Child Health in Rural Mexico: Did Progresa improve children's morbidity risks?

Introduction

It is widely acknowledged that poor health at early life is associated with poorer health outcomes later in life (Case, Lubotsky et al. 2001). There is evidence both from developed and developing countries showing that children's health status is positively associated with family's socio-economic status (Case, Lubotsky et al. 2001; Singer 2001; Burgess, Propper et al. 2004). Children growing up in poverty are more likely to have poorer health outcomes than their better-off peers because they are more exposed to the hazards associated with ill health.

In developing countries, children living in impoverished environments are likely to catch infectious diseases because a complex interplay of risks factors (e.g. poor diet, unhealthy environments, inadequate access to health services, and incidence of natural disasters) makes them less resistant to disease. Children with chronic health problems tend to miss more days of school, leading to lower academic achievements and greater dropout rates, which later translate into lower earnings in life. Hence, poor health during childhood has detrimental consequences for human capital formation, human development and economic growth.

Despite important progress during the 1990s, diarrhoea and acute respiratory infections (ARI) are still the two leading causes of child mortality in developing countries and remain among the most common childhood diseases. In the year 2000 the United Nations compiled a new set of targets known as the Millennium Development Goals (MDG), which include a series of child health related targets aimed to follow up and reinforced the 1990's World Summit commitments. The main goal in this area is to reduce between 1990 and 2015 under-five mortality rates by two thirds. In contrast with the World Summit for Children, the MDGs have no specific targets to attack and control infectious diseases. Although decreasing child mortality is necessary for improving children's well-being, it is not sufficient. Efforts and measurable goals should be targeted specifically to address child morbidity.

An important limitation of international goals such as the WSG and the MDG is that health targets may overlook the outcomes of the poor. Health targets are set at the national level; hence, progress may not necessarily reflect gains among the most disadvantaged groups (Gwatkin 2002). There is wide evidence that in many low and middle-income countries there are important health gaps between socio-economic groups that have even widened across time (Cleland, Bicego et al. 1992; Pebley and Goldman 1995; Wagstaff 2000; Wagstaff and Watanabe 2000; Victora, Wagstaff et al. 2003; Gwatkin, Rutstein et al. 2004). Greater improvements could be achieved by implementing effective interventions, whose efforts are targeted to the population at highest risk. The latter is crucial since health differentials prevail not only during infancy and childhood, but also at other stages of life (Evans, Whitehead et al. 2001).

One of the central goals of Mexico's anti-poverty programme, Progresa, is to reduce and prevent morbidity among children living in extreme poverty. The activities of Progresa in this strand include: improving access to medical treatment by promoting regular visits to the health centre; improving health care practices through monthly educational sessions; and improving children's nutritional status through a monetary grant for food consumption and nutritional supplements.

Up to now there have been two assessments of Progresa's performance on improving child health outcomes; but neither has examined the effect of the Programme on reducing specific infectious diseases (Gertler 2000; Gertler, Rivera Domarco et al. Forthcoming 2004). The purpose of this study is to estimate Progresa's effect on reducing the prevalence of diarrhoea and respiratory infections. Specifically, we want to answer whether Progresa had a positive effect on improving these health outcomes, on whether this effect was stronger among children who received nutritional supplements, and whether the Programme had greater effects among certain groups of the population.

Methodology

For the first objective, we specify model (1). This model estimates Progresa's effect on (M_{it}) child's morbidity status (probability of being ill with diarrhoea or

ARI) using a dummy variable for living in a treatment locality (P_{it}), a dummy for wave of data collection (W_{it}) and an interaction term that provides estimates for the effect of living in a treatment locality by wave of data collection ($P_{it}.W_{it}$). Additionally, we include a set of variables at the individual (I_{it}), household (H_{it}), and community (C_{it}) level to control for differences in the outcomes that are not associated with Progresa's intervention.

$$M_{it} = \beta_1 P_{it} + \beta_2 W_{it} + \beta_3 P_{it}.W_{it} + \beta_4 I_{it} + \beta_5 H_{it} + \beta_6 C_{it} + e_{it} \quad (1)$$

where i=1,2,…n (individuals), t=2,3 (waves of data collection).

