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## *Nicaragua: Combining Demand- and Supply-Side Incentives*

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### *Highlights*

A conditional cash transfer program should incorporate both demand-side and supply-side performance incentives.

Significant improvements are seen in immunizations, growth monitoring, and reductions in stunting.

Two-phase impact evaluation does not disentangle the individual impacts of demand-side and supply-side incentives, but its results suggest that a well-targeted strategy of supply-side performance incentives could, on its own, be enough to achieve and maintain high levels of health care service use among poor rural populations.

The Red de Protección Social (RPS) is one of the first conditional cash transfer (CCT) programs implemented in a low-income country. Modeled after the Mexican program Progresa (now called Oportunidades), Nicaragua's CCT program is designed to address both current and future poverty by making cash transfers to poor households in rural areas. The transfers are conditional on the children in these households attending school and making visits to preventive health care providers. Monitoring and enforcing compliance with these conditions make RPS a demand-side pay-for-performance scheme, which addresses financial

constraints that prevent individuals from accessing basic education and health services. By targeting poor households, the program alleviates short-term poverty; by linking the transfers to investments in human capital, the program aims to reduce long-term poverty (Maluccio and Flores 2005).

Although demand-side incentives are a key element, RPS is unique in that it complements these with supply-side incentives through a performance-based scheme to improve the use and quality of preventive health services among the very poor. Since the program's earliest stages, the government of Nicaragua recognized the urgent need to strengthen the supply of specific health care interventions in program areas so that beneficiary households could comply with the program's conditions. Two key implementation decisions were taken:

—Recognizing the inability of the Ministry of Health to expand services quickly to residents in remote localities, the government, for the first time, outsourced these services to private providers and nongovernmental organizations (NGOs) through competitive bidding.

—Contracted providers were to be paid based on their achievement of measurable and predetermined targets, verified by independent sources. This performance-based system was aimed at providing incentives for health providers to develop efficient plans to expand coverage rapidly in underserved areas.

The combination of providing performance-based awards in the form of monetary transfers to households and setting up incentives for health providers to attain performance targets proved an effective strategy to increase access to and improve the quality of basic health services in RPS localities. The RPS was conceived as a two-phase program, to be implemented over a period of five years, starting in 2000. The first phase, supported by the Inter-American Development Bank (IDB) and executed by the Nicaraguan Emergency Social Investment Fund (ESIF), was supposed to last three years, with a budget of \$11 million. In 2002, as a condition of the IDB loan and to assess whether the program needed any modifications before its expansion, the government solicited external evaluations of the first phase. The International Food Policy Research Institute (IFPRI) conducted a quantitative impact evaluation using a randomized locality-based design.

Based in part on positive findings from the various evaluations, the government and IDB agreed in late 2002 to expand the program for three years, with a budget of \$22 million. Execution of the second phase was passed to the Ministry of the Family to institutionalize the program within a line ministry. The original RPS design was modified to include a broader array of preventive health care interventions, reduce the size of transfers, and strengthen targeting tools. IFPRI also

conducted a quantitative impact evaluation, using a quasi-experimental design, alongside a qualitative evaluation of the program's second phase. The results of both evaluations are inconclusive on the relative contribution of supply-side and demand-side incentives. But they do imply that the combination can increase the use of health services among the poor and improve health outcomes significantly.

## Constraints

A CCT program aims to ease the budget constraints or the income-related demand constraints that families face when securing health care or education for their children. Cash transfers help families to cover the private costs—both direct and opportunity—of sending children to school or bringing them for preventive health checkups. Increasing the supply of services alone may not help because demand can remain constrained for reasons such as the high cost of accessing services, an imperfect knowledge of the long-term benefits of investing in human capital such as health and education, an environment of increased risk that reduces the incentive to invest in human capital for the long term, and social exclusion.

Demand for preventive health care of a given quality is influenced by whether an individual appreciates its value and is willing and able to seek it, which in turn depends on the direct and opportunity costs of accessing services. Recognizing these tensions and introducing demand-side, performance-based interventions such as CCTs that try to align consumer objectives with social goals have the potential to support care-seeking behavior (Eichler 2006).

When the RPS was designed, the evidence for demand-side constraints was stronger for education than for health. According to the 1998 Living Standards Measurement Survey, 48 percent of extremely poor children in Nicaragua cited economic reasons for not attending school, and 6 percent said rural labor activities kept them away. IFPRI's baseline data, collected for the impact evaluation, showed that in RPS localities only 58.9 percent of extremely poor children ages seven to thirteen were in school. The same figure was 65.7 and 81.7 percent, respectively, among the poor and the nonpoor (IFPRI 2001). This evidence strongly suggested income-related, demand-side constraints without being necessarily conclusive.

