REACHING THE POOR

with Health, Nutrition, and Population Services

What Works, What Doesn't, and Why

Edited by
Davidson R. Gwatkin
Adam Wagstaff
Abdo S. Yazbeck

THE WORLD BANK

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Foreword

The poor suffer from far higher levels of ill health, mortality, and malnutrition than do the better-off; and their inadequate health is one of the factors keeping them poor or for their being poor in the first place. The health of the poor must thus be a matter of major concern for everyone committed to equitable development, from policy makers to service providers.

Health services can make an important contribution to improved health conditions among disadvantaged groups. Yet as the contents of this volume make clear, the health services supported by governments and by agencies like ours too often fail to reach these people who need them most.

This is not acceptable. Nor need it be accepted. The studies presented here point to numerous strategies that can help health programs reach the poor much more effectively than at present. In doing so, they strongly reinforce the messages of the 2004 *World Development Report* and other recent publications about the importance and possibility of making services work better for poor people.

Readers will no doubt form different views about which of these strategies are most promising for a particular setting—whether, for example, one would be best advised to follow Brazil's approach of seeking universal coverage for basic health services, Cambodia's strategy of contracting with non-governmental organizations, Nepal's use of participatory program development, or some other approach. This is to be expected and welcomed. We look forward to a vigorous and productive discussion on issues like these in order to build upon the important basic findings presented here that better performance is possible.

We also hope that readers will take to heart the equally important message that improved performance is needed. In light of the evidence presented here, it is clearly not safe to assume that the health projects important and intended for the poor are actually serving them. For example, poor women desperately need better delivery attendance than they are now receiving. But initiatives that reach primarily the better-off—like the institutional delivery program covered by the Bangladesh study in this volume—fall far short of filling this need. As this illustration shows, assumptions that

programs reach the poor need to be replaced with vigilance in order to ensure that they do.

In brief, better performance in reaching the poor is both needed and feasible. These are the two messages from this volume that we shall be discussing with our colleagues. We are pleased to share these messages with other readers, as well, in the hope and anticipation that they too will find them valuable.

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Preface

This volume presents eleven case studies that document how well or how poorly health, nutrition, and population programs have performed in reaching disadvantaged groups. The studies were commissioned by the Reaching the Poor Program, which was undertaken by the World Bank in cooperation with the Bill and Melinda Gates Foundation and the governments of the Netherlands and Sweden in an effort to find better ways of ensuring that health, nutrition, and population programs benefit the neediest.

The case studies, reinforced by other materials gathered by the Reaching the Poor Program, clearly demonstrate that *health programs can reach the poor far better than they presently do.* We hope that policy makers will take this message to heart and will find the experiences reported here helpful as they seek to develop the more effective strategies required to ensure that the poor share fully in health improvements.

Davidson R. Gwatkin, Adam Wagstaff, and Abdo S. Yazbeck

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Acronyms, Abbreviations, and Data Notes

ADB	Asian Development Bank
ANC	Antenatal care
BCG	Bacille Calmette-Guérin (tuberculosis) vaccine
BIA	Benefit-incidence analysis
CHC	Community health center
CHRW	Community health research worker
CI	Concentration index
DH	District hospital
DHMO	District health and medical officer
DHMT	District health management team
DHS	Demographic and Health Survey
DOD	Difference of differences
DOTS	Directly observed treatment, short course (for tuberculosis)
DPT	Diphtheria, pertussis, and tetanus vaccine
ECHINP	Early childhood nutritional programs (Peru)
EmOC	Emergency obstetric care
EOC	Essential obstetric care
EPI	Expanded Programme of Immunization
EU	European Union
FCHV	Family and child health volunteer
FDH	Female district hospital
FP/RH	Family planning and reproductive health
FGD	Focus group discussion
FONCODES	Social Investment Fund (Peru)
FWV	Family welfare visitor
GBA	Greater Buenos Aires
HAART	Highly active antiretroviral therapy
H&FWC	Health and family welfare center
HDSS	Health and Demographic Surveillance System
IBGE	Instituto Brasileiro de Geografia e Estatística

ICDDR,B	International Centre for Diarrhoeal Diseases Research, Bangladesh
IFPRI	International Food Policy Research Institute
IFRC	International Federation of Red Cross and Red Crescent Societies
IIPS	International Institute for Population Sciences
IMCI	Integrated management of childhood illness
INDEC	Instituto Nacional de Estadística y Censos (Argentina)
ITN	Insecticide-treated net
KMET	Kisumu Medical and Educational Trust (Kenya)
LSMS	Living Standards Measurement Surveys
MCU	Maternity care unit
MCWC	Maternal and child welfare center
MDGs	Millennium Development Goals, United Nations
MICS	Multiple Indicator Cluster Survey (UNICEF)
MMR	Measles, mumps, and rubella vaccine
MMR	Maternal mortality ratio
NFHS	National Family Health Survey (India)
NGO	Nongovernmental organization
NMCC	National Malaria Control Centre (Zambia)
PACFO	Programa de Complementación Alimentaria para Grupos en Mayor Riesgo (Peru)
PAHO	Pan American Health Organization
PAI	Infant Feeding Program (Peru)
PAISM	Program of Integral Assistance to Women's Health (Brazil)
PANFAR	Nutritional Assistance Program for High-Risk Families (Peru)
PCA	Principal component analysis
PETS	Public Expenditure Tracking Survey
PHC	Primary health center
PNAD	National Household Sample Survey (Brazil)
PNC	Postnatal care
PROMUDEH	Ministerio de Promoción de la Mujer y Desarrollo Humano (Peru)
PRONAA	National Food Assistance Program (Peru)
PRONOEI	Programas no Escolarizados de Educación Inicial (Peru)
PRSP	Poverty reduction strategy paper (World Bank)
PSF	Family Health Program (Brazil)
RCV	Red Cross volunteer

RCH	Reproductive and child health
RH	Reproductive health
RPP	Reaching the Poor Program
SEA	Standard enumeration area
SES	Socioeconomic status
SEWA	Self-Employed Women's Association (India)
STPAN	Secretaría Técnica de Política Alimentaria Nutricional (Peru)
SUS	Sistema Único de Saúde (Unified Health System) (Brazil)
THC	Thana health complex
U5MR	Under-five mortality rate
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UPHSDP	Uttar Pradesh Health Systems Development Project
USAID	U.S. Agency for International Development
VCT	Voluntary counseling and testing
VDC	Village development committee (Nepal)
WHO	World Health Organization
WHS	World Health Survey (WHO)
ZRCS	Zambia Red Cross Society

All dollar amounts are current U.S. dollars unless otherwise indicated.

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Peru: Is Identifying the Poor the Main Problem in Reaching Them with Nutritional Programs?

Martín Valdivia

How well social programs reach the poor has been a long-standing social policy question in developing and developed countries. As J. S. Mill observed, the key issue in designing policies to alleviate poverty is "giving the greatest amount of needful help with the smallest amount of undue reliance on it" (Besley and Kanbur 1993, 67). The question is not only about who receives the benefits but also about their impact and cost. These concerns pertain both to the poor who urgently need cash or in-kind transfers and to the nonpoor who have to pay for these benefits and on whose support the political sustainability of social programs depends.

The answer to the question requires a definition of who the neediest are, what they need most, and what is the best way to provide them with it. But the complications do not end there. Next, the neediest have to be identified—not as simple a job as it may first appear. Being concerned about program costs, we cannot just ask the individuals who belong to the group defined as "the neediest"—say, the poor, who lack the income to purchase a basket of basic needs. If we did, many nonpoor would be tempted to say they are poor in order to receive the transfers. But the cost of finding out who is truly poor may be high, so program officers have to live with imperfect solutions. The consideration of incentives and administrative costs leads us to the notion of an optimal but imperfect level of targeting (Besley and Kanbur 1993). Tullock (1982) adds another rationale for less-than-perfect targeting: the nonpoor usually have more political power than the poor,

so some leakage may be necessary to avoid eroding the political base that sustains a social program. This argument is controversial but is relevant to the current debate, especially with reference to established programs.

