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Why do Beneficiaries Leave the Safety Net in Mexico? A Study of the Effects of Conditionality on Dropouts

CAROLA ÁLVAREZ
Inter-American Development Bank, Washington, DC, USA

FLORENCIA DEVOTO
Jameel Poverty Action Lab, Rabat, Morocco

and

PAUL WINTERS *
American University, Washington, DC, USA

Summary. — This paper analyzes the characteristics of beneficiaries who drop out of the Mexican conditional cash transfer program *Oportunidades* to determine if dropping out of the program is a result of self-targeting by the non-poor or the exclusion of the target poor population. Using *Oportunidades*' administrative data and a discrete duration model, the analysis indicates that wealthier beneficiaries have greater odds of dropping out, suggesting that conditionality acts as a screening device. The results also indicate that administrative factors and the provider of health services to beneficiaries also have an important influence on whether beneficiaries remain in or leave the program.

Key words — Latin America, Mexico, *Oportunidades*, cash transfer, conditionality, targeting

1. INTRODUCTION

Conditional cash transfer programs (CCTs) have become a common tool for poverty alleviation and human capital formation among the poor, especially in Latin America. [1] Subsidies are given to poor families to (i) have a direct poverty-alleviation effect by increasing total household income and thus consumption, and (ii) elicit a behavioral change in these families so that a certain action, such as increased investment in the human capital of the children of the poor, will take place. Impact evaluations of these programs have concentrated on verifying the behavioral changes and their related effects. [2] Much discussion has arisen as to whether conditioning the subsidy is absolutely necessary to elicit the behavioral change and thus the impact. It has been difficult to shed light on this question given that the counterfactual to conditioning payments, a randomized unconditional transfer, has not been possible to implement (Davis, Handa, Stampini, &

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Winters, 2006). [3] While the lack of data makes a clear statement on the role of conditionality impossible, the consensus seems to be that behavioral changes are correlated with the type of conditions that each program requires (Das, Do, & Özler, 2005).

Conditions can have consequences beyond the impact on outcomes. In some programs, failing to meet the program's conditions implies that the recipients would receive a reduced payment or possibly be dropped from the program's roster. Therefore, conditions on the receipt of transfers may also encourage self-selection out of the program, thereby acting as a screening mechanism (Das *et al*., 2005). Such screening mechanisms have been used in workfare programs by placing work requirements on program recipients that lead to self-selection into the program by those that are unemployed (Galasso & Ravallion, 2003; Jalan & Ravallion, 2003). Using data from Mexico's *Oportunidades* program, this paper evaluates the role of conditionality in CCTs in inducing self-selection and increasing the efficiency of the targeting system of the programs.

In targeting beneficiaries, *Oportunidades* employs a carefully constructed system to determine eligibility. [4] This system uses community-level geographic targeting to minimize the errors of omission (excluding the poor who should be eligible for the program) as well as household-level proxy mean tests to limit errors of inclusion (including the non-poor in the program). [5] The targeting procedure is as follows. First, potential recipient communities are ranked based on an index of marginality developed from the national population census. The marginality index is a proxy for the degree of access to basic goods and services at the community level and thus gives a sense of how remote, and correspondingly how poor, a community is. After communities are identified as sufficiently poor, the second step is to select households for participation in the program based on data collected from a household census within the community. A proxy means test is calculated for each household using discriminant analysis, and households above the cut-off point are deemed eligible as beneficiaries. The key factors used to discriminate between the poor and non-poor are observable household assets that indicate relative wealth. Once families are incorporated they remain in the program and receive benefits, if they adhere to the conditions placed on the receipt of the subsidies.

While poor beneficiaries are carefully targeted, the program may include the non-poor for two reasons. [6] First, the creation of a wealth index using discriminant analysis is at best an approximation of income or consumption poverty and it may be the case that this index allows the inclusion of non-poor households. Second, the program has been in operation for a number of years and the benefits of the program may result in some households no longer being considered poor.

Similarly, the exclusion of the poor may be related to two factors. Given the initial geographic targeting of the program to marginal communities, the poor that happen to live in communities that are better off may have been missed, at least in the earlier years of operation. Furthermore, new poor households may form in communities after the roster has been created, meaning they have been left out. To manage these issues of dynamic changes in the welfare status of beneficiaries, the program returns to survey the communities every three years, and, based on a proxy means test, verifies the eligibility of current recipients, and determines if new households in the community are eligible for the program. Note, however, that at least during the early years of the program covered in this study, households were not "graduated" from the program if they were deemed no longer poor. More households could be added, but households were not removed from the roster.

Changes in administrative rules or actions to update the roster may also lead to households being removed from the program. Furthermore, households may "self-select" out of the program through their behavior; by failing to meet certain conditions of the program or failing to pick up their checks, a significant number of households are dropped from the roster and lose their eligibility for transfers. If this is simply the result of the quasi-poor—those who are just above the poverty line—opting out of the program because the opportunity costs of conditionality are too great, conditionality is acting as a screening mechanism that minimizes the errors of inclusion and thus improves targeting. However, dropping out of the program may be related to a completely different phenomenon. It could be the case that conditionality places unreasonably high costs on very poor households, making them unable to receive the transfer and therefore working against the program's objective of protecting the most vulnerable. For example, the costs associated with attending health lectures or visiting health

clinics may be very high for poor households, particularly those in distant, marginal communities where transport costs are high. If this is the case, dropouts may then increase the errors of omission by making the very households that the program tends to target ineligible.

The purpose of this paper is to examine the characteristics of households that drop out of the *Oportunidades* program to answer the following policy questions: (i) could conditionality increase the program's targeting efficiency by acting as a disincentive for quasi-poor households to remain in the program indefinitely?; (ii) are the poorest being overburdened by program requirements?; (iii) what characteristics of the program are increasing the risks of the poorest leaving the safety net? To answer these questions, the paper is organized as follows. Section 2 discusses the *Oportunidades* program in detail, including a description of the eligibility requirements and the conditionality associated with the program, and provides a conceptual framework for analyzing dropouts. Section 3 then describes the data set used in this study. The analysis uses the administrative data from the program, including data from the household census conducted to determine eligibility as well as administrative data on the length of time households remained in the program. Section 4 presents the empirical approach used in the analysis. In particular, a discrete non-repeatable one-way duration model is estimated that explains the hazard rate, $h(t)$, or the risk of dropping out of the program at time t, given that the event did not occur before time t. In Section 5, the results of this analysis are presented. Finally, conclusions and policy implications are discussed in Section 6.

2. THE EFFECT OF PROGRAM ELIGIBILITY AND CONDITIONS ON DROPOUTS: A CONCEPTUAL FRAMEWORK

The targeting system that *Oportunidades* used to identify beneficiary households is described in the introduction. Within the households that are declared eligible through this process, the bimonthly transfer payment is in most cases provided directly to mothers under the assumption they are more likely to use the resources to benefit their family and children. The amount of the transfer is dependent on the composition of the household and in particular on the number and age of children. *Oportunidades* has two different forms of cash transfers: A basic transfer composed of a food grant, to which school scholarships grants are added if children in the family are of school age. Each type of transfer is linked to separate and independent conditionality requirements. The total amount a household can receive from *Oportunidades*, however, is capped at a certain amount to limit incentives to expand the number of children in a household. At the beginning of the program (1998), the cap was just under 600 pesos, which is calculated to be about 20% of total household expenditures (Skoufias, 2005). Beneficiaries receive payments every two months.

