DISCUSSION PAPERS IN ECONOMICS

Working Paper No. 06-02

Providing a Healthier Start to Life: The Impact of Conditional Cash Transfers on Infant Mortality*

Tania Barham

Providing a Healthier Start to Life: The Impact of Conditional Cash Transfers on Infant Mortality*

Tania Barham

Department of Agriculture and Resource Economics

U.C. Berkeley†

May, 2005

1 Introduction

Every year more than 10 million children die from preventable diseases such as malnutrition and intestinal infections in developing countries (World Bank, 2003). The majority of these deaths take place during infancy, before the child reaches the age of one.[1] Consequently, finding effective policies to reduce mortality among infants is a key part of the development agenda. This is evidenced by the selection of infant mortality as one of the targets

Progresa differs from typical income transfer programs since the cash transfers to beneficiary households are made conditional upon household members engaging in a set of actions designed to improve their health, nutrition and education status. The aim of the program is to build the human capital of young children and thereby break the intergenerational transmission of poverty. Previous research on Progresa has taken advantage of a randomized treatment and control evaluation database to investigate if the program improved various aspects of children's health.[4] This research has shown that the nutritional status of children improved and the number of days a mother reported her child ill decreased for treatment households as compared to those from similar families that did do not receive the transfer (Behrman and Hoddinott, 2001; Gertler and Boyce, 2001; Gertler, 2004). These findings indicate that there are some important nutritional benefits of conditional cash transfers, but most other indicators of children's health used in these studies rely on parent's recall and perceptions of good health which have potential reporting biases. This paper therefore focuses on infant mortality, which is a broader and more objective measure of children's health.[5]

In addition, the sample size in the Progresa randomized treatment and control database is too small to accurately estimate the impact of the program on infant mortality. This paper resolves the sample size problem by constructing a panel data set of 2,399 municipalities[6] from 1992 to 2001 and uses a non-experimental research design. The treatment effect of Progresa on

---

[4]The evaluation database is a panel of household surveys that contains information on the treatment and control households both before and after the intervention.

[5] The IMR is commonly used as a primary indicator of children's health, especially in developing countries. This is partly due to inadequate information systems to gather data on child morbidity in many countries, and because obtaining objective measures of children's health that does not rely on parent's recall or perceptions of good health is difficult. In addition, infants are especially susceptible to many common diseases. Thus, their death rate serves as an indicator of the overall health of children in areas that suffer from high rates of preventable diseases (Lederman, 1990).

[6]In the 2000 Census there were 2445 municipalities in Mexico with an average population of 40,000 people and an average size of 800 square kilometers. They are often compared to the size of a county in the US.

rural infant mortality is identified using the phasing-in of the program over time in rural Mexico. This leads to a variation in the intensity of treatment indicator -- the percent of the rural population covered by the program -- both within and between municipalities. The econometric model employs municipality and time fixed effects, and includes variables associated with the program phase-in rule to control for program timing bias. The analysis also explicitly controls for changes in the supply of health care in rural areas. Additionally, the identification strategy takes advantage of the fact that Progresa was not provided in urban areas prior to 2000, and uses the urban IMR to test whether unobservable municipal time-variant variables are biasing the results. Using these techniques, we find that the program led to a reduction of approximately 2 deaths per 1000 live births among program participants. From an average IMR of 18, this is an 11 percent reduction. Reductions in infant mortality were even higher in Progresa areas where, prior to the program, houses had better access to piped water, fewer sewage systems, and in areas where the population spoke some Spanish.[7] Furthermore, robustness checks show that the program had no spurious impact on urban infant mortality, and also show that the impact is not the result of an endogenous increase in the number of live births.

With the exception of Progresa, there is very little evidence at this time of the causal impact of conditional or unconditional cash transfer programs on children's health outcomes or mortality in other developing countries. Results from the Colombian conditional cash transfer program show that while the number of episodes of acute diarrhea decreaColom

(Maluccio & Flores, 2004). Studies on the effect of increasing the amount and coverage of the social pension program in South Africa for the elderly black population found that income transfers also led to nutritional improvements among girls (Duflo, 2003; Case, 2001). The present study therefore makes an important contribution to the literature on health impacts of cash transfer programs by investigating a different and important children's health indicator, infant mortality. It is also the first study to use government administrative data to investigate outcomes of conditional cash transfer programs that could not have been studied otherwise.

The remainder of the paper is organized as follows. Section 2 describes the Progresa program including the targeting mechanism and the phase-in rule. A description of the data is conditioning the cash transfers on children attending school and family members obtaining sufficient preventative health care. Therefore, the income transfer not only relaxes the household budget constraint, but also provides an increase utilization of health and education services. While the program was first introduced in rural areas, it expanded into urban areas in 2000. This study focuses on the rural program.

The health component of Progresa was designed to address many recalcitrant health used mobile clinics and foot doctors to reach many marginalized communities that did not have access to permanent health clinics.