Several instruments have been developed for targeting the poor at a reasonable cost. Proxy means-tested programs are used to identify the poor on the basis of observable, easily collected information such as residential neighborhood, dwelling characteristics, family size, and age composition. This method is cheaper than the ideal of trying to collect unbiased income or expenditure information, but in practice, it still seems expensive. Sometimes, excluding certain individuals within a locality from program benefits is also complicated, especially when program officers do not agree with the results of the proxy means instrument. Poverty maps, used to identify neighborhoods where the neediest are concentrated, can further reduce costs while at the same time sparing program officers the dilemma involved in the exclusion of a group of individuals and families. Finally, programs can be designed in a way that discourages the nonpoor from participating. The possibilities range from altering the nature of the transfer itself, by offering low-wage jobs or low-income-elasticity goods such as food, to establishing certain procedures for receiving transfers, such as long waits in line (Alderman and Lindert 1998). The use of these instruments varies across programs, and targeting performance is a result of a combination of instruments.

This discussion of targeting is highly relevant in the current Peruvian context, where several important sectors within the public administration and civil society share the objective of reorganization of social policy. Many of the advances have concentrated on restructuring public food programs under the Program for the Integral Protection of Childhood, now administered by the National Food Assistance Program (PRONAA).[1] This institution was in charge of organizing the transfer of the food programs to local governments. Over the past two years, PRONAA itself and the Vaso de Leche (Glass of Milk) program have gone through a number of corruption-related media scandals and have experienced heavy leakage of benefits to the nonpoor. Several evaluations have been done on the various kinds of leakage affecting these programs. All this attention reflects the growing importance of the issue in Peru.[2]

Research Questions

In this chapter I analyze the targeting performance of a subset of targeted public food programs in Peru on the basis of information from the Living Standards Measurement Surveys (LSMSs). The programs are Vaso de Leche,

the school breakfast program, and several small early childhood nutritional programs with similar objectives and procedures, aggregated under the category ECHINP. Unlike most previous studies, this one focuses on individual data on who benefits from programs, which allows checking not only the extent to which transfers reach poor families but also whether transfers are indeed received by the intended age groups. In addition, I follow two interesting methodological lines that provide important insights for the evaluation of the targeting performance of the programs. One explores the sensitivity of estimated targeting errors to changes in the poverty line; the second analyzes the extent to which the targeting performance of different programs changes with their size and timing. Unlike the case in previous studies, the marginal analysis presented here for the school breakfast and Vaso de Leche programs compares information for two years (1997 and 2000) so that individual data can be used instead of regional averages.

The Programs and the Data

Public food programs have come under close scrutiny in Peru following large increases in their number and budgets during the 1990s. Several new, uncoordinated programs, with confusing or overlapping objectives, were created under a number of government agencies.[3]

The programs analyzed in this study are the largest public programs targeting the health and nutrition of children in Peru. In 2000 the total combined budget for Vaso de Leche, the school breakfast program, and the ECHINP aggregate was equivalent to $195 million, representing more than 80 percent of all public resources allocated to food programs (table 14.1). Vaso de Leche,

Table 14.1. *Total Budget for Selected Public Food Programs, Peru, 1998–2000 (Thousands of U.S. dollars)*

Program	*1998*	*1999*	*2000*
Vaso de Leche	97,645	90,273	93,159
School breakfast	68,013	73,547	67,935
Early childhood nutritional programs (ECHINP)	38,324	55,471	34,673
Subtotal	203,982	219,291	195,767
Total budget, all food and nutritional programs	234,565	266,967	240,278

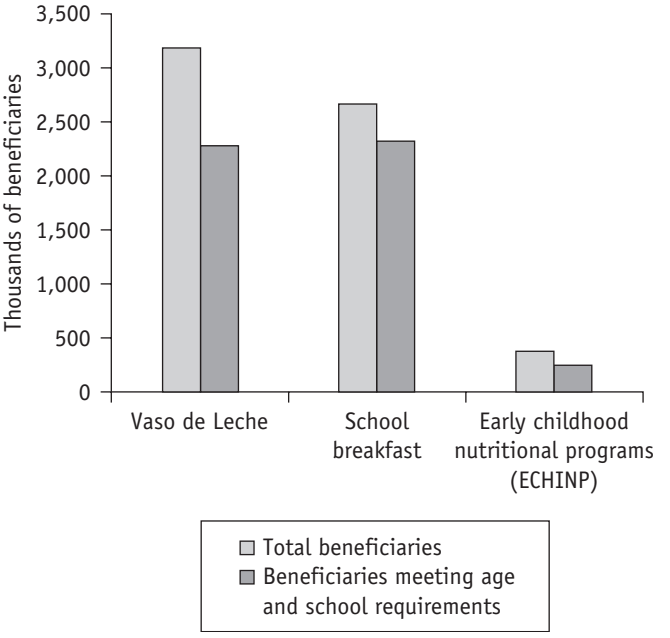
Sources: For 1998 and 1999, STPAN (1999); for 2000, Instituto Cuánto (2001).

with an annual budget of $93 million in 2000, is the largest food program, closely followed by the school breakfast program, with $68 million. The ECHINP aggregate is much smaller, with a budget of $35 million.

With household-level information from the 2000 LSMS, we can also compare program sizes by the number of individuals reporting themselves as program beneficiaries (figure 14.1). By this measure, the largest program was Vaso de Leche (3.1 million), followed by the school breakfast program (about 2.6 million). Unlike the case of Vaso de Leche, the number of beneficiaries of the school breakfast program closely matches the number reported by the program. The Secretaría Técnica de Política Alimentaria Nutricional (STPAN 1999) reports that Vaso de Leche is based on a total of 4.9 million beneficiaries but that according to some case studies, program beneficiaries may be overestimated by as much as 100 percent.

In addition to having the smallest budget, the ECHINP aggregate appears to have the smallest number of beneficiaries, and the difference is even larger than for the first two programs, suggesting that per capita transfers are also larger.

Figure 14.1. *Size of Selected Public Programs, Peru, 2000*



Source: LSMS 2000 (Instituto Cuánto 2000).

School Breakfast Program

The school breakfast program targets public primary school children. It was created in 1992 to improve nutrition for children age 4–13 to enable them to enhance their educational achievements and attendance. The program is funded by the central government through two public institutions: the National Food Assistance Program (PRONAA) and the Social Investment Fund (FONCODES). Coordination between the two agencies seemed loose, but FONCODES tended to concentrate on rural areas.

Breakfast, delivered to public schools during recreation periods, is organized by local mothers' committees.[4] It theoretically consists of a cup of a milklike beverage, fortified with cereals, and six small fortified biscuits and is the same for all children regardless of age. In practice, local committees make adjustments to incorporate local inputs, mainly milk and grains.[5]

In principle, PRONAA and FONCODES identify beneficiary schools on the basis of the poverty level of the district in which the schools are located, and the number of students registered in primary levels determines the number of breakfasts delivered. In practice, these criteria work for new areas, but transfer levels for older neighborhoods are maintained even when nutritional risk or poverty has manifestly been reduced.

Vaso de Leche

The Vaso de Leche program, started in 1984, was designed to target children under age six and pregnant or breastfeeding women. It has, however, heavy leakage toward older children (7 to 13 years old) and the elderly.[6] In that sense, it overlaps significantly with the school breakfast program. The treasury funds the program through the municipalities, which buy food and transfer it to the registered local mothers' committees. The committees then organize distribution to registered households. The process often implies a reduction in rations, as committees tend to increase the number of registered beneficiaries.

Distribution takes place in the municipal building, another community building, or the homes of elected local leaders. The ration varies by committee, but it usually includes 250 milliliters of milk, as well as cereals and other products, and it is often unprepared when delivered.[7] This is a key difference between Vaso de Leche and the school breakfast program, and one that facilitates allocation among household members according to the food preferences of the mothers or household head, regardless of program guidelines.

The size of the transfer to municipalities is based on the poverty level in the district, but the transfer received by the household is affected by the number of committees registered in the municipality and the number of families registered with the committees. Again, as with the school breakfast program, history affects practice. The committees are in charge of verifying poverty among families in their neighborhoods and the presence of children in the prescribed age range. There are no clear rules for updating information, and it is often claimed that many families remain beneficiaries although they are no longer poor or do not have children in the prescribed age group.

