briefing notes

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EARLY EVALUATION OF A NEW NUTRITION AND EDUCATION PROGRAMME IN COLOMBIA

Orazio Attanasio
Murtaza Syed
Marcos Vera-Hernandez

THE INSTITUTE FOR FISCAL STUDIES
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Early evaluation of a new nutrition and education programme in Colombia

Orazio P. Attanasio
Institute for Fiscal Studies and University College London

Murtaza Syed
Institute for Fiscal Studies

Marcos Vera-Hernandez
Institute for Fiscal Studies

In recent years, international financial institutions, policy-makers and economists have paid considerable attention to micro development policies based on cash transfers targeted to poor families and released only if the potential beneficiaries comply with specific conditions. Such conditional cash transfers have been particularly popular in education and nutrition policies – that is, in policies whose aim is to foster the accumulation of human capital among young children. In the case of the nutrition interventions, the conditions are often that the mother of the children, who receives the transfers, enrols them to development and growth check-ups and/or attends hygiene, vaccination and contraception courses. Much of the attention on conditional transfer programmes originated from the perceived success of a large programme of this nature started in rural Mexico in 1998 and evaluated scientifically with semi-experimental methods. Since the evidence on *PROGRESA*, as the Mexican programme was known, has received much attention, several international organisations have been promoting similar interventions in many developing countries and in particular in Latin America. It should be stressed that while *PROGRESA* has been widely branded as a success and has surely improved the nutritional and development outcomes of very young children and enrolment for secondary school, the reasons behind this success are not entirely obvious. In particular, it is not completely clear whether the conditionalities imposed by the programme played a role in determining the outcomes and what that role was.

In 2000, the World Bank (WB) and the Inter American Development Bank (IADB) approved a loan to the Colombian government to finance three welfare programmes intended to alleviate poverty and foster development in Colombia. The first programme, called *Familias en Acción* (*FA*), was inspired by *PROGRESA* and consists of a conditional subsidy to education and nutrition. The poorest families with children under the age of 5, living in communities with fewer than 100,000 inhabitants and with enough school and health

infrastructure, are to receive a basic nutritional subsidy (around US$15 per month). To take part in the programme, mothers must take their children to have vaccinations and to growth and development check-ups (this explains why the programme could only be rolled out in communities with enough health infrastructure). Mothers are also supposed to attend courses on hygiene, vaccination and contraception. Households with children aged 6 to 17 receive a separate grant per child, conditional on sending that child to school. The grant is about US$8 for children attending primary schools and about US$16 for children attending secondary school. The grant is paid monthly conditional on the child's attendance at 80 per cent of lessons. A final important feature of the programme, also replicated from the Mexican programme, is that the transfers are specifically targeted towards the mothers.

The other two programmes financed by the WB/IADB loan are a workfare programme and a training programme for young urban unemployed. One of the clauses that the WB and the IADB negotiated with the Colombian government was that a small fraction of the budget for the three programmes had to be spent on evaluating their effects. These evaluations had to be tendered internationally and assigned by a committee that included WB officials and international development experts. The Centre for the Evaluation of Development Policies (EDePo) at IFS formed a consortium with a research institute (Econometria) and a data-collection firm (SEI) in Colombia and won the three contracts for the evaluation of the three programmes. The evaluation of *FA* is now under way and we are able to present our first results.

The basic methodology behind the evaluation is to compare communities targeted by the programme with communities where the programme did not operate because they did not fulfil all the criteria to qualify for it. As assignment of the programme was not random, we paid particular attention to choosing the 'control' communities so that they were as similar as possible, in a variety of dimensions, to the 'treatment' communities. As one of the criteria that communities had to satisfy to qualify for the programme was the presence of a bank, most of the controls have a similar education and health infrastructure (schools and hospitals) to treatment areas but typically do not have a bank.