2.2 Targeting and Program Phase-In

Progresa used a two-stage process to identify eligible beneficiary households in rural areas (Skoufias et. al., 1999). In the first stage, rural localities[8] were selected. Localities with 2,500 inhabitants or less are denominated as rural.[9] In order to meet the program's objectives, localities where chosen based on a number of attributes. Localities were first ranked by a marginality index[10] and only those with a high marginality[11] were included in the program. Next, localities were screened to ensure access to primary and secondary schools as well as to a permanent health care clinic.[12] Finally, the program used population density data and information on the proximity of localities to each other to determine the geographic isolation of the locality. This information was used to identify groups of localities where the maximum benefit per household in extreme poverty would be reached. As a result, any locality with less

[8]A locality is a cluster of inhabited houses that can vary in size from 1 dwelling to over a million and has an average population size of 489. Localities are grouped into municipalities. The 2000 census recorded that there were 199,391 localities in 2,445 municipalities in Mexico. This leads to an average of 80 localities in a municipality with the range from 1 to 1630. A municipality is approximately 100 times larger than a locality with an average population of 40,000 as compared to 489 in 2000. The average population in rural areas of a municipality is 10,306, while the mean population of a rural locality is 125.
[9]Of the 199,391 localities in the 2000 census 196,350 were rural. The average number of people living in a rural locality is 126.
[10]This index is constructed using the principal components method. The variables that make up the index include: literacy rate; percent of dwellings with running water, drainage, and electricity; average occupants per room; percent of dwellings with a dirt floor; and percent of labor force working in the agriculture sector.
[11]

than 50 inhabitants or that was determined to be geographically isolated was excluded from the program.

While the exact program phase-in rule is not clearly documented, the general criteria are known (Skoufias et. al., 1999). For logistical and financial reasons, the program was phased-in over time starting with 2,578 localities in 7 out of 32 states in 1997 (Figure 1). In 1998, the were taken at approximately 6 month intervals. The design was created in order to ensure rigorous evaluation of the program impacts. The delay in the implementation of the program in control villages was justified since the government lacked sufficient funds to provide the program nationally from the outset. While many studies on Progresa take advantage of these data, there are only two deaths of children under age one in the control areas in the post-intervention period. For this reason, we use vital statistics data and a different identification strategy to study the program impacts on IMR as explained in the following sections.

3 The Data

We construct infant mortality rates using 1992-2001 vital statistics data. The mortality data are from a nation-wide database containing information on every registered death in Mexico and were provided by the Mexican Ministry of Public Health. While these data are available at the municipality level, they do distinguish whether the death occurred in a rural or urban locality

The intensity of treatment indicator is the percent of rural households in a municipality consistent panel of municipalities from 1992-2001, municipalities which were split in a particular year are amalgamated. This results in a balanced panel of 2,399 municipalities.

4 Identification Strategy

4.1 Sources of Variation

The objective is to estimate the treatment effect of Progresa on rural infant mortality. Ideally, we would compare the IMR in treated rural localities with the counterfactual ─the IMR had Progresa not been available in the locality. Since the counterfactual is never observed, we would take advantage of the phasing-in of the program over time and use rural localities yet to be treated as the comparison group. Since infant mortality is not available at the locality level, we instead investigate the impact of the program on municipality-level, rural IMR. Similar to localities, new municipalities came onto the program over time between 1997 and 2001 (Figure 2) leading to variation in the intensity of treatment across municipalities over time. Therefore, municipalities yet to be treated can be used as comparison municipalities. The identifying assumption in this case is that the changes in infant mortality observed in the comparison group are the same as in the treatment group had they not received the program. Although it is not possible to test this assumption, we can test that the pre-intervention trends in infant mortality are the same between municipalities that joined the program in different years. If the trends are the same in the pre-intervention period, they are likely to have been the same in the post-intervention period in the absence of the program.

We test that the pre-intervention trends in rural IMR, IMR^r, between municipalities that joined the program in different years are the similar. Two sets of dummy variables are used

$ENTERk$ and $YEARj$, where k=1998-2001 and j=1991-1996. $ENTERk$ takes on the value 1 if the first program locality of municipality m was phased-in during year k, and is zero otherwise. $YEARj$ are year dummy variables for 1991-1996 (years prior to the program introduction). Using data prior to 1997, the equation used to test the difference in trends is:

$$= \beta_0 + \sum \beta \quad + \sum \sum \theta \quad * \quad + \tag{1}$$

If the 0 's are not significantly different from zero, then the pre-intervention trends do not statistically differ between municipalities entering the program in subsequent years. Results are reported in Table 1. With the exception of the group of municipalities that joined the program in 2001 and those municipalities that have no Progresa, the results show that the pre-intervention trends in the rural IMR are not significantly different from municipalities that entered the program in 1997. Municipalities that joined the program in 2001 and those that do not have Progresa will therefore not be included in the comparison group.

Not all Progresa localities within a municipality were phased-in to the program during the same year. As a result, the program intensity also varies over time within a municipality. For example, Table 2 shows that there were 2,424 Progresa localities in 1997. In 1998, the number of Progresa localities in health care clinics than those that joined the program later, we control for changes in the supply of health care in rural municipalities, as well as the percent of Progresa localities with access to a permanent health care clinic. Furthermore, localities with lower population densities were phased-in during 1999. While we do no know the dens this change differed between the 1997 phase-in gr suggestive evidence. In Figures 3-5, trends in average municipality rural IMR are provided for three groups of municipalities, based on the year the program was first offered in the municipality. Only municipalities that entered the program in 1997, 1998 and 1999 are shown on the graphs. Municipalities that entered in 2000 are not displayed since there are just 12 observations. Those that joined in 2001 are also excluded since the pre-intervention trend for this group is statistically different from the other municipalities. Trends in urban IMR over the same time period are presented in Figure 6. Finally, since program intensity varies between municipalities, trends in rural IMR are also presented only for municipalities that had an average program intensity of 30 percent or more over the program period (Figure 7).

