

Chapter XVII
Using multi-topic household surveys to improve poverty reduction policies in developing countries

Paul Glewwe

Department of Applied Economics
University of Minnesota
St. Paul, Minnesota, United States of America

Abstract

The present chapter shows how household surveys can be used by researchers and government officials in developing countries to formulate policies to reduce poverty. It begins with relatively simple descriptive analyses, highlighting the key contribution of household survey data: they provide information on who is poor and on the characteristics of the poor. The chapter then discusses more complex multivariate analyses, which are based on multiple regression techniques. For each type of analysis, examples are provided on how household survey data can be used to formulate policies to reduce poverty.

Key terms: Poverty, policy formulation, descriptive analyses, multivariate analyses.

A. Introduction

1. Almost all developing countries accept the fact that a primary objective of economic and social development is the reduction, and eventual elimination, of poverty. While all Governments may have the same goal, the policies they implement to reduce poverty should not necessarily be the same. The nature of poverty, and the characteristics of the poor, will vary from one country to another, hence the appropriate policies should also vary.

2. The present chapter is much too brief to discuss in detail the many ways in which government policies can affect poverty in developing countries. See Lipton and Ravallion (1995) and World Bank (2001) for recent detailed treatments. Yet a general overview can be provided, and for the purposes of this chapter, it is convenient to divide government policies into four broad types. The first type comprises macroeconomic policies, which are economy-wide policies that have implications for economic growth and stability. The most important macroeconomic policies are the overall level of taxation and government spending, monetary policies (which influence interest rates and the inflation rate), international economic policies (which affect the exchange rate, foreign trade and foreign capital flows), and policies regarding banks and other financial institutions. The second type of government policies comprises those that affect prices, such as taxes and subsidies on specific goods and services. Government provision of public services and infrastructure, such as health clinics, schools and transportation and communication networks, represents the third general type of government policy. The last type comprises government programmes designed to provide direct assistance to the poor. Examples of these policies are Mexico's Programa de Educación, Salud y Alimentación (PROGRESA), which provides cash grants to poor families if their children regularly attend school, and Jamaica's food stamp programme, which provides poor families with vouchers that can be used to purchase food items in local shops. All four types of policies can have important effects on poverty.

3. The impact on poverty of any of these types of policies depends on the characteristics and behaviour of the poor and, in some cases, on the characteristics and behaviour of the non-poor population. For example, the impact on poverty of government subsidies for specific food items, which should lower the price of those items, depends on the extent to which the poor purchase those items. This implies that Governments need information on the characteristics and behaviour of the poor in their countries in order to choose policies that are most effective in reducing poverty. Household surveys provide this crucial information.

4. Almost all developing countries, even the poorest, conduct some kinds of household surveys, such as income and expenditure surveys, labour-force surveys, and demographic and health surveys. These surveys provide a wealth of information that can be used to better understand the nature of poverty and the likely effects of government policies on the poor. This chapter shows how household surveys from developing countries can be used to formulate policies to reduce poverty. Section B begins by showing what can be learned from simple descriptive statistics calculated from survey data. Section C discusses more complex methods based on multivariate analysis and is followed by a brief concluding section.

B. Descriptive analysis

5. To ensure that government policies and programmes intended to help the poor are effective, information is needed on whether the policies are indeed reaching the poor and on the effect those policies are having. Unfortunately, such information is often lacking in developing countries. For example, policies that increase economic growth may raise the incomes of certain occupations more than others. There then arises the question which occupations are most common among the poor. A similar point applies regarding pricing policies. The impact on the poor of government plans to increase taxes on, say, petroleum products depends on whether poor households consume significant amounts of those products. The same issue arises regarding whether new schools or health clinics should be built in certain areas of the country: this raises the question whether those areas have a relatively high concentration of poor households. Finally, for any programme that provides direct benefits to the poor, whether services or in-kind or monetary transfers, programme administrators would like to know what proportion of the programme beneficiaries are poor, and what proportion of the poor benefit from the programme.

