Simple Poverty Scorecard® Poverty-Assessment Tool Honduras

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Abstract

The Simple Poverty Scorecard-brand poverty-assessment tool uses ten low-cost indicators from Honduras' September 2007 Multi-Purpose Continuous Household Survey to estimate the likelihood that a household has income below a given poverty line. Field workers can collect responses in about ten minutes. The scorecard's accuracy is reported for a range of poverty lines. The scorecard is a practical way for pro-poor programs in Honduras to measure poverty rates, to track changes in poverty rates over time, and to segment clients for targeted services.

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Simple Poverty Scorecard® Poverty-Assessment Tool

			Name	Identifier
Interview ID:				
Interview date:		Participant:		
Country:	HND	Field agent:		
Scorecard:	001	Service point:		
Sampling wgt.:		Number of household members:		

Indicator	Value	Points	Score
1. How many household members are 14-years-old or younger?	A. Five or more	0	
	B. Four	11	
	C. Three	14	
	D. Two	16	
	E. One	23	
	F. None	32	
2. What is the highest educational level that the female head/spouse has reached?	A. None, pre-school, or literacy program	0	
	B. Primary school	6	
	C. No female head/spouse, common cycle, or no data	10	
	D. Diversified or higher	14	
3. What is the main occupation of the male head/ spouse?	A. No data or no main occupation	0	
	B. Farmer, rancher, agricultural worker, or no male head/spouse	9	
	C. Shop owner, salesperson, service worker, transport and storage operator, or worker in textiles, construction, mechanics, graphics, chemicals, food processing, etc.	11	
	D. Office worker, transportation operator, professional, technician, director, manager, administrator, or related job	16	
4. How many household members receive a salary in their main occupation?	A. None	0	
	B. One	3	
	C. Two or more	10	
5. How many rooms does the household use as bedrooms?	A. One	0	
	B. Two	1	
	C. Three	4	
	D. Four or more	5	
6. What is the main construction material of the floors of the residence?	A. Dirt, other, or no data	0	
	B. Mud bricks, poured concrete, or wood	3	
	C. Cement bricks	4	
	D. Ceramic tile or granite	7	
7. What is the household's source of water?	A. Not public network	0	
	B. Public network	3	
8. Does any household member have a working refrigerator?	A. No	0	
	B. Yes	4	
9. Does any household member have a working stove with four burners?	A. No	0	
	B. Yes	5	
10. Does any household member have a working television with or without cable?	A. No	0	
	B. Yes, without cable	2	
	C. Yes, with cable	4	

Score:

Simple Poverty Scorecard® Poverty-Assessment Tool Honduras

1. Introduction

Pro-poor programs in Honduras can use the Simple Poverty Scorecard poverty-assessment tool to estimate the likelihood that a household has income below a given poverty line, to measure groups' poverty rates at a point in time, to track changes in groups' poverty rates over time, and to segment clients for targeted services.

The direct approach to poverty measurement via surveys is difficult and costly. As a case in point, Honduras' September 2007 Multi-Purpose Continuous Household Survey (EPHPM, *Encuesta Permanente de Hogares de Propósitos Múltiples*) runs 20 pages. The income module includes dozens of questions.

In contrast, the indirect approach via the scorecard is simple, quick, and inexpensive. It uses ten verifiable indicators (such as "What is the main construction material of the floors of the residence?" and "Does any household member have a working refrigerator?") to get a score that is highly correlated with poverty status as measured by income from the long survey.

The scorecard differs from "proxy means tests" (Coady, Grosh, and Hoddinott, 2002) in that it is tailored to the capabilities and purposes not of national governments but rather of local pro-poor organizations. The feasible poverty-measurement options for local organizations are typically subjective and relative (such as participatory wealth

ranking) or blunt (such as rules based on land-ownership or housing quality). These approaches may be costly, their results are not comparable across organizations nor countries, and their accuracy and precision are unknown.

The scorecard can serve several purposes. For example, a local pro-poor organization can use scoring to measure the share of its participants with income below a poverty line such as the Millennium Development Goals' line of $1.25/day at 2005 purchase-power parity (PPP). Or USAID microenterprise partners could use the scorecard to report how many of its participants are among the poorest half of people below the national poverty line. Or an organization could use the scorecard to measure movement across a poverty line over time (for example, Daley-Harris, 2009). For all these uses, the scorecard is an income-based, objective tool with known accuracy. While income surveys are costly even for governments, many local pro-poor organizations can implement an inexpensive scorecard.