If Progresa is successful, there should notice a break in the trend in rural IMR soon after the program entered the municipality. However, since the program intensity increased over time within a municipality, these breaks may not be visible in the first year of the program. Mean municipality program intensity by year for each of the three groups is presented in Table 5. The first group of municipalities began to receive the program in 1997. Only 24 percent of rural households in these municipalities were covered by the program in that year. In 1998, the program was greatly expanded covering 55 percent of rural households in these same municipalities. Thus, there may be a larger impact of the program in 1998 rather than 1997 for this group. Figure 3 demonstrates that this is indeed the case for the municipalities that entered the program in 1997. The break in the trends for the two other groups occurs the year the program entered the municipalities. We verify that these breaks are not due to general trends in the municipalities by presenting a similar graph for urban IMR. As expected, there are no breaks in the trend in urban IMR the year the program entered the municipalities.

4.3 Empirical Model

We develop the empirical model by first considering a cohort of infants that dies in year t , in municipality m . Whether an infant dies, ($D = 1$, during that year dep[redacted] whether the infant was born in a household registered for Progresa benefits or not that year, and if the infant's mother was registered for the program during her pregnancy , H^{t}, $H^{t\ 1}$, H

Given the lack of individual-level data and because mortality is identified at the municipality level, equation individual is aggregated to the rural municipality level as follows:

$$\alpha \quad \beta \quad \varphi \quad \varepsilon \; , \qquad (3)$$

$$= \alpha \; + \tau \;\; + \sum \beta \qquad\qquad {}_{,}{}^{-} \; + \sum \varphi \qquad + \qquad , \qquad (2.5)$$

where the r superscript is added to emphasize that these data are for rural areas of the municipality. The dependent variable is now labeled IMR^r since it is a measure of the rural infant mortality rate. Heteroskedasticity and serial correlation maybe both be present in the error term. Thus, the regressions are weighted by the number of rural households[17] and robust standard errors that are corrected for serial correlation[18] are used. The estimate of the treatment effect of Progresa on the treated is measured by the G 's, while the average treatment effect can be calculated by multiplying the impact on the treated by the average of the *Intensity*.

5 Results

5.1 General Impact of the Program

We start by estimating the treatment effect of Progresa on the rural IMR. Columns 1 through 5 of Table.6 present different specifications for estimating this impact. The adjusted R the program reached an average of 47 percent. Therefore, the average treatment effect is a 5 percent reduction in the rural IMR.

5.2 Spillover Effects

Reduction in infant mortality among the treated may be overestimated due to the inability to exclude non-eligibles (non-poor in a locality) from benefiting from the improved health supply or due to program spillover effects. While cash transfers are only provided to beneficiaries, improvements in the health supply associated with the program could potentially lead to mortality reduction in the non-eligible group. Furthermore, program beneficiaries may inform those not in the program of the health gains they experienced from increased health care utilization or share their knowledge from the health education session. These health spillover effects could also generate lower infant mortality rates among the untreated.

Bobonis and Finan (2002) study health spillover effects and find no indication of such effects on the incidence of illness or on self-reported health indicators for children. This provides partial evidence that spillover effects may not be a concern. However, it may be that women's health behaviors during pregnancy and their child's infancy are not related to behaviors that affected the children's health outcomes mentioned above. While this question can be investigated further using the randomized treatment and control evaluation database, the average treatment affect reported in this paper provides a lower bound on the impact of the program on the treated.

5.3 Validity Checks

Although the model controls for time-invariant unobserved municipal heterogeneity, it cannot control for unobserved time-varying municipality factors that may be correlated with the treatment variable and infant mortality. We take advantage of the fact that Progresa mainly operated in rural localities before 2001 and test whether the program had a significant impact on urban IMR.[19] If there are indeed municipal-level omitted variables, *program intensity* might also impact urban IMR due to these unobservables. Table 6, column 6, shows that the program had no significant impact on urban IMR, thereby providing some evidence that unobservables are not biasing the results.

A further concern is that during program implementation there was an expansion of health care in rural communities. To control for possible biases, information on per capita health care infrastructure and personnel are included in the regression equation. Although many of these regressors are likely to be endogenous, if their inclusion does not influence the coefficient on the lag of the *program intensity*, we gain some confidence that health care supply is not correlated with the phasing-in of the program. The results in columns 1 to 3 of Table 7 demonstrate that the program impact remains unchanged.

During the first three years of the program, two criteria for choosing localities were relaxed. After 1997, the condition that beneficiaries had to have access to permanent health clinic no longer applied as mobile clinics and foot doctors also provided health care in many areas. Also, in 1999, localities that had a lower population density and were isolated from other Progresa localities were incorporated in the program. We include a variable defined as the percent of rural Progresa localities with access to permanent health clinic in a given year to take into account the first change in the phase-in rule. The addition of this control has almost no effect on the estimate of the impact and is not significantly different from zero (Table 7, column

[19] There are some semi-urban localities that joined the program before 2000. The program did expand to urban localities in 2000 but this should not affect our analysis.

4). Additionally, we control for the density of the municipality and the inclusion of this variable also does not change the estimate of the treatment effect varies from -1.6 to -2.6. However, none of these values are significantly different from the comparable program impact of -1.86 in column 5 of Table 7.