The food grant, which is the same amount for each beneficiary household, is conditional on health check-ups for all family members and on attendance by the recipient at public health lectures. At registration, households set up a schedule of health appointments for all relevant household members for the year. This information is given to the health provider who maintains attendance records. Along with these check-ups, transfer recipients are also asked to attend health and nutrition talks at the health clinic. The health provider is required to fill in a form every two months certifying beneficiary attendance at these talks. This results in a report to the *Oportunidades* administrators indicating whether the beneficiary family is in compliance with the conditions of the basic food transfer. Failure to be compliant for four consecutive months (two bimonthly periods) or for six non-consecutive months out of any twelve months (three bimonthly periods out of six) results in the family being dropped from the program.

School scholarships are linked to specific children and thus differ by household. The amounts depend on the year in school with increasing amounts for secondary school and, in particular, for female secondary school students. The grants are awarded to beneficiaries during the school calendar year and all children over seven and under 18 are eligible. Children must register and ensure a monthly attendance rate of 85% to receive the award. School officials verify registration by signing a form for each family and certify attendance through submitting attendance forms to the proper authorities. If attendance requirements are not met, the amount linked to that particular child is deducted from the bimonthly total payment to the family. Failure to meet the conditions associated with children's schooling, therefore, does not result in expulsion from the program but rather in a reduced payment.

The health and schooling conditions described above are clearly not without costs. The principal cost for the household of meeting conditions is the opportunity cost of time. Attending public lectures, scheduling and making health check-ups, and attending school all require using valuable household labor time. While these costs are greatest for the recipient and school-age children, all members incur costs to some degree since each has to go to annual health check-ups. For potential or actual migrants in the household, the cost of time could be high. Even the time involved in getting to the health centers and schools can represent a significant investment and will incur a direct cash cost for transportation that can be particularly high for more remote households.

In deciding whether to remain in the program, households will compare the total costs, including opportunity costs, with the benefits associated with remaining in the program—namely, the cash received from being a beneficiary household. Note that by rule, *Oportunidades* reduces payment for failure to enroll in and attend school, but does not remove recipients from of the program. However, beneficiaries who fail to meet the conditions of the basic food grant part of the program are dropped from the program. Households can therefore decide to partially comply by only meeting the food grant conditions, but fail to meet the education conditions and still remain in the program. As discussed below, the available data only allow for the analysis of full dropouts from the program (those who to meet the health conditions associated with the food grant). Therefore, the decision considered in this paper is the decision to comply with food grant conditions, given the costs of such a condition and the benefits of remaining in the program.

The expectation is that those households with the greatest opportunity cost of time are the most likely to fail to meet the conditions of the program—namely, beneficiary households that have other economic opportunities and are likely to be the relatively better off. These opportunities could include local employment, which increases the value of time, or migration, which automatically removes a household from the program. [7] This is the screening mechanism described in the introduction that may lead to self-targeting. Additionally, however, given the costs of transportation, it may be the case that more marginal households with limited infrastructure access or who are cash constrained could potentially also find it difficult to meet the conditions of the program. Evidence does suggest that children in recipient households that are further away from secondary schools are less likely to enroll (De Janvry & Sadoulet, 2006). This may suggest difficulties for these households in meeting the health conditions as well. Thus, the findings may indicate that both the better-off and poorest households leave the program as a result of their actions.

The discussion thus far assumes that only the actions of households can lead them to drop out of the program. These can be viewed as ''voluntary'' dropouts in that they are a result of household behavior. [8] However, mechanisms other than failing to meet conditions can lead to being eliminated from the program. First, reporting mechanisms to enforce conditions rely on health personnel filling in forms to inform the program of noncompliance on the part of families. With such a large program, this in itself may lead to some problems. In fact, as shall be seen in the subsequent sections of the paper, the efficiency and quality of the health provider may influence the reporting of compliance and thus the ability of beneficiaries to stay in the program. Another cause for the removal from the program is failing to pick-up the transfer payment two periods in a row. By rule, this leads to the recipient being removed from the program roster. While this can be the result of recipient behavior and could be linked to the opportunity cost of time and the costs associated with transportation, it can also be the result of administrative problems. For example, picking up a check requires having an identification card that is supplied by the program. If for some reason, the program fails to deliver all proper identification to the recipients in time, they cannot pick up their checks and thus could lose eligibility. Finally, the program regularly conducts audits of its procedures and an audit may find that a recipient should not have been eligible in the first place. [9] Each of these mechanisms, therefore, may lead to households being ''involuntarily'' dropped from the program.

To summarize, three triggers lead to a recipient being dropped from the program: (i) being reported as failing to meet health conditions two periods in a row or for three out of six periods; (ii) failing to pick up payments two periods in a row; or (iii) administrative audits. Ideally, we would be able to identify whether the underlying reason for losing program eligibility was due to the behavior of households (voluntary dropouts) or to administrative glitches or ''shocks'' that are due to the program (involun-

tary dropouts). Unfortunately, the available data do not explicitly identify why a household is removed from the program, so it is not possible to separate the voluntary and involuntary dropouts. To ensure that the analysis properly assesses the influence of behavioral factors—that is, those linked to voluntarily dropping out—we carefully control for factors related to involuntary dropouts.

3. OPORTUNIDADES' ADMINISTRATIVE DATA

The data used in this analysis come from the *Oportunidades* program, which collects information on when beneficiaries enter the program as well as if and when they drop out. For each rural community in which *Oportunidades* operates, the program conducts a complete census of households in the community—referred to as the ENCASEH—to determine eligibility. [10] The questionnaire used for the census consists of detailed socioeconomic information, including the characteristics of the recipient and household, measures of household income including income sources, and receipt of public assistance programs. The administrative data also include the community marginality index, which is used for the geographic targeting as noted above, and the score (or *puntaje*) used for the household targeting. Finally, the administrative information includes other data such as the health provider used by the beneficiary household. [11] Once constructed into a single data set, the data include significant details on the characteristics of all households that were eligible for *Oportunidades* at the time of entry into the program, as well as administrative details.

As of 2005, *Oportunidades* had incorporated five million participants, including more than 3.3 million in rural areas. For this analysis, we focus on rural areas since this is where most of the extreme poor in Mexico reside and where there is greater concern that conditions may lead to poor households dropping out of the program. Furthermore, the urban areas were not incorporated until 2001 and not in large numbers until later, so the focus on rural areas allows for an analysis of a longer period of time. The analysis focuses on the four cohorts that entered the program in 1998, [12] rather than on all of the cohorts that entered the program during 1997–2004. The choice of this set of cohorts is based on the following reasons: (i) these cohorts had been in the program for a significant amount of time allowing for longer-term analysis of dropouts; (ii) the program was dramatically expanded in 1998 so these are large cohorts (1.6 million households) with national coverage; and (iii) using four cohorts instead of one helps to reduce cohort-specific issues while using a limited number of cohorts allows us to easily control for cohort and time-specific events. A 1% random sample of these cohorts was constructed, creating a data set of 16,017 households. [13] The data set includes all households that were eligible for *Oportunidades* in the selected communities. Eight percent of the sample belongs to the cohort that entered in the first bimonthly period of 1998 (January–February or 1998.1), 61% in the fourth bimonthly period (July–August or 1998.4), 5% in the fifth (September–October or 1998.5), and 26% in the last bimonthly period of the year (November–December or 1998.6). The breakdown reflects the relative sizes of each of these cohorts and the sample can be viewed as representative of the four cohorts that entered the program in 1998.

