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TARGETING HEALTH PROGRAMS TO REACH THE POOR

In principle, the efficiency of poverty-oriented social programs can be increased dramatically through “targeting” -- an infelicitous term applied to efforts to focus development programs more directly on the poor. By one widely-cited estimate, a set of “perfectly targeted” programs -- that is, programs whose benefits reach all the poor and only the poor -- could eliminate poverty at less than 10% the cost of development programs that do not discriminate between poor and rich.

But that is in theory. What about reality? And what about health, rather than general development? How much of an improvement can be expected from a vigorous effort to target health activities so that the greatest possible benefit goes to the poor?

No knowledgeable advocate of targeting, no matter how enthusiastic, would claim that the maximum attainable gain from targeting comes anywhere close to the theoretical maximum referred to above. But a measure does not have to be ideal in order to be worthwhile, and this raises the possibility that targeting might still have much to offer. The purpose of what follows is to explore this possibility.

The review will proceed in several stages. First will be an introduction to the targeting literature. Second will be a summary of what’s know about the overall potential for targeting. This will be followed by individual sections on particular types of targeting: individual, geographic, age, and disease. At the end will be a summary of the implications for World Bank operations of all that has been said.

Introduction

Program targeting has long occupied a central place in thought about poverty alleviation. As a result, there is a voluminous literature on the subject.

Some of this literature expresses philosophical reservations, particularly on the part of those who consider stimulation of initiative on the part of the poor to be central to any significant long-term poverty alleviation. From this perspective, targeted programs are inherently top down, in that they are initiated other than the poor; and they thus tend to promote dependency rather than foster initiative on the part of their intended beneficiaries. Adherents to this school of thought do not necessarily consider

1 Aside from conveying the image of a cunning hunter stalking his or her innocent prey, the term “targeting” has other unfortunate connotations discussed in the following section. Despite the expression’s difficulties, however, it is to be employed in the remainder of this essay in deference to conventional usage.

targeted programs to be all bad: rather, targeted programs can be seen as distinctly preferable to untargeted top-down efforts that benefit the rich more than the poor. But praise of this sort tends to be faint enough to make it difficult to distinguish from restrained condemnation.\(^3\)

The great majority of the available literature, however, is primarily technocratic in nature, concerned with the much narrower question of how well or poorly targeting achieves its principal immediate objective of increasing the proportion of program benefits that accrue to the poor. Not nearly all of this literature can be covered in the brief overview that is the objective of this note. Rather, the contents of the note will be selective, focusing on: 1) field experience, and 2) health.

The focus on field experience means that the note will not do justice to the impressive theoretical and conceptual work on poverty targeting that has developed over the years. For this, the interested reader is strongly encouraged to consult one or more of the numerous thoughtful summaries that exist.\(^4\) But, while this theoretical/conceptual work will not be explicitly covered, it will nonetheless play an essential role in underpinning what is said. Of particular importance will be three points emerging from that work:

- **The measurement of targeting accuracy.** There is consensus that two aspects of accuracy are important: the proportion of people reached by any given program who are poor, and the proportion of the poor in a given society who are reached by the program. A program deficient with respect to the first of these aspects will often be said to suffer from an “inclusion error” (sometimes referred to as “type I error” or “leakage”) -- in that it includes a lot of people who are not poor. Shortcomings with respect to the second aspect are often termed “exclusion (or type II) errors” or “undercoverage” -- that is, the exclusion of a lot of people who are poor and deserve to be included.

- **The types of targeting available.** Different authors employ different taxonomies and terminology, but all differentiate between what might be called “direct” and “indirect” targeting. The former, often referred to as “individual targeting,” applies to programs that seek to direct their benefits toward particular individuals who are poor through some sort of means testing. The latter goes under a variety of names -- such as “broad,” “characteristic,” or “indicator” targeting -- each of which has a somewhat different connotation. What the methods referred to by these different names share is an


emphasis on particular groups of people or types of program, rather than on individuals. Such emphasis is adopted in full that it cannot produce the degree of targeting theoretically available through an individual approach; but in belief that the greater administrative feasibility (and soon-to-be described political benefits) of indirect targeting will outweigh its theoretical shortcomings. Examples of indirect targeting would include targeting population groups (say, landless agricultural workers) in which the incidence of poverty is especially high; targeting geographic areas in which most people are poor, services that are of primary relevance to the poor (such as clean water supplies in situations where most of the better off already have access to clean water); targeting through initiatives to deal with problems concentrated among the poor (communicable diseases, for example); and through what is sometimes known as “self-targeting” or “self-selection” -- that is, through programs made universally available but thought likely to found attractive only by the poor (by, say, offering free hospitalization in large wards rather than individual rooms) As will be seen, these types of targeting are by no means mutually exclusive: it is common to find programs that apply two or three simultaneously.

- The merits and demerits of precise targeting. Members of the targeting community tend to be political realists, recognizing that acceptance of poverty alleviation measures by income groups who dominate most countries is central to the measures’ sustainability. For this reason, the literature is replete with warnings against trying to be too precise in targeting, on the grounds that at least some leakage or inclusion error may well be central to provide upper income groups the amount of benefit necessary to gain their support or acquiescence.5

The second focus, on health, means that the review will be dealing with only a relatively small part of the targeting field. Work on targeting has tended to cover four broad program areas: cash transfers, food subsidies, public employment programs and social services. Health and nutrition activities have received a moderate amount of attention within the social service area (and nutrition within the food subsidy area as well), but they have by no means been central. The review that follows will draw upon lessons learned from work in other areas when they are particularly relevant for health, and when necessary because of the absence of direct information from the health field. But the emphasis will be on experience of applying targeting to the health field itself.

The Overall Record

5 For recent such warnings, see Jonath B. Gelbach and Lant H. Pritchett, “More for the Poor Is Less for the Poor: The Politics of Targeting,” World Bank Policy Research Working Paper 1799, July 1997; and Gelbach and Pritchett, “Indicator Targeting in a Political Economy: Leaker Can Be Better,” September 1997 (manuscript). The latter piece contains a bibliography of work on this topic by others, and also an account of the most widely-cited experience where increased targeting appears to have cost a poverty-oriented program enough political support to diminish its effectiveness significantly. The experience is from Sri Lanka’s where, in the late 1970s, the government shifted from providing subsidized rice to the entire population to offering food stamps to the poor. In the ensuing years, the subsidy program suffered progressive budget reductions to the point where the value of the transfer per recipient fell to under half its previous level. (Gelbach and Pritchett, September 1997, p.3.)
Most overviews of the literature on targeting social services, including health, are in essence collections of minor passages drawn from studies devoted primarily to other dimensions of service delivery. This, the wide range of situations studied, and differences in the study methods used make it extremely difficult to draw any clear conclusions.