5.4 Under-Reporting of Births and Death

Under-reporting of both births and deaths is common in rural Mexico. The fact that the urban municipality IMR is higher than the rural municipality IMR is partly a reflection of this phenomenon. As long as the under-reporting does not change in a manner that is correlated with the lag of *program intensity* the estimates will be unbiased. However, one might be concerned that mothers in program areas may be more likely to register their child's birth in hopes of receiving a cash transfer in the future. Or, more babies may be born alive due to increased prenatal care utilization or improved mother's health. Thus, it is possible that the program impact is a result of an increase in the number of registered live births rather than a reduction in mortality. To investigate if this is the case, the impact of Progresa on the number of registered lives births per 1000 population in a municipality is also examined. Results in Table 10 demonstrate that the treatment variable, the lag of *program intensity*, had no impact on the number of live births per 1000 population. Thus, the estimate of the program impact is not the result of an endogenous increase in the number of births[22].

5.5 Heterogeneity of the Treatment Effect

Data from 1995 is used to examine if the program impact varies by pre-intervention characteristics of Progresa areas within the municipalities.[23] Findings from Table 11 highlight

---

[22]Skoufias, 2001 reports a similar result.
[23]Since the 1995 Conteo data is available at the locality level, it is possible to calculate the characteristics of just the localities that eventually receive Progresa in a municipality.

that the program was more successful at reducing infant mortality in municipalities where Progresa areas had better access to piped water, less access to sewage systems, and where all the municipalities as a whole the infant mortality rate declined by 13 percent. In contrast, the rural infant mortality rate declined by 2 deaths per 1000 live births in areas where some of the population in Progresa areas only spoke an indigenous language. The mean rural IMR was 18 and the program intensity reached 53 percent in these areas. Therefore the rural IMR fell by 11 percent among the treated and 6 percent on average in these municipalities.

Lastly, the reductions in rural IMR mainly took place in the three quarters of the municipalities where less than 30 percent of the households in Progresa localities had some type of sewage system prior to program implementation. The decline in infant mortality among the treated in these areas is similar to the main impact of the program at 2 deaths per 1000 live births, or 11 percent.[25] The treated in those municipalities with better access to sewage experienced almost no decline in their infant mortality as a result of the program. However, the average rural IMR was also lower in these areas prior to the program at 17 as compared to 19.5 in areas with less access to sewage. This may seem contradictory to the results from piped water, but less than 35 percent of the municipalities had Progresa areas with both good access to piped water and sewage systems.

6 Discussion

The conditional cash transfer program, Progresa, led to a significant decline in infant mortality in rural Mexico. Findings suggest that the program resulted in an 11 percent reduction of Tc 0.2241 913 T0a resulted in5pe24 Tlted in5pe, Pannocen 11 ithe tr0 Tdw 2illose effect(prior to the prog

The average treatment effect, which is a 5 percent reduction in the rural infant mortality rate in municipalities where some of the population received Progresa, is on the other hand a lower

We presented evidence on the internal validity of these results. We showed that the program did not lead to a reduc

7 References

Alderman, H. 1986. *The Effects of Income and Food Price Changes on the Acquisition of Food by Low-Income Households*, International Food Policy Research Institute, Washington, D.C.

Alderman, H. 1993. "New Research on Poverty and Malnutrition: What are the Implications for Research and Policy?" in M. Lipton and J. Van der Gaag eds., *Including the Poor*, The World Bank, Washington, D.C.

Attanasio, O. and R., Victor. 2000. "Consumption Smoothing in Island Economies: Can Public Insurance Reduce Welfare?" *European Economic Review*, 44(7), 1225-58.

Behrman, J. and J. Hoddinott. 2001. *Program Evaluation with Unobserved Heterogeneity and Selective Implementation: The Mexican Progresa Impact on Child Nutrition,* Penn Institute of Economic Research Working Papers no. 35.

Behrman, J., and A. Deolalikar. 1987. "Will Developing County Nutrition Improve with Income? A Case Study for Rural South India," *Journal of Political Economy*, 95(3), 108-138.

Behrman, J. and P. Todd. March 1999. *Randomness in the Experimental Samples of Progresa*. International Food Policy Research Institute, Washington, D.C.

," Journal ofpoa(..Intern)6(ational Food Policy)6(Research InTT0 1 Tf0 Tc 0 Tw 16.0is, Ges of P -0.0014 TaP.7

Currie, J. and J. Gruber. 1996. "Saving Babies: Th

Maluccio, J. and R. Flores. 2004. *Impact Evaluation of a Conditional Cash Transfer Program: The Nicaraguan Red De Proteccion Social*. International Food and Policy Research Institute, Washington D.C.

Meyer D. 1995. "Natural and Quasi-Experiments in Economics", *Journal of Business &*

Szilagyi, P. 1998. “Managed Care for Children: Effect on Access to Care and Utilization of Health Services,” *The Future of Children*, 8(2):39-59.

The World Bank. 2003. *Millennium Development Goals* [on-line]. [Accessed on October 21]. Available from the World Wide Web <http://ddp-ext.worldbank.org/ext/MDG/gdmis.do>.

8 Tables and Figures

Figure 1: Trends in the Number of Progresa Beneficiary Families and Localities.