6. Unfortunately, many developing countries have little information about the location and characteristics of the poor, and thus they have very little idea about the extent to which the poor benefit from, or are harmed by, government policies and programmes. Household surveys can fill many of these information gaps. The present section discusses how this can be achieved, using many examples from developing countries. Although many of the uses of household survey data to understand poverty are very simple, amounting to the production of simple tables and graphs, this type of information is often much more useful than what can be obtained from more sophisticated analyses.

1. Defining poverty

7. Before investigating the impact of government policies on the poor, one must be clear on who is poor, which in turn requires a definition of poverty. People do not always agree on what poverty is. However, there is general agreement that there exists, in principle, a minimal "decent" standard of living that individuals and households should be able to attain if they are to have the opportunity to live a fulfilling life. Most discussions of poverty focus on material necessities, as opposed to political freedoms, human rights, and psychological well-being, and this chapter will do the same. The material necessities that are most obvious, and thus for which there is a large degree of consensus, are: (a) adequate diet; (b) basic shelter/housing; and (c) potable water and sanitary means of waste disposal. Most observers would also add basic education opportunities and simple preventative health care. Some would argue for an even larger "bundle" of goods and services, adding, for example, cultural or recreational activities, but on this point there is less consensus on what to include, or even whether to include these types of goods and services.

8. Philosophers, economists and other social scientists can, and often have, spent large amounts of time debating what is the appropriate minimal bundle of goods and services that an individual or household should have in order not to be considered poor. Once a bundle of goods and services is agreed upon, lack of consumption of particular components of the bundle can be used as an "indicator" of poverty. A more practical approach, taken by many economists, is to

point out that almost all of the items in the bundle cost money, so that the real issue becomes not the exact composition of the bundle but its monetary cost. This approach sets a “poverty line” in terms of a given amount of money and then defines as poor any household whose income or expenditures are less than that amount. In fact, the starting point for many monetary poverty lines used in developing countries is a bundle of goods and services that meets minimal requirements. For example, one component would be a bundle of food items that meets minimal nutritional needs, and that also reflects national food consumption patterns. The next step would be to calculate the cost of this bundle. The remainder of this chapter will assume that this approach is followed; for a more detailed treatment of how such a poverty line can be drawn, see Ravallion (1998).

2. Constructing a poverty profile

9. Once a workable definition of poverty has been set in terms of household income or household expenditure, a description of the poor can be constructed using household survey data. Such a description is often called a “poverty profile”. This is carried out by using income and/or household expenditure data in the household survey to calculate each household’s total purchasing power (total income or total expenditures). The poor are defined as those households whose purchasing power is lower than the poverty line.

10. The above paragraph contains an implicit lesson and an implicit question. The lesson is that poverty analysis requires household survey data that include reasonably accurate information on total household income and/or total household expenditure. Without such data, poverty analysis is difficult because some other way will have to be found of classifying households as poor or non-poor. While some useful information could probably be obtained from a survey without such data, much more can be learned from household surveys that collect income and/or expenditure data. The question is, If one has a survey with both income and expenditure data, which should one use? In general, expenditure data are preferred because they are usually more accurate than income data and because consumption expenditures are, in theory, more closely tied to household welfare, since income is sometimes used to repay debts or to save for future consumption and, as such, does not necessarily reflect current welfare.

11. The first task when constructing a poverty profile is to describe who the poor are. Without household survey data, policy makers and other observers often have little idea of who the poor are and what characteristic they have. Even worse, some perceptions that they do have may be inaccurate. For example, many government officials and other observers spend most of their time in large urban areas and think of the poor in terms of what they see in those areas, yet in virtually all countries the incidence of poverty is much higher in rural areas. Thus, the first task in using household survey data is to estimate the incidence of poverty, describe the location of the poor in terms of urban versus rural areas and by region of the country, and calculate some basic characteristics of the poor. It is important to check the rates of poverty by ethnic and religious groups, by level of education, and by occupation. It is also useful to examine housing conditions among the poor, as well as ownership of any productive assets. With this and other information, one can begin to provide useful advice to policy makers.