There is, however, one important exception: a series of case studies undertaken in Latin America, the region in which targeting methods appear to have been most widely applied, in the late 1980s and early 1990s. The studies were undertaken using a comparable benefit-incidence approach that focused particularly on leakage or inclusion errors. The studies covered approximately thirty social sector programs in eleven countries. Most of the programs were national in coverage; most, although not all, were operated by governments. The programs applied a wide range of targeting methods; many used more than one.

The results:

- **While none achieved perfection, the more carefully targeted programs were much more successful in reaching the poor than the less carefully targeted ones.** This was the conclusion drawn from comparing the results of the eighteen programs covered that had sufficient data, with the results produced by other, less well targeted social service programs operated by Latin American governments.

  - One comparator was a set of eight untargeted programs offering general food subsidies to entire populations. On average (as measured by the median), 33% of the total program benefit went to the poorest 40% of households.

  - A second comparator consisted of twenty-two government primary care and primary education programs. These programs were not specifically targeted on the poor, but could reasonably considered more relevant for the poor than the rich since they offered services to which most of the rich already had easy access. Among the twenty-two programs in this group, 58% of the average (median) program’s total benefit went to the poorest 40%.

  - In the eighteen more carefully targeted programs, the poorest 40% received 72% of total program benefits.

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6 The case studies are summarized in two pieces by Margaret Grosh, on which the contents of this section are based. The first is Margaret Grosh, Administering Targeted Social Programs in Latin America: From Platitude to Practice. (Washington: The World Bank, 1994.) A briefer report appears as Margaret Grosh, “Toward Quantifying the Trade-off: Administrative Costs and Incidence in Targeted Program in Latin America,” in van de Walle and Nead, 1995, pp. 450-88.

7 It is worth noting that all figures refer to the poorest 40% of households. Because of higher fertility among the
• The three principal targeting methods used were all about equally effective. The eighteen targeted programs with adequate data relied primarily on three techniques: individual targeting, geographic targeting, or self-targeting. The median of the limited number of programs in each of these categories was about the same: in each category, the poorest 40% of households gained 70-75% of the total program benefits.

• The administrative costs of the targeted programs were below 10% of total program costs. On average (median), the administrative costs of programs employing individual targeting was around 9% of total program expenses; the administrative costs of programs using geographic targeting was on the order of 6-7%.8

Data like these are in line with other, less formal reports on targeting social services in Latin America.9 Elsewhere, the situation is less clear. There are numerous reports of failure -- particularly in Africa -- as will be reported below. On the other hand, there appear to be at least several programs outside Latin America that have done far better. For example, as will be discussed further in the following section, the Thai health ministry appears to have reached some 65% of poorest 25% of the country’s population through a program of individual targeting that suffers from about 20% leakage. Moving outside of health, one of the most highly regarded of all targeted programs is in India: the carefully-studied Maharashtra employment guarantee scheme.10 And China appears to be making a determined effort at geographic targeting through a series of programs oriented toward the poorest one-quarter of the country’s counties that, while as yet undocumented, appear to stand a reasonable chance of success.11

In other words, the overall record of targeting appears mixed, as does that of most development activities. Even the most effective of the targeted programs for which information is available fall far short of the ideal of “perfect targeting” cited at the outset. At the same time, there are enough examples of large-scale, government operated targeted initiatives that perform significantly better than less well targeted programs in reaching the poor to suggest strongly that targeting poor, the 40% poorest households can be expected to contain considerably more than 40% of individuals in the population. A report based on the incidence of benefits to the lowest 40% of individuals would show lower figures for all three types of programs described here; but since all three types of programs would be effective, their relative standing in terms of ability to reach the poor would not necessarily be affected.

8 Figures include both the costs of screening potential beneficiaries and of delivering program benefits to them.
9 See, for example, the program covered in Guy P. Pfeffermann and Charles C. Griffin, Nutrition and Health Programs in Latin America: Targeting Social Expenditures. Washington: The World Bank, 1989.
10 See, for example, Martin Ravallion and Gaurav Datt, “Is Targeting through a Work Requirement Efficient?: Some Evidence for Rural India,” in Van de Walle and Nead (1995), pp. 413-44.
can make enough of a difference to justify its use.

**Individual Targeting**

As noted at the outset, there are many particular types of targeting methods available. Of them, individual targeting has received by far the most attention within the health community. The reasons have less to do with the method’s promise, which is not necessarily greater than -- or even as great as -- the methods described in succeeding sections, than with the recent history of the health sector.

An important feature of this history is the shift in government objectives from the universal provision of free services to the development of a mixed private-public system. One component of this shift has been the introduction of fees for services at government facilities that were previously available without charge. The introduction of fees has drawn widespread criticism from many quarters because of its potential impact on the poor. Part of the response has been an effort to lessen any such impact on the poor by including, as components of the new financial regimes introduced, provisions for fee waivers or exemptions for those in need -- that is, individual targeting.

The record of individual targeting in health programs is not well understood. But to the extent that it is understood, the method’s effectiveness appears to vary depending upon the degree of effort expended and upon the particular approach adopted.

**Variations in Intent and Effectiveness**

The amount of variation, both in seriousness of intent and in effectiveness seems quite large. At the one end of the broad spectrum are the many African and other governments that, to all appearances, declared an intent to exempt the poor, issued a vaguely-worded circular or two, and then forgot about the subject. At the other end are programs that devoted a great deal of time, effort, and experimentation to the best way of identifying those most in need -- like the Latin American programs described above; and that of Thailand, also mentioned previously.