The statistical approach here aims to be understood by non-specialists. After all, if managers are to adopt the scorecard on their own and apply it to inform their decisions, they must first trust that it works. Transparency and simplicity build trust. Getting "buy-in" matters; proxy means tests and regressions on the "determinants of poverty" have been around for three decades, but they are rarely used to inform decisions by local pro-poor organizations. This is not because these tools do not work, but because they are presented (when they are presented at all) as tables of regression coefficients incomprehensible to non-specialists (with indicator names such as

"LGHHSZ_2", negative points, and points with many decimal places). Thanks to the predictive-modeling phenomenon known as the "flat maximum", simple scorecards are about as accurate as complex ones.

The technical approach here is innovative in how it associates scores with poverty likelihoods, in the extent of its accuracy tests, and in its derivation of formulas for standard errors. Although the accuracy tests are simple and standard in statistical practice and in the for-profit field of credit-risk scoring, they have rarely been applied to poverty-assessment tools.

The scorecard is based on the September 2007 EPHPM conducted by Honduras' *Instituto Nacional de Estadística* (INE). Indicators are selected to be:

- Inexpensive to collect, easy to answer quickly, and simple to verify
- Strongly correlated with poverty
- Liable to change over time as poverty status changes

All points in the scorecard are zeroes or positive integers, and total scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). Non-specialists can collect data and tally scores on paper in the field in five to ten minutes.

The scorecard can be used to estimate three basic quantities. First, it can estimate a particular household's "poverty likelihood", that is, the probability that the household has per-capita income below a given poverty line.

Second, the scorecard can estimate the poverty rate of a group of households at a point in time. This is simply the average poverty likelihood among the households in the group.

Third, the scorecard can estimate changes in the poverty rate for a given group of households (or for two independent samples, both of which are representative of the same population) between two points in time. This estimate is the change in the average poverty likelihood of the group(s) of households over time.

The scorecard can also be used for targeting services to poorer households. To help managers choose an appropriate targeting cut-off, this paper reports several measures of targeting accuracy for a range of possible cut-offs.

This paper presents a single scorecard whose indicators and points are derived from household income data and Honduras' national poverty line. Scores from this single scorecard are calibrated to poverty likelihoods for six poverty lines.

The scorecard is constructed and calibrated using a sub-sample of the September 2007 EPHPM. Its accuracy is then validated on a different sub-sample of the September 2007 EPHPM as well as on the entire October 2005 EPHPM and the entire September 2004 EPHPM. While all three scoring estimators are unbiased when applied to the population from which they are derived (that is, they match the true value on average in repeated samples from the same population from which the scorecard is built), they are—like all predictive models—biased to some extent when applied to a different population.[1]

[1] Important examples of "different populations" are nationally representative samples at another point in time or non-representative sub-groups (Tarozzi and Deaton, 2007).

Thus, while the indirect scoring approach is less costly than the direct survey approach, it is also biased in practice. (The direct survey approach is unbiased by definition.) There is bias because scoring must assume that the relationships between indicators and poverty in the future will be the same as in the data used to build the scorecard. It must also assume that these relationships will be the same in all sub-groups as in the population as a whole.[2] Of course, these assumptions—ubiquitous and inevitable in predictive modeling—hold only partly.

When applied to the September 2007 validation sample for Honduras with the national poverty line and $n = 16{,}384$, the difference between scorecard estimates of groups' poverty rates and true rates at a point in time is +0.3 percentage points. Across all six lines, the average absolute difference is 0.6 percentage points, and the maximum absolute difference is 1.1 percentage points. Because the September 2007 validation sample is representative of the same population as the data that is used to construct the scorecard and because all the data come from the same time frame, the scorecard estimators are unbiased and these observed differences are due to sampling variation; the average difference would be zero if the September 2007 EPHPM were to be repeatedly redrawn and divided into sub-samples before repeating the entire scorecard-building and accuracy-testing process.

[2] Bias may also result from changes over time in the quality of data collection, from changes in the real value of poverty lines, from imperfect adjustment to account for differences in cost-of-living across time or geographic regions, or from sampling variation across surveys.

