's conditional cash transfer (CCT) program, Oportunidades, which covers about 5 million people. About 70 percent of these families are in rural areas, 16 per cent live in semi-urban areas, and the remainder lives in urban areas. The principal project development objectives are to (i) complement the income of poor families with children (ii) increase the accumulation of human capital in extremely poor families through improvements in their access to education, health and nutrition (iii) strengthen program quality.
- \$US2 billion IDB credit line to boost resources for Oportunidades. A first \$200 million loan within the conditional credit line for investment projects (known as CCLIP) seeks to improve education, health and nutrition among the poor. A pilot program within Oportunidades will incorporate new initiatives especially adapted to the needs of the urban poor, as well as the indigenous population. This operation is the third to Mexico for Oportunidades since it was launched in 1997. Two previous IDB loans totaled \$2.2 billion, the largest amount the IDB has ever lent for a single social program in Mexico. These operations were not only significant financially but also because the Bank supported Mexico in developing rigorous independent evaluation mechanisms and constant program design improvements during these years. Building on this experience, the IDB is also financing similar conditional cash transfer programs in 15 Latin American and Caribbean countries.

Pakistan:

- US\$60 million World Bank Technical Assistance Credit to enhance the operation and management of a nationwide safety net system in Pakistan. Over a four year period, the proposed SSN TA project would provide support through (i) building the foundations for a national, unified targeting system that could progressively be used for a defined set of targeted programs, (ii) strengthening the institutional capacity to roll out and manage an efficient and transparent national safety net system including the piloting of ‘safety ladders’ through linkages with complementary measures, and (iii) supporting the evolution of the National Social Protection Strategy (NSPS) through the establishment of a monitoring and evaluation system for the strategy across programs and interventions. The project is therefore seen as the beginning of a longer term engagement to establish structures and systems for better social protection of the poor in the country.

Peru:

- \$15 million IDB loan to support the second phase of the government's health-sector-reform program PARSALUD aimed at women and children under 3 years of age in impoverished rural areas. The program seeks to promote appropriate practices and family and community health care resources for women while pregnant, in labor, and nursing, and their children; improve the response capabilities of health service networks to handle obstetric and neonatal emergencies and provide comprehensive health care; and strengthen governance to ensure an efficient, equitable, and high quality health care system becomes available for all sectors of society. The World Bank has pledged another \$15 million for the program, whereas the government will provide an extra \$132.4 million. The IDB loan is for a 20-year term, with a 5-year grace period, at a variable LIBOR-based interest rate. Conversion to local currency is optional.

Philippines:

- \$US405 million World Bank Specific Investment Loan for the Philippines Social Welfare and Development Reform Project, which aims to advance the social protection reform agenda of the Government of the Philippines by (i) strengthening the effectiveness of the new CCT program to provide cash transfers and promote access to health and education services for poor households in select areas and (ii) improving targeting of social protection programs in select areas. The project brings in Bank support as the Government increases its focus on social protection in response to the recent food crisis and general poverty trends and as the Bank prepares to incorporate social protection as a pillar of the next Country Assistance Strategy.
- \$US500 million short-term fiscal stimulus loan for the Philippines which is the first loan approval for the Asian Development Bank's Countercyclical Support Facility (CSF). The \$3-billion CSF, established in June 2009, supports ADB's developing member countries (DMC) needing to ramp up fiscal spending to counter the global economic slowdown. To be eligible to access the CSF, DMCs must be adversely

affected by the global economic slowdown, demonstrate sound macroeconomic policies, and have a countercyclical program in place. Besides the Philippines, the following countries have requested CSF allocations: Bangladesh, Indonesia, Viet Nam, Kazakhstan, Pakistan and Sri Lanka. CSF allocations will be subject to Board approval. The Philippines loan will help close the Government's budget financing gap for this year. It is designed to support the Government's countercyclical expenditure program in its 2009 budget, which includes labor-intensive infrastructure projects, and the scaling up of the conditional cash transfer program, among other crisis mitigating programs.