Early Childhood Nutritional Programs (ECHINP)

For the ECHINP category, I have selected and aggregated five relatively small programs with similar objectives and target populations. All of them focus on children under age three. Four have exclusively nutritional objectives: the Nutritional Assistance Program for High-Risk Families (PANFAR), operated by the Ministry of Health; the Infant Feeding Program (PAI), operated by the Ministerio de Promoción de la Mujer y Desarrollo Humano (PROMUDEH); and two other programs, Niños and Nutrición Infantil, run by nongovernmental organizations (NGOs).[8] The fifth program is the PROMUDEH integral child-care program, Wawa-Wasi, which targets poor children under age three. All these programs deliver precooked food rations (*papillas*) for children under three but use different locations for distribution.[9] PANFAR uses Ministry of Health facilities and personnel. Other programs' distribution mechanisms rely heavily on the participation of the beneficiaries' mothers and often use the community center or preschool buildings.

In the case of the Ministry of Health programs, public health facilities are responsible for identifying the family's socioeconomic status. Some health centers have developed means-testing instruments, but others rely more on the subjective impressions of social assistants. Beneficiaries are also recruited through the centers' extramural activities, in which they register information on the socioeconomic characteristics of the families and seek out newborns and pregnant women. Rules vary by center, but families classified as poor or indigent are offered the baskets of the applicable program. Still, the subjectivity of the process allows for significant leakage.

These programs are intended to help nutritionally vulnerable children, but each defines nutritional risk differently. PANFAR, for instance, looks for families with parents who have a primary education at most and with

unstable employment status, more than three children under age five, pregnant and breastfeeding women at nutritional risk, or women who have recently given birth (Gilman 2003). A family is eligible if it has four of the above characteristics or if some of the children under five are undernourished. Eligibility is reviewed every six months, and the subsidy is withdrawn if no child under five is undernourished. This process generates a perverse incentive for which anecdotal evidence is often cited.

Table 14.2 summarizes the key characteristics of the food programs analyzed in this study. As indicated above, the empirical analysis uses the infor-

Table 14.2. *Summary Analysis of Selected Public Food Programs, Peru*

Item	*School breakfast*	*Vaso de Leche*	*Early childhood nutritional programs (ECHINP)*
Start of program	1992, PRONAA funding 1993, FONCODES funding	December 1984	PANFAR, 1988 Wawa-Wasi, 1994
Type of transfer	Food ration (prepared)	Food ration (precooked)	Food ration (precooked)
Delivery mechanism	Public schools	Mothers' clubs	Ministry of Health facilities
Primary target group	Children age 4–13 attending public primary schools	Children under age 6; pregnant and breastfeeding woman	Children under age 3 at nutritional risk
Secondary target groups	None	Children age 7–13; tuberculosis patients; elders	None
Geographic targeting	Yes	Yes	No
Household/ individual targeting	No	No	Yes
Target population size[a]	5,159,807	8,802,312	2,074,662
Target (poor) population size[b]	3,439,627	5,651,974	1,384,366

Sources: Author's compilation; for target population size, LSMS 2000 (Instituto Cuánto 2000).

Note: FONCODES, Social Investment Fund; PANFAR, Nutritional Assistance Program for High-Risk Families; PRONAA, National Food Assistance Program.

a. Target population within the age and school restriction of the program.

b. Target poor population within the age and school restriction of the program.

mation available in the Peruvian LSMS surveys. The LSMS is a multipurpose household survey with a representative sample at the national level and for seven regional domains. It collects information on many dimensions of household well-being such as consumption, income, savings, employment, health, education, fertility, nutrition, housing and migration, expenditures, and use of public social services.

The benefit-incidence information comes from social programs module 12 in the LSMS questionnaire. The first question asks the key informant whether any household member benefited from each program in the 12 months prior to the survey date. If the answer is positive, she is asked to identify those household members. For the most part, I use the 2000 LSMS, which includes a sample of 3,997 households and 19,957 individuals. For the marginal incidence analysis, I compare two rounds of the LSMS (1997 and 2000) that have different sample sizes but similar sampling procedures and questionnaires in the relevant modules.

Measurement Issues and Methodology

Lack of sufficient resources for social spending is the norm in developed and developing countries worldwide, although the size and nature of their needs differ substantially. Most public programs are forced to identify a target group on the basis of need or urgency. For nutritional programs, priorities are often defined in terms of vulnerability, which is related to income, age, and gender. Thus, in developing countries poor children and poor women of reproductive age are usually identified as the most vulnerable groups. In this context, it is always relevant to know to what extent public programs attend to individuals or families outside the target population (type 1 error, leakage) and to what extent part of the target population does not receive the transfers (type 2 error, undercoverage). To estimate the magnitude of these errors, the first task is to define the poor and identify the age group that is most vulnerable. Some of those decisions may have a significant impact on the evaluation of the targeting performance of public health programs.

The *poor* can be defined as any individual or household that cannot afford to purchase a consumption basket of basic needs designated by a group of local experts. In Peru, for instance, most poverty studies work with a basic consumption basket and a basic food basket. Inability to purchase a basic food basket identifies the *extremely poor*.

With a household survey, we can estimate all household members' expenditures or income and use this estimate to determine whether mem-

bers are poor, assuming that resources are pooled within the household. A usual practice is to estimate per capita income or expenditures and compare it with the value of an individual consumption basket.[10] We can use the poverty indicator to define the measures of leakage and undercoverage, but for many programs poverty is not the only criterion for defining a target group. In fact, all the programs analyzed here specify children of various ages as the priority target population.[11] Enforcing that priority can be somewhat problematic if the program allows for food intake within the household because household heads can easily decide to distribute the food according to their preferences rather than the preference established by the program. In that sense, we report here two measures of leakage: (1) any case of a beneficiary who is nonpoor, is out of the age range, or does not attend a public school and (2) nonpoor beneficiaries.

We can use the two measures of targeting errors to evaluate the performance of a particular program over time or to compare two or more programs. If program A has a lower leakage rate and a lower undercoverage rate than program B, we can say that program A has a better targeting performance than program B. The evaluation is more complicated if program A has a lower leakage rate but a higher undercoverage rate. Some analysts, concerned only about leakage, would then rank program A first. Nevertheless, it can be argued that it is easier for smaller programs (with higher undercoverage) to have less leakage. That could be because operators are especially careful at the initial or pilot stages of a program but also because smaller programs are usually under less political pressure than larger ones to distort their allocation procedures.

Several issues need to be considered when analyzing absolute and relative targeting performance in search of policy implications. Here we discuss two of them: the arbitrariness of the poverty line, and the fact that the size of the leakage is not necessarily a measure of the way an expansion or contraction of a program affects the targeted population.

Targeting Errors and the Poverty Line

A key issue with the use of the targeting errors defined above is that they do not look at the entire distribution of beneficiaries across the expenditure distribution but only at whether they are above or below the poverty line. The poverty line approach has at least two limitations. The first concerns its arbitrariness and is particularly important if some individuals above the poverty line are not significantly different from some of those below the line in terms of, say, nutritional vulnerability. The second limitation is that a pro-

gram may have many beneficiaries just above the poverty line while another program may have many beneficiaries farther above the poverty line.

With respect to the arbitrariness of the poverty line, it is important to keep in mind that program officers usually cannot observe beneficiaries' per capita expenditures and are limited to proxies based on the characteristics of the locality (geographic targeting) or of the dwelling and the family. In this sense, program leakage may come about because many beneficiaries just above the poverty line have dwelling and family characteristics similar to some who are below the poverty line. More important, they may face similar nutritional risk, so that the decision to identify such beneficiaries as a leakage is questionable.

These considerations lead us to explore the robustness of the measures of targeting errors defined above to changes in the poverty line to see if the program ranking changes significantly as we move the poverty line upward or downward. For these factors to be significant in aggregate terms, they have to imply a systematic bias in the sense that many individuals above (below) the poverty line should be considered appropriate (inappropriate) beneficiaries. An additional condition is a significant concentration of children, beneficiaries or not, around the standard poverty line.