The plan for the evaluation consisted of two phases. A first data collection was planned for 2002 in both treatment and control communities. This 'baseline' information was collected between July and November 2002 in 122 communities, of which 57 were treatments and 65 were controls. The baseline data collection was scheduled before the beginning of the programme and was supposed to be followed by another data collection, a year later, after the programme had started in the treatment communities. The planned evaluation was to compare a number of outcomes, ranging from nutritional outcomes (food intake, weight and height of children), to health outcomes (occurrence of various illnesses), to educational outcomes (enrolment in schools). The techniques that we planned to use were designed to take into account pre-

programme differences and compare outcomes for treated households with those for 'similar' 'untreated' households.

For a variety of reasons, the government decided to start the programme in 25 of the treatment communities included in our sample before we had a chance to collect the baseline information. In what follows, we will denote by 'Treatment' the communities where the programme had already started operating when the baseline data were collected and by 'Control' the communities where it had not started. While the start of the programme in some communities before the baseline survey obviously poses some problems for the original evaluation plans, it also affords us the opportunity of a first preliminary assessment of the programme based on comparison between outcomes in the communities where the programme was implemented early and outcomes in the communities where the programme had not yet started. The techniques to be used are substantially similar to those planned originally.

The first data collection was successfully concluded in November 2002 and we were able to start analysing the data in January 2003. The data are of remarkable quality and present a complete and rich picture of the poor population targeted by the programme. The very collection of this database represents an important achievement, as it was gathered in one of the most violent environments in the world, in the midst of a fierce civil war. Each of the interviewers collecting the information was detained at least once, and more often many times, by armed agents.

In this Briefing Note, we present some of the results of the preliminary evaluation of the effects of the programme. A complete description of the database and of the preliminary evaluation results is contained in the Baseline Report.[1]

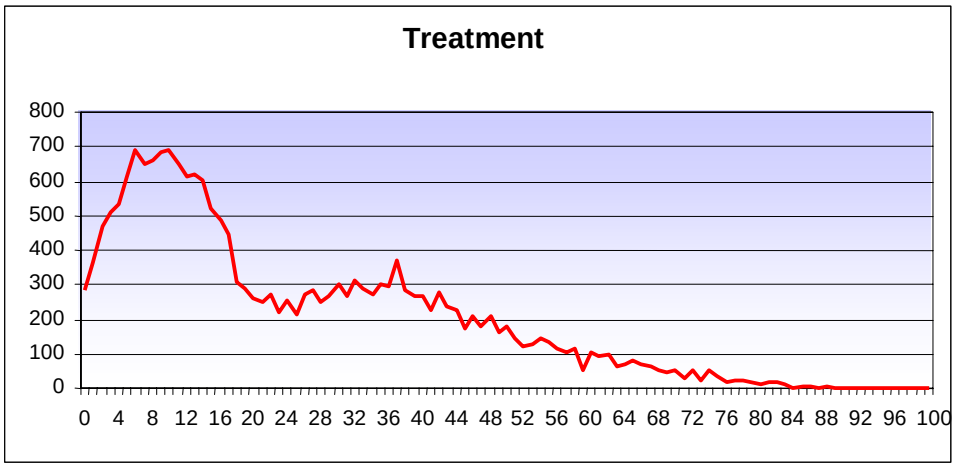
Before presenting the results, however, some important caveats to their interpretation must be stressed. First, the programme has only operated for a few months in the Treatment communities. Therefore we are only able to observe the effects in the very short term. These may be very different from the effects in the medium and long terms. Secondly, what we are using as 'Control' communities are communities where the programme was about to start. Indeed, in most of them, households had already registered for the programme and were just waiting for it to start. These households might have reacted in anticipation of the programme and therefore distorted the nature of the evaluation. Thus some of the effects we are trying to estimate could be understated. Thirdly, the sample we are dealing with is much smaller than we considered optimal when designing the evaluation. We should be able to estimate with sufficient precision only relatively large effects.

[1] O. Attanasio et al., *Baseline Report on the Evaluation of* Familias en Acción, Institute for Fiscal Studies, November 2003, www.ifs.org.uk/edepo/wps/familias_accion.pdf.