Oportunidades is organized around a bimonthly payment. While entry into the program depends on when *Oportunidades* enters the communities and initiates the program, beneficiaries are not required to meet program conditions immediately and therefore are not at risk of dropping out or receiving a reduced payment until the next (or second) period begins. As noted, dropping out is only the result of failing to meet conditions linked to the food grant and not the education grant. Failure to meet the education grant would only lead to lower payment. While the partial compliance linked to education conditions would be interesting to examine, data is only available for whether a household completely loses eligibility and as such, the analysis and conditions discussed below refer only to the food grant portion of the program. Beneficiaries have the entire two-month period to meet these conditions and can only be removed from the program or drop out by failing to meet conditions at these two-month intervals. Thus, the first time beneficiaries can drop out is at the end of the second period of risk and after this they can only lose eligibility at the end of these two-month intervals. Dropouts are therefore not a continuous variable, but a discrete occurrence and are treated as such in the analysis.

The risk of dropping out of the program at time t, given that the "dropout event" did not

occur before time t—that is the hazard rate—is defined as the total number of dropouts over the risk set in a given two-month time period. Since beneficiaries enter the risk set one period after they are incorporated into the program, we calculate the conditional probability distribution for dropping out from the second bimonthly period of 1998 (March–April, or 1998.2) to the fourth bimonthly period of 2004 (August–September, or 2004.4), which is the last period for which data are currently available. This gives up to 39 discrete observation points in time for each household. In total, we end up with a sample of 514,972 observations for the 16,017 households. Before analyzing these data in detail, we will characterize the basic behavior of dropouts over time and provide descriptive statistics of the covariates of the model.

Figure 1 shows the dropout rates over the discrete periods in question as well as a smoothed version of the hazard function [14] and Figure 2 shows the survivor function. The figures show that the pace at which beneficiaries leave the program is not constant over time. Dropouts accelerate until reaching a peak in period 14 and the risk of dropping out stays relatively high until it begins to decrease after 30 bimonthly periods. The survivor function suggests that on average approximately 0.5% of households in the program dropout every bimonthly period, and over the course of the 39 periods or 6.5 years, nearly one of every five participants who entered the program in 1998 are no longer in the program by the middle of 2004.

Note that the discrete hazard function (the bars in Figure 1) shows the existence of significant peaks at certain periods, suggesting that dropouts may be linked to factors other than self-selection out of the program. In particular, in evaluating the data there is some concern that dropouts in certain periods are related to the previously noted changes in administrative procedures. For example, in Figure 1 the discrete hazard function shows that the largest number of beneficiaries that drop out occurs during the first risk period, which could be because *Oportunidades* administrators fail to turn in paper work or instructions to beneficiaries in a timely manner. Detailed discussions with *Oportunidades* administrators revealed other operational issues that may have affected the probability of dropping out. Since the program was launched, the procedures to monitor whether beneficiaries are meeting conditions have improved significantly. Two important changes happened during the periods in question: (i) the introduction of operational guidelines ("*Reglas de Operacion*") in mid-1999 and (ii) the introduction of a *just-in-time* monitoring system [15] in mid-2000. The just-in-time monitoring system introduced algorithms to allow for better monitoring of conditionality and thus

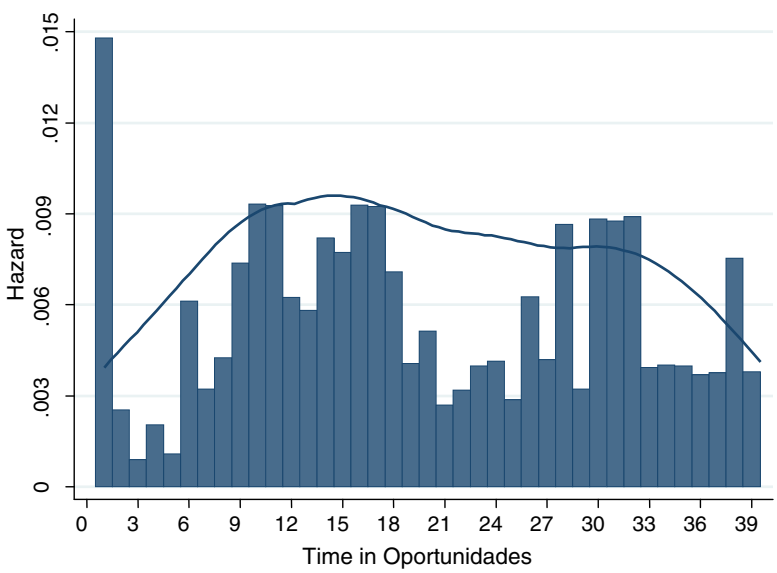

Figure 1. *Discrete and smoothed hazard functions for dropouts.*

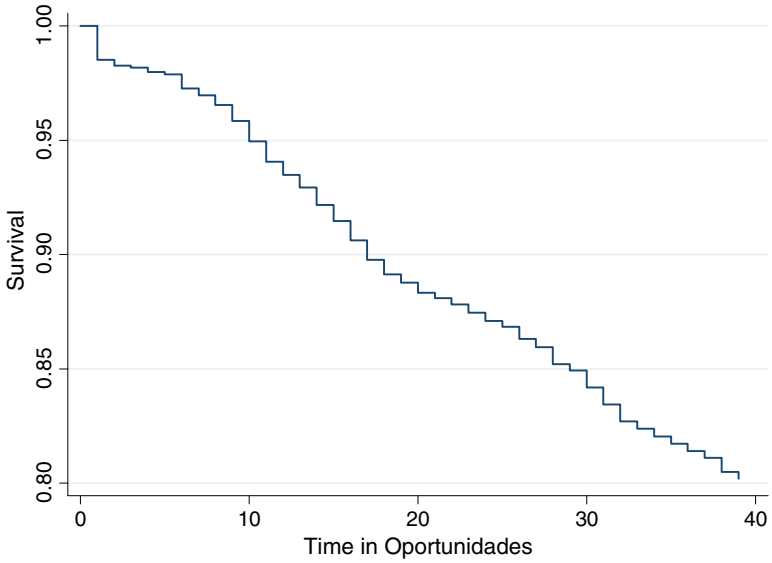

Figure 2. *Survivor function given time in Oportunidades.*

potentially led to an increase in dropouts. In addition to these changes, there were also changes in the *puntaje* that made it national in scope, which led to reclassifying the eligibility status of many families, as well as changes in the payment system from cash payments to direct deposits in bank accounts.