*The Least Impressive Programs*

According to a recent questionnaire study of 26 developing countries -- most but not all in Africa -- found that close to three-quarters of the countries responding reported at least some kind of official policy to exempt the poor from user. But, said the study organizers, “there were numerous informational administrative, economic, and political constraints to effective implementation of these exemptions.”\(^\text{12}\) In most countries, for example, policy guidelines on whom to exempt were quite vague;

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local exemption administrators found it very difficult to assess household incomes; and/or the potentially eligible were often unaware that exemptions were available.\textsuperscript{13}

In Africa, according to a another recent review, 17 of the 37 countries surveyed appeared to have some sort of national policy exempting the poor from clinic fees.\textsuperscript{14} These 17 countries included most of those in Anglophone Africa where national fee policies had been introduced. Zimbabwe’s policy was quite explicit about who should be exempted (everyone with a monthly income of Z$400 or below); but elsewhere, “usually the policy is simply stated that those variously described as “the poor,” “paupers” (Lesotho), or “those who cannot afford to pay” (Mozambique) should be exempted. A great deal of discretion is therefore left in the hands of those applying the policy at the local level.” \textsuperscript{15} In Francophone Africa, “for the most part,... (the fee exemption) schemes are loosely specified and applied in various ways..."\textsuperscript{16} In no case does there appear to be a formal budgetary provision to reimburse the units providing service for any income foregone through fee waivers.

Firm data concerning the effectiveness of such casual approaches to individual targeting, which appear to constitute the majority of cases, are lacking. However, several reviews of the less formal literature concerning such cases suggest that the casual approach doesn’t work very well. In most cases, few people appear to end up being exempted; in those cases where the number of exemptions is large, it is by no means clear that the majority of those exempted are poor. According to one review, “...the evidence suggest that exemption practice is often ineffective.”\textsuperscript{17} Another review of individual targeting in health concluded that, “in general, targeted interventions in sub-Saharan Africa have been compromised by a variety of difficulties, including excessive leakage, overly subjective exemption criteria, informal identification and verification procedures, and excessive costs.”\textsuperscript{18}

\textit{The Most Impressive Programs}

Not all individual targeting programs perform so poorly, however. Another global review of country program experience found that of the 29 means-testing programs for which reasonably careful assessments exist, the assessment authors considered the programs unsuccessful in 20 cases, but successful in 9.\textsuperscript{19} Most (8) of these were in Latin America; but there was one in Africa (Ethiopia); and

\textsuperscript{13} Ibid., pp. 374-76.
\textsuperscript{15} Ibid., p.26
\textsuperscript{16} Ibid., p. 36
\textsuperscript{18} Hugh Waters, \textit{“Literature Review: Equity in the Health Sector in Developing Countries, with Lessons Learned for Sub-Saharan Africa} (manuscript, 1995), p. 18
\textsuperscript{19} Willis, 1993, pp. 64-5.
other information suggests there are at least some programs that have performed far better than those described in the preceding paragraphs.

Particularly noteworthy in this regard is the experience in Thailand, alluded to previously. Thailand has been offering free medical care to low-income groups, through an initiative known as the “Low Income Support Program,” since 1975. The program has been modified numerous times as the government has gained experience with it. In its present form, the program is open to Thai families with incomes of less than 2,000 baht, whose members constitute around 25% of the country’s population. Local officials of the Ministry of Home Affairs determine whether the income of potential beneficiaries is adequately low for them to qualify; and issue identity cards, valid for three years, to those families found eligible. The cardholders are then exempted from fees at government health facilities. The cost is covered by a special allocation to the service-providing facilities from the Ministry of Public Health, which allocates around 8% of its total budget to this end. Coverage under the program has risen rapidly in recent years, and it now reaches some 11 million people -- a number of people equaling around 20% of the country’s population and 80% of its poor population. Independent surveys suggest that about 20% of the 11 million people are non-poor who are improperly included. Adjusting for this suggests that, all in all, the program covers about 65% of Thailand’s poor, with an inclusion error on the order of 20%.

Whether such figures justify categorizing the Thai program as a success depends upon the standard a program must meet in order to qualify as successful. Many Thai are quite dissatisfied with the program, at least compared with the several other health subsidies that the government provides, and are seriously disturbed by the fact that 20% of those covered are not poor. On the other hand, the Thai program is clearly a world apart from the African and other experiences described earlier. Whatever one’s judgment concerning success, it seems legitimate to consider the Thai program is about as effective as any in existence; and to consider it a useful indicator of the best performance that can reasonably be expected of a nationwide program based on individual targeting.

### Reasons for the Variations


21 For example, Khoman reports that, “The scheme... has been the subject of much criticism since its inception, particularly with respect to the distribution of the card.” Ibid., p. 187.
In brief, the information presented in the preceding section indicates that, among the many apparent failures, there is a significant minority of cases in which individual targeting seems to have made a noticeable difference in tilting the orientation of large-scale health systems to the poor. This raises the question of the reasons for such differences in accomplishment. Of particular interest is whether there are elements distinguishing the more from the less impressive cases that can form the basis for policy recommendations.

The previously-cited study of 29 individual targeting programs suggest that such differentiating elements do indeed exist. The absence of an adequately large sample to permit multivariate analysis must limit the degree of confidence placed in its findings, but bivariate analyses are nonetheless interesting. What’s of special interest is the more impressive performance of programs with formal, carefully-established operating procedures that, among other things, clearly separate beneficiary assessment from service provision. For example:

- **Formal Eligibility Criteria.** Under 10% of the programs with only vague criteria for eligibility were judged successful. Over one-half of the projects where the criteria were explicitly stated -- in terms of monthly income, type of housing, family assets (such as amount of land, number of animals), etc. -- were thought to have succeeded.

- **Independent Eligibility Verification.** Leaving it to service providers to decide who did or did not meet the eligibility criteria was to invite failure. Only 2 of the 17 programs based on this approach were judged successful. In other cases, the assessment of eligibility was made by somebody else, who made a special effort to assess the eligibility of the prospective beneficiaries: in Jamaica, the Ministry of Labour employed 150 full-time field workers to visit homes and assess financial status through a formal protocol; in Honduras, the same function was performed by the country’s school teachers, who devoted three days at the beginning of each year to the task; in Thailand, as noted, the Interior Ministry’s local officials are assigned responsibility for issuing the identification cards identifying the poor. Over three-quarters of the programs that employed some method like this were found successful.