While the data are described in detail in the Baseline Report, it is worth highlighting a few statistics about the population we are studying, to put our findings into context, before presenting the results of the preliminary evaluation. We are dealing with an extremely poor population. Average monthly expenditure is only US$150, including our estimates of consumption in kind (based on local prices). Given that average family size is seven, this consumption figure implies that these families are well below the $1-a-day-per-person poverty line (even though we have not adjusted the figure above for differences in the cost of living). Around 60 per cent of the household budget is spent on food among the families in our sample, compared with about 15 per cent in the UK.

A feature that is worth noting and that is peculiar to this particular population is its age structure, which has clearly been affected by the civil war and consequent migration. In Figure 1, the age structure in Treatment communities is plotted, but a similar picture can be obtained in Control communities: rather than the smoothly declining curve typical of populations with relatively high fertility, we notice a marked downward shift of the curve corresponding to ages 18 to 35. The relatively low number of individuals aged 18 to 35 is then reflected in a low number of children aged 0 to 5.

Figure 1
Age structure



Looking at the variables that constitute the focus of our impact evaluation, in Tables 1 and 2 and Figure 2, we provide information on nutrition and health variables and on school enrolment rates.

Table 1 reports the percentage of children affected by different degrees of malnutrition, defined in terms of z-scores for weight per age. Z-scores are a

way of measuring the degree of difference from an accepted reference point.[2] The reference population, as often in studies of this kind, is US children. A z-score below –2 indicates that the child in question weighs less than the US mean for children of the same age minus two standard deviations and defines 'global malnutrition'. Children with a z-score between –2 and –1 are defined to be 'at risk of malnutrition', while children with a z-score between –1 and 2 are defined as 'normal' for their age. As many as 10 per cent of the children in our sample are severely malnourished, while 33 per cent are at risk of malnutrition. We can already observe some differences between Treatment and Control communities. We will investigate these differences below and relate them to the effectiveness of the programme.

Table 1
Distribution of z-scores for weight /age

Type of community		*Global malnutrition*	*At risk of malnutrition*	*Normal*	*Overweight*
		$z \leq -2$	$-2 < z \leq -1$	$-1 < z \leq 2$	$z > 2$
Total		10.2	32.7	55.9	1.3
Treatment		8.7	33.0	56.7	1.5
Control		12.2	32.2	54.6	0.9
Treatment	Urban	8.2	32.8	57.2	1.7
	Rural	9.0	33.2	56.4	1.4
Control	Urban	12.7	32.8	53.6	0.9
	Rural	11.9	31.8	55.4	0.9

Source: IFS–Econometria SA–SEI Consortium, baseline survey, October 2002.

In Table 2, we report the occurrence of various diseases in the two weeks preceding the interview among the children aged 2 to 6 in our sample. Of these children, 14 per cent experienced diarrhoea, while as many as 42 per cent had some kind of respiratory illness.

In Figure 2, we plot school enrolment rates against age in our sample. As can be seen, enrolment rates are remarkably high for children below age 12. This constitutes a large improvement relative to a few years ago and was driven by a policy to construct many new schools in small towns in Colombia. However, enrolment rates drop very quickly at older ages.