In a second model we include three additional terms to evaluate whether children receiving nutritional supplements had better outcomes than those who did not receive this benefit. Model (2) includes a term for estimating the main effect of receiving supplements (S_{it}), the conjoint effect of receiving supplements and living in a treatment locality ($P_{it}.S_{it}$), and the conjoint effect of receiving supplements and wave of data collection ($S_{it}.W_{it}$).

$$M_{it} = \beta_1 P_{it} + \beta_2 W_{it} + \beta_3 S_{it} + \beta_4 P_{it}.W_{it} + \beta_5 P_{it}.S_{it} + \beta_6 S_{it}.W_{it} + \beta_7 I_{it} + \beta_8 H_{it} + \beta_9 C_{it} + e_{it} \quad (2)$$

Furthermore, to control for the fact that we do not have a baseline measure we estimate the previous models controlling for children's anthropometric status (height for age[1]) at time t-1. These models are carried out only for the longitudinal sample with three observations across time since it is the sample that includes information on nutritional status at baseline.

$$M_{it} = \beta_1 P_{it} + \beta_2 W_{it} + \beta_3 P_{it}.W_{it} + \beta_4 I_{it} + \beta_5 H_{it} + \beta_6 C_{it} + \beta_7 N_{it-1} + e_{it} \quad (3)$$

$$M_{it} = \beta_1 P_{it} + \beta_2 W_{it} + \beta_3 S_{it} + \beta_4 P_{it}.W_{it} + \beta_5 P_{it}.S_{it} + \beta_6 S_{it}.W_{it} + \beta_7 I_{it} + \beta_8 H_{it} + \beta_9 C_{it} + \beta_{10} N_{it-1} + e_{it} \quad (4)$$

Finally, to assess whether Progresa had a greater effect among specific groups we estimated a model with interactions of living in a Progresa locality and a group of household and community characteristics linked with lack of resources (parental

[1] We include height for age because at baseline this health outcome showed variations between treatment and control groups.

education, mother's language, distance to the health centre and region). We tested the inclusion of other household characteristics linked with this policy intervention (e.g., number of children within the household), but in the final model we include a selected number of covariates to have a more parsimonious model.

$$M_{it} = \beta_1 P_{it} + \beta_2 W_{it} + \beta_3 P_{it}.H_{it} + \beta_4 P_{it} C_{it} + e_{it} \quad (5)$$

Results

Our findings suggest a positive Programme effect on reducing morbidity rates. Although the magnitude and significance of Progresa's impact varies according to health outcome and age group, we observe a consistent pattern in the majority of our analyses. After Programme implementation there is a significant difference in the outcomes of treatment and control groups, with this difference representing lower morbidity rates due to the intervention. In addition, once children living in control areas are incorporated into the Programme, differences between treatment groups are no longer evident.

Regarding the incidence of diarrhoea, estimates from our multivariate models suggest that after one year of Progresa's operation, children under five receiving benefits are 32 percent less likely of being ill than they might be in absence of intervention. However, two years after Programme implementation we do not observe further improvements among the treatment group.

With respect to ARI, our results suggest a positive Programme effect at wave two (odds of 70:1), although not as strong as that observed for diarrhoea (p-values of 0.07). However, the models show important increases between waves two and three among children in treatment localities. Therefore, it is not clear that the Programme's activities are associated with an improvement in this health outcome. The quality of these reports suggests these findings should be treated with caution since it is not clear they represent actual levels of morbidity or mother's perceptions of illness.

We do not find evidence of significant interactions between household or community characteristics and Progresa, except for distance to the health centre

and region of residence. It seems that beneficiary children living nearer to the health centre have and those living in the Altiplano and Huasteca region have reduced chances of being ill than their control counterparts.

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