Senegal:

- \$US18 million World Bank Economic Recovery Loan (ERL) to help mitigate the adverse effects of high food prices through supporting child nutrition and developing a targeted safety nets program. The project's main components are: (i) a cash transfer program to vulnerable mothers of children under five, accompanied by a strong communication campaign on maternal and child nutrition, in order to provide both additional resources and information for securing appropriate food intake; (ii) a community-driven nutrition strategy that involves growth monitoring for children under two, nutrition education for mothers, provision of iron and vitamin A supplements, de-worming and insecticide treated benefits and (iii) support to sectoral and national nutrition policies, encompassing periodic distribution of micronutrient supplements, supervision of nutrition services, scaling up of food fortification and a comprehensive monitoring and evaluation scheme.

West Bank and Gaza:

- \$US40 million World Bank loan to support the Palestinian Reform and Development Plan with actions in two policy areas: (i) strengthening the Palestinian Authority's fiscal position and (ii) improving public financial management. Moreover, the Bank approved two additional financing grants. One is a 5 million addition to the previous 10 million-dollar-grant for the Third Emergency Services Support Project (ESSP III). This additional financing aims to help mitigate the deterioration in the provision of essential public services in education, health and social services. The other additional financing is a 3 million-dollar-grant directed to the Palestinian NGO III Project, with the objective of improving the quality and sustainability of NGO social service delivery.

Sources: Excerpted from Grosh and Andrews (2009) and various press releases by ADB, IADB and the World Bank as of September 14, 2009.

Conclusion

Children are at risk during the presently unfolding global economic slowdown. Focusing on infant mortality, this paper reviewed the empirical literature in this area and provided a few illustrative calculations in order to help highlight this point. According to one set of estimates, the additional infant mortality in 2009 could be between approximately 56,000 and 138,000 for a sample of 57 developing countries. Taking this into account and factoring in the average annual reduction in infant deaths in recent years, the global downturn could result in either a smaller net reduction in infant mortality of 36,000 in 2009, or an increase in net infant mortality of 46,000 in those 57 developing countries. Earlier projections by the World Bank arrive at even higher estimates than the ones illustrated here. There is a large range of estimated impact based on the available studies, signaling that there is still scope to further sharpen the estimates and evidence in this area. In addition, as the economic crisis abates, economies will undoubtedly rebound. However, as evidence from past economic crises show, the downturn may be very “inclusive” (i.e. poor and low income people will be affected and often disproportionately more than richer people), whereas the recovery is not necessarily so. Therefore, while primarily illustrative, the calculations in this paper and the over-all empirical evidence in this area underscore the strong risk that the global slowdown, if left unmitigated, and the eventual recovery, if not pro-poor, could undermine recent progress in reducing infant mortality, setting the world back in terms of reaching the Millennium Development Goals (MDGs).

The abovementioned numbers are illustrative and do not yet fully account for the variety of policy responses that governments can implement to protect children from the negative effects of the global slowdown. Policy responses to expand social protection and resuscitate pro-poor growth can mitigate most, if not all, of the increase in infant mortality. This paper emphasizes three key areas for policymakers to consider:

1. Providing humanitarian relief to the most severely affected countries and population groups;
2. Expanding social protection to the poorest and most vulnerable in order to mitigate the worst implications of the global slowdown on children and women, blunting their protracted ill-effects; and,
3. Resuscitating growth in a way that is pro-poor and ensures that the recovery of household incomes—notably among the poor and low income households—is robust and sustained.

In addition to these, policymakers should not lose sight of the policies and social sector investments that address the broader challenges of poverty reduction and human development and also help lower many of the pre-existing vulnerabilities of children and women. Policy responses in this area include promoting protective household practices for infants, young children and mothers, including care, breastfeeding, diarrhea prevention, good weaning and complementary feeding practices, and handwashing—all of which are not greatly economy-

dependent.⁴⁹ The escape from poverty and many of the deprivations that characterize this condition is also often the means to be much more resilient to crises and income shocks. Thus the main message of this paper for policymakers is that, based on empirical evidence on past crises, the possible impact of the present crisis on infant mortality is nothing that cannot be mitigated by policies that protect children and women and ensure sufficient social sectors investments in the first place.

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⁴⁹ Empirical studies that suggest the importance of these and other factors in reducing infant mortality include: Agha (2000), Aguilera and Marrufo (2007), Chopra and others (2009), Jalan and Ravallion (2003) and WHO (2000).

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For more information, please contact:

The United Nations Children's Fund (UNICEF)
3 United Nations Plaza, Policy, Advocacy and Knowledge Management
New York, NY 10017, USA

E-mail: workingpapers@unicef.org

Website: www.unicef.org/policyanalysis