The evidence of demand-side constraints on the use of health services was quite limited. The IFPRI baseline data showed that only 66 percent of extremely poor children younger than three had received a health checkup in the six months before the data were collected in RPS localities. This figure was 73 percent among

poor and 78 percent among nonpoor children. Other indicators, such as the percentage of children monitored for growth and development, demonstrated a similar pattern.

However, locality-specific RPS surveys from before the program began confirmed that supply constraints were much more binding in health than in education services, in terms of both access and quality. More than a third of RPS resources were therefore earmarked to strengthen the supply of preventive health services, with education receiving a smaller share.

During the first twenty-four months of program execution, the greatest impacts on service use in both education and health were observed among very poor households (IFPRI 2003), suggesting that constraints in demand (scarce household resources) were more binding than constraints in supply. Once the RPS began, all residents had to comply with the same set of conditions to receive transfers, facing fairly uniform access to and quality of preventive health services (Maluccio, Murphy, and Regalía 2006).

During program preparation, not enough data were available to determine either the private costs faced by households in accessing health care and education or the optimal size of the transfer, especially in health. The program estimated the average size of the transfer by taking into consideration the consumption-poverty gap, which is the difference between extremely poor households' average consumption and the official extreme poverty line. During the program's first phase, the average transfer was about 21 percent of recipients' total annual household expenditures before implementation of the program. In the second phase, the value of the average transfer was reduced by about 30 percent.

### *Cash versus Conditional Cash*

RPS households received transfers if they sent their children to school and took them for health checkups. Making transfers conditional was justifiable on three grounds. Parents might not value the returns from investing in their children's health and education, possibly due to a lack of information on future returns. Their investment decisions would be suboptimal, and conditioning the transfer might enhance welfare for both parents and children. Parents might reasonably assess and value such returns but simply prefer to spend their money on other things, in which case conditions would impose a welfare loss for parents and enhance children's welfare. Parents could always opt out of the program. Investments in health and education would have large externalities that families would not internalize. In this case, conditions would address market failures and help to capture cross-sector effects.

Whatever the rationale for conditions, if household budget constraints are the main reason for suboptimal investment in the health and education of children, income transfers alone can increase the use of these services (Schady and Araujo 2006). The marginal contribution of conditions should be assessed against the costs of ensuring compliance. The design of the RPS impact evaluation did not allow an assessment of the relative contributions of factors related to income (transfers) and price (conditions) on the final outcomes. However, RPS impacts on the use of health and education services were higher among the very poor (IFPRI 2003), which suggests that income factors might have played a critical role, perhaps greater than conditions.

Although the increased income may have alleviated demand constraints and thus enabled households to use more health and education services, enforced compliance of RPS conditions boosted collective action at the municipal level to demand better coverage of services from the government, leading to more responsive supply. This empowerment factor is an important feature of CCT programs. If supply is not stepped up in response to demand-side incentives, conditions can frustrate beneficiaries and lead to calls for easing the monitoring of their compliance with program requirements, thereby diluting the conditionality aspect of the transfers.

### *Health Interventions*

At the end of the 1990s, Nicaragua had levels of infant mortality well above the Central American average, a high prevalence of infectious and parasitic diseases, and pervasive malnutrition. Infant mortality accounted for the majority of all premature deaths. Malnutrition was the main factor underlying more than half of under-five mortality and 20 percent of maternal deaths (World Bank 2001).

Before the RPS program started, 37.9 percent of children younger than five living in RPS program areas suffered from retarded growth (stunting) because of malnutrition or illness (IFPRI 2001). This figure was 1.6 times greater than the national prevalence of stunting for this age group for 1997 and 1998 and nearly twenty times greater than the statistically expected prevalence for healthy populations. In program areas, the poorest 20 percent of children showed the highest levels of stunting (Maluccio and Flores 2005).

Access to health care was (and still is) characterized by large and persistent differences between the poor and nonpoor in Nicaragua. Extremely poor children reported illness 50 percent more frequently than children who were not poor, who, in turn, used health services 50 percent more frequently when they were sick. To access health care, the extreme poor had to travel three times the distance and

spend three times as much to reach health facilities as their nonpoor counterparts (World Bank 2001). Before the program started in 2000, only 40 percent of children ages twelve to twenty-three months in RPS areas had received up-to-date vaccinations (IFPRI 2001). According to the 1998 Demographic and Health Survey, the vaccination coverage in rural areas was 68 percent. Before the program started, just above 70 percent of children younger than three in RPS areas had received any medical checkup during the previous six months (Maluccio and Flores 2005). As mentioned, service use was lower among the poorest households.