The overall sense emerging from reviewing cases like these is that such specific measures as these are important not only in themselves but also, and perhaps even more importantly, as indicators of the significant amount of effort and resources that policy makers are prepared to devote. Individual targeting cannot be made to work, it would seem, through just a few circulars or committee meetings. Rather, it takes careful planning, implementation, monitoring; and it costs money. And there will often be need for a long time horizon: as noted earlier, it’s taken Thailand over twenty years of continued program modification to reach the level of achievement it is currently enjoying.

**Alternative Mechanisms**

The focus of the discussion thus far has been on what been on the experience of individual targeting as administered technocratically by relatively large-scale administrative mechanisms, particularly government health ministries. In closing, it would be well to note that there are other ways
of approaching administering targeting efforts that seem potentially promising in circumventing some of the problems described above.

Although not enough experience has yet been gained with such approaches to permit a full assessment of their effectiveness, there are two that deserve mention. One refers to a way of identifying poor beneficiaries; the other to channels for service delivery as well as beneficiary identification.

**Participatory Poverty Assessment**

The approach to identifying beneficiaries is known as “participatory participatory assessment” or PPA. Its basic premise is that villagers are much better able to identify the poor among them than are outside government authorities. It employs a relatively non-quantitative approach based on guided discussions with village members. The discussions proceed in two stages. The first stage consists of reaching consensus about the appropriate indicators of wealth and poverty. The second consists of identifying individual families or people as rich or poor on the basis of the agreed-upon indicators.

This approach has thus far been applied in 15-20 countries, especially in Africa. Among the best-known is Tanzania, where discussions like those described above took place in 87 villages in different parts of the country and involved over 6,000 village residents. In each village, the residents produced maps locating the dwellings of those they considered to belong to the poorest of five wealth categories. In Dodoma region, for example, the poor were defined as people who were mostly old, disabled; lived by begging; childless women; and/or mentally unfit. In Kilimanjaro region, participants defined the poor as people who were landless, did not plant crops, depended upon relatives, and lived in substandard housing. The percentage identified as poor through application of these criteria in the study villages ended up closely approximately the percentage defined as living below the poverty line through more formal, consumption-based methods, although there may have been some differences in the particular individuals who would qualify as poor.

By encouraging people first to establish criteria for poverty before identifying individuals who were poor, the PPA approach seeks to lessen the problem commonly attributed to village-based beneficiary approaches: the proclivity of village leaders to identify their relatives, friends, and political supporters as those most deserving program benefits. Just how well it succeeds in this regard remains unclear. The Tanzania project organizer acknowledges this as an issue but doubts whether it is enough to outweigh the PPA approach’s benefits.

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23 Ibid., p.10

24 Ibid., p. 78.

25 More recently, the PPA approach as figured prominently in preparation of the World Bank’s 2000/01 *World Development Report*, which is focusing on poverty. In preparation for this, the Bank has commissioned a series of some 20-25 country studies incorporating interviews with over 20,000 poor men and women identified.
Reliance on Intermediaries

Should individual targeting prove too difficult for government ministries to implement, an alternative is to look to organizations that do not suffer from the same limitations. There are at least two possibilities: non-government organizations, and social funds.

There is a widespread belief that, for a variety of reasons, non-governmental organizations are much better at identifying and serving the poor than are government health programs. This is not inevitably the case, but where it is, governmental grants to or contracts with non-governmental organizations for the delivery of services would obviously represent a potentially attractive alternative to efforts to target poor individuals through the government service system.

The same argument applies to social funds, a relatively new form of quasi-governmental financial intermediary that channels funds directly to small-scale projects for poor and vulnerable groups operated by local governments, non-governmental organizations, or community groups. Social funds have thus far been created in 34 countries, especially in Africa and Latin America, as a way around rigidities in traditional government ministries that prevent the ministries from reaching the poor effectively. Thus far, the World Bank and Inter-American Development Bank have made loans to social funds in over fifty countries, with a total value of over $3.5 billion. Roughly one-third of this amount has gone to health, nutrition, and population.

Data limitations prevent any clear assessment of just how well Social Funds have in fact reached the poor. But such information exists suggests an overall picture quite similar to that presented above with respect to individual targeting in more traditional government programs. That is, social funds that adopt explicit, carefully-designed and -implemented approaches to beneficiary identification work much better than those which do not. As with more conventional, ministry-administered individual targeting through PPA techniques. The people thus identified were not targeted to become the recipients of health service subsidies, but rather to become sources of information of relevance for “pro-poor” program design. Future versions of this note will include findings from the studies, which are still under development.

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26 For example, a recent survey in Tanzania found that the income level of voluntary agency health services was considerably higher than that of the government or private commercial services. (Gaspar Munishi, “Private Health Care in Tanzania: Private Health Sector Growth Following Liberalization in Tanzania,” International Health Policy Program Working Paper, September 1997). A similar situation appears to exist in Zambia. (Francois Diop, “Use of Living Standards Surveys to Inform Policy: Examples from Senegal and Zambia,” presentation to the WHO Meeting on Policy-Oriented Monitoring of Equity in Health and Health Care,” Geneva, September 29-October 3, 1997).

27 Soniya Carvalho “Portfolio Improvement Program Review of the Social Funds Portfolio” (manuscript, May 1995), p. iv

28 Ibid., p. 10.

29 Future versions of this note will incorporate findings from recent evaluations of the social fund experience that are not currently available.

30 Ibid., p. 17.
programs, the existence of such approaches appears much more common in Latin American than in African social funds.\textsuperscript{31}

**Geographic Targeting**

To the extent that poverty is unevenly distributed within a country or other geographic division, one obvious way of increasing the likelihood that health (or other) programs will reach those most in need is to give priority to those geographic units in which the poor tend to cluster.\textsuperscript{32} Poverty does indeed seem to be at least somewhat unevenly distributed almost everywhere, and rather highly concentrated in at least some places; and this suggests that geographic targeting has the potential to play a significant role in making program’s more pro-poor. Realizing this potential, however, can be more challenging than it might seem.