12. An example of some basic characteristics of the poor comes from a recent World Bank (1999) report on poverty in Viet Nam, where 37 per cent of the population were estimated to be poor in 1998. In Viet Nam, 79 per cent of the poor work in agricultural occupations; and almost all of them are self-employed. Another basic fact is that poverty is much higher among ethnic minority groups: although minority groups constitute only 14 per cent of the general population, they constitute 29 per cent of the poor in Viet Nam.

13. One of the most important characteristics of the poor is where they live. Ideally, policy makers would like to know the incidence of poverty in every city, town and rural district. Unfortunately, the sample size of a typical household survey is usually between 3,000 and 15,000 households, which is too small to provide precise estimates of poverty at such a disaggregated level. Yet if recent census data are also available, it is possible to combine those data with household survey data to obtain estimates of poverty for much smaller geographical areas. The basic idea is to estimate the relationship between various “predictor” variables and household income or expenditure, using the household survey data. The predictor variables used are variables that are also found in the census. The fact that, with an estimate of the predictive relationship, the census data can be used to simulate the distribution of expenditures in relatively small geographical areas, allows one to estimate the incidence of poverty in those areas. An example of this using data from Ecuador is Hentschel and others (1998). For more detailed discussions of the methods used, see Rao (2002) and Kalton (2002).

14. A final important point regarding the definition of poverty and the construction of poverty profiles is that one often wants to compare poverty at different points in time for the same country, or at the same point in time for different countries. When doing so, it is important that the data from the household survey used to define expenditures or income be collected in the same way over time or across countries. Very small differences in questionnaire design or other changes in the method of collecting the data can often lead to significant but completely spurious changes in the estimates, often in unanticipated ways. To be frank, it may not be possible to make such comparisons if the data collected or the way in which the data are analysed, or both, are not the same in the surveys being compared. Thus any changes in the way the data are collected for the variables that define poverty must be considered very carefully, in order to limit the potential for observed changes to be due merely to statistical procedures as opposed to actual change. Thus, it is usually best not to change the way in which the data are collected in any significant way.

3. Using poverty profiles for basic policy analysis

15. Knowledge of the location of the poor and some of their basic characteristics is the starting point for providing advice to policy makers. Of course, specific programmes to assist the poor must be located where the poor are most heavily concentrated, but much more can be accomplished, programmatically, if simple statistics about the poor are analysed properly. The present subsection describes four kinds of basic information on the poor that can be used to draw lessons on the impact of various policies on the poor.

16. *How the poor earn income.* As explained above, one of the ways that government policies affect the poor is by affecting the incomes they earn. Thus an important question is what the poor do to earn a living. Perhaps the first question to ask is whether the poor are self-employed, as opposed to earning wages by working for an employer. In many countries, the vast majority of the poor are self-employed farmers, craftsmen or traders. By definition, those poor who are self-employed will not be directly affected by policies that affect wage earners, such as changes in minimum wage laws or the implementation of a “social security” or health insurance scheme that applies only to wage earners.

17. Because many of the poor are self-employed farmers, an important question is, What crops do they produce, and how much of what they produce is sold? A specific example of this comes from Côte-d’Ivoire. Glewwe and de Tray (1990) found that many poor Ivorian farmers produce cotton, while cotton production among non-poor farmers was quite rare. Thus government policies that affect the price of cotton will primarily affect the poor in that country.

18. *Consumption patterns of the poor.* The economic well-being of the poor is also determined by the prices of the goods and services that they consume. For example, in Ghana, less than 1 per cent of the poorest 20 per cent of the population own either a motorbike or an automobile (Glewwe and Twum-Baah, 1991). This implies that there will be little direct effect of an increase in the price of gasoline on poor Ghanaians, although there may be an indirect effect owing to rising public transportation costs.