Each of these events could influence the probability of dropping out of the program and thus need to be controlled for in the subsequent analysis. All are time-specific events; that is, they occurred at specific calendar time periods and can thus be controlled for in regression analysis with appropriate dummy variables. Specifically, two dummy variables were created to account for the introduction of the operational guidelines (dummy equals one after 1999.4) and for changes in the monitoring system of the program (dummy equals one after 2000.4). These two dummies identify if there is an upward or downward shift in the risk of dropping out after these two changes. Furthermore, we have the following calendar time-specific dummies to deal with other administrative issues: (i) implementation of guidelines (1999.4), (ii) distribution of new identification cards (''*Hologramas*'') (2000.3 and again in 2001.3), (iii) problems with payment withdrawals (2002.6), (iv) no delivery of debit card or no signature of *Bansefi* contracts (2003.2), and (v) correction of inclusion errors (2003.4, 2003.5, and 2003.6). Unlike the introduction of the operational guidelines and monitoring system, these were single events and are thus controlled for with dummies for the specific calendar time.

Before proceeding to the detailed analysis, Table 1 presents summary statistics of the characteristics of the households in the sample prior to entering the program. The data are also divided by households that have dropped out and households that are still in the program, with initial tests of difference. Results indicate that relative to the active group the dropout group is characterized by a higher proportion of males, more average years of education, a higher proportion of non-indigenous, a lower proportion of married recipients, and a higher proportion of employed recipients. Households that have dropped out of the program tend to have fewer members and a lower dependency rate.

To measure the relationship between poverty and dropping out, the *puntaje* is used. As noted earlier, targeting at the household level is done through the *puntaje*, which is a wealth index based on household assets. At the beginning of the program, different regional models of the index coexisted, which classified the households as ''eligible'' or ''non-eligible'' based on its relative regional position. In 2001, *Oportunidades* started to use a unique national model to create the *puntaje* and reclassified households accordingly. To make the *puntaje* comparable among all the 1998 cohorts and following *Oportunidades*' practice, we reclassified the

Table 1. *Summary statistics of household characteristics*

	Total	Active	Dropout	Tests of difference
Characteristics of recipient				
Male recipient	9.5%	8.8%	12.4%	−5.98
Age	41	41	41	−0.74
Years of education	2.9	2.8	3.2	−7.16
Indigenous	7%	7%	6%	1.24
Single	35%	33%	43%	−11.74
Works outside home	21%	20%	24%	−3.99
Household characteristics				
Dependency ratio	1.2	1.3	1	12.23
Number of people	5.4	5.6	4.6	18.31
Public assistance	7.9%	8.2%	7.1%	2.00
Transfers from family member	7.1%	6.6%	9.8%	−6.15
Puntaje	2.5	2.6	2.1	16.90
Community characteristics				
Index of marginality	−0.04	−0.03	−0.11	6.10
Healthcare provider				
IMSS Solidaridad	26%	29%	10%	21.67
Household observations	16,017	13,051	2,966	

households using the national *puntaje* model. The initial comparisons from Table 1 suggest that dropouts are less poor on average than active households. [16]

Receiving income from a relative who does not live in the same household is more usual among households that have dropped out. Furthermore, receiving any kind of other public assistance is more likely in the group that stays in the program. At the community level, the marginality index can be used to see the relationship between community wealth and program exit. Recall that the index was used for the geographic targeting of communities in the program and measures community remoteness and poverty. Table 1 indicates that households that have dropped out tend to belong to richer communities rather than poorer communities. Finally, households that use the health provider *IMSS Solidaridad* (IMSS is the Spanish acronym for the Mexican Institute for Social Security) appear to have a lower incidence of leaving the program.

4. ANALYZING DROPOUTS: THE EMPIRICAL APPROACH

To evaluate the reasons for the beneficiary households to drop out of the *Oportunidades* program, a discrete duration model is employed. Duration models are appropriate when trying to evaluate events in which a change from one state to another occurs and when the timing of this transition between states is of interest. Also referred to as survival analysis or event history analysis, duration models are used to examine similar types of transitions that are studied here, such as the length of time a worker remains unemployed, the time a person remains married, or the survival time of a terminally ill patient (Greene, 2003). The models can be continuous time models in which the change of state can occur at any time, or discrete models in which the change in state can occur only at specific intervals (Box-Steffensmeier & Jones, 2004).

As noted in the project description above, the *Oportunidades* program is organized around a bimonthly payment program. While entry into the program depends on when *Oportunidades* enters the communities and initiates the program, beneficiaries are not required to meet program conditions immediately and therefore are not at risk until the next period begins. Beneficiaries have the entire two-month period to meet conditions and can only be dropped out, or drop out by failing to meet conditions, at these discrete two-month intervals. As such, the appropriate model for analysis is a discrete duration model (Box-Steffensmeier & Jones, 2004).

Given the discrete nature of the data and the other characteristics mentioned above, the

analysis of the data can be conducted using standard discrete dependent variable models such as the logit or probit. There are no clear reasons to choose one over the other and in this case a logit model is used. [17] The data are organized so that in each period that the beneficiaries are at risk, they receive a zero if they did not drop out and a one if they did drop out. Since data is available for all beneficiary households from the onset of the program, there is no left censoring or left truncation of the data. However, communities were entered in a staggered pattern so that new cohorts are included in the program at different initial time periods, which is referred to as flow sampling. All beneficiaries either drop out or remain in the program and since the data cover a limited period of time (until 2004.4) they are subject to right censoring. Those observations that are right censored never dropped out of the program and receive a zero in every period for which they are at risk. Finally, beneficiaries do not re-enter the program once they have dropped out and are thus only observed for a single spell. [18]

Dropouts are explained by both time-invariant and time-variant covariates and can be interpreted in the same manner as a standard logit model. The specific variables included are discussed below and focus on the factors that are expected to influence dropouts. In a discrete duration model, if time is not specifically incorporated into the model the baseline hazard is constant and thus flat with respect to time in the sense that the risk of dropping out is the same for all observations (Box-Steffensmeier & Jones, 2004). Duration can be incorporated into the model by including time variables in the logit regression using a parametric or non-parametric approach. A non-parametric approach, such as including dummy variables for each hazard period, is reasonable if the analysis is principally focused on explaining dropouts and not predicting the hazard function. A parametric model provides a better prediction of the baseline hazard function but requires assumptions about the form of the function—that is, the expected shape of the pattern of dropouts. If a certain form is assumed, the parameters of that form can be estimated. While we are primarily interested in explaining dropouts and not the hazard function, we do wish to use the hazard function to examine differences in hazard rates for certain household groupings in the sample. As such, we examined both parametric and non-parametric approaches. The results are robust across the specifications and we focus our attention on the approach in which a polynomial—specifically time, time squared, and time cubed—is used to represent the hazard function. The base result follows this specification. To explore whether the hazard function varies across households, interactions between this polynomial and other variables of interest are included in the specification.