One common, simple example of geographic targeting is the emphasis often placed on rural areas. This is done because incomes are generally believed to be lower and poverty more prevalent there than in the cities.\textsuperscript{33}

More precise geographic targeting is obviously possible, with the amount of gain depending upon just how unevenly poverty is distributed spatially. The point can illustrated through a comparative look at two examples: one low-income, the other upper middle-income:

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The low-income example is from India, where about 45% of the rural population is below the poverty line. There, programs offering services to everybody in those poorest states (defined in terms of percentage of population below the national poverty line) containing 25% of India’s total rural population would reach around 32% of the county’s rural poor -- somewhat but not dramatically above the 25% of the poor who would be reached were poverty evenly distributed among states, but still a distinct minority of the total number of rural poor in the country. Of those reached, about 62% would be poor, 38% non-poor.

\textsuperscript{31} Ibid.

\textsuperscript{32} The words in parentheses -- “or other” -- are particularly important here. For the great majority of work on the potential of geographic targeting has been on programs other than health. Particularly important and sophisticated has been the research on inter-regional income transfers. For an introduction to this extensive literature, see Judy L. Baker and Margaret E. Grosh, “Measuring the Effects of Geographic Targeting on Poverty Reduction,” Living Standards Measurement Study Working Paper No. 99, The World Bank, 1994; and Martin Ravallion, “Poverty Alleviation through Regional Targeting: A Case Study for Indonesia,” in Avishay Braverman, Karla Hoff, and Joseph Stiglitz, eds. Agricultural Policy and the Theory of Regional Organization, 1991.

\textsuperscript{33} With considerable reason. According to the World Bank’s 1997 World Development Indicators, agricultural workers constituted 69% of low-income countries’ labor force in 1990, but the agricultural sector produced only 25% of those countries’ output -- implying incomes considerably below the average. The same appeared to be the case in the middle-income countries, where 32% of the workers were in the agricultural sector that accounted for 11% of national output.
In Romania, the upper middle-income illustration, around 20% of the population is below the poverty line. There, offering services to everyone in the regions containing the poorest 25% of the population would reach roughly 30% of the country’s poor. Of those served through the programs, about 25% would be poor; the remaining 75% would not.

In other words, the potential for geographic targeting is higher in India than in Romania. The percentage of the country’s poor reached through a given program is slightly larger (32% vs. 30%), because poverty is more somewhat more unevenly distributed. More significantly, the percentage of those reached who or poor (62% vs. 25%) is notably greater, a reflection of the fact that overall poverty is much higher.

Still greater precision can be gained by focusing on smaller geographic units (a process which, if extended to its logical conclusion, would end up by targeting the poorest households). The amount of benefit likely to be gained through decreasing the size of geographic units also appears likely to vary. For example, in the India and Romania cases noted above, the benefit would be relative to modest. In India, for instance, use of 56 agro-climatic regions rather than 16 states as the basis for selection would increase the percentage of the country’s rural poor covered only from 32% to 34%, while reducing leakage from 38% to 34%. In Romania, selection from among 41 judets rather than five regions would result in covering 37% rather than 30% of the total poor, and in leakage of 68% rather than 75%.34 In Mexico, on the other hand, moving from the state to the municipal level could have a considerably larger impact on targeting, improving coverage from 40% to 60%, lowering leakage from 61% to 42%.35

Several countries, particularly in Latin America, have sought to be even more precise by identifying villages or other small communities that are especially poor. This has typically be done through construction of a basic needs or similar index based on questions contained in national censuses like literacy rates, education levels, and quality of housing. Recently, there has been experimentation with techniques to target on the basis of measures more obviously and directly related to consumption, traditionally the indicator preferred by economists concerned with poverty. The techniques concerned involve combining data from in-depth sample surveys, which ask many questions from a relatively small number of households, and from national censuses, which ask a few questions about all the households in a country. The basic idea is to identify those questions on the household survey instruments that: 1) best predict the consumption levels of households covered; and 2) are also included in the national census. Then, average values for the questions thus identified can be calculated for individual villages covered by the census data in order to predict the average consumption levels prevailing in those


villages; and the poorest villages can be selected on this basis. The use of such techniques is still in infancy, but the initial experience with them has been promising in such widely varying settings as Burkina Faso, Ecuador, and South Africa.\footnote{The Burkina Faso experience is described in David Bigman, Stefan Dercon, Dominque Guillaume, and Michel Lambotte, “Community Targeting for Poverty Reduction in Burkina Faso,” paper presented at a November 1997 World Bank workshop on geographical targeting for poverty reduction and rural development. For more on Ecuador, see Jescko Hentschel, Jean Olson Lanjouw, Peter Lanjouw, and Javier Poggi, “Combining Survey Data with Census Data to Study Spatial Dimensions of Poverty: A Case Study of Ecuador,” July 5, 1999. Information about South Africa is available in Harold Alderman, Miriam Babita, Nthabiseng Makhatha, Berk Özler, and Olivia Qaba, “How Small Can You Go? Combining Census and Survey Data for Mapping Poverty in South Africa,” December 1999.}

All in all, from a technical perspective, geographic targeting would appear to have a great deal of potential in some places, where the spatial distribution of poverty is quite uneven; less than in others, where poverty is less unevenly distributed (and/or less severe overall). Even where the potential is great, however, that potential will not always be easily realized. For one thing, locational decisions are notoriously political almost everywhere; and almost by definition, poor areas have limited political influence -- otherwise, they would not be poor. Beyond this are the administrative weaknesses found in poor areas: targeting a poor district with a notoriously incompetent administration might well result in a program that serves fewer poor people per unit of resources invested than an activity undertaken in a competently-administered wealthier area.

Targeting by Age

An alternative to targeting poor individuals is to target those age groups in which the poor are concentrated: that is, age-based targeting. There are two ways of assessing the promise and accomplishment of such targeting. One is by asking which age groups deserve highest priority in programs oriented toward the poor. The second is by asking about the record of how well health programs focusing on those age groups, whatever they may be, have reached the poor members of that age group. These are two very different questions; and, as will be seen, both must be addressed in order to produce a sensibly pro-poor approach.