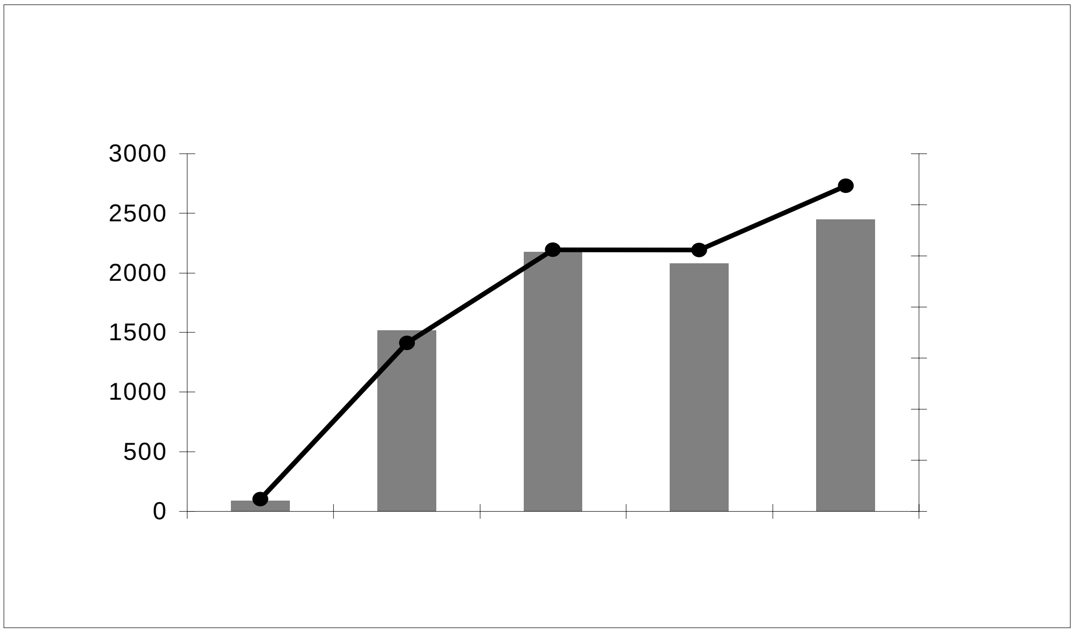


Figure 3: Trends in Rural IMR for Municipalities That Enter the Program in 1997.

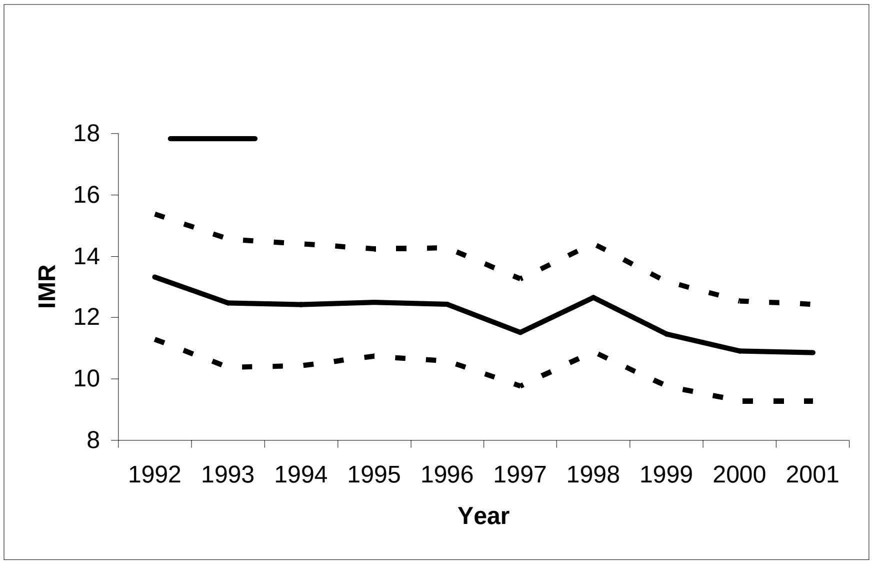


Figure 5: Trends in Rural IMR for Municipalities That Enter the Program in 1999.

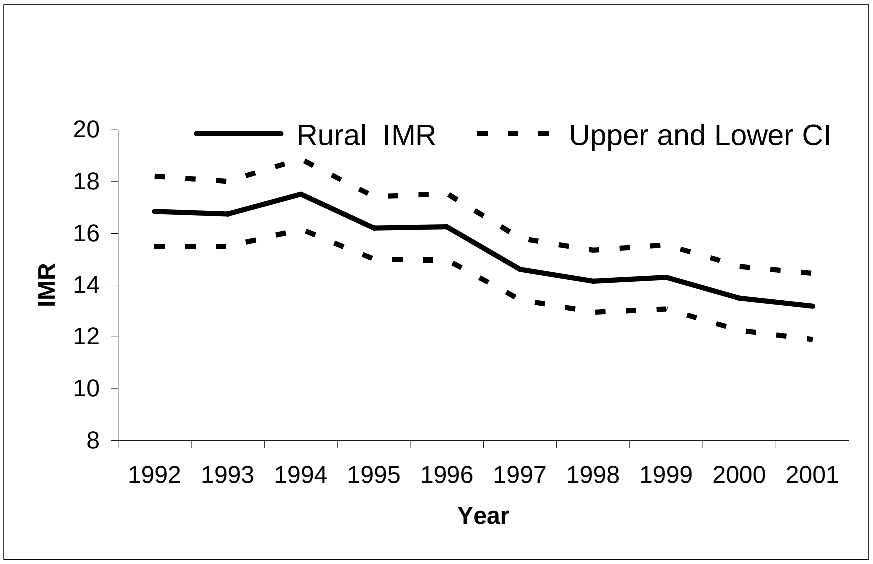
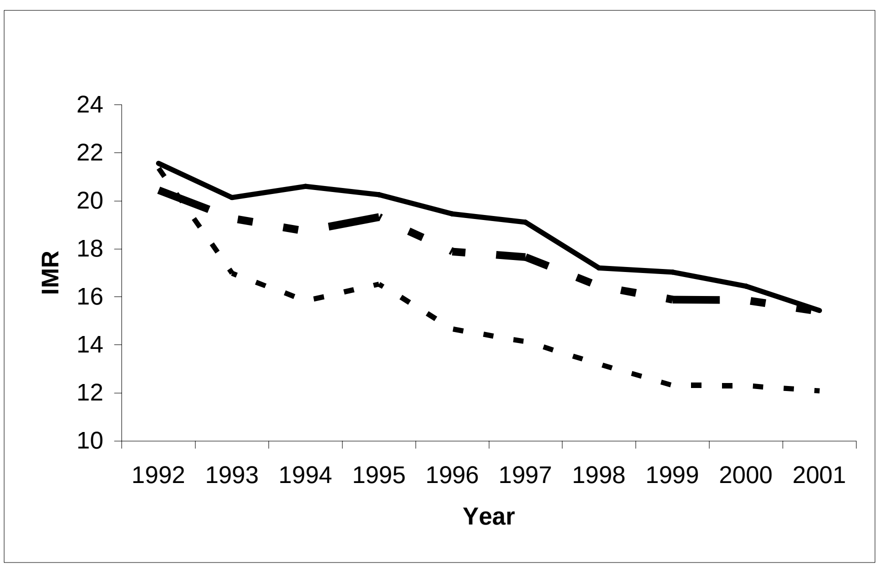