19. More generally, data on the consumption of food and non-food items, and on the availability of electricity and piped water, provide a wealth of information for policy makers to consider. When a tax or subsidy is being considered on a particular type of good, the data should be examined to see to what extent the poor will be affected. Note also that exchange-rate policies will also affect prices, hence the extent to which the poor consume imported goods is also of interest. The example of Ghana given directly above is a case in point: all of Ghana’s petroleum products are imported.

20. *Services used by the poor.* Subsidies to health and education are often justified, at least in part, by the benefits that they provide to the poor. However, there are many kinds of health services and many different types and levels of education. Data on who uses those services provide an opportunity to check the poverty status of the beneficiaries of specific policies.

21. A recent example of this is from Viet Nam. Gertler and Litvack (1998) found that the typical person in the poorest 20 per cent of the population made about one outpatient visit per year to a government hospital and about two outpatient visits per year to a commune health centre. In contrast, a typical person in the wealthiest 20 per cent of the population made four or five outpatient visits per year to a government hospital and only about one outpatient visit to a commune health centre. The main reason for the disparity is that government hospitals are found primarily in urban areas, while about 90 per cent of the poor in that country live in rural areas. The obvious implication of these simple figures is that subsidies to commune health centres benefit the poor more than the non-poor, while subsidies to hospitals benefit the non-poor much more than the poor.

22. *Programme participation.* A final straightforward use of household survey data is to examine who participates in various government programmes that are intended to help the poor. This requires a household survey with one or more specific questions on households' participation in programmes, as well as income or expenditure data that can be used to classify households as poor or non-poor. While such data were rare in the past, they are becoming increasingly common as survey designers recognize their value.

23. An example of the use of a household survey to assess the targeting of a programme comes from Jamaica (Grosh, 1991). Household survey data showed that food stamps were, perhaps not surprisingly, much more likely to be used by poor households than by non-poor households. Paradoxically, the benefits of general food subsidies tended to go primarily to better-off households. This information was presented to the Government in the late 1980s; and in the early 1990s, the food stamp programme's benefits were doubled while food subsidies were ended.

24. A final general point about basic descriptive analysis is that almost all household surveys are based on complex sample designs rather than random samples. Accordingly, subpopulation groups of particular interest, such as the poor, are oversampled, which implies that sampling weights must be used to obtain unbiased estimates of basic descriptive statistics. In addition, calculation of standard errors must take the sample design into account. As these points are discussed in more detail in chapter XVI and in other chapters of this book, the reader should consult those chapters before undertaking descriptive analysis.

C. Multiple regression analysis of household survey data

25. The above examples of the use of household surveys are based on very simple statistics which may be calculated by anyone who can use a simple statistical software package. Yet, the policy lessons drawn from them may be too simplistic in that they ignore behavioural responses to those policies. For example, if a tax is removed from a particular agricultural product because it is commonly produced by the poor, non-poor households may also start to produce that crop as its price increases, so that some of the benefits of the policy could go to non-poor households.³¹ Similarly, a tax on a particular type of food item may appear to have a large negative effect on the poor if they consume large amounts of that good; but if there is another similar good that is not taxed, the poor may simply switch to that good with only a small reduction in their welfare. Another example concerns education. The fact that poor children in a given country rarely attend upper secondary school suggests that there is little benefit to the poor of reducing the tuition fees for those kinds of schools, but it is possible that such a reduction in tuition will greatly increase enrolment of poor children in those schools. This possibility in turn implies that looking at current enrolment patterns would underestimate the benefit to the poor of such a policy.

³¹ When the tax is in place, the price received by producers will be lower than the price paid by consumers, the difference being the amount of the tax. When the tax is removed, the producer price will be equal to the consumer price; and in almost all cases, this means that the price received by producers will increase and the price paid by consumers will decrease.