Priority Age Groups

Globally

A relatively clear picture of which age groups deserve highest priority in international-level pro-poor health strategies can be obtained from a recent study of the global burden of disease undertaken by the Harvard School of Public Health for the World Health Organization and the World Bank.\footnote{Christopher J. L. Murray and Alan D. Lopez, eds. The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020. Cambridge, Mass.: Harvard School of Public Health on behalf of the World Organization and the World Bank, 1996.} The data provided in that study permit a crude estimate of the age distribution of death in different socio-


economic groups of the global population. Here is a summary of that distribution for three population groups: the global population as a whole, and the 20% of the global population living in the poorest and in the richest countries:\textsuperscript{38}

\begin{center}
\textit{Percentage of Deaths by Age}
\end{center}

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Population Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Global Poorest 20%</td>
</tr>
<tr>
<td>Under 15</td>
<td>50.7%</td>
</tr>
<tr>
<td>15-59</td>
<td>24.5%</td>
</tr>
<tr>
<td>Over 60</td>
<td>24.8%</td>
</tr>
<tr>
<td>Total:</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

The figures show that, in the global poorest 20%, children under 15 suffer over 50% of all deaths. This is notably higher than the 30% of total deaths in the world as a whole that are experienced by children under 15, and far higher than the under 5% of all deaths among the richest 20% of the world population that occur below age 15.

A second way of approaching the same data is to look at the degree of poor-rich differences in death rates at different ages. Here are the relevant figures from the same exercise as just described:\textsuperscript{39}

\begin{center}
\textit{Age-Specific Death Rates (per 1000 people in Age Group)}
\end{center}

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Col. 1</th>
<th>Col. 2</th>
<th>Col. 3</th>
<th>Col. 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population Group</td>
<td></td>
<td>Poor/Rich Ratio (Col. 2/ Col.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Global Poorest 20%</td>
<td>Global Richest 20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>175.4</td>
<td>21.1</td>
<td>8.3 : 1.0</td>
<td></td>
</tr>
<tr>
<td>5-14</td>
<td>33.3</td>
<td>3.4</td>
<td>9.8 : 1.0</td>
<td></td>
</tr>
<tr>
<td>15-29</td>
<td>55.6</td>
<td>13.7</td>
<td>4.1 : 1.0</td>
<td></td>
</tr>
<tr>
<td>30-44</td>
<td>88.0</td>
<td>26.0</td>
<td>3.4 : 1.0</td>
<td></td>
</tr>
<tr>
<td>45-59</td>
<td>185.5</td>
<td>86.4</td>
<td>2.1 : 1.0</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>294.5</td>
<td>159.7</td>
<td>1.8 : 1.0</td>
<td></td>
</tr>
</tbody>
</table>


\textsuperscript{39} Ibid.
Of greatest interest is the right-hand column, which shows, for different ages, the death rates experienced by the poor as a multiple of death rates among the rich. As can be seen, death rates among the poor are eight to ten times as among the rich in ages 0-14. The poor-rich differences then fall steadily as age levels increase. Rich-poor differences, in other words, are far greater at younger than at older ages.

**Within Countries**

Similar calculations can be made at the country level. A 1993 exercise based on information from fourteen countries in Africa, Asia, and Latin America estimated the differences between the healthiest and least healthy population groups. Here are some of the results.

### A. Percentage of Deaths by Age: Typical High-Mortality (African) Developing Country

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Least Healthy 10-20% of Population</th>
<th>Healthiest 10-20% of Population</th>
<th>Ratio (Col.2/Col.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>56.5</td>
<td>35.0</td>
<td>1.6 : 1.0</td>
</tr>
<tr>
<td>15-44</td>
<td>16.5</td>
<td>15.5</td>
<td>1.1 : 1.0</td>
</tr>
<tr>
<td>45-64</td>
<td>12.2</td>
<td>17.0</td>
<td>0.7 : 1.0</td>
</tr>
<tr>
<td>65+</td>
<td>14.8</td>
<td>32.5</td>
<td>0.5 : 1.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Ratio of deaths 0-14 to deaths 65+ 3.8 : 1.0 1.1 : 1.0

### B. Percentage of Deaths by Age: Typical Low-Mortality (Latin American) Developing Country

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Least Healthy 10-20% of Population</th>
<th>Healthiest 10-20% of Population</th>
<th>Ratio (Col.2/Col.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>56.5</td>
<td>35.0</td>
<td>1.6 : 1.0</td>
</tr>
<tr>
<td>15-44</td>
<td>16.5</td>
<td>15.5</td>
<td>1.1 : 1.0</td>
</tr>
<tr>
<td>45-64</td>
<td>12.2</td>
<td>17.0</td>
<td>0.7 : 1.0</td>
</tr>
<tr>
<td>65+</td>
<td>14.8</td>
<td>32.5</td>
<td>0.5 : 1.0</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**


41 Ibid., p. 208.
The results are generally similar to those of the international figures presented earlier:

- In both the low-mortality and high-mortality countries, the figures of column 2 show that deaths among the least healthy are concentrated in the lower age groups, especially when compared to the higher age groups in the same country. This is somewhat less so in the low- than in the high-mortality country: the proportion of total deaths in the former that occur in the 0-14 age group being around 40%, compared with around 55% in the latter. But even in the low-mortality countries, the proportion of total deaths occurring below 15 years is far higher than that for any other age group covering the same number of years.

- In both the high- and the low-mortality countries, the rich-poor mortality ratio shown in column 4 declines steadily with age in both countries, indicating much greater disparities at younger than at older ages.\(^\text{42}\) This ratio is particularly high for the youngest age group in the low mortality country (9.6 : 1.0, compared with 1.6 : 1.0 in the high-mortality country), suggesting particularly high poor-rich disparities at this age in the more advanced developing countries, at least in Latin America.

By now, the pattern should be obvious. In almost any developing country setting, as well as for the world as a whole, ill health\(^\text{43}\) in poor population growth is concentrated among the young. Poor infants, children, and youth suffer a significantly higher proportion of total ill health experienced by a poor population group than do the older members of that population group. And rich-poor differences in health status are much greater at younger than at older ages. Thus, ceteris paribus, an age-targeted health program oriented toward the poor would wish to give highest priority to the young.

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\(^{42}\) The reader should be aware that the rich-poor ratios presented here refer to numbers of deaths, rather than to mortality rates. As such, they include differences in the age structure as well as in mortality rates, and are thus not directly comparable to the rich-poor differences in mortality rates presented for the global figures presented earlier. Poor-rich ratios for mortality rates in the high- and low-income countries covered here were calculated as part of the study from which the country data were drawn. (See Gwatkin 1993, p. 207.) The overall patterns are quite similar to those of the ratios presented in the text of the current note.