Given this background, the RPS health interventions during the first phase concentrated on preventive health care services for children younger than six that included child growth and development monitoring, vaccinations, anti-parasite medicines, and micronutrients. Preventive health care providers referred sick children to the closest health unit. RPS providers held health educational workshops every two months on topics like household sanitation, nutrition, and reproductive health.

Before the program, some RPS localities had no access to preventive health services. Others did, supposedly, but often the closest health post could be reached only after many hours of walking. The RPS program provided service locations within an hour's walk from beneficiary families. Its biggest impact on access, however, came in its second phase, when it entered the impervious terrain of the Atlantic coast. In places like Wiwili, a vast and sparsely populated municipality on the border with Honduras, there were only nine health centers, often accessible only by an expensive, eight-hour boat ride. These centers were typically staffed only by auxiliary nurses because both doctors and medicines were in short supply. Since 2004, however, 325 service locations have been established and are visited regularly by private health teams from the municipal center.

Mothers bring their children to the local service location to be seen by the private provider's health care team. Teams are made up of three members, each with his or her own responsibilities according to a set protocol: a doctor, a professional nurse, and an auxiliary nurse, psychologist, or nutritionist. Transporting vaccines to the most remote localities and preserving the integrity of the cold chain were a logistical challenge, which was often met with the support of the communities by placing, for example, refrigerators that run on gas in key locations.

During the RPS's second phase, the menu of health interventions was expanded to include sexual reproductive health, maternal health, and vaccination boosters for children between six and nine years old. *Promotoras*—beneficiary women selected by the community—were present when services were delivered and thus acquired training on the job. They became an important part of a network of human

resources capable of the tasks associated with nutritional counseling and child growth monitoring.

### **Demand Side: Transfers**

With limited information on national poverty rates, the RPS team had to determine the best way to identify the program's target population of extremely poor rural households with children under fourteen. During the first phase, the team wanted to compare the effectiveness of two targeting options: only geographic targeting and geographic combined with household-level targeting. They used geographic targeting to select departments, municipalities and, within municipalities, localities. Then, in some localities, household targeting was used to select households based on poverty criteria.

At the beginning, all rural areas in all seventeen departments of Nicaragua were eligible for the program. The focus on rural areas reflected the distribution of poverty in the country: of the 48 percent of Nicaraguans designated as poor in 1998, 75 percent lived in rural areas (World Bank 2001). For the first phase, the government selected the departments of Madriz and Matagalpa from the central region on the basis of poverty and their capacity to implement the program. This region was the only one that showed worsening poverty between 1998 and 2001, a period during which both urban and rural poverty rates were declining nationally (World Bank 2003). In 1998 approximately 80 percent of the rural population of Madriz and Matagalpa were poor, and half of those were extremely poor (Maluccio 2005). These departments were less than a day's drive from RPS headquarters in the capital, Managua. They also had reasonably good coverage of schools and, to a lesser extent, of health posts (Arcia 1999), reducing the share of RPS resources needed to increase services (Maluccio, Murphy, and Regalía 2006).

During the next stage of geographic targeting, the RPS team chose six (of twenty) municipalities based on similar poverty criteria used at the department level. The last stage was designed to select appropriate localities from these six municipalities. A marginality index was constructed, and an index score was calculated for all fifty-nine localities. The index was a weighted average of a set of proxy poverty indicators (including family size, access to potable water, access to latrines, and illiteracy rates) in which higher index scores were associated with more impoverished areas (Arcia 1999). During the first stage of the first phase, forty-two localities with the highest scores were deemed eligible to receive the program and formed the impact evaluation area of the first phase.

The initial design called for geographic targeting in these localities—that is, all resident households were eligible to receive the transfers. Nevertheless, about 2.5 percent were excluded because they were deemed to have substantial resources by, for example, owning land or a pickup truck (Maluccio 2005). Another 6.8 percent were excluded for other reasons, such as having a single, able-bodied member or falsifying information. Finally, about 6,000 households were included as beneficiaries at the end of 2000.

To explore the effectiveness of geographic combined with household-level targeting, in mid-2001 RPS incorporated an additional 4,000 households from the remaining seventeen localities, based on a proxy means test. A model predicting households' per capita expenditures in rural areas was estimated using information from the 1998 Living Standards Measurement Survey. The RPS team designed a questionnaire to collect the information needed to register beneficiaries for the program and to apply the proxy means test. In the seventeen targeted localities, households whose predicted per capita expenditures were above a certain threshold were excluded from the program. Unintentionally, the threshold chosen for the application of the proxy means test nearly coincided with the country's official poverty line.