26. Household surveys can be used to estimate how household behaviour changes in response to policy changes. This is not an easy task because it requires much more sophisticated types of analysis. The most common methods used to carry out such estimation are those of multiple regressions analysis. The most sophisticated methods often use data from specially designed household surveys that collect the precise data needed to carry out such an analysis. This is necessary because these methods often require data that are not found in typical household surveys. The present section describes three common ways to use household survey data to estimate how policies can influence household behaviour. For a more detailed treatment, see Deaton (1997).

1. Demand analysis

27. Economists often estimate the impact of prices and household income on purchases of goods and services. Such research is called demand analysis. The general concept is that for any good (i), the purchases of that good (q_i) by a household are determined by the income (y) of the household, the price (p_i), of that good and the prices of all other goods. This can be expressed as

$$q_i = f(y, p_1, p_2, \dots, p_i, \dots, p_n) + \varepsilon \approx \beta_0 + \beta_1 p_1 + \beta_2 p_2 + \dots + \beta_i p_i + \dots + \beta_n p_n + \beta_{n+1} y + \varepsilon.$$

The function $f(y, p_1, p_2, \dots, p_i, \dots, p_n)$ is a very general representation of how income and prices affect household demand, where ε reflects the impact of other causal factors (and perhaps a random variation in q_i that has nothing to do with any causal factors). A common simplification in demand analysis is to assume a linear representation, which is shown here by the term to the right of the “ \approx ” symbol, which indicates that this simplification is an approximation. If ε is uncorrelated with y and the price variables, then simple ordinary least squares (OLS) can be used to obtain unbiased estimates of the coefficients (the β 's) of the income (y) and prices (p_i) in this linear relationship. In actual applications, this assumption may not hold, and many other estimation issues could complicate the analysis. For further information on demand system estimation, the classic reference is Deaton and Muellbauer (1980). More recent treatments are found in Pollack and Wales (1992) and Lewbel (1997).

28. To perceive how demand analysis provides information beyond the information obtained using simple descriptive statistics, consider the impact of a tax on an imported foodstuff, such as wheat. (Developing economies often tax imported items because such taxes are relatively easy to administer; and the tropical climate in many developing countries would suggest that imports are the only source of wheat.) Suppose the current price of one kilogram of wheat flour is 10, and that the typical poor household consumes 60 kilograms of wheat flour per year. Assuming that the import price is fixed at the international price, a 50 per cent tax on wheat imports would raise the price of wheat flour to 15, which implies that the typical poor household would pay 300 (5×60) in additional taxes. Of course, this analysis based on simple descriptive statistics assumes that poor households will continue to purchase the same amount of wheat flour after the tax is imposed. In fact, it is likely that households will decrease consumption of wheat flour and increase consumption of other staple crops (such as rice, maize or cassava) in response to the increased price of wheat flour. Demand analysis estimates allow one to calculate the size of this behavioural response. Suppose that the equation in the previous paragraph depicts the demand for wheat, so that q_i represents kilograms of wheat flour purchased by households per year and p_i

represents the price of one kilogram of wheat flour. If $\beta_i = -3$, then an increase in the price of wheat flour by 5 will reduce consumption of wheat flour by 15, so that annual consumption of an average poor household would be 45 kilograms. This in turn implies that the average poor household would pay 225 (5×45) in additional taxes, instead of 300. While this example is quite simple, it points to the need to take account of household behaviour when examining the impact of specific policies.

29. An example of the use of demand analysis to analyse the impact of government policies on the poor is that of Deaton, Parikh and Subramanian (1994). The authors estimate a system of demand equations for over 10 different kinds of food items. They calculate the overall impact of increases in food prices on national social welfare, as well as the extent to which the changes affect the welfare of the poor. One particularly interesting result is that increases in the price of rice have less negative effects on the welfare of the poor than do increases in the price of coarse grains, since the poor are more dependent on the latter. Thus, taxes on rice hurt the poor less than do taxes on coarse grains.