5. FACTORS INFLUENCING DROPOUTS

Table 2 presents the results for the analysis of dropouts based on the duration model described in the previous section. Odds ratios are reported instead of coefficients for ease of interpretation. The results indicate that a number of beneficiary characteristics influence the odds of dropping out and we begin by looking at the characteristics of the individual beneficiaries themselves. If the recipient is male, the odds of dropping out are significantly higher. Male recipients represent less than 10% of the recipient population and their enrollment in the program usually indicates that an adult female is not in the house. Older recipients also have higher odds of dropping out and the effect appears to diminish with age—although the magnitude on the square term is small suggesting that it has a limited effect. As the number of years of education increases, the recipient is significantly less likely to drop out, suggesting that the higher educated are more likely to stay in the program. Recall that on average, recipients have only 2.9 years of education and that 37% have no formal education. The result may indicate that controlling for other factors, those with some education may see the value of education and are more likely to want to take advantage of *Oportunidades*. This is explored further below. Beneficiaries that are indigenous—as defined by the fact that they do not speak Spanish—are more likely to leave the program. There is some concern that language barriers may limit the ability of households to comply with conditions so this issue is also explored further below. Single-headed households are also found to have greater odds of dropping out, which may indicate that such families have a harder time meeting conditions with only one primary adult in the family. Finally, those recipients who were working outside the home at the time of the initial survey are found to have greater odds of leaving the program. This

Table 2. *Duration model of dropouts*

	Odds ratio	*z*-stat
Characteristics of recipient		
Male recipient	1.14	2.26
Age	0.90	−25.17
Age squared	1.00	22.11
Years of education	0.97	−4.11
Indigenous	1.22	2.36
Single	1.16	3.50
Works outside home	1.18	3.44
Household characteristics		
Dependency ratio	0.89	−3.39
Number of people	0.95	−3.84
Public assistance	0.83	−2.34
Transfers from family member	1.15	2.01
Puntaje	0.42	−14.81
Puntaje squared	1.24	6.79
Puntaje cubed	0.99	−3.23
Community characteristics		
Index of marginality	0.98	−0.56
Healthcare provider		
IMSS Solidaridad	0.24	−22.40
Administrative factors		
Operational guidelines in effect (1999.4 onward)	7.48	18.18
Just-in-time monitoring system in effect (2000.4 onward)	4.07	12.03
Implementation of guidelines (1999.4)	0.62	−3.96
Distribution of identity cards (2003.3)	6.57	18.03
Distribution of identity cards (2001.3)	2.66	11.50
Problem with payment withdrawals (2002.6)	1.54	3.78
No delivery of debit card or no *Bansafi* signature (2003.2)	2.24	8.31
Correction of inclusion errors (2003.4–2003.6)	2.08	10.34
Hazard function		
Time	0.53	−18.35
Time squared	1.03	15.20
Time cubed	1.00	−12.48

No. of observations 514,972.
Notes: Results for state fixed effects and date of entry fixed effects are included in the regression but not presented in the results.

is most likely because the opportunity cost of time is high and they are thus unable to meet conditions easily.

Moving to household variables, the results indicate that, controlling for other factors including household wealth, households with a higher dependency ratio and greater household size have lower odds of dropping out, indicating that the composition of the household influences whether a household remains in the program. Larger households potentially receive more money, but because of the cap on total funds, having more than two children eligible for the education grant does not increase payment. On the contrary, there is some concern that these households may be more likely to drop out because of the greater burden of conditions that require all household members to receive check-ups, but the results indicate that this concern is unfounded. Similar to the results for recipient employment, beneficiaries who receive private transfers from family members (mostly remittances) are more likely to leave the program. This may be because they have less of a need for *Oportunidades* transfers, and prefer to substitute an unconditional transfer for a conditional one. The result, however, runs contrary to the evidence that *Oportunidades* does not crowd out remittances (Teruel & Davis, 2000), so the variable may be simply an indicator of households that have greater opportunities through migration. Those that were receiving public assistance from the government before *Oportunidades*, however, are less likely to drop out. Since those receiving such assistance are likely to be the extreme poor, this result provides evidence that the poor remain in the program.

As discussed previously, a principal concern of this paper is determining the relationship between wealth—as measured by the *puntaje* index—and dropping out, with our hypothesis being that the richest and poorest households may be most susceptible to dropping out of the program. To test this hypothesis, it is necessary to include the *puntaje* variable in a nonlinear form. In the regression linear, squared, and cubed terms are included. The results presented in Table 2 support the hypothesis that wealth matters (all three variables are significant) and indicate a nonlinear relationship between dropping out and the *puntaje*. To see this relationship more clearly, Figure 3 graphs *puntaje* against the predicted probability of dropping out [19] based on the specification presented in Table 2. The graph indicates that the likelihood of leaving the program is highest at low levels of the *puntaje* (relatively wealthier recipients) and declines at a diminishing rate as the *puntaje* increases. The results support the hypothesis that conditionality is leading to self-selection

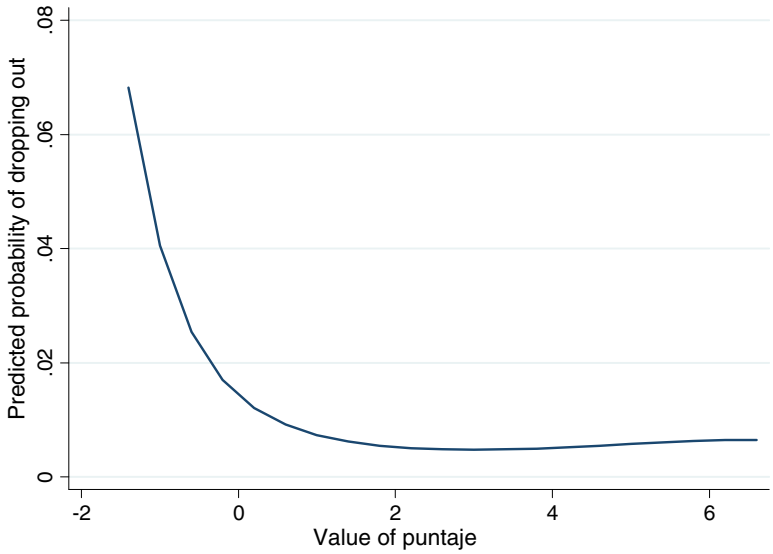

Figure 3. *The relationship between wealth (puntaje) and dropping out.*

out of the program and is thus acting as a targeting mechanism. Note, however, that while there is a small increase in dropouts at the poorer end of the distribution, the level of dropouts is relatively small. Thus, it appears that concerns that conditionality may be pushing out the extreme poor are unsupported by evidence.

While the *puntaje* measures individual wealth, the marginality index examines how marginal a community is. This variable is included to determine if those who leave the program are more likely to come from more or less marginal communities. The results indicate that the community level of marginality does not influence dropouts. These results hold even when nonlinear specifications are included (results not shown).

As noted, there are two main providers in the areas covered by *Oportunidades*: (i) *Secretaria de Salud* (*SSA*)—the public health system of the Mexican Secretary of Health—and, (ii) *IMSS Solidaridad/Oportunidades* (*IMSS*)—a program managed by the Mexican Institute for Social Security that serves the rural poor not in areas covered by social security protection. Although serving different communities, there is a geographic overlap in the coverage of the providers in that they serve different communities within the same state. [20] It might be that beneficiaries from different providers face a different likelihood of dropping out depending on access to services, the monitoring of conditionality, and the quality of care. The results (see Table 2) indicate that recipients using IMSS as a healthcare provider are much less likely to drop out than those using SSA. This could be solely because of the fact that IMSS tends to be a more stable health provider. SSA staff are often recent graduates from medical schools, who are deployed to these health posts for durations of less than a year. This may lead to increased mistakes in monitoring conditions and in reporting failure to meet conditions. It may also be that IMSS staff get to know recipients better and are thus more likely to follow through to ensure that recipients meet conditions. In either event, this is problematic in that it suggests that healthcare providers, who are required to report on whether conditions are met, have a significant influence on whether households drop out. This is explored more fully below.