In the second phase, with the adoption of a consumption-based poverty map for rural areas, which was consistent with the country's official poverty map, the RPS program strengthened geographic targeting. Following a thorough analysis of the strengths and weaknesses of the proxy means test methodology, per household targeting would only be applied in localities with predicted incidence of extreme poverty of less than 45 percent.

### *Compliance and Payments*

Households eligible for the program could receive conditional cash transfers for three years. This limitation was based on concerns about the program's fiscal sustainability; indeed, impact evaluation results suggested that some of the demand constraints households faced were not overcome in three years, especially in education.

In the first phase, households received a cash transfer (*bono alimentario*) of \$224 per year, paid in six installments on a bimonthly basis. The size of the transfer did not depend on the size of the household. Receipt depended on attending the educational workshops held every other month and taking all children younger than six years old to scheduled preventive health care appointments. In the second phase, this transfer decreased to \$168 in the first year, \$145 in the second, and \$126 in the third, last year of eligibility.

Cash transfers could be collected only by a designated household representative. In almost all cases, the RPS appointed the mother to this role, given the preponderance of evidence worldwide that resources controlled by women show higher returns for the well-being of children and the entire family. Cash payments were every second month, and mothers were required to show photo identification, bar-code program cards. All children enrolled in the program were linked to their mother's bar code. *Promotoras* and local program representatives organized and assisted the women at payment posts in each municipality. Health service providers and schoolteachers recorded households' compliance with program requirements on ad hoc RPS forms. The RPS team regularly collected these and recorded the data in a management information system, which was the basis for payment. Overall, the frequency of payments was regular.

In the first two years, approximately 10 percent of beneficiaries were penalized at least once and therefore did not receive one or both transfers (*bono escolar* and *bono alimentario*). Approximately 5 percent voluntarily left the program, either by dropping out or by leaving the program area (Maluccio and Flores 2005). Fewer than 1 percent were expelled during the first two years for reasons such as repeated failure to comply with program requirements, failure to collect the cash transfer for two consecutive periods, more than twenty-seven unexcused school absences during the school year, and false reporting.

A full listing of program requirements during the first phase, including those planned but ultimately not enforced, by type of household is presented in table 11-1. When it was learned that some, but not all, schools practiced automatic promotion, enforcement of the grade promotion condition was deemed unfair and was dropped. Similarly, when there were delays in vaccine delivery, the up-to-date vaccination condition was eliminated, as was the punishment for children who did not show adequate weight gain. These changes highlight the importance of careful program design and the need for flexibility in program implementation (Maluccio and Flores 2005).

### Supply Side: Payment

To understand the degree of innovation brought about by the RPS performance-based payment program, it is important to analyze the incentive structure providers faced in 2000, before the program, and to compare the changes introduced with the trends of the sectorwide health reform.

Before the program started, preventive health care services were underused, especially by the poor. Services were provided by understaffed and chronically

Table 11-1. *Requirements in Phase One of the RPS in Nicaragua, by Type of Household*

<i>Program requirement</i>	<i>No targeted children (A)</i>	<i>Children ages 0–5 (B)</i>	<i>Children 7–13 who have not completed fourth grade (C)</i>	<i>(B + C)</i>
Attend bimonthly health education workshops	✓	✓	✓	✓
Bring children to prescheduled health care appointments either monthly (younger than two years) or bimonthly (two to five years)		✓		✓
Adequate weight gain for children under five <sup>a</sup>		✓		✓
Enrollment in grades one to four of all targeted children in the household			✓	✓
Regular attendance (85 percent) of all targeted children in the household <sup>b</sup>			✓	✓
Promotion at end of school year <sup>c</sup>			✓	✓
Delivery of the cash transfer from the family to the teacher			✓	✓
Up-to-date vaccination for all children younger than five <sup>b</sup>		✓		✓

Source: Maluccio and Flores (2005).

a. Discontinued in phase two, starting in 2003.

b. No more than five absences every two months without a valid excuse.

c. Not enforced.

underfunded Ministry of Health centers. The ministry decided on budget allocations according to historical trends, with no needs-based planning or budgeting process. Public health providers were expected to cover wide geographic areas with inadequate reimbursement even for travel costs and with no incentives to extend coverage to more people. In addition, the ministry had no experience in contracting private providers. The two measures introduced by the RPS—contracting providers and aligning payments with measurable targets—were therefore dramatic changes with far-reaching effects.