One way to analyze the sensitivity of the presented measures of incidence focuses on the leakage rate, using concentration curves to compare the targeting performance of the programs under analysis. A concentration curve for the beneficiaries of a program lets us know the proportion of beneficiaries who belong to any first expenditure or income percentile of the population.[12] If we focus on one point of the expenditure distribution, say x, then we can use $1 - C(x)$ as a measure of the leakage rate. In addition, if the concentration curve for program A is above that for program B, it can be said that program A has a lower leakage rate for all levels of the poverty line.[13] We need to be careful with these comparisons, however, for they could be somewhat misleading when comparing programs that focus on populations with different poverty levels.

Marginal Incidence Analysis

The proportions of poor and nonpoor benefiting from a program at any time may not be a good indicator of how an expansion or contraction would affect the poor. There are arguments for both early and late capture by the nonpoor, based on the presence of positive participation costs that differ for the poor and nonpoor and change with the scale of the program (Lanjouw and Ravallion 1998). The higher cost of reaching remote areas is typically

the argument advanced for early capture. Late capture could result because whereas small pilot projects are more carefully monitored and under less political pressure than larger projects, expansion would invariably transfer the program to public officials with less expertise and fewer compatible incentives. Political pressures or bribes that distort resource allocation are also more likely as a program expands.

Furthermore, political distortions can affect the dynamics of beneficiary selection. A good system for identifying beneficiaries can imply low leakage rates at the beginning. Later, leakage increases because households that escape poverty or no longer have children in the targeted age range cannot be excluded from the group of beneficiaries. After a while, the average leakage rate would be high, but leakage in new areas, where the system for identifying beneficiaries is again applied properly, could remain low.

All these arguments indicate the need to expand the analysis of the estimated marginal incidence properties of the programs being studied. Lanjouw and Ravallion (1998), Younger (2002), and others based their estimates on one cross-section, so they used heterogeneity across regions to infer marginal behavior. Here, I use heterogeneity over time to estimate the impact of a program expansion or contraction on the poor on the basis of individual data.[14] The idea is to estimate the following equation:

$$D_{iqt} = \alpha_q + \beta_q p_t + v_{qt} \qquad q = 1, \ldots, 5 \tag{14.1}$$

where i indexes the individual, t indexes the year of the survey, and q indexes the per capita expenditure quintiles. The dependent variable is the program participation dummy for each individual. The explanatory variables are quintile dummies and the interaction between these dummies and the program participation rate for a particular year; β_q can be interpreted as the marginal effect of an increase in program participation on the participation rate in a particular quintile; and $\beta_q > 1$ (< 1) would indicate that a general expansion (contraction) in coverage will cause a more than proportional increase (reduction) in participation for that quintile.

I estimate (14.1) imposing the following restrictions:

$$\sum_q \alpha_q = 0 \quad \text{and} \quad \sum_q \beta_q = 5$$

The estimated vector $\hat{\beta}_q$ is used to generate a concentration curve by plotting

$$\sum_j^q \hat{\beta}_j \Big/ 5$$

on q, so that we can check which program is marginally more pro-poor.[15]

The key issue is to analyze to what extent the marginal ranking differs from the average ranking. Programs A and B may have the same average level of leakage, but the marginal performance of program B may be substantially more pro-poor than that of program A. If that is so, cutting (expanding) program B will have a larger negative (positive) effect on the poor.[16]

Empirical Results

The LSMS questionnaire asks key respondents whether the household receives transfers from a large list of public programs and which household members benefit. It could be argued that individual identification is biased toward the age groups the programs target in the fear that surveyors could denounce the household to the program. We are in no position to check this, but we note that the LSMS survey is now run by a private firm, Instituto Cuánto, whose surveyors are trained to explain to respondents that none of the information revealed to them goes to any government agency. In that sense, such bias may not be important. Moreover, the survey results are very consistent with the characteristics of each program's delivery mechanisms.

Table 14.3 shows participation rates by quintile for each of the public programs studied here. The analysis is done at the individual and household levels. At the individual level, two estimates are presented, one that constructs quintiles on the whole population and a second that does it for those belonging to the target population.[17] At the individual level, the Vaso de Leche program achieves the largest coverage rate, 12.4 percent. The coverage of the school breakfast program is similar, at 10.4 percent. The ECHINP aggregate covers only 1.4 percent of the Peruvian population. Vaso de Leche was less pro-poor than the other two programs in 2000. Almost 4 percent of Peruvians in the least poor quintile, and not quite 19 percent in the poorest quintile, benefited from it. The ECHINP aggregate shows the lowest coverage but also the greatest pro-poor bias; the proportion of beneficiaries among the poorest is 17 times that of the least poor quintile.

Estimated coverage rates are naturally larger when analysis is restricted to the target population, and in that case the school breakfast program has the largest coverage, with 44.7 percent. In 2000 almost 31 percent of schoolchildren in the least poor quintile and more than 55 percent in the poorest quintile benefited from the program. The ECHINP aggregate again shows the lowest coverage but the greatest pro-poor bias; the proportion of beneficiaries among the poorest is 5.4 times greater than in the least poor quintile. At the household level, average global rates are similar to the latter individual rates for all programs, but differences by quintile are significant for Vaso

Table 14.3. *Coverage of Selected Social Programs by Per Capita Expenditure Quintile, Peru*
(percent)

Level and program	Quintile 1	2	3	4	5	All quintiles
Individual level						
School breakfast	18.7	13.4	10.0	7.1	2.6	10.4
Vaso de Leche	18.8	15.3	13.0	10.7	3.9	12.4
Early childhood nutritional programs (ECHINP)[a]	3.4	1.6	1.2	0.5	0.2	1.4
Individual level, targeted population						
School breakfast[a]	55.1	55.5	42.9	39.4	30.7	44.7
Vaso de Leche[b]	31.4	26.7	30.8	23.5	15.0	25.5
Early childhood nutritional programs (ECHINP)[c,d]	19.4	16.9	13.9	4.8	3.6	11.7
Household level[e]						
School breakfast	67.1	58.5	48.3	41.1	29.4	48.9
Vaso de Leche	48.1	41.7	35.7	28.6	14.8	33.8
Early childhood nutritional programs (ECHINP)[c]	22.2	18.0	12.7	5.9	3.9	12.5

Source: LSMS 2000 (Instituto Cuánto 2000).

a. As a share of children age 4–13 who attend public school.

b. As a share of children under age 13 and women who are pregnant or breastfeeding.

c. Includes Nutritional Assistance Program for High-Risk Families, Infant Feeding Program, Wawa-Wasi, Programas no Escolarizados de Educación Inicial, and Cuna.

d. As a share of children under age three.

e. As a share of households with at least one member in the age and school restriction of each program.

de Leche, with the household data indicating a more pro-poor bias than do the individual data.[18]

Table 14.4 shows the individual-level leakage and undercoverage rates for the analyzed programs by type of location (urban or rural). The smallest leakage rate—that is, the lowest proportion of beneficiaries who are non-poor—is in the ECHINP aggregate (17.1 percent). The estimated leakage rates for the school breakfast and Vaso de Leche programs are closer to each other, between 28 and 32 percent.

Analyzed by type of location, most of the difference between the ECHINP aggregate and the other programs occurs in rural areas; the performance of the

Table 14.4. *Estimated Leakage and Undercoverage Rates, Selected Public Programs, Peru*
(percent)

	Leakage[a]			*Undercoverage*[b]		
Program	*Global*	*Urban*	*Rural*	*Global*	*Urban*	*Rural*
School breakfast	28.8	31.3	27.3	86.4	91.5	79.4
Vaso de Leche	31.4	33.0	30.1	84.3	88.0	79.3
Early childhood nutritional programs (ECHINP)[c]	17.1	22.5	15.9	97.9	99.4	95.9

Source: LSMS 2000 (Instituto Cuánto 2000).

a. Nonpoor beneficiaries as a share of total beneficiaries.

b. Poor beneficiaries as a share of total poor.

c. Includes Nutritional Assistance Program for High-Risk Families, Infant Feeding Program, Wawa-Wasi, Programas no Escolarizados de Educación Inicial, and Cunas.

programs is more similar in urban areas. All programs show lower leakage rates in rural areas. For the total beneficiary population, Vaso de Leche has the lowest undercoverage rate (84 percent), and the ECHINP aggregate has the highest. A special bias is observed toward rural areas, where the Vaso de Leche and school breakfast programs cover about 20 percent of the population.

