

Combining census and household survey data to map poverty at high resolution for Kenya, Tanzania and Uganda

Some of the most promising approaches for obtaining high-resolution maps use existing data and generally require little or no additional data-collection efforts. One approach combines survey and census data using econometric techniques to overcome typical limitations in the geographic coverage of household welfare surveys and the lack of direct welfare indicators in censuses (Alderman et al., 1999; Elbers and Lanjouw, 2001; Statistics South Africa, 2000).

A multidisciplinary, multi-institution effort is now in progress in Kenya, Tanzania and Uganda aimed at producing high-resolution poverty maps. Research teams associated with the statistical bureaus of each country are involved in a careful analysis and testing in order to develop a robust statistical model. The first stage of the analysis starts with a household survey such as a welfare monitoring survey (WMS) to obtain a reliable estimate of household expenditure (y). Household expenditure is then used to calculate more specific poverty measures linked to a poverty line.

Most household surveys are designed to produce statistically reliable results at a relatively coarse level, such as the six units of analysis (urban and rural estimates for three regions) used in Ecuador by Elbers and Lanjouw (2001). Population and housing censuses typically do not collect information on household expenditures, but provide complete coverage of a country and can be aggregated to small statistical or administrative areas such as villages and communities.

Combining survey and census data can overcome the typical limitations of surveys (too small a sample size to create high-resolution maps) and censuses (lack of direct welfare measures), and it allows the production of statistically reliable poverty indicators at much higher resolution, such as at the parish level—1,000 units of analysis—in Ecuador) (Elbers and Lanjouw, 2001).

This approach requires a common set of explanatory variables (x) at the household level in both the survey and the census. Typically, these variables are such household characteristics as household size, educational level and quality of housing, and are obtained from the same or similar questions in the respective questionnaires.

The next step involves statistically estimating the relationship between household expenditure (y) and household characteristics (x) in the survey. Once robust relationships between y and x have been established, the researcher can apply these estimated relationships to the same variables, i.e. household characteristics (x) in the census, to predict per capita household expenditures.

Other small-area estimation (SAE) approaches have extended this statistical estimation of poverty and include other explanatory factors going beyond the variables in the census or survey, by using geographic information system (GIS) data layers to calculate information on, for example, distance to markets and crop production.

Recent poverty maps produced for South Africa highlight their potential usefulness (Alderman et al., 1999; Statistics South Africa, 2000). Government institutions in South Africa were the first major users of these new poverty maps, but other researchers are also beginning to use the new data. The poverty maps have been instrumental, for example, in guiding educational outreach campaigns to slow the further spread of cholera outbreaks that started in Durban in September 1999. By combining epidemiological information with poverty data and demographic profiles from the census, the outbreak of the disease could be clearly linked to some of the poorest areas in Durban. Researchers also established a close correlation between access to sanitation and clean drinking water (from more detailed census data) and the prevalence of the disease. Other users working on crime issues combined information on the location of crime hot spots with the poverty maps and census data to characterise communities neighbouring these hot-spot areas. This helped to formulate first hypotheses on potential linkages between community characteristics and crime.

References

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