In parallel, the Ministry of Health began a broader reform of the public sector in 2001, with mixed results. Targeted at improving the way medical care was organized and financed, the reform effort aimed to improve budgeting arrangements,

provide incentives to improve the tracking of funds, and link financial rewards and sanctions to the use of funds. The Ministry of Health, regional health authorities, also called the Local System of Integrated Health Care (SILAIS), and health centers signed annual management agreements. These contracts specified certain actions to be taken, goals to be achieved, and budgets to be allocated at the facility level. Although the contracts were supposed to provide incentives to improve local performance, the implementation of financial rewards and sanctions so far has not been systematic. The expansion of health coverage to remote areas by contracting NGOs has also not been much of a success. What the reform has delivered, however, is better execution by SILAIS and health centers of the programmed budget, better management of commitments, and the development of monitoring mechanisms.

Two considerations follow. The RPS scheme for delivering services in underserved areas went well beyond what, at this stage, broader health sector reform has achieved. By piloting outsourced services, the program proved the feasibility of quickly overcoming capacity constraints to access health services. By paying providers based on performance, the RPS demonstrated an effective mechanism to increase access to and improve the quality of basic health services. Unfortunately, the RPS model has not yet gained enough political and institutional support to be included as part of a sectorwide strategy. This may be due, in part, to the fact that RPS was never housed within the Ministry of Health, so the health sector never fully owned the program.

To constructively engage the government in considering institutionalizing RPS as a health strategy, future research should address an important issue not discussed here: the relative cost-effectiveness of RPS-like schemes for delivering services compared to other alternatives, such as direct delivery of services by the Ministry of Health, with or without demand-side incentives.

### *Choice of Service Provider*

The Ministry of the Family and the Ministry of Health were jointly responsible for the selection of health service providers through an international competitive bidding process. More than one provider could be contracted for a municipality with a large population. The program contracted the service of private agencies and NGOs; the providers selected were trained and certified by SILAIS.

### *Contract Terms*

The contract specified a unit cost for each preventive health service, such as prenatal care. The amount a provider was paid was determined by multiplying the number of people served by the unit cost of the service provided. The program

paid providers for the services offered, and the Ministry of Health paid for inputs like vaccines and micronutrients. Health care providers were paid every second or third month, depending on the municipality.

Providers conducted an initial analysis of the coverage of services to be offered in their assigned localities. With the help of the *promotoras*, they surveyed all households to accomplish the following:

- Validate the household-level demographic information collected through an RPS population census questionnaire,
- Identify the final universe of households to be served with a final estimation of the amount in the contract signed with the Ministry of the Family,
- Enroll households, and
- Establish a baseline for the services to be provided.

This baseline allowed the RPS team to determine the services each household member would need. It shared this information with the Ministry of Health to ensure an adequate supply of inputs, such as vaccines and micronutrients. Providers were paid a fee of about \$9.30 per household for this diagnostic.

### *Performance and Payment*

A contracted provider was paid an upfront fee of 3 percent of the entire amount of a one-year contract, with the rest paid bimonthly or quarterly as targets were met. The targets were divided into groups by beneficiary age and by categories, such as pregnant or breastfeeding women. A provider was required to offer services to between 95 and 98 percent of individuals in every group, but if it missed this target for one group, it could still be paid for services to the other groups. If targets were missed for reasons outside a provider's control, an appeal could succeed in reinstating a payment after an RPS team verified the reasons. A provider was also considered in compliance with the contract if it met with household members but was unable to deliver a service such as a vaccination because the Ministry of Health did not provide the vaccine on time. These situations became relatively rare as the program got under way. Although demand-side and supply-side incentives may not be enough to ensure a stable supply of vaccines, one reason the vaccines were more available as the program progressed might be that the incentives motivated providers to pressure suppliers of the vaccine—that is, the Ministry of Health. Providers also served households not enrolled in the RPS program but in the same localities and could be paid up to an additional 10 percent for doing so.

To verify targets, the RPS team supplied providers with ad hoc forms for each household, to be signed when a service was provided. The RPS team periodically

collected these forms to assess both households' compliance with program conditions and providers' attainment of targets. Payments were then issued by the Ministry of the Family, usually within two months.

Every six months, the RPS team randomly checked a sample of providers, households, and individual beneficiaries to verify that the information that the health care providers submitted was accurate. Discovery of false reporting of information triggered a suspension of payments, and repeated false reporting terminated the contract with the health provider. Additionally, twice a year, a firm of independent external auditors performed random checks of the records of a representative sample of providers, localities, households, and individuals.

The risk of providers losing payments by not meeting targets seemed a real threat at the start of the program, but in practice, providers always complied with the 95 to 98 percent target and received full payment. Some of this success can be attributed to the program's outreach effort, such as involving *promotoras* to organize women to come for health checkups. Providers also sometimes used their own resources to mobilize schoolteachers and community leaders and to buy radio airtime to spread the program's message.