In conclusion, there seems to be a systematic relation between the size of the program, in number of beneficiaries, and its performance as measured by the leakage rate. The ECHINP aggregate has the smallest programs and the programs with the smallest leakage rates. But before trying to interpret these results, we should analyze their robustness. The first issue to consider is that the estimated targeting errors in table 14.4 define as a leakage only a nonpoor beneficiary, not the cases in which the beneficiary does not fulfill the age and school restrictions. In the Vaso de Leche program, for example, benefits to poor children above age 13 are not considered leakage.

Because not all programs face the same additional restrictions, it is important to disentangle the effect of each factor on the estimated leakages. Table 14.5 compares the leakage estimates in table 14.4 with those that tighten the definition of a leakage. When the age and school restrictions are considered, Vaso de Leche still has the largest leakage rate, with 49.5 percent, but this estimated rate is now much larger than that of the school breakfast program, 38 percent, which in turn is not much different from that of the ECHINP aggregate, 41.5 percent.[19]

Table 14.5 also shows that for the school breakfast program, which delivers rations only in public schools, the age restriction is more important than the school restriction. When the age restriction is omitted, the leakage rate for the school breakfast program rises 4 percentage points, to 33 percent.

The largest age effects are found with the Vaso de Leche and ECHINP programs. In the Vaso de Leche program the leakage rate rises 18 percentage points, to 49.5 percent, indicating that two-fifths of the leaks reported in the last column of table 14.5 are to beneficiaries who are indeed poor but are over 13.[20] For the ECHINP aggregate, the age effect is even more important, since its omission implies a 25 percentage point increase in the estimated leakage rate, meaning that almost three out of every five ECHINP leaks are to poor beneficiaries who are over three years old.

In summary, the age and school restrictions are not that relevant for the school breakfast program, which is not surprising because delivery takes place in the school. The age restriction has a significantly larger effect on Vaso de Leche and the ECHINP aggregate. This latter result is important because it suggests that food programs which allow for consumption within the household permit reallocation of the rations for the benefit of members who are not within the age restrictions set by the program.[21] Actually, it can be argued that such deviations should not be called leakage, but we need to keep in mind that failure by policy planners to take into account these intrahousehold reallocations can reduce the effect of the transfer on the originally targeted population because the per capita ration shrinks when distributed among more individuals than planned.[22] Furthermore, it should make us think about the justification for a program that imposes its preferences on households, especially if we consider that health and nutritional vulnerability are indeed determined at the household level.

Targeting Errors and the Poverty Line

We presented a way of analyzing the robustness of the comparison between two programs to changes in the poverty line,[23] which focuses on the leakage rate and uses the concentration curve to compare two programs along the

Table 14.5. *Leakage Rates under Alternative Set of Restrictions, Selected Public Programs, Peru*
(percent)

Program	*Poverty restriction only*	*No age restriction*	*No school restriction*	*All restrictions*
School breakfast	28.8	33.0	37.1	38.0
Vaso de Leche	31.4	31.4	49.5	49.5
Early childhood nutritional programs (ECHINP)	17.1	17.1	41.5	41.5

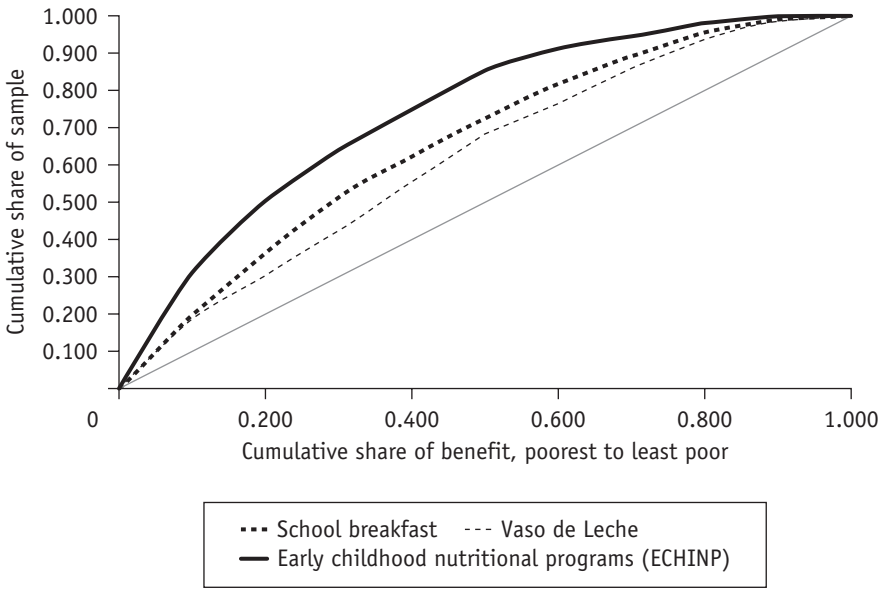
Source: LSMS 2000 (Instituto Cuánto 2000).

whole expenditure distribution. Figure 14.2 plots the concentration curves for the three programs and shows that the ECHINP aggregate performs best, as its concentration curve dominates those of the other two. The school breakfast program seems to slightly outperform Vaso de Leche, but no clear difference is observed, especially around the first decile.

In conclusion, movement of the poverty line has a negligible effect on the comparison of the targeting performance of the three programs analyzed here. The ranking remains intact when we omit the age restriction, which results in the largest differences among programs (see table 14.5).

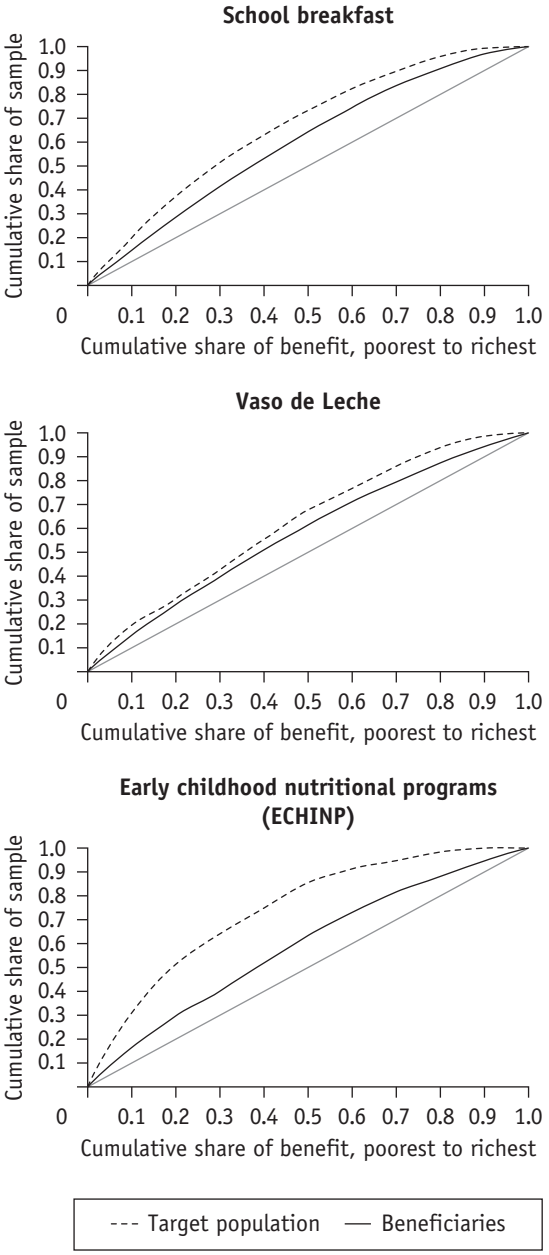
Several factors could explain the observed superiority of the ECHINP aggregate. It differs from the other two programs because its programs are the only ones that use individual targeting instruments and because the programs focus on younger children (up to age three), who tend to be more concentrated in poor families. One way to approximate the importance of differences in the age groups assisted by each program is to compare the concentration curve of each program's beneficiaries with the curve of the target age group. Figure 14.3 plots those two curves for each program. We can see that the pro-poorness of the ECHINP aggregate well exceeds the

Figure 14.2. *Concentration Curves, Selected Public Food Programs, Peru, 2000 (percent)*



Source: LSMS 2000 (Instituto Cuánto 2000).