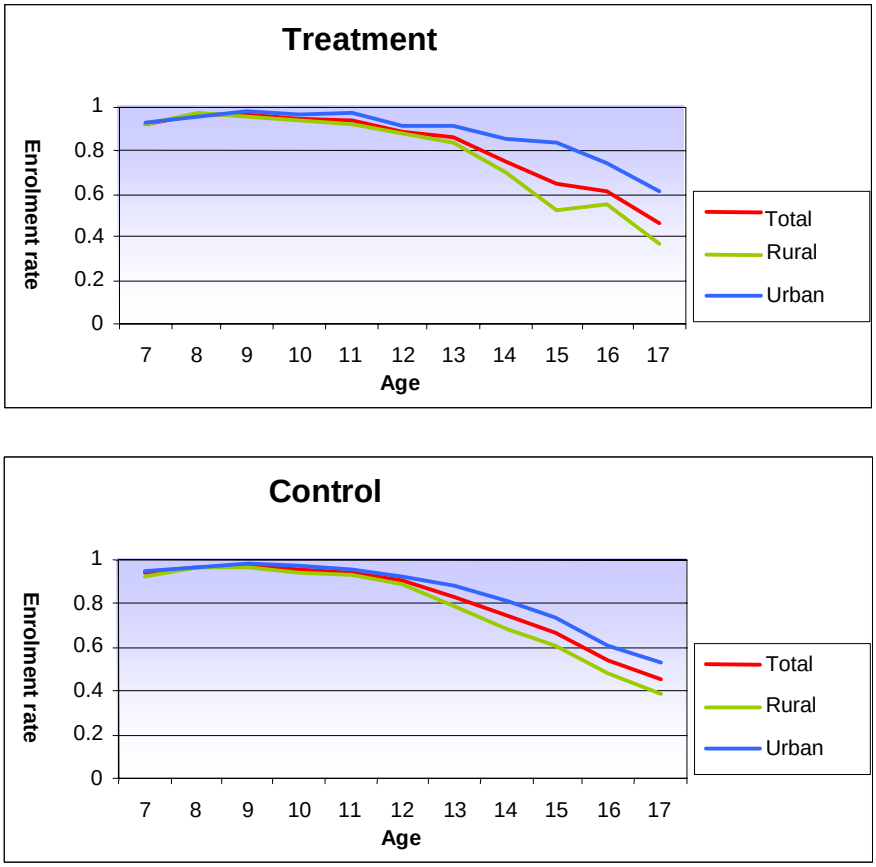
[2] Z-scores here are constructed by subtracting from the weight of a given child the mean weight of a reference population of the same age and dividing by the standard deviation of the same population.

Table 2
Percentage of children aged 2 to 6 suffering from various diseases

Type of community		*Diarrhoea in the last 15 days*	*Acute respiratory illness in the last 15 days*	*Other illness in the last 15 days*	*Any kind of illness in the last 15 days*
		Mean	*Mean*	*Mean*	*Mean*
Total		14.3	42.1	16.7	54.7
Treatment		12.3	40.7	17.7	53.7
Control		17.1	43.9	15.2	56.1
Treatment	Urban	12.5	39.4	16.8	52.5
	Rural	12.2	41.4	18.2	54.3
Control	Urban	19.4	47.8	15.8	59.8
	Rural	15.5	41.1	14.8	53.4

Source: IFS–Econometria SA–SEI Consortium, baseline survey, October 2002.

Figure 2
School enrolment rates by age and area



Results of the preliminary evaluation

Our preliminary evaluation, based on the methodology known as 'propensity score matching', focuses on education, nutrition and health variables. The procedure consists of comparing households living in Treatment communities with 'similar' households living in Control communities, where 'similar' is defined in terms of a number of observable individual- and community-level variables. Further details on this can be found in the Baseline Report.

Starting with education, in Table 3, we look at school enrolment rates for two groups of children: those aged 7 to 13 and those aged 14 to 17. We separate urban and rural areas. From the table, we see that the programme does not seem to have any effect on younger children. This is perhaps not surprising, as the enrolment rate is already very high for this age group. However, for older children in urban areas, we find an astounding increase of 13 percentage points in enrolment rates. If these results were to be confirmed in the medium and long terms, they would constitute an important success of the programme. For older children in rural areas, the effect is estimated at 5.5 percentage points. The smaller rural effect might be related to the lower availability of secondary schools in rural areas.[3]

Table 3
Impact on school enrolment

	Effect of the programme	*Average value of variable in Control communities*	*Number of observations in Treatment communities*
Urban			
Enrolment probability, age 7–13	0.003	0.941	1,920
Enrolment probability, age 14–17	0.138*	0.639	885
Rural			
Enrolment probability, age 7–13	0.012	0.915	2,691
Enrolment probability, age 14–17	0.055	0.496	1,198

* Statistically different from zero at the 5 per cent level.

[3] In Tables 3 to 6, for the sake of brevity, we do not report the standard errors of our estimates, which can be found in the Baseline Report. The effect in rural areas is not statistically significant from zero. However, this lack of precision is probably due to the relatively small sample size.