The next set of variables presented in Table 2 controls for changes in the administration of the program. In some cases, these administrative factors were designed to improve the monitoring of the program and in others these are administrative difficulties. In general, the expectation is that administrative factors will increase the odds of dropping out since the factors usually signal improvements in the monitoring of program conditions. With the exception of the initial introduction

of operational guidelines in 1999, all of the other administrative factors increased the odds of dropping out. The negative impact of the introduction of guidelines compared to the large effect of the guidelines once in place suggests a lag in the effect of introducing the guidelines. In general, the significance and large magnitude of the results indicate that administration of programs has a substantial influence on whether recipients stay in the program. This is only problematic if these administrative changes result in increased inefficiencies. In some cases, it may mean that the administrative factors are increasing the self-targeting of households by leading to better enforcement of conditions. The specific impact of administrative factors on poverty is examined below.

Finally, the results with respect to the time variables are considered. Figure 4 shows the smoothed survival function controlling for the other factors that influence dropping out—that is, the survival function for the specification shown in Table 2. The graph clearly shows a steady decline in dropouts over time and mirrors those without controls (Figure 2). On average, there is an approximately 0.5% dropout rate for each period, or around 3% per year which leads to 20% of beneficiaries leaving the program over the period in question. The survival function is relatively flat, suggesting that households are at similar risk of dropping out no matter how long they stay in the program.

(a) *Specifications with interactions*

The analysis presented above raises a number of issues and questions that can be addressed through alternative specifications of the basic model; specifically, through the use of interactions. Here we address some of these issues.

General concerns regarding whether dropouts are greater in more marginal communities proved unfounded. However, there may be some reason to be concerned that in less marginal communities, recipients may be more likely to dropout since they are fewer in number and thus have less social interaction with other recipients and more difficulty in interacting with *Oportunidades*. To examine this hypothesis, the regression presented in Table 2 is rerun with all the presented variables as well as dummy variable to represent households with low-marginality indices (from better-off communities) and high-marginality indices (from worse-off communities). The dummies were included in a new specification along with interaction terms between these dummies and the *puntaje* variables since they are a measure of poverty. The results (not shown) were significant for both sets of interaction terms, suggesting that the relationship between the *puntaje* and the probability of dropping out depends on how marginal a community is. To view the results, Figure 5 shows the predicted probability of dropping out for the range of values of the *puntaje* for

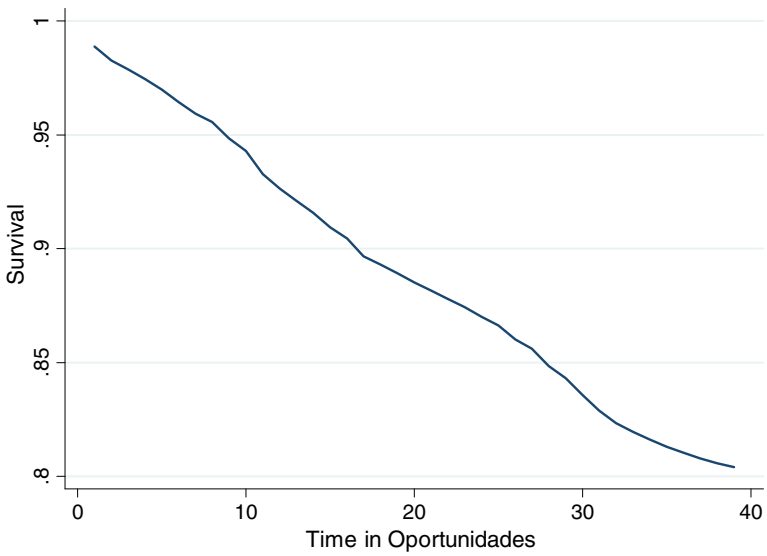

Figure 4. *Survival in Oportunidades controlling for other factors.*

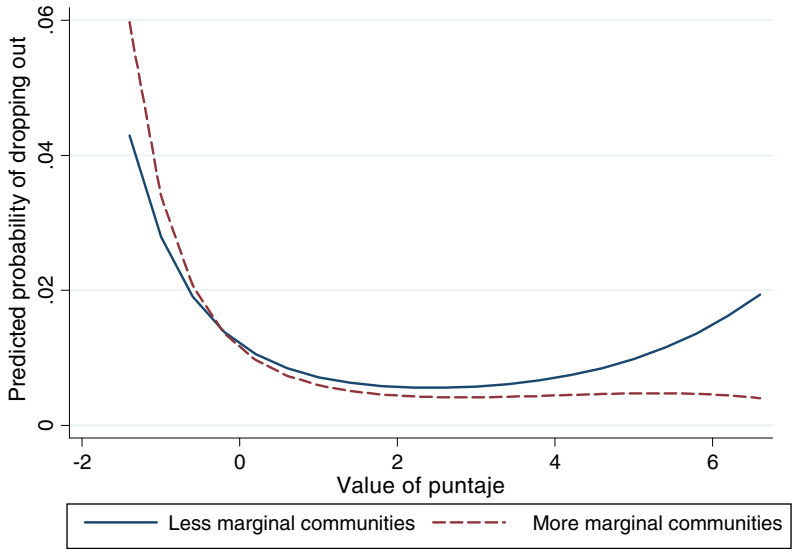

Figure 5. *The relationship between wealth (puntaje) and dropping out in low and high marginal communities.*

households in low- and high-marginality communities. Examining the graph, the pattern for more marginal communities is similar to those found in general (see Figure 4). For less marginal communities, it does appear, however, that poorer households are more likely to drop out. This is potentially a source of concern and should be further explored.

The results in Table 2 indicate that being indigenous increases the odds of leaving the program. The indigenous population in Mexico is on average poorer than the Mexican population as a whole and has faced historical discrimination. In its initial stages, *Oportunidades* failed to provide adequate information in indigenous languages, which may have led to confusion over rules and failure to meet conditions. To examine whether the indigenous population is leaving the program at a faster rate than the non-indigenous population, particularly in the initial stages of the program, an additional specification was run in which the hazard function was interacted with the indigenous dummy variable to test whether dropouts vary across time between the two populations. The results (not shown) indicate that there is a significant difference in survival rates for the indigenous population. These results can be seen graphically in Figure 6. Indigenous people are leaving the program at a faster rate than the non-indigenous population. At the end of the period in question, 3–4% more indigenous people had dropped out compared to non-indigenous. There does not appear, however, to be a higher level of dropouts of indigenous at the initial stages of the program as was hypothesized. If anything, the rate of departure from the program by indigenous people increases around the tenth time period and continues at a higher rate until the twentieth period.

A specification was also run to examine if indigenous households suffered more from administrative glitches than non-indigenous households. Again, the specification used interactions, in this case interactions between indigenous recipient and the administrative dummies. The results (not shown) did not indicate any significant differences.

The results presented in the previous section indicate a negative relationship between education and dropping out, which suggests that, controlling for wealth, educated recipients may value health and education more for their children than similarly poor households. To explore this, an interaction for education and *puntaje* was included. The results for the key sets of variables are reported in Table 3. The positive odds ratio on the linear *puntaje*-education interaction supports the hypothesis that for households with similar levels of poverty, those with education are more likely to stay in the program.

The base results (Table 2) also point to a difference in dropouts across healthcare provider.