Figure 14.3. *Concentration Curves, Beneficiaries and Target Population, Selected Public Programs, Peru, 2000*
(percent)



Source: LSMS 2000 (Instituto Cuánto 2000).

pro-poorness of the age group the programs work with, since the two curves for these programs are the farthest from each other. In the case of the other two programs, especially Vaso de Leche, the two curves are very close.[24]

The pattern observed in figure 14.3 suggests that something other than target group age has to be invoked to explain the superior performance of the ECHINP aggregate. One of these factors could be the ECHINP programs' use of specific individual targeting instruments, which could be of significant help, despite criticism about their subjectivity and sensitivity to political pressure. Nevertheless, our analysis cannot be considered proof positive. The observed feature may be less a property of the ECHINP programs than a result of the other two programs' targeting procedures. Accordingly, we focus next on those programs' targeting performance.

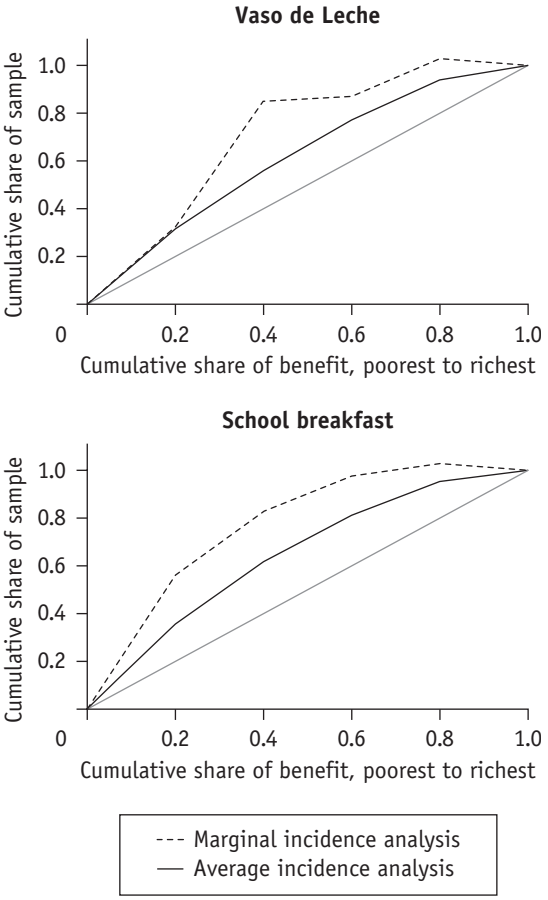
Marginal Incidence Analysis for the School Breakfast and Vaso de Leche Programs

As we have seen, average incidence analysis may not provide enough information to adjust the scale of an antipoverty program, as a number of factors could generate early or late capture by the nonpoor. With early capture, a program would have a large leakage rate, yet the effects of the reduction of that program could fall disproportionately on the poorest. We can estimate the marginal effect by using the variation of the coverage programs across quintiles and over time.

Here, we look at the results of the marginal analysis proposed above for two of the largest and oldest food programs in Peru: Vaso de Leche and the school breakfast program.[25] The exercise uses information from the 1997 and 2000 rounds of the LSMS. (See annex figure 14.1 for coverage rates by quintile and geographic area in both programs in both years.)

Figure 14.4 plots the concentration curves associated with the marginal effects estimated using expression (14.1) and compares them with the average effects.[26] The concentration curves for both programs, but especially the school breakfast program, show a stronger pro-poor bias at the margin than on average. This means that if the Vaso de Leche program were expanded, about 32 percent of the new beneficiaries would belong to the poorest quintile, so that marginal behavior is no different from average behavior. The estimates also suggest that 51 percent of the new beneficiaries would be in the second-poorest quintile, much larger than the proportion of current beneficiaries in that quintile (26 percent). In the case of the school breakfast program, 58 percent of the new beneficiaries would be concentrated in the

Figure 14.4. *Marginal and Average Effects, Vaso de Leche and School Breakfast Programs, Peru, 2000*



Source: LSMS 1997 and 2000 (Instituto Cuánto 1997, 2000).

poorest quintile and 23 percent in the second-poorest quintile. The averages are 38 and 22 percent, respectively.

The robustness of these results can be evaluated by looking at what happens when the analysis is repeated with regional averages instead of individual data. This approach was followed by Lanjouw and Ravallion (1998), using cross-sectional data. Annex table 14.2 includes those estimates. The school breakfast program estimates are similar. For the Vaso de Leche program the pro-poorness of the marginal effect is even larger for the three

poorest quintiles. The pro-poorness of both programs at the margin is an interesting result, since it suggests that two programs with a fairly mediocre targeting performance on average have a significantly greater pro-poor behavior at the margin. The implication is that cutting (expanding) the programs would damage (benefit) the poorest much more than the average leakage rate would suggest.

How can we explain this dramatically different targeting performance at the margin? As observed above, many researchers have argued that the difference could result from mechanisms that facilitate or promote early capture by the nonpoor (Lanjouw and Ravallion 1998). One idea is that the less poor have more political power and can influence public officials to make them early beneficiaries. Later, as the program expands, the poor inevitably benefit more. We cannot test this hypothesis properly here, but we mention a possible alternative that has more to do with the dynamics of each program's beneficiary list.

As explained above, initial transfers are distributed according to the poverty level of the districts in which the schools or mothers' clubs are located. Once a public school is included in the registry, it is politically difficult to drop it when poverty is reduced in the surrounding neighborhood. In the Vaso de Leche program it is difficult to retire a mothers' club once the municipality has registered it as a beneficiary. It is also conceivable that after a family or household has been registered as a beneficiary, it is unlikely to be dropped from the registry if it moves out of poverty or has fewer children in the qualifying age range.[27] If that is true, a program will spring more and more leakage as time passes, no matter how good its system for the initial selection (identification) of beneficiaries is.

Disentangling these two mechanisms would be interesting, but the important thing is that either hypothesis would weaken the emphasis on the use of poverty maps and means-tested programs to identify the poorest. In the case of the second hypothesis, however, the focus shifts toward designing enforceable exit rules for pruning the beneficiary list, giving due consideration to the political economy of program delivery mechanisms managed on the ground by social organizations.

Summary of Results, Policy Implications, and Limitations

This study analyzes the targeting performance of selected public child nutrition programs in Peru: Vaso de Leche, the school breakfast program, and an aggregate of programs (ECHINP) focused on the nutrition of children in their first three years. These programs have large leakages—

between 40 and 50 percent of their beneficiaries fall outside the target group, either because they are not poor or because they are outside the age range. The leakages are larger for the Vaso de Leche program (50 percent) and in urban areas, where poverty rates are relatively lower. The numbers argue for urgent policy intervention to reduce these leaks. Nevertheless, a closer look suggests that improving poverty maps and means-tested programs may not be the right priority. Instead, priority should be given to defining delivery protocols that are consistent with program objectives and to addressing political distortions in their management so that appropriate exit rules for beneficiaries become feasible.

In analyzing the robustness of those results, I explore three key adjustments to the original estimates:

- restricting the definition of leakage to the poverty level of the individual or household, disregarding the age of the beneficiary
- exploring the effect of movements in the poverty line
- comparing the average with the marginal incidence estimates

With respect to the first adjustment, the effect of the age restriction is very important, especially for programs (Vaso de Leche and the ECHINP aggregate) that allow for consumption within the household. The results call into question the notion that in-kind transfers are preferable to cash transfers because they can be better directed to the target population. Indeed, when the age restriction is dropped, Vaso de Leche ceases to be the one with the worst targeting performance, and the ECHINP aggregate becomes by far the program with lowest leakage (17 percent). Furthermore, none of the analyzed programs have a leakage rate above 32 percent once the age restriction is disregarded.