For n = 16,384, the 90-percent confidence intervals for these estimates are +/– 0.6 percentage points or less. For n = 1,024, these intervals are +/–2.3 percentage points or less.

When the scorecard built from the September 2007 construction and calibration samples is applied to both the September 2007 validation sample and the entire September 2003 EPHPM for the national line with n = 16,384 to measure change between two points in time, the difference between scorecard estimates and true values for changes in groups' poverty rates is +1.7 percentage points. The average absolute difference across all six poverty lines is 1.6 percentage points, and the maximum absolute difference is 2.2 percentage points. The 90-percent confidence interval for this estimate with n = 16,384 is +/–0.8 percentage points or less.

Estimated changes between the September 2007 EPHPM validation sample and the entire October 2005 EPHPM are less accurate, probably because one of the two periods (most likely, October 2005) is somehow unusual.

Section 2 documents data, poverty lines, and poverty rates for Honduras. Sections 3 and 4 describe scorecard construction and offer practical guidelines for use. Sections 5 and 6 detail the estimation of households' poverty likelihoods and of groups' poverty rates at a point in time. Section 7 discusses estimating changes in poverty rates, and Section 8 covers targeting. Section 9 places the new scorecard here in the context of similar existing exercises for Honduras. The final section is a summary.

2. Data and poverty lines

This section discusses the data used to construct and validate the scorecard. It also documents the poverty lines to which scores are calibrated.

2.1 Data

The scorecard is based on data from the 21,630 households in Honduras' September 2007 EPHPM (Round 35). This is the most recent national income survey available for Honduras. Households are randomly divided into three sub-samples (Figure 2):

- *Construction* for selecting indicators and points
- *Calibration* for associating scores with poverty likelihoods
- *Validation* for measuring accuracy on data not used in construction or calibration

In addition, the validation of estimates of changes in poverty rates for two independent samples between two points in time uses the 7,174 households in the October 2005 EPHPM (Round 31) and the 8,057 households in the September 2003 EPHPM (Round 28).[3]

[3] Data and documentation for the three EPHPM rounds is at `http://www.ine-hn.org/sociales/encuestas/ine/ephpm/`, retrieved 5 May 2010.

2.2 Poverty rates and poverty lines

2.2.1 Rates

As a general definition, the *poverty rate* is the share of people in a given group who live in households whose total household income (divided by the number of members) is below a given poverty line.

Beyond this general definition, there two special cases, *household-level poverty rates* and *person-level poverty rates*. With household-level rates, each household is counted as if it had only one person, regardless of true household size, so all households are counted equally. With person-level rates (the "head-count index"), each household is weighted by the number of people in it, so larger households have greater weight.

For example, consider a group of two households, the first with one member and the second with two members. Suppose further that the first household has per-capita income above a poverty line (it is "non-poor") and that the second household has per-capita income below a poverty line (it is "poor"). The household-level rate counts both households as if they had only one person and so gives a poverty rate for the group of $1 \div (1 + 1) = 50$ percent. In contrast, the person-level rate weighs each household by the number of people in it and so gives a poverty rate for the group of $2 \div (1 + 2) = 67$ percent.

Whether the household-level rate or the person-level rate is most relevant depends on the situation. If an organization's "participants" include all the people in a household, then the person-level rate is relevant. Governments, for example, are

concerned with the well-being of their people, regardless of how those people are arranged in households, so governments typically report person-level poverty rates.

If an organization has only one "participant" per household, however, then the household-level rate may be more relevant. For example, if a microlender has only one borrower in a household, then it might want to report household-level poverty rates.

The scorecard is constructed using Honduras' September 2007 EPHPM and household-level lines, scores are calibrated to household-level poverty likelihoods, and accuracy is measured for household-level rates. This use of household-level rates reflects the belief that they are the most relevant for most pro-poor organizations.

Organizations can estimate person-level poverty rates by taking a household-size-weighted average of the household-level poverty likelihoods. It is also possible to construct a scorecard based on person-level lines, to calibrate scores to person-level likelihoods, and to measure accuracy for person-level rates, but it is not done here.

2.2.2 Poverty lines

Figure 3 reports poverty lines and poverty rates for urban-, rural-, and all-Honduras, based on EPHPM Rounds 35, 31, and 28.