Providers subcontracted health care teams whose members were paid on average 30 to 50 percent more than the Ministry of Health personnel operating in the same municipalities. Teams operating in the most difficult terrain also received additional financial incentives. The annual cost per household for the services provided varied substantially across municipalities, with a 2005 average across all municipalities of \$134.

In localities where demand-side transfers to beneficiary households stopped in 2003 but the supply of health services did not, the pay-for-performance nature of the providers' contract did not change. At first, providers continued to be paid on compliance with the 95 to 98 percent coverage target by group, but over time this changed: providers were still paid according to performance, but also according to population covered. Despite the withdrawal of demand-side transfers and changes in the terms of the contract described, preventive health service use rates remained very high eight to ten months after cash transfers were discontinued (IFPRI 2004).

## Results

The original RPS design included a rigorous impact evaluation strategy in part because the two-phase IDB loan required achieving, during the first phase, a set of quantitative triggers as preconditions for the second phase. These triggers

included targets that were expressed in terms of net impacts: changes in the treatment group compared to changes in a control group, known as “difference in difference.” The RPS impact evaluation was therefore expected to rely on a robust design that included a control group and both a baseline and follow-up surveys to enable estimating this difference in difference. Both the government and the IDB wanted to learn as much as possible from the implementation of such of an innovative intervention, which was among the first of its type in a low-income country.

IFPRI and the government carried out the impact evaluation in close coordination, which showed strong ownership and commitment. Continuous IDB support complemented these efforts. A baseline survey in 2000 was followed by other surveys in 2001, 2002, and 2004, and a qualitative evaluation was carried out in 2003.

Overall, the RPS impact evaluation strategy was one of the most comprehensive and well executed among all social program impact evaluations carried out in Latin America and the Caribbean and one of the best of CCT programs worldwide. It also proved that an impact evaluation of its caliber could be conducted in a low-income country at a reasonable cost. Five key factors contributed to the success of the evaluation:

- A team of dedicated external consultants with sound analytical skills and the capacity to lead survey fieldwork,
- The capacity and experience of the local counterpart team that carried out survey fieldwork under the supervision of external consultants,
- The dedication of the external team to transfer knowledge to the local RPS team,
- The careful planning of all the evaluation stages from design through implementation, and
- The RPS team’s commitment to stick with the planned evaluation design and implementation plans.

Such an evaluation would not have been possible had the program’s execution not been consistently coherent and successful. This factor is too often taken for granted. Off-track program execution is the main determinant of an ineffective impact evaluation.

The methodological approach of the evaluation differed in the first and second phases (Maluccio and Flores 2005). The first used the randomization of localities in treatment and control groups, chosen through the transparent process of a lottery at a public event. The design of the second phase was quasi-experimental,

with control localities selected in areas where the RPS did not plan to expand. This made the design less robust than randomization, but it was the only design deemed feasible. Because the evaluation of the first phase showed that the program could deliver important impacts, excluding localities by a lottery in the second phase was considered not ethically appropriate.

During its first phase, the RPS had positive double-difference estimated average effects on a broad range of indicators and outcomes. Where it did not, the result was often due to similar, though smaller, improvements in the control group. Almost all estimated effects were greater for the poorest households, often reflecting their lower starting points. As a result, the program reduced inequality across expenditure classes for a variety of outcomes (Maluccio and Flores 2005): the average net impact on total annual household expenditures per capita was 18 percent. Most of this increase was spent on food and resulted in an improvement in the diet of the beneficiaries.

In terms of health outcomes, between 2000 and 2001, the RPS induced an average net increase of 16.4 percentage points among children under three who were receiving preventive health care (Maluccio and Flores 2005). Between 2000 and 2002, the net increase was “only” 8.4 percentage points, largely as a result of continued improvement in the control group. The services provided by the RPS, as measured by process indicators such as whether a child was weighed or a health card was updated, improved to an even greater extent, especially among the extremely poor (see table 11-2). The average net impact was 13.1 percentage points, but among extremely poor households it was 18.8. Participation by children between the ages of three and five in preventive health checkups also increased substantially.

Vaccination rates climbed more than 30 percentage points to above 70 percent in the intervention areas between 2000 and 2002 (see table 11-3). A smaller increase was observed in control areas. These results are particularly striking when compared to Demographic and Health Survey figures showing coverage in rural areas declining from 68 percent in 1998 to 60 percent in 2001 (Maluccio and Flores 2005). It is likely that the Ministry of Health’s supply of vaccines to providers in RPS municipalities also increased the availability of vaccines for public health units in the control localities. Given the RPS municipalities’ initial vaccination coverage, it is entirely plausible to attribute at least some part of this improvement in both treatment and control localities to the RPS.