The importance of the age-related leaks within households for Vaso de Leche and the ECHINP aggregate suggests that food programs which allow consumption of the food ration in the household cannot prevent distribution of the transfer among household members instead of to the targeted individuals. It is hard to argue that this is bad per se. On the contrary, the policy implication is that these intrahousehold reallocations need to be considered when defining the size of the transfer because otherwise they imply a reduction in the size of the transfer per capita and limit the possibility that the programs' transfers will improve nutrition within the target population.

Changes in the poverty line have little effect on ranking the targeting performance of the three programs analyzed here. In other words, the ECHINP aggregate has lower leakage than the others no matter where program officers draw the poverty line. The comparison of each ECHINP compo-

nent's concentration curve with that of its target population also suggests that the superiority of the aggregate cannot be explained by differences in the distribution of the programs' target groups and supports the notion that the programs' targeting instruments perform better for some reason. What we do not know is how the small size of the programs considered within the ECHINP aggregate influences these results.

With respect to the marginal incidence analysis, the school breakfast and Vaso de Leche programs display very pro-poor behavior at the margin despite their mediocre targeting performance on average. This result suggests a need for caution about making decisions based on a program's average targeting performance. Even though a program shows large leakages on average, a cut (or expansion) could still damage (or benefit) the poor disproportionately.[28] For policy, this result implies that emphasis on improving the targeting instruments used by these two programs should be shifted to dealing with the political distortions that influence the selection of beneficiaries. Working with the political economy underlying the delivery mechanisms would seem to be a powerful way to get base organizations (mothers' clubs) to accept appropriate exit rules when beneficiaries escape poverty. Nevertheless, along the lines of Tullock's arguments, these leaks to the nonpoor may be optimal, in the sense that they may be necessary to sustain the political support of the people who pay for the programs. If so, the political base for the programs will have to be changed before anything can be done about leakage.

Further research is definitely needed before any action is taken, and considering the limitations of this study, its findings must be taken cautiously. One important limitation is our assumption that all beneficiaries receive the same kind of transfer, when they often do not, for several reasons. In the case of food programs involving daily rations, two individuals may identify themselves as beneficiaries of the program, but one receives more rations because she goes more regularly to the community center where meals are delivered. The content of the ration also varies significantly by region, and foods are often chosen for the convenience of local agricultural producers rather than for their nutritional value. We could try to homogenize transfers by assigning them a value, but assigning a unit value to a transfer is often complicated. A common solution is to use the unit production cost as the transfer value. Finally, when analyzing a program's benefits distribution, other sources of large leaks must be considered—for example, those associated with large administrative costs or corruption, which may vary substantially among programs.

Annex Table 14.1. *Targeting Errors and the Poverty Line, Selected Public Programs, Peru*

Error and program	*0.75*	*0.9*	*1.0 (poverty line)*	*1.1*	*1.25*
Leakage					
School breakfast	56.6	43.2	38.0	32.9	28.1
Vaso de Leche	66.3	54.3	49.5	45.4	41.0
Early childhood nutritional programs (ECHINP)	57.1	47.8	41.5	39.1	37.4
Undercoverage					
School breakfast	50.0	51.2	52.1	52.6	53.5
Vaso de Leche	72.0	71.5	71.7	71.9	72.3
Early childhood nutritional programs (ECHINP)	83.9	82.2	85.3	85.8	86.5

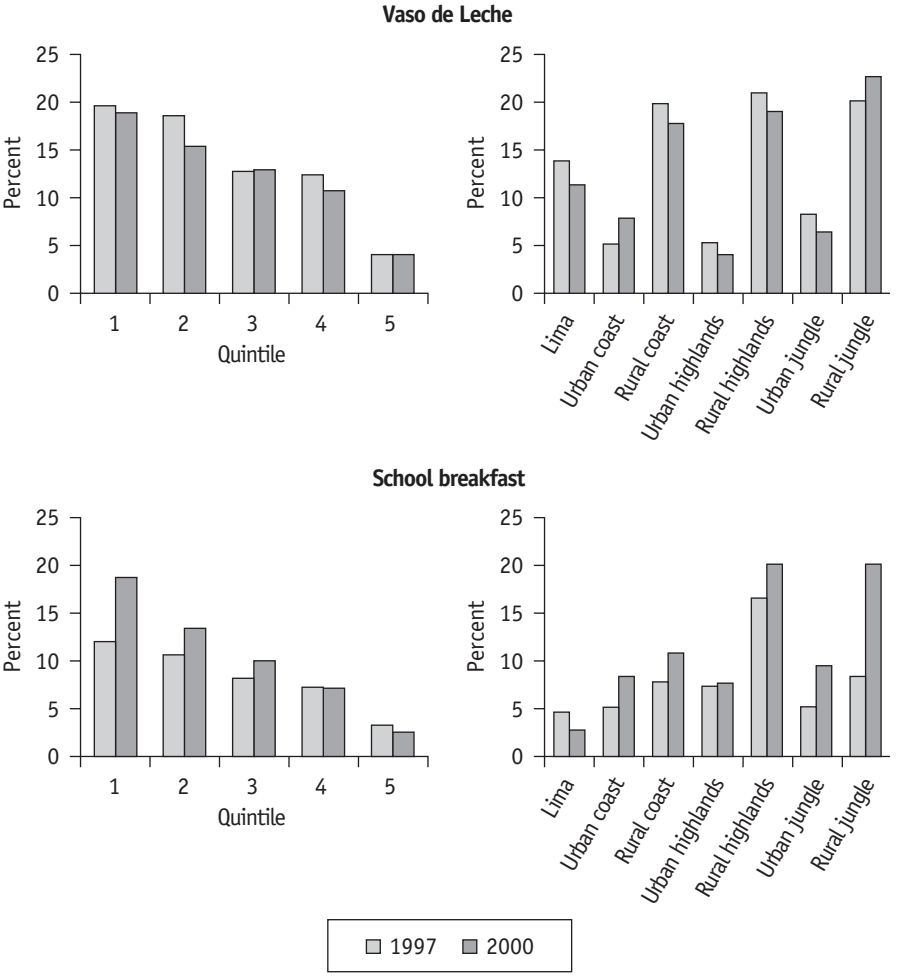
Source: LSMS 2000 (Instituto Cuánto 2000).

Annex Table 14.2. *Marginal Effects by Quintile, Vaso de Leche and School Breakfast Programs, Peru, 1997–2000*

	With individual data		*With regional averages*	
Quintile/quarter	*Vaso de Leche*	*School breakfast*	*Vaso de Leche*	*School breakfast*
1 (poorest quintile)	1.601 (2.83)[a]	2.804 (12.37)[a]	2.113 (1.64)[b]	2.219 (3.44)[a]
2	2.605 (4.61)[a]	1.337 (5.90)[a]	3.176 (3.82)[a]	1.289 (4.10)[a]
3	0.141 (0.25)	0.736 (3.25)[a]	1.533 (1.81)[b]	0.635 (1.69)[b]
4	0.753 (1.33)	0.263 (1.16)	–0.698 (–0.53)	0.737 (1.62)[b]
5 (least poor quintile)	–0.101 (–0.18)	–0.139 (–0.61)	–1.124 (–1.41)	0.121 (0.27)

Source: LSMS 2000 (Instituto Cuánto 2000).
Note: Numbers in parentheses are absolute values of *t*-statistics.
a. Significant at 1 percent.
b. Significant at 10 percent.

Annex Figure 14.1. *Vaso de Leche and School Breakfast Program Coverage, by Quintile, Region, and Year, Peru*



Sources: LSMS 1997 and 2000 (Instituto Cuánto 1997, 2000).

Notes

This chapter benefited from comments by two anonymous reviewers and by participants at the World Bank conference "Reaching the Poor with Effective Health, Nutrition, and Population Services: What Works, What Doesn't, and Why?" held in Washington, DC, in February 2004. In addition, I thank Gianmarco León for excellent research assistance, as well as Jorge Mesinas and Verónica Frisancho for their help in the initial stages of the project.