\(^{43}\) Strictly speaking, it is not correct to draw inferences about overall health, as done here, from the figures presented above which deal only with mortality and exclude morbidity. The justification for taking such a liberty lies in the preliminary results from global DALY calculations that are currently in progress, which show that use of an approach that includes morbidity, as DALYs do, reinforces rather than dilutes the patterns emerging from the study of mortality alone. (Findings from the DALY-based exercise will be incorporated in later versions of this manuscript.)
Reaching the Poor Members of the Priority Age Groups

While figures like those cited argue clearly for a focus on the young in poverty-oriented health programs, a focus on the young is far from a sufficient condition to ensure that the poor are reached through a program adopting that focus. For there are rich young people as well as poor young people. If a health program is to help the poor, it must reach not just youth, but poor youth.

Do current child health programs reach the poor? Or are the programs’ primary beneficiaries more likely to be the children of the middle and upper income groups?

No firm answer is possible, but hints are available concerning the two principal components of governmental health services:

- **Primary health care.** A recent summary of over twelve country experiences suggests that primary care, while notably more effective at reaching the poor than other governmental health care programs, still serves more people in the richest than in the poorest population quintile in seven of the twelve. In no case does the proportion of total primary health care benefits going to the poorest 20% of the population exceed 25%. Since primary care is normally an important element of governmental health programs for children, such findings imply that government programs serve poor children less well than rich.

- **Immunization Programs.** The initial results from two recent exercises suggest that immunization coverage is considerably lower among the poor than among the better-off.

One of these is a recent econometric study based on inter-country data. The preliminary analysis, based on data from some 40 to 50 countries, covered measles and DPT immunization. The analysis showed an average immunization rate of 62% among the poor, of 88% among the non-poor for these two programs when the World Bank’s international poverty line is used as the basis for distinguishing between the two groups.

---

44 Nor, for that matter, is it a necessary condition. It is quite possible to envisage a program focused on the elderly that serves only the poor. Witness, for example, the activities of Mother Teresa among the dying destitute of Calcutta. But the older the age, the lower the percentage of the ill population belonging to that age group which is poor -- and thus the greater the importance of adding some supplementary targeting mechanism, like individual targeting, to ensure that the poor members of the age group concerned are a program’s principal beneficiaries.


46 Dean Jamison, World Bank health and poverty seminar presentation, December 16, 1997. The presentation was a report on work in progress, and the results presented thus remain subject to potentially significant change. Further information on the presentation is contained in a summary report on the seminar available from Dave Gwatkin, ext. 33223. (The World Bank international poverty line, on which the figures cited are based, is a daily consumption of $1.00 per day per capita, expressed in 1985 dollars adjusted for inter-country differences in
The second exercise is a set of tabulation of household data collected under the Demographic and Health Survey (DHS) program. Such tabulations, prepared for forty countries thus far, show that poor children are less well reached than rich ones in every case. The point can be illustrated with respect to the ratio of full immunization coverage in the richest relative to the poorest 20% of the population. On average, the ratio was 1.84 : 1, meaning that children in the top 20% of the population were just under twice as likely to be fully immunized as children in the lowest 20%. (The ratio in Sub-Saharan Africa was somewhat larger than this global average; the ratios elsewhere were somewhat smaller.)

Neither of these two bits of information deserves to be considered definitive. But they do reinforce one another in suggesting that, while governmental child health programs are reaching the poor to a significant degree, they serve the poor less well than the rich.

Targeting by Disease

Another approach to targeting is by disease: that is, to concentrate on those diseases that are most important for the poor, or for poor-rich differences. What are these diseases?

Priority Diseases

Globally

This question can be answered at least crudely at the international level by reference to the global disease burden data described in the preceding section. The following table presents tabulations of this data for the global poorest and richest 20%, and for the three principal disease groups featured in the global burden of disease study:

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47 Defined as receipt of BCG, three doses of DPT and oral polio, and measles.


49 Gwatkin and Guillot, op. cit. The Gwatkin-Guillot work also contains information for 27 more detailed disease categories that will not be discussed here because of space constraints.

---
Deaths in the Poorest and Richest 20% of the Global Population

<table>
<thead>
<tr>
<th>Disease Group</th>
<th>Global Poorest 20%</th>
<th>Global Richest 20%</th>
<th>Poor-Rich Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (000s)</td>
<td>% of Total</td>
<td>Number (000s)</td>
</tr>
<tr>
<td>Communicable</td>
<td>8,159</td>
<td>58.6</td>
<td>726</td>
</tr>
<tr>
<td>Diseases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noncommunicable</td>
<td>4,449</td>
<td>32.0</td>
<td>8,017</td>
</tr>
<tr>
<td>Diseases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injuries</td>
<td>1,315</td>
<td>9.4</td>
<td>666</td>
</tr>
<tr>
<td>Total:</td>
<td>13,923</td>
<td>100.0</td>
<td>9,409</td>
</tr>
</tbody>
</table>

As a class, communicable diseases are clearly most important for the global poorest 20%, causing more deaths (58.6% of the total deaths in that population group) than noncommunicable diseases (32.0%) or injuries (9.4%) combined. This is in stark contrast to the situation prevailing among the global richest 20%, where noncommunicable diseases are dominant, responsible for over 85% of deaths. On the other hand, even among the poorest 20%, noncommunicable diseases are far from inconsequential, being responsible for nearly one-third of all deaths.

The importance of communicable diseases is even clearer from the perspective of the poor-rich gap. As indicated by the figures just presented, communicable diseases cause over 11 times as many deaths among the poor as among the rich. Noncommunicable diseases, on the other hand, kill only somewhat more than half as many poor as rich.

Within Countries

As of yet, no analyses of the recent burden disease data have yet been undertaken for poor and rich population groups within countries. There has, however, been an effort to approach this question...
by applying an earlier version of the same basic method to another data set. The effort covered the
same two illustrative country settings as those covered in the example for age-based targeting presented
earlier: that is, it compared distribution of disease in the healthiest and least healthy 10-20% of the
population in a high- and low-mortality country (with characteristics typical of Africa and Latin America,
respectively).