The biggest impacts on service use in both education and health were observed among very poor households (IFPRI 2003). The increased use of health services, combined with improvements in diet, led to a 5.5 percentage point decline in

Table 11-2. *Average Effect of RPS on Children from Birth to Three Years of Age in Nicaragua, by Poverty Status<sup>a</sup>*

<i>Group</i>	<i>Extremely poor</i>	<i>Poor</i>	<i>Nonpoor</i>
<i>Taken to health control in the last six months</i>			
Double difference, 2001–2000	17.5* (9.0)	20.6* (8.8)	6.6 (9.4)
Double difference, 2002–2000	15.2* (8.3)	6.5 (6.4)	–9.1 (8.6)
<i>Weighed in the last six months</i>			
Double difference, 2001–2000	29.9*** (9.6)	23.5*** (8.9)	13.0 (12.1)
Double difference, 2002–2000	18.8** (9.5)	7.3 (9.1)	8.3 (13.1)

Source: Maluccio and Flores (2005) using Nicaraguan RPS evaluation data.

a. Standard errors correct for heteroskedasticity and allow for clustering at the *comarca* level and are shown in parentheses (StataCorp 2001). Analysis is based on all children newborn to three years old in 706 households in the intervention group and 653 households in the control group in each year.

\*\*\* $p > 0.01$

\*\* $p > 0.05$

\* $p > 0.10$

Table 11-3. *Average Effect of RPS on Percentage of Children Twelve to Twenty-Three Months of Age with Updated Vaccinations in Nicaragua<sup>a</sup>*

<i>Survey round</i>	<i>Intervention</i>	<i>Control</i>	<i>Difference</i>
Follow-up, 2002	71.4 [91]	69.4 [121]	2.0 (6.0)
Follow-up, 2001	81.9 [105]	72.8 [114]	9.1 (7.1)
Baseline, 2000	38.9 [139]	41.5 [123]	–2.6 (9.2)
Difference, 2001–2000	43.1*** (7.1)	31.3*** (6.8)	11.7 (9.8)
Difference, 2002–2000	32.6*** (7.2)	28.0*** (8.5)	4.6 (11.0)

Source: Maluccio and Flores (2005) using Nicaraguan RPS evaluation data.

a. Standard errors correcting for heteroskedasticity and allowing for clustering at the *comarca* level are shown in parentheses (StataCorp 2001). Analysis is based on all children twelve to twenty-three months old in 706 households in the intervention group and 653 households in the control group in each year (number of children is shown in brackets).

\*\*\* $p > 0.01$

Table 11-4. *Effect of RPS on Percentage of Children under Five Who Are Stunted in Nicaragua<sup>a</sup>*

<i>Survey round</i>	<i>Intervention</i>	<i>Control</i>	<i>Difference</i>
Follow-up, 2002	36.5 [469]	41.7 [518]	-5.2 (4.7)
Baseline, 2000	39.8 [512]	39.5 [483]	0.3 (4.9)
Difference, 2002–2000	-3.4*** (1.3)	2.2 (2.8)	-5.5* (3.0)

Source: Maluccio and Flores (2005) using Nicaraguan RPS evaluation data.

a. Height-for-age  $z$  score  $< -2.00$ . Standard errors correcting for heteroskedasticity and allowing for clustering at the *comarca* level are shown in parentheses (StataCorp 2001). Analysis is based on all children newborn to three years old in 706 households in the intervention group and 653 households in the control group in each year.

\*\*\* $p > 0.01$

\* $p > 0.10$

stunting among children under five, more than one and a half times the national rate's decrease between 1998 and 2001 (see table 11-4). Very few programs in the world have rigorously demonstrated such a rapid and substantial decline in stunting (Maluccio and Flores 2005).

Between 2000 and 2002, RPS improved the distribution of iron supplements and antiparasite medicines to these same children. The dramatically high rates of anemia did not improve, however. The qualitative evaluation found that although they understood the value of supplements, mothers did not always administer them for a variety of reasons, such as children simply did not like them or they induced vomiting or diarrhea (Adato and Roopnaraine 2004). The qualitative evaluation showed that beneficiaries viewed preventive health services favorably and found the presentation of health education materials simple and accessible. Putting into practice what was presented during the health sessions proved more difficult. Beneficiaries greatly valued the quality and easy access to health services and the "good treatment" received from health care providers (Adato and Roopnaraine 2004).