2.2.2.1 Official poverty lines

The derivation of Honduras' official poverty lines begins with a 30-item food basket—based on 1988 consumption patterns—that provides an average minimum daily requirement of 2,200 Calories (INE, 2007a; World Bank, 2006). The food poverty line is the cost of this food basket. For September 2007, urban food line is HNL33.79 per

person per day, and the rural food line is HNL25.93, giving household-level poverty rates of 22.8 and 53.0 percent (Figure 3).

The national poverty line is defined as the food line plus an allowance for essential non-food goods and services. The urban non-food allowance is equal to the food line, so the urban national line is twice the urban food line. The rural non-food allowance is one-third the rural food line, so the rural national line is 133 percent of the rural food line. For September 2007 (Round 35), the urban national line is HNL67.58 per person per day, and the rural national line is HNL34.62, giving household-level poverty rates of 53.1 and 64.2 percent (Figure 3).

2.2.2.2 Discrepancies with reported poverty rates

Compared with poverty rates reported in INE (2007b), the rates reported here for the national line are 3.3 percentage points lower (urban) and 0.4 percentage points lower (rural). For the food line, the poverty rates here are 0.5 percentage points higher (urban) and 0.8 percentage points higher (rural) than INE's published rates. There are two known reasons for these differences.

First, INE calculates poverty rates for Round 35 after excluding households that did not report income from a main occupation. While some such cases could be errors, many households in fact do not have income from a main occupation. Reported poverty rates for Rounds 31 and 28 also seem to use an undocumented filter that differs from the filter for Round 35.

Second, poverty status does not make sense for 3,489 households in the INE database for Round 35. These cases have income below a line, but INE does not count them as poor, or they have income above a line, but INE does not count them as non-poor. For example, one household marked by INE as poor has per-capita income 40 times greater than the poverty line. It is of course possible—perhaps probable—that the analysis in this paper is mistaken. INE has not responded to a memo (available on request) asking for clarification about these issues.

The poverty rates reported here do not exclude any households, and poverty status is derived from poverty lines and income figures in the INE database, not from the INE-provided database field purporting to record poverty status.

2.2.2.3 Additional poverty lines

Because local pro-poor organizations in Honduras may want to use different or various poverty lines, this paper calibrates scores from its single scorecard to poverty likelihoods for six lines:

- National
- Food
- USAID "extreme"
- $1.25/day 2005 PPP
- $2.50/day 2005 PPP
- $3.75/day 2005 PPP

The USAID "extreme" line is defined as the median income of people (not households) below the national line (U.S. Congress, 2002).

The $1.25/day 2005 PPP line is derived from:

- 2005 PPP exchange rate for "individual consumption expenditure by households" (World Bank, 2008): HNL9.662 per $1.00
- Price deflators:[4] 137.10 for September 2003, 162.10 for October 2005, 183.25 for September 2007, and 158.52 for 2005 on average

Using the formula in Sillers (2006), the $1.25/day 2005 PPP line for Honduras as a whole in September 2007 is:

$$(\text{2005 PPP exchange rate}) \cdot \$1.25 \cdot \frac{\text{CPI}_{\text{Sept. 2007}}}{\text{CPI}_{\text{Ave. 2005}}} =$$

$$\left(\frac{\text{HNL9.662}}{\$1.00}\right) \cdot \$1.25 \cdot \frac{183.25}{158.52} = \text{HNL13.96}.$$

The all-Honduras $1.25/day 2005 PPP line for Rounds 28 and 31 are computed in the same way. The $2.50/day line and the $3.75/day line are multiples of the $1.25/day lines.

The 2005 PPP lines above apply to Honduras as a whole. These are adjusted for urban/rural differences in cost-of-living in a given round using:

- L, a given all-Honduras 2005 PPP poverty line
- i, index to urban/rural ($i = 0$ for urban, $i = 1$ for rural)
- p_i, population proportion in area i
- π_i, national poverty line in area i

The cost-of-living-adjusted poverty line L_j for area i is then $\frac{L \cdot \pi_i}{\sum_{j=0}^{1} p_j \cdot \pi_j}$.

[4] Banco Central de Honduras, retrieved 5 May 2010 from `http://www.bch.hn/download/ipc_historico/ipcm912004.pdf`.