Table 4
Impact on nutritional inputs

	Effect of the programme	*Average value of variable in Control communities*	*Number of observations in Treatment communities*
Urban			
Number of days that 2- to 6-year-olds ate eggs	0.705*	2.400	1,040
Number of days that 2- to 6-year-olds ate vegetables	1.383*	1.264	1,040
Sum of number of days that 2- to 6-year-olds ate meat or liver of beef or pork	0.961*	2.037	1,040
Rural			
Number of days that 2- to 6-year-olds ate eggs	0.774*	2.668	1,528
Number of days that 2- to 6-year-olds ate vegetables	1.148*	1.672	1,528
Sum of number of days that 2- to 6-year-olds ate meat or liver of beef or pork	0.880	2.411	1,528

* Statistically different from zero at the 5 per cent level.

Table 5
Impact on nutritional status of children aged 0 to 6

	Effect of the programme	*Average value of variable in Control communities*	*Number of observations in Treatment communities*
Urban			
Weight / median weight of a US child of same height	1.867	99.307	1,217
Weight / median weight of a US child of same age	2.911	90.071	1,217
Rural			
Weight / median weight of a US child of same height	2.318*	99.272	1,772
Weight / median weight of a US child of same age	2.449*	89.489	1,772

* Statistically different from zero at the 5 per cent level.

Moving to nutrition, we report some results on children's food intakes in Table 4 and look at children's weight by height and weight by age in Table 5. Table 4 documents a substantial increase in the intakes of protein-rich foods (and vegetables). The intakes of basic staples (rice, potatoes etc.), which we do not report for the sake of brevity, do not change much. The effect of the programme on intakes is very large: for instance, the number of days per week children eat meat goes from two to three in urban areas, while the number of days they eat vegetables more than doubles.

The reported increases in food intakes are reflected in Table 5 in significant increases in the weight of the children taking part in the programme. This result is particularly impressive given the relatively short period over which the programme has been operating.

Table 6
Impact on occurrence of illness

	Effect of the programme	*Average value of variable in Control communities*	*Number of observations in Treatment communities*
Urban			
Probability of suffering from any illness	–0.028	0.561	1,306
Probability of suffering from ADD	–0.102*	0.212	1,306
Probability of suffering from ARD	–0.032	0.448	1,306
Probability of staying in bed due to health problems	–0.027	0.138	1,306
Probability of not being able to do normal activities	–0.020	0.204	1,306
Rural			
Probability of suffering from any illness	–0.007	0.513	1,918
Probability of suffering from ADD	–0.054	0.170	1,918
Probability of suffering from ARD	–0.021	0.404	1,918
Probability of staying in bed due to health problems	–0.021	0.153	1,918
Probability of not being able to do normal activities	–0.024	0.230	1,918

* Statistically different from zero at the 5 per cent level.

Finally, in Table 6, we look at the prevalence of some illnesses among children, as reported by their mothers. In particular, we look at acute respiratory diseases (ARD) and acute diarrhoea diseases (ADD). While all of the effects are negative, indicating a decrease in the occurrence of illnesses, only the decrease in the prevalence of diarrhoea in urban areas is statistically significant according to the matching estimates. However, the lack of significance is likely to be related to the small sample sizes, especially for the matching estimates.

Conclusions

In this Briefing Note, we have considered the results of a preliminary evaluation of an important new programme implemented in 2002 by the Colombian government to foster the accumulation of human capital among poor households in rural areas. The results we obtain, which are subject to a number of caveats, indicate some important and promising early effects of the programme. Future work, especially after the first follow-up data, which are currently being collected, become available, will focus on the following:

1. Extending the analysis to the whole set of communities covered by the survey; the number of treated communities will double relative to the baseline, which will allow us to obtain much more precise estimates.

2. Evaluating the effect after a year of the programme.

3. Measuring heterogeneity in programme effects and relating it to various variables.

4. Understanding the mechanisms through which the programme operates. We will put particular emphasis on attempting to evaluate the effect of conditionalities, especially in the nutrition component where they might not always have been enforced.