The program's second phase, with average transfers reduced by 30 percent mainly for fiscal sustainability considerations, was about as effective as the first in terms of increasing the use of health services, although the measurement of results was less certain because of the change in design (IFPRI 2004). After households stopped receiving transfers but continued receiving preventive health care, service use remained around the peak reached in 2002 and even improved on some

indicators, such as vaccination rates. These results can be interpreted in very different ways. It could be argued, for example, that the RPS generated, at least in the short term (eight to ten months after transfers were stopped), a lasting effect on service use. It could also be said, however, that demand subsidies might not be needed and that setting up an effective delivery scheme might be enough. For the same households, use of education services declined after transfers were discontinued, halving the net gains in school enrollment during the program's first phase. One possible interpretation suggests that the cost of sending children to school is higher than the cost associated with health checkups.

In the second phase, the program generated a net average impact of 5 percentage points in the use of family planning methods among females between twelve and forty-nine years old. The impact was three times greater among women between thirty and forty. The qualitative evaluation stresses the variation across localities, mainly related to religion, with less support for family planning in evangelical localities (Adato and Roopnaraine 2004).

Program impacts on the use of maternal care services were rather modest, mainly because of improvements in the control group. In the first phase, the impact on pregnant women having at least one prenatal checkup was estimated at 24.5 percentage points. This declined to 15.1 percentage points in the second phase. A marginally significant net impact of 4.6 percentage points was seen among women who had at least one postnatal checkup (from an extremely low initial coverage of 8.3 percent) in the second phase.

## Role of Government

The Nicaraguan Emergency Social Investment Fund designed and successfully executed the program's first phase. ESIF's institutional structure, accounting systems, and nationwide presence at the local level provided an excellent platform for development of the RPS program. The program's intended activities bore little similarity to ESIF's core activities, however, making the upfront investment of time and resources for the RPS team very high. Transfers and supply-side interventions did not start until the end of the first year of operation. The first-year cost-transfer ratio—the administration and private costs associated with a one-unit transfer to beneficiaries—was 2.54. That is, \$2.54 was spent to transfer \$1 of benefits to eligible households either as demand subsidies or as health care services. The cost-transfer ratio improved dramatically throughout the course of the program (Caldés and Maluccio 2005), reaching a low of about \$0.20 by 2005.

Before the second phase, the RPS team was moved from ESIF to the Ministry of the Family to institutionalize the program within a line ministry and strengthen coordination among the Ministry of Health, the Ministry of the Family, and the Ministry of Education. This coordination remained patchy, and the program suffered a setback in autonomy and in its plans to reduce administrative costs.

At the start, the Ministry of Health considered RPS as a headache and agreed only reluctantly to IDB's suggestion of outsourcing health services to reach remote localities. Relations between RPS and the ministry remained tense during the first phase for several reasons, including the ministry's increased workload and the higher wages of contracted providers. At the central level, differences arose over the ceiling of \$90 per household per year imposed by the Ministry of Health, despite wanting the RPS to provide more services. The final cost was about 50 percent higher.

By the second phase, relations between the Ministry of Health and the Ministry of the Family improved: information, training, and part of the resources were shared, and each side appreciated the expanded coverage in remote areas. Despite this progress and the impact evaluation results, however, the model of private services provision is far from being institutionalized in the Nicaraguan health sector. It is regrettable that current Ministry of Health budgets earmark no resources to contract providers for RPS localities beyond the program's five years. For extremely poor households in RPS areas, therefore, access to maternal and child care services will once again become elusive. Had the Ministry of Health been given more ownership over the program from the beginning, the increased support within the health sector might well have led to improved institutionalization and continuity.

## Conclusions

The difficulty in disentangling the individual impacts of demand-side and supply-side incentives aside, the RPS evaluation clearly shows that combining the two can significantly increase the use of health services among poor households and improve health outcomes. An evaluation about ten months after demand-side incentives had been stopped in certain areas revealed that use rates for preventive health care services remained high. This might be because the program strategy dramatically improved provider outreach activities and thus the access of poor households to health services, reducing the costs of time and travel to reach delivery points. It is possible, therefore, that a well-targeted strategy of supply-

side, performance incentives could, on its own, be enough to achieve and maintain high levels of health care service use among poor rural populations in Nicaragua. The RPS evaluation shows that this conclusion holds among poor households that have benefited from a relatively long period (three years) of education on the importance of preventive health care, alongside demand-side financial incentives, at least ten months after the incentives had been discontinued. The results, though, cannot exclude that, even after their removal, demand-side incentives continue to exert, at least in the short term, a positive impact on service use. In considering RPS-like approaches, future research efforts should be devoted to unbundling the bundle of incentives and assessing the relative contribution of supply versus demand incentives.

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