3. Scorecard construction

For the Honduras scorecard, about 90 potential indicators are initially prepared in the areas of:

- Family composition (such as household size)
- Education (such as the education of the female head/spouse)
- Employment (such as the main occupation of the male head/spouse)
- Housing (such as the main construction material of the floors)
- Ownership of durable goods (such as refrigerators or stoves)

Figure 4 lists all the candidate indicators, ranked by the entropy-based "uncertainty coefficient" that is a measure of how well the indicator predicts poverty on its own (Goodman and Kruskal, 1979).

The scorecard also aims to measure *changes* in poverty through time. This means that, when selecting indicators and holding other considerations constant, preference is given to more sensitive indicators. For example, ownership of a stove is probably more likely to change in response to changes in poverty than is the age of the male head/spouse.

The scorecard itself is built using the national poverty line and Logit regression on the construction sub-sample. Indicator selection uses both judgment and statistics (forward stepwise, based on "c"). The first step is to use Logit to build one scorecard for each candidate indicator. Each scorecard's accuracy is taken as "c", a measure of ability to rank by poverty status (SAS Institute Inc., 2004).

One of these one-indicator scorecards is then selected based on several factors (Schreiner *et al.*, 2004; Zeller, 2004), including improvement in accuracy, likelihood of

acceptance by users (determined by simplicity, cost of collection, and "face validity" in terms of experience, theory, and common sense), sensitivity to changes in poverty status, variety among indicators, and verifiability.

A series of two-indicator scorecards are then built, each based on the one-indicator scorecard selected from the first step, with a second candidate indicator added. The best two-indicator scorecard is then selected, again based on "c" and judgment. These steps are repeated until the scorecard has 10 indicators.

This algorithm is a Logit analogue to the familiar R^2-based stepwise with least-squares regression. It differs from naïve stepwise in that the criteria for selecting indicators include not only statistical accuracy but also judgment and non-statistical factors. The use of non-statistical criteria can improve robustness through time and helps ensure that indicators are simple and make sense to users.

The final step is to transform the Logit coefficients into non-negative integers such that total scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line).

The single scorecard here applies to all of Honduras. Tests for Mexico and India (Schreiner, 2006a and 2006b), Sri Lanka (Narayan and Yoshida, 2005), and Jamaica (Grosh and Baker, 1995) suggests that segmenting scorecards by urban/rural does not improve targeting much, although such segmentation may improve the accuracy of estimated poverty rates (Tarozzi and Deaton, 2007).

4. Practical guidelines for scorecard use

The main challenge of scorecard design is not to squeeze out the last drops of accuracy but rather to improve the chances that scoring is actually used (Schreiner, 2005). When scoring projects fail, the reason is not usually technical inaccuracy but rather the failure of an organization to decide to do what is needed to integrate scoring in its processes and to learn to use it properly (Schreiner, 2002). After all, most reasonable scorecards predict tolerably well, thanks to the empirical phenomenon known as the "flat maximum" (Falkenstein, 2008; Hand, 2006; Baesens *et al.*, 2003; Lovie and Lovie, 1986; Kolesar and Showers, 1985; Stillwell, Barron, and Edwards, 1983; Dawes, 1979; Wainer, 1976; Myers and Forgy, 1963). The bottleneck is less technical and more human, not statistics but organizational change management. Accuracy is easier to achieve than adoption.

The scorecard here is designed to encourage understanding and trust so that users will want to adopt it and use it properly. Of course, accuracy is important, but so are simplicity, ease-of-use, and "face validity". Programs are more likely to collect data, compute scores, and pay attention to the results if, in their view, scoring does not make a lot of "extra" work and if they think that the whole process generally makes sense.

To this end, the scorecard here fits on a single page. The construction process, indicators, and points are simple and transparent. "Extra" work is minimized; non-specialists can compute scores by hand in the field because the scorecard has:

- Only 10 indicators
- Only categorical indicators
- Simple weights (non-negative integers, and no arithmetic beyond addition)

A field worker using the paper scorecard would:

- Record participant identifiers
- Read each question from the scorecard
- Circle each response and its points
- Write the points in the far-right column
- Add up the points to get the total score
- Implement targeting policy (if any)
- Deliver the paper scorecard to a central office for data entry and filing

4.1 Quality control

Of course, field workers must be trained. The quality of outputs depends on