Figure 6: Trends in Urban IMR by Year Municipality Entered Program.



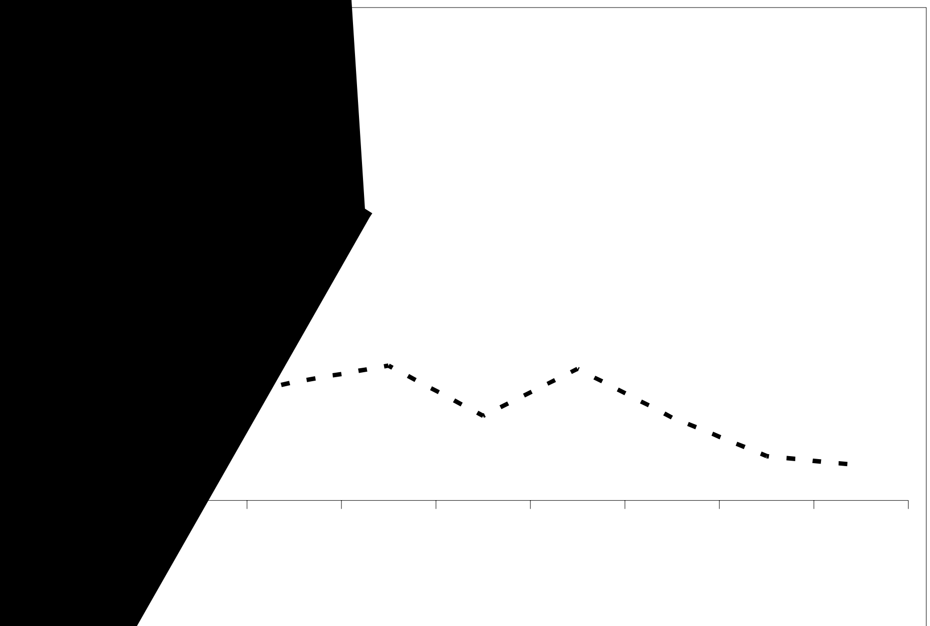


Table 1: Difference in Pre-Intervention Trends in Rural Infant Mortality Rate by Date Municipality Entered Program.

Year	Municipalities that entered in 1997	Difference in IMR between municipality by entry date compared to 1997				
		No Progresa	1998	1999	2000	2001
Mean IMR 1990 = 21.17						
1991	-3.704	5.813	0.99	0.462	17.876	3.793
	[0.903]	[6.765]	[0.999]	[1.349]	[22.539]	[2.534]
1992	-3.758	-3.436	-1.809*	-1.065	16.823	2.415
	[0.863]	[4.660]	[0.952]	[1.305]	[12.120]	[2.612]
1993	-4.605	-5.882	-1.289	-0.495	-3.135	-0.148
	[0.892]	[4.626]	[0.979]	[1.301]	[10.327]	[2.435]
1994	-4.624	-10.010**	-0.822	0.31	-5.713	2.221
	[0.908]	[4.346]	[0.996]	[1.330]	[11.242]	[2.354]
1995	-4.519	-12.081***	-0.54	-1.182	2.781	5.315**
	[0.871]	[4.192]	[0.960]	[1.324]	[12.304]	[2.557]
1996	-4.609	-10.494**	-1.45	-1.07	20.293	-2.145
	[0.905]	[4.194]	[0.991]	[1.344]	[29.969]	[2.204]

Notes:

1. Standard errors in brackets.

2. * significant at 10%; ** significant at 5%; *** significant at 1%.

3. See equation 1 for the specification of the equation corresponding to these results.

4. 1990 was the year left out and municipalities that entered in 1997 was the group of municipalities left out.

5. Column 2, is the decrease in the rural IMR between 1990 (21.17) and the other years for municipalities that entered in 1997.