2. Use of social services

30. Health and education programmes can provide many benefits to poor households, but participation does not necessarily imply that substantial benefits have been received. Some of those programmes may be ineffective. In the area of health, policy makers would like to know whether participation actually improved individuals' health status. In education, they would like to know how much children actually learned by attending school. Many studies have been conducted using household survey data from developing countries that attempt to investigate how successful health and education programmes are in attaining their objectives.

31. One recent example that illustrates the use of multiple regression is an analysis of the impact of specific school characteristics on student learning, and thereby on future wages. Glewwe (1999) examined this question by estimating the impact of school and household characteristics on children's academic performance, as measured by test scores, using household survey data from Ghana. The equation utilized was of the following form:

$$T_i = \beta_0 + \beta_1 MED_i + \beta_2 FED_i + \beta_3 y_i + \beta_4 IQ_i + \beta_5 SC_{1i} + \beta_6 SC_{2i} + \dots + \varepsilon,$$

where T_i is the test score of child i , MED_i and FED_i are the education levels of the child i 's mother and father, respectively, y_i is the income of child i 's household, and the SC variables represent a large number of school and teacher characteristics. Estimation of such an equation is quite complicated (see Glewwe, 2002); but once the β 's are estimated, they provide information on how different school and teacher characteristics affect student achievement. Comparing these impacts with the costs of the various school and teacher characteristics provides guidance on which types of education spending are most cost-effective.

32. Glewwe's analysis of data from Ghana found that repairing leaking roofs in classrooms and providing blackboards in classrooms that do not have them significantly raised student achievement and school attainment (years spent in school). Simple calculations of the financial

rates of return on such “investments” in school quality showed those rates of return to be very high, sometimes 25 per cent or more.

3. Impact of specific government programmes

33. While it is easy to use household survey data to examine whether a particular household or individual participates in some kind of programme designed to help the poor, it is harder to determine the extent to which their participation actually raises their welfare. The problem here is that participation may have other effects that reduce welfare. For example, a “food for work” programme may provide employment to poor individuals, but the benefits of the increased income must be weighed against the cost of working, including the impact of working on their health. Similarly, when households are provided with food stamps in order to raise their food consumption, it is not necessarily the case that their use of those stamps to purchase food will increase food consumption, since they may well divert some or all of the money that would have been used to purchase that food to some other use. Assessing the impact of programmes on household behaviour requires careful and sophisticated econometric analysis to understand all the effects of programme participation and, ultimately, the overall impact of participation on household welfare.

34. A recent example of this is found in a paper by Jacoby (2002) that examined the impact of school feeding programmes in the Philippines. The paper examined whether provision of school lunches to children resulted in their parents’ providing them with less food at home. While most economists would have expected such a reallocation of food eaten at home, Jacoby found no evidence of such a diversion. Instead, he found that participation in the school feeding programme had no effect on children’s consumption of food at home, which implies that overall food consumption among participating children increased by the amount of the food provided at schools.

D. Summary and concluding comments

35. Household surveys provide a rich source of information that can be used by policy makers and programme designers to evaluate whether policies and programmes benefit poor households. To be useful, a survey must contain income or expenditure data, in order to classify households as poor or non-poor, and data that indicate how the household will be affected by a particular policy or programme. Until recently, the household surveys used were often designed for other purposes. Yet in the 1980s and 1990s, new household surveys were developed with the explicit intention of providing this type of information. Among the most prominent of these were the Living Standards Measurement Study (LSMS) household surveys of the World Bank. A brief introduction to these surveys is provided in Grosh and Glewwe (1998) and an extremely detailed treatment is given in Grosh and Glewwe (2000). However, even standard surveys designed for other purposes can be made much more useful for poverty analysis by adding a few questions. For example, it would be very useful to add questions on participation in national poverty programmes (such as rural employment programmes or food stamp programmes) to a standard household income and expenditure survey.

36. This chapter has provided the reader an overview of how to use household surveys to design policies that will reduce poverty in developing countries. The discussion is admittedly brief, owing to the space constraints in this publication. Readers who would like a more detailed treatment should consult the books and papers cited in this chapter.

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