1. See *El Peruano* (2002: 223000). The norm does not include the Vaso de Leche program, which is administered by municipalities.

2. See Alcázar, López-Cálix, and Wachtenheim (2003) and Stifel and Alderman (2003), which focus on the Vaso de Leche program. For a general evaluation of all public food programs, see STPAN (1999) and Instituto Cuánto (2001).

3. See STPAN (1999) or Instituto Cuánto (2001) for a detailed description of these programs and their evolution over time. In 2002 the regulation and supervision of most of these programs were unified under the National Institute of Health (NIH), which is part of the Ministry of Health. Later, the responsibility was transferred to PRONAA, a dependency of the Ministry for the Promotion of Women and Human Development (PROMUDEH).

4. Cueto and Montes (1999) find that most breakfasts are delivered between 9 AM and 11 AM because children are hungrier by that time than when they arrive at school.

5. Changes in the regulation have encouraged these adjustments, shifting purchases to local producers as part of program objectives.

6. Actually, the law indicates that older children, (up to age 13), elders, and tuberculosis patients should be served after the needs of younger children and mothers are met.

7. See Alcázar, López-Cálix, and Wachtenheim (2003). Local mothers' committees argue that they do not prepare the product because of lack of organization and resources but also because coming in daily for the ration is too burdensome for individuals who live in remote places. This way, recipients only have to come once a week (or once a month) to pick up the ration for the whole period.

8. The Programa de Complementación Alimentaria para Grupos en Mayor Riesgo (PACFO) is another nutritional program run by the Ministry of Health, but it is not included as a separate alternative in the LSMS questionnaire. Because it has the same objective and target population as PANFAR, some households that report benefiting from PANFAR may actually be PACFO beneficiaries.

9. An important difference is that the PANFAR basket does include some food for adults (for example, oil, rice) on the premise that the economic situation of the family is what puts the children at nutritional risk.

10. In some cases adjustments are made according to household composition, with the understanding that there are consumption economies of scale and differences in the needs of household members by age and gender (Deaton and Zaidi 1999). We disregard this practice, following Valdivia (2002), which reports a negligible effect for these adjustments when the value of relevant parameters remains within a reasonable range. Actually, the ranking of households does not change much, but poverty levels may still change substantially with these adjustments if the poverty line is kept fixed. We deal with that issue below when discussing the effect of movements in the poverty line over the estimated targeting performance of the analyzed programs.

11. One exception is the Vaso de Leche program, which also includes pregnant and breastfeeding mothers as part of the priority target population.

12. The curve can be above or below the 45° line of equality. Being above the line implies that the program has a pro-poor bias; being below the line implies a bias favoring the nonpoor.

13. This ordering is incomplete in the sense that not much can be said if concentration curves cross at some point.

14. See Younger (2002) for a discussion of the advantages of such a procedure.

15. Younger (2002) also suggests running a model with fixed effects at the department (or region) level, since departments of regions have different unobservable characteristics for department (region).

16. It should be kept in mind that budget adjustments cannot be based solely on these estimates because they do not take into account the marginal benefits and costs of the program.

17. For the target population, I restrict the analysis to individuals within the age and school restrictions set for each program. At the household level, the analysis is restricted to those having at least one member within the age and school restriction for each program. The comparison of these two levels of analysis is important for checking consistency with the findings of previous studies that focus on household-level data (Younger 2002; Stifel and Alderman 2003).

18. Household-level results are consistent with those reported in Stifel and Alderman (2003) but not with those in Younger (2002). I have not been able to identify the reasons for that discrepancy.

19. A disaggregated analysis by type of location is available on request. Observed patterns are similar in urban and rural areas.

20. This finding for the Vaso de Leche program is indeed consistent with the results of Alcázar, López-Cálix, and Wachtenheim (2003). The authors use two Public Expenditure Tracking Surveys (PETS) to analyze the channeling of resources from the Vaso de Leche program and the educational programs in Peru. For Vaso de Leche, they find that the largest leakage occurs within the household because rations are actually distributed among all household members, not only among children under age six and pregnant and breastfeeding women. Only 41 percent of the ration assigned to the household actually reaches the target group.

21. Most programs in the ECHINP aggregate deliver *papillas,* which are supposed to be specifically for children in their first months. Nevertheless, according to anecdotal evidence, the *papillas* are dissolved in beverages and soups that are also consumed by household members outside the age range.

22. Stifel and Alderman (2003) do attempt to evaluate the nutritional impact of the Vaso de Leche program using a model with district fixed effects. They find no significant effect.

23. This analysis disregards the age restriction, defining a leak as occurring only when the individual is not poor.

24. The other feature we can observe from figure 14.3 is that the distribution of the target groups does not seem to differ much across programs.

25. Marginal analysis for the other ECHINP programs was not feasible because they were not singled out in the LSMS surveys before the one in 2000.

26. Annex table 14.2 shows the corresponding βs. The coefficients for the poorest three quintiles are significant.

27. Anecdotal evidence supporting this hypothesis is growing in Peru. The media report cases of beneficiaries of the Vaso de Leche program in neighborhoods that were once slums but are now residential neighborhoods, while new slums receive no transfers. If the program were expanded, the current slums, not the residential areas, would likely benefit the most. The problem is that neighborhoods and households work their way out of poverty, but the political economy of the program does not allow for appropriate revision of the list of beneficiaries.

28. In addition, targeting performance at the margin is not sufficient to determine program expansion or shrinkage. The answer to that question requires an analysis of the program's nutritional impact and cost.

References

Alcázar, Lorena, José López-Cálix, and Eric Wachtenheim. 2003. Las pérdidas en el camino: Fugas en las transferencias municipales, Vaso de Leche y educación. Instituto Apoyo, Lima.

Alderman, Harold, and Kathy Lindert. 1998. The potential and limitations of self-targeted food subsidies. *World Bank Research Observer* 13(2): 213–29.

Besley, Timothy, and Ravi Kanbur. 1993. The principles of targeting. In *Including the poor: Proceedings of a symposium organized by the World Bank and the International Food Policy Research Institute,* ed. Michael Lipton and Jacques van der Gaag. Washington, DC: World Bank.

Cueto, Santiago, and Iván Montes. 1999. Asistencia alimentaria a niños pre-escolares y de educación primaria en areas rurales. Grupo de Análisis para el Desarrollo, Lima.

Deaton, Angus, and Salman Zaidi. 1999. Guidelines for constructing consumption aggregates for welfare analysis. World Bank, Washington, DC.

Gilman, Josephine. 2003. "Managing for results. A nutrition program experience from Peru. Proyectos de Informática, Salud, Medicina, Agricultura, Lima.

Instituto Cuánto. 1997. Living Standards Measurement Survey 1997. Lima.

———. 2000. Living Standards Measurement Survey 2000. Lima.

———. 2001. Diseño de una estrategia de racionalización del gasto social público en alimentación nutricional. Final report. Lima.

Lanjouw, Peter, and Martin Ravallion. 1998. Benefit incidence and the timing of program capture. Policy Research Working Paper 1956, Development Research Group, Poverty and Human Resources, World Bank, Washington, DC.

Stifel, David, and Harold Alderman. 2003. The "Glass of Milk" subsidy program and malnutrition in Peru. Policy Research Working Paper 3089, Public Services, Development Research Group, World Bank, Washington, DC.

STPAN (Secretaría Técnica de Política Alimentaria Nutricional). 1999. Los programas de alimentación y nutrición: Consolidado y comparación de características. Lima.

Tullock, Gordon. 1982. Income testing and politics: A theoretical model. In *Income-tested transfer programs: The case for and against*, ed. Irwin Garfinkel. New York: Academic Press.

Valdivia, Martín. 2002. Acerca de la magnitud de la inequidad en salud en el Perú. Working Paper 37, Grupo de Análisis para el Desarrollo, Lima.

Younger, Stephen. 2002. Benefits on the margin: Observations on average vs. marginal benefit incidence. Cornell University, Food and Nutrition Policy Program, Ithaca, NY.