6. Column 3, is the difference in the decrease in rural IMR between municipalities that entered in 1997 and those that never received Progresa.

7. Columns 4-7 show the difference in the decrease in rural IMR between municipalities that entered in 1997 and those that entered in later years.

Table 2: Number of New Program Localities Between 1997-2001 by the Date the Municipality Started the Program.

Year the Municipality Entered the Program	1997	1998	1999	2000	2001
1997	2,424	4,705	5,560	5,538	5,927
1998		28,261	35,222	440	9,413
1999			16,726	240	2,548
2000				46	23
2001					376

Table 3: Differences in Means of Pre-Program Locality Characteristics, by phase group.

	Percent of			Average number of occupants in a household (1995)	Marginal-ization Grade (00-95)[c]	Percent of Households With				
	Workers in the primary sector (1990)	Indigenous speakers (1995)[a]	Illiterates (1995)[b]			Dirt floor (1990)	Dirt floor (2000)	Piped water (1995)	Sewage (1995)	Electricity (1995)
Mean for Phase Group 1997	76.4	22.7	27.1	5.4	4.5	71.9	50.2	41.4	13.2	65.2
	[0.6]	[0.7]	[0.4]	[0.0]	[0.0]	[0.8]	[0.6]	[1.0]	[0.6]	[1.1]
Differences in Means Between other Groups and Phase Group 1997										
Phase 1998 - Phase 1997	2.8***	-3.9***	1.5***	0.1***	0.1***	-13.5***	1.6**	-4.7***	-2.9***	-5.5***
	[0.6]	[0.8]	[0.4]	[0.0]	[0.0]	[0.9]	[0.7]	[1.0]	[0.6]	[1.2]
Phase 1999 - Phase 1997	-2.4***	-6.1***	-0.7*	-0.2***	-0.4***	-28.3***	-5.4***	3.9***	5.7***	-3.0**
	[0.7]	[0.8]	[0.4]	[0.0]	[0.0]	[0.9]	[0.7]	[1.1]	[0.6]	[1.2]
Phase 2000 - Phase 1997	0.2	-5.3***	-0.6	-0.2***	-0.5***	-32.0***	-8.0***	1.9	6.1***	-2.8
	[1.5]	[1.2]	[0.8]	[0.1]	[0.1]	[1.9]	[1.5]	[2.5]	[1.4]	[2.2]
Phase 2001 - Phase 1997	2.3***	-5.5***	2.1***	-0.2***	-0.1***	-33.7***	1.4**	-7.9***	1.3**	-20.4***
	[0.7]	[0.8]	[0.4]	[0.0]	[0.0]	[0.9]	[0.7]	[1.1]	[0.6]	[1.2]
Observations	53624	63771	63771	63771	64213	64328	62023	63771	63771	63771

Notes:

a. Percent of population over 4 year olds.

b. Percent of population over 14 year olds.

c. The marginalization grade ranges from 0 to 5 with 5 being the most marginalized.

1. Standard errors in brackets.

2. * significant at 10%; ** significant at 5%; *** significant at 1%.

3. Time and municipality fixed effects included.

Table 4: Change in Mean Locality Characteristics Between 2000 and Pre-Program Time Period, by phase group.

	Percent of			Average	Marginal-	Percent of Households With			
	Workers In the Primary Sector (00-90)	Indigenous Speakers (00-95)[a]	Iliterates (00-95)[b]	Number of Occupants in a Household (00-95)	ization Grade (00-95)[c]	Dirt Floor (00-90)	Piped Water (00-95)	Sewage (00-95)	Electricity (00-95)
Mean for Phase Group 1997	-10.292	-0.406	-2.595	-0.461	-0.368	-21.838	7.921	6.936	11.947
	[0.640]	[0.229]	[0.264]	[0.022]	[0.017]	[0.897]	[0.845]	[0.720]	[0.961]
Differences in the change between other Phase Groups and Phase Group 1997									
Phase 1998 - Phase 1997	0.305	0.326	-0.377	0.012	0.002	14.346***	0.07	1.745**	0.853
	[0.666]	[0.238]	[0.273]	[0.023]	[0.018]	[0.945]	[0.871]	[0.744]	[1.000]
Phase 1999 - Phase 1997	1.058	0.264	0.329	0.056**	0.368***	21.426***	-4.926***	0.679	-3.413***
	[0.694]	[0.244]	[0.287]	[0.025]	[0.019]	[0.983]	[0.905]	[0.773]	[1.018]
Phase 2000 - Phase 1997	1.745	-0.032	-0.658	0.081	0.345***	22.513***	-6.218***	-0.828	-3.552**
	[1.533]	[0.521]	[0.576]	[0.063]	[0.049]	[1.944]	[2.234]	[1.647]	[1.714]
Phase 2001 - Phase 1997	3.034***	0.332	0.323	0.114***	0.245***	33.007***	-5.154***	-1.158	-1.221
	[0.744]	[0.250]	[0.304]	[0.026]	[0.019]	[1.031]	[0.941]	[0.792]	[1.049]
Observations	58039	68043	68043	68043	68859	67661	68043	68043	68043

Notes:

a. Percent of over 4 year olds.

b. Percent of over 14 year olds.

c. The marginalization grade ranges from 0 to 5 with 5 being the most marginalized.

1. Robust standard errors in brackets.

2. * significant at 10%; ** significant at 5%; *** significant at 1%.

3. Time and municipality fixed effects taken out.

Table 5: Mean Municipality Program Intensity by the Year the Municipality Entered the Program.