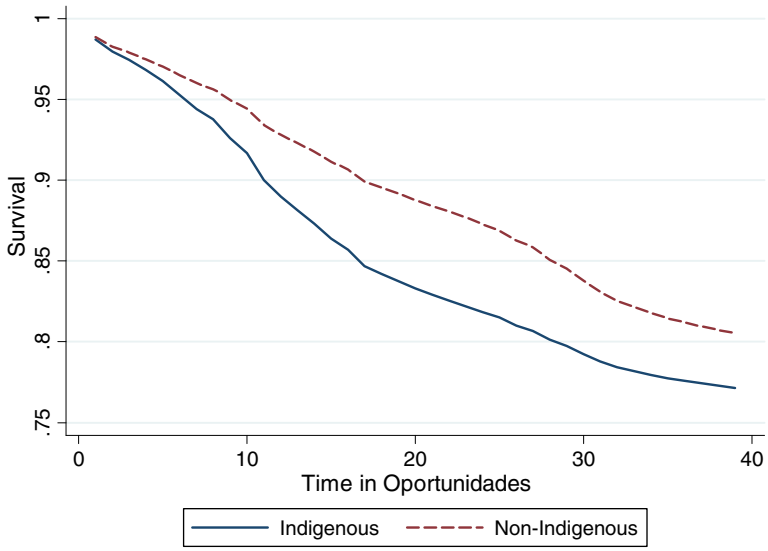

Figure 6. *Survival in Oportunidades by indigenous and non-indigenous households.*

Table 3. *Duration model with education and puntaje interaction*

	Odds ratio	*z*-stat
Characteristics of recipient		
Years of education	0.94	−4.78
Household characteristics		
Puntaje	0.32	−13.74
Puntaje squared	1.37	7.13
Puntaje cubed	0.97	−4.00
Puntaje * education	1.07	3.32
Puntaje squared * education	0.98	−2.20
Puntaje cubed * education	1.00	1.26

Following a similar procedure for the indigenous variable, the relationship between the healthcare provider and survival was examined. The results (not shown) again indicate a strong relationship, suggesting a different rate of program departures for those using IMSS *versus* SSA. Based on this specification, Figure 7 shows the difference in dropouts over time across the healthcare providers. The results are rather dramatic, with a much lower survival rate for SSA *versus* IMSS. Nearly 25% of SSA recipients are expected to dropout over the 39 periods *versus* less than 10% for IMSS. The results should be viewed with some caution since the healthcare variable may be capturing something else about the households that receive healthcare through each provider and additional health and community variables that could help control for other factors were not available for inclusion in the regression. The results, however, are dramatic enough to strongly suggest examining in detail the reasons for this occurring.

Lastly, the administrative variables are shown in Table 2 to have a strong effect on the odds of leaving the program. The results are a bit deceptive since they may simply be reflecting better enforcement of rules rather than administrative problems. To explore how the administrative rules affected rich and poor households, interactions between the administrative variables and the *puntaje* were included in the model. The results are presented in Table 4 and indicate some differences. First, the operational guidelines that were introduced in 1999 appear to have led to greater dropouts by poorer households (since the higher *puntaje* indicates greater poverty). However, the just-in-time monitoring system and correction of inclusion errors seem to have hurt wealthier households more. The just-in-time monitoring was designed to improve monitoring of conditions and it appears to have caught more households who were wealthier and failing to meet conditions and thus, has assisted with self-targeting. The correction of the inclusion errors was designed to weed out mistakes in the *puntaje* calculation and also appears to have

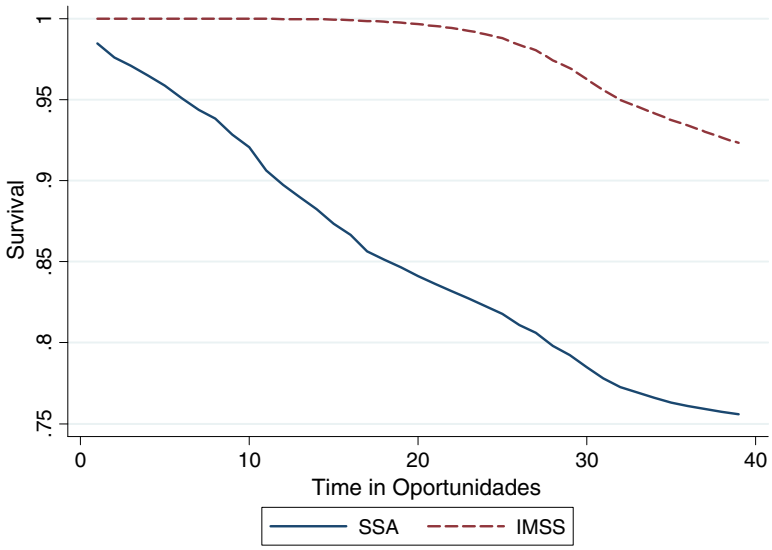

Figure 7. *Survival in Oportunidades by healthcare provider.*

Table 4. *Duration model with puntaje and administrative variables interaction*

	Odds ratio	*z*-stat
Household characteristics		
Puntaje	0.40	−12.61
Puntaje squared	1.16	4.18
Puntaje cubed	0.99	−2.18
Administrative factors		
Operational guidelines in effect (1999.4 onward)	2.82	6.44
Just-in-time monitoring system in effect (2000.4 onward)	5.08	9.93
Implementation of guidelines (1999.4)	0.60	−1.99
Distribution of identity cards (2003.3)	6.25	9.27
Distribution of identity cards (2001.3)	2.63	6.01
Problem with payment withdrawals (2002.6)	1.15	0.62
No delivery of debit card or no *Bansafi* signature (2003.2)	1.97	3.50
Correction of inclusion errors (2003.4–2003.6)	9.79	18.62
Operational guidelines in effect * *Puntaje*	1.58	7.54
Just-in-time monitoring system in effect * *Puntaje*	0.91	−1.96
Implementation of guidelines * *Puntaje*	1.03	0.27
Distribution of identity cards * *Puntaje*	1.01	0.16
Distribution of identity cards * *Puntaje*	1.00	0.04
Problem with payment withdrawals * *Puntaje*	1.15	1.73
No delivery of debit card or no *Bansafi* signature * *Puntaje*	1.08	1.05
Correction of inclusion errors * *Puntaje*	0.41	−12.14

been successful in identifying wealthier households. Taken together, the results indicate that administrative changes can have a strong influence on who remains in the program and who drops out.

6. CONCLUSIONS AND POLICY IMPLICATIONS

In this paper, administrative data from Mexico's *Oportunidades* program are analyzed to

shed light on the following policy questions: (i) could conditionality increase the program's targeting efficiency by acting as a disincentive to remain in the program indefinitely?; (ii) are the poorest being overburdened by program requirements?; and (iii) what characteristics of the program are increasing the risks of the poorest leaving the safety net?