The results were far from definitive, given the large number of deaths categorized as resulting
from “other causes” (typically 35-40% of the total). Also, the assessment could benefit significantly
from an updating based on the fuller data that have since become available. What the assessment
shows is nonetheless of considerable interest: namely, that even in the low-mortality (Latin American)
country, infections and parasitic diseases cause more deaths among the least healthy 10-15% of the
population than do circulatory system diseases and neoplasms.

Reaching the Poor Victims of the Priority Diseases

The same point made earlier with respect to age is equally relevant here: namely, that it is
important to reach poor victims, not just any victim, of whatever diseases one decides are highest
priority. This is likely to be at least somewhat easier when one focuses on communicable diseases
since, as seen above, they are so much more prevalent among the poor. But the congruence is by no
means perfect; and while there may be little communicable disease among the very rich, there is a great
deal in other non-poor groups. It would be quite possible for communicable disease programs to deal
primarily with easier-to-reach non-poor groups, largely bypassing the poor.

Whether this is in fact an issue remains largely unknown. What can currently be said has
already been said in the discussion of age-based targeting. Just as programs like primary care and
immunization programs focus primarily on the young, so too do they tend to emphasize communicable
diseases; and this makes such programs relevant for the current discussion. The information available
on programs like these, as presented earlier in the discussion of age-based targeting, suggest that they
deserved to be condemned with faint praise. That is, they appear to reach the poor far better than other
types of health programs, and their coverage of the poor is far from trivial. Even they, however, usually
appear to serve at least somewhat more rich than poor.

Implications for Project Development

What all this means for project development depends at least to some extent on one’s outlook.

As noted at the outset, targeting is not for everybody. Even the most clearcut evidence of
targeting’s effectiveness in directing program benefits toward the poor would be of little significance to

50 Gwatkin, op. cit.
someone persuaded that centrally-administered programs work to the detriment of the poor, and that it is feasible to replace such programs in the near future with community-oriented approaches that can permit the poor to take control over their destinies.

From other perspectives, however, the evidence is worth serious consideration. One such perspective, obviously, is that of the conscientious central program administrator wishing to serve the poor as well as possible. Another is that of the community activist who, however much (s)he may deplore the dependency created by centralized programs, believes that such programs are destined to remain important for some time to come and that centralized programs that reach the poor are less deplorable than ones that do not.

For those wishing to look at the evidence of targeting effectiveness, what has been said thus far gives rise to four suggestions:

- First, overall, well-designed and -implemented targeting can make a noticeable difference. Targeting is no panacea, however; and if done poorly, it can have little impact.

The Latin American data cited are particularly instructive in this regard: carefully-targeted programs, using a wide range of targeting mechanisms, were able to ensure that some 70-75% of program benefits went to the poorest 40% of households. This is less impressive than seeing 100% of the benefits reach the poorest quintile of individuals, to be sure; but it’s far better than the 40% or less achieved by the untargeted program, and a notable improvement even over such “quasi-targeted” health programs like primary care.

There are also cases of significant accomplishment outside Latin America. But at the same time, there are more examples of unsuccessful than successful attempts at targeting. Successful targeting obviously takes requires careful attention.

Information like this suggests that:

-- It is worth the time and trouble to explore carefully the targeting options available in any particular setting, in anticipation that that the exploration will uncover one or more approaches well worth including in poverty-oriented projects.

-- At the same time, much more than targeting will almost certainly be required for the development of highly progressive, pro-poor initiatives.

- Second, targeting directly on poor individuals can work; but it requires particular care and effort.

Individual targeting appears to have worked moderately to very well where implemented seriously. As noted, for example, Thailand provides an illustration of what individual targeting can accomplish: 65% of so of the country’s poor population is served through a program that costs around
8% of the health ministry budget, and with a leakage or inclusion error of around 20%. But this degree of accomplishment has required the development of an unusually careful administrative approach through over twenty years of trial and error. Elsewhere, where individual targeting has been tried “on the cheap” -- that is, with minimal administrative effort and without additional resources to cover the additional costs of the extra services provided -- it appears to have failed miserably.

This suggests that individual targeting is certainly among the options worthy of serious consideration, but only if the leaders of the projects concerned are prepared to devote a significant amount of intellectual and financial resources to its implementation.

- Third, individual targeting is by no means the only option available. Targeting by age and disease also have considerable potential, even if unlikely to be sufficient in themselves to achieve precision.

As has been seen, illness and death among the poor are concentrated among the young and are caused by communicable disease to a much greater degree than is the case among higher socio-economic groups. This makes communicable diseases and the young the obvious targets of choice in poverty-oriented health programs.

But the correspondence among poverty, age, and communicable disease is far from perfect. For example, while around 50% of global deaths at ages 0-4 occur are suffered by people belonging to the poorest 20% of the global population, the other half is experienced by the 80% of the world’s people who are better off.\(^\text{51}\) The pattern is similar for communicable diseases. Experience to date appears to indicate that extra measures will be needed to see that the majority of communicable disease or child care programs benefits go to the poorest 20%, rather than being captured by the better-off.

This suggests that age and disease targeting can better be introduced in conjunction with other targeting mechanisms than undertaken alone.

- Fourth, as indicated by the preceding sentence, targeting mechanisms are not mutually exclusive. While firm evidence is lacking, several targeting methods applied simultaneously appear likely to prove more effective than reliance on a single mechanism, at least in reducing errors of inclusion.

There are no multiple-cell controlled field experiments to show whether two or three targeting

\(^{51}\) Gwatkin and Guillot, *op. cit.*
mechanisms introduced simultaneously would work better than any one mechanism alone. It is worth noting, however, that most of the impressive Latin American programs referred to above used one or more supplementary targeting mechanisms in addition to the principal one that was implemented. And, as just noted, a priori considerations suggest that combining age/disease targeting with some other method could reasonably be expected significantly to reduce leakage.52

This suggests that the simultaneous use of multiple targeting methods is worth considering, beyond the example given for age and disease targeting given in the preceding section, especially for projects where potential leakage is of particular concern.

52 What would happen to exclusion errors is less clear. It is possible to imagine circumstances under which the combination of two or more indirect targeting methods could bring decreased inclusion at the cost of increased exclusion. Thus, the application of multiple targeting methods deserves to be approached with care where the possibility of exclusion is a major concern.