Year the Municipality Entered the Program	Year 1997	1998	1999	2000	2001
1997	0.24	0.55	0.59	0.55	0.57
1998		0.34	0.46	0.44	0.49
1999			0.30	0.29	0.36

Notes
1. Program intensity is defined as the proportion of rural household receiving Progresa benefits in December of a given year.

					Urban IMR
[1]	[2]	[3]	[4]	[5]	[6]

Table 7: The Impact of Progresa on IMR Controlling for Health Supply.

							Urban IMR
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Lag of program intensity							

Table 8: The Impact of Progresa on IMR Controlling for Municipality Characteristics and Time Trends.

	[1]	[2]	[3]	[4]	[6]	[7]	[8]	[9]	[10]	[11]
Lag of program intensity	-1.919**	-1.968**	-1.970**	-1.869**	-1.855**	-1.899**	-1.825**	-3.06***	-0.513	0.53
	[0.898]	[0.898]	[0.898]	[0.901]	[0.910]	[0.885]	[0.890]	[0.96]	[1.480]	[1.006]
Municipality characteristics for localities that eventually receive Progresa benefits										
Percent of households with :										
Piped water	0.007						0.003		-0.030	
	[0.020]						[0.021]		[0.017]	
Electricity		0.066					0.070*		-0.016	
		[0.040]					[0.041]		[0.0030]	
Sewage			-0.014				-0.013		-0.017	
			[0.018]				[0.018]		[0.018]	
Percent of:										
Rural population >4 that speaks an indigenous language				0.118			0.132		-0.032	
				[0.145]			[0.161]		[0.037]	
Rural population >14 that is illiterate					0.07		0.113		-0.033	
					[0.120]		[0.131]		[0.152]	
Average number of occupants in rural households						1.78	0.787		-2.681	
						[1.692]	[1.990]		[1.700]	
Observations	18804	18804	18804	18804	18804	18804	18804	18940	12037	12164
Adjusted R^2										

Table 9: The Impact of Progresa on IMR Controlling for Municipality Characteristics in Progresa Areas.

								Urban IMR
	[1]	**[2]**	**[3]**	**[4]**	**[6]**	**[7]**	**[8]**	**[10]**
Lag of program intensity	-2.623***	-2.074**	-1.602*	-2.002**	-2.117**	-1.892**	-2.602***	0.684
	[0.911]	[0.922]	[0.934]	[0.923]	[0.895]	[0.888]	[0.989]	[1.230]
Municipality characteristics for localities that receive Progresa benefits								
Percent of households with :								
Piped water	-0.027***						-0.033***	0.027**
	[0.006]						[0.007]	[0.011]
Electricity		-0.009					0.009	-0.003

Table 10: Impact of Progresa on the Number of Registered Live Births per 1000 Population.

	Rural		Urban
	[1]	**[2]**	**[3]**
Lag of program intensity	0.344	-0.124	-1.249
	[1.273]	[1.247]	[0.785]
Observations	20922	20842	12709
Adjusted R^2	0.49	0.5	0.63
Mean dependent variable	31.63	31.59	30.88
Year effects	Y	Y	Y
Municipality fixed effects	Y	Y	Y
Health suppy controls	N	Y	Y

Notes:

1. Standard errors in brackets. Standard errors are robust and clustered at the municipality level.

2 * significant at 10%; ** significant at 5%; *** significant at 1%

3. All regressions are weighted by number of rural/urban households in municipality.

4. Program intensity is defined as the proportion of rural household receiving Progresa benefits in December of a given year.

5. IMR=infant mortality rate, it is the number of deaths before the age of 1 per 1000 live births.

Table 11: Heterogeneity of the Impact of Progresa on IMR by Pre-Intervention Municipality Characteristics.

	Rural IMR				
	[1]	[2]	[3]	[4]	[5]
Lag of program intensity	-2.048**	-1.653*	-1.759*	-1.945**	-1.962**
	[0.909]	[0.911]	[0.924]	[0.908]	[0.900]
Interaction of the Lag of Program Intensity with an indicator variable that in 1995:					
30-100% of households in Progresa villages have a sewage system	1.818*				
	[1.020]				
75-100% of households in Progresa villages have piped water into household		-3.630***			
		[1.081]			
91-100% of households Progresa villages have electricity in the houseold			-1.617		
			[1.000]		
80-100 % of over 15 year olds are literate in Progresa villages				0.179	
				[1.038]	
0 % of the population only speaks an indigenous language in Progresa villages					-3.715*
					[2.152]
Observations	18792	18792	18792	18792	18792
Adjusted R^2	0.58	0.58	0.58	0.58	0.58
Mean dependent variable	17.56	17.56	17.56	17.56	17.56
Year effects	Y	Y	Y	Y	Y
Municipality fixed effects	Y	Y	Y	Y	Y
Health suppy controls	Y	Y	Y	Y	Y
Other municipality characteristics[1]	Y	Y	Y	Y	Y

Notes:

1. These municipality characteristics are an aggregation of the locality characteristics of Progresa areas only.
2. Standard errors in brackets. Standard errors are robust and clustered at the municipality level.
3. * significant at 10%; ** significant at 5%; *** significant at 1%
4. All regressions are weighted by number of rural/urban households in municipality.
5. Program intensity is defined as the proportion of rural household receiving Progresa benefits in December of a given year.
6. IMR=infant mortality rate, it is the number of deaths before the age of 1 per 1000 live births.