Conditionality in cash transfer programs has been used for targeting resources to the poor by inducing self-selection into the program, so that beneficiaries of the targeted population participate in the program and others opt out (Das *et al*., 2005). Workfare programs are a typical example, where wages paid are set below market minimum wage values for inferior goods (such as hardship in manual labor). While *Oportunidades* relies on proxy means tests to screen people into the program, results from this analysis indicate that conditionality seems to have an effect on the choice of opting out of the program and thus increases the program's overall targeting performance by screening out some of the non-poor. As such, it satisfies two important targeting criteria: (i) that beneficiaries are willing to participate in the program, and (ii) that the non-eligible population finds that the costs of the conditions greater than the benefits derived from remaining in the program (Ravallion, 2003). The results of the analysis of various measures of relative household welfare—such as the proxy means score (*puntaje*), dependency rate, remittance receipt, and work outside of the home—all suggest that households that are relatively better off are more likely to drop out of the program. Conditionality seems to increase the targeting efficiency of CCT programs and suggests that there is less need for frequent recertification of recipients.

Conversely, the cost of the program's conditionality does not seem to be overly burdensome for the extreme poor as they do not appear to systematically dropout of the program. However, we found specific instances of concern where the program may be dropping out the extreme poor and thus increasing the vulnerability of these households and reducing their human capital accumulation. The two specific instances are in the case of indigenous populations and the case of the extreme poor in low-marginality communities, where there is likely to be greater inequality. The screening out of the extreme poor in low-marginality communities may be due to the fact that they have greater opportunities and thus higher opportunity costs of time. This requires further consideration.

A further concern regarding the equity of access relates to the increasing odds of dropping out due to operational changes such as the 1999 introduction of operational guidelines. When such changes increase the efficiency of monitoring conditions, they may improve the value of conditionality in screening out wealthier households. If, however, they reflect operational inadequacies, they are of concern in that they are not correlated to any specific welfare level and can "shock" any number of extremely vulnerable communities.

The policy implications of the first finding argue for the inclusion of conditionality in program design to induce beneficiary families that may have erroneously been included or have changed their welfare status over time to self-select out of the program. One must stress that this relationship should hold for a program in which conditionality is closely monitored and enforced such as the *Oportunidades* program. Argentina's *Plan Jefes y Jefas* included 20 hours of community work per week in the hope it would act as a screening device for individuals who were already employed. However, Galasso and Ravallion (2003) find that the condition was only partially successful in screening out employed individuals since the requirement of 20 hours of work per week was not expensive enough for individuals employed in the informal sector to opt out. It could also be the case that the 20 hour per week work requirement was not closely monitored or enforced, which could have transformed the program into a *de facto* unconditional transfer scheme.

The finding that the extreme poor in less marginal communities and indigenous households in general appear to have a higher probability of dropping out should be carefully reviewed by program operators. In the last few years, *Oportunidades* has been actively engaged in establishing re-entry mechanisms for these sorts of cases. Much of the fieldwork during the past two years in rural areas has been concentrated in resurveying communities and incorporating families that may have dropped out but are still highly vulnerable.

A third and related policy conclusion is that administrative shocks, or changes in certain operational processes, have an enormous impact on the probability of families being taken off the roster and thus losing eligibility. For example, the inability of the program to deliver and renew the beneficiaries' identification cards has in some instances resulted in entire groups being removed from the program. The magnitude of

the this type of shock is equivalent to a covariate shock such as a drought or flood, and thus we conclude that even though the program has generated higher degrees of protection against various shocks that families faced, [21] it has generated some of them itself because of operational mishaps. In recent years, the program has dramatically reduced these types of shocks by implementing decentralized monitoring systems to prevent these occurrences. However, the cyclicality of misreporting on health conditionality, particularly for those families relying on SSA healthcare services is of great concern.

Finally, it should be noted that these results have implications for the various impact evaluations of *Oportunidades* that have been conducted. Most of the impact evaluations use experimental data from the then-named PROGRESA program that was collected in the first two years of the program (1997–99). [22] The results presented here indicate that it is the poor that have tended to remain in the program while the wealthier have been more likely to leave. If this is the case, earlier impact evaluations may underestimate the long-term positive impacts of the program on outcome variables if the identified treatment effect is greater for poor households than households on average and may overestimate the long-term impact if the treatment effect is greater on average for wealthier households.

NOTES

1. Among some are Mexico's *Oportunidades*, Honduras *PRAF*, Nicaragua's *Red de Protección Social*, Jamaica's *Path*, Colombia's *Familias en Acción*, Ecuador's *Bono Solidario*, Brazil's *Bolsa Escola* and *Bolsa Familia*, and Argentina's *Ingreso para el Desarrollo Humano* and *Jefas y Jefes*.

2. For a summary of the estimated impacts of Mexico's Progresa program—the name of Oportunidades prior to 2001—see Skoufias (2005), for Nicaragua's *Red de Protección Social* see Maluccio and Flores (2005) and for Colombia's *Famílias en Acción* see Attanasio, Battistin, Fitzsimons, Mesnard, and Vera-Hernández (2005).

3. A program that randomly assigns households into conditional transfers, unconditional transfers, and a control has not been implemented and evaluated. Schady and Araujo (2006) evaluate the Ecuadorian cash transfer program, *Bono de Desarrollo Humano*, and find that even though conditions were not enforced there were significant impacts.

4. Programa de Desarrollo Humano Oportunidades (2001–05) Rules of Operation www.oportunidades.gob.mx.

5. See Cornia and Stewart (1995).

6. For an analysis of targeting errors in the rural sector see Skoufias, Davis, and de la Vega (1999). For an evaluation of targeting in urban areas see Coady and Parker (2004).

7. Recipients are tied to their location so if they migrate they cannot re-register elsewhere unless that area is recertified.

8. Although this behavior may be due to constraints households face, for our purposes here we define them as voluntary in the sense that they are a result of household behavior.

9. Note that the audits only check to see if there were errors in the original assessment of eligibility and do not reassess whether the household would currently be eligible for the program.

10. The census appears to have been carefully managed and successful in capturing information on all households with very few households missed in the target communities.

11. Health providers are the state health secretariat services or the Instituto Mexicano del Seguro Social's IMSS-Oportunidades program.

12. Note that while there are six potential bimonthly periods per year, in 1998 new recipients only entered in four of them – January–February, July–August, September–October, and November–December.

13. For 3% of households, there was incomplete information in the corresponding ENCASEH and the household was therefore not included. Analysis of the available data for these households suggests they are no different from those included in the sample and there is no reason to suspect that losing these observations leads to any systematic problems with the data.

14. The smoothed version of the hazard function is created using a kernel function.

15. This system is known as the *Sistema Integral de Información de Oportunidades (SIIOP)*.

16. The puntaje may be an imperfect measure of poverty, but it is the measure used by the Mexican government for the *Oportunidades* program and as such the measure it uses for decision-making. Throughout the paper, we assume that it is an adequate wealth-based measure of poverty.

17. Results for the probit model mirrored those of the logit model indicating that the choice of logit is unimportant.

18. It is possible that households that dropped out re-entered the program by reapplying in the subsequent entry round. However, *Oportunidades*' officials indicated that the incidence of this is low and should not be important in this analysis.

19. This is calculated using the mean predicted probability of dropping out for the relevant range of values of *puntaje*.

20. This is important in that if the healthcare providers covered different parts of the country it might be the case that this variable captures regional effects rather than the influence of the healthcare providers. Since there is geographic overlap and we control for community level factors, this should not be an issue.

21. See Skoufias and Quisumbing (2005) for a discussion the shocks faced by rural households.

22. See Skoufias (2005) for an overview of some of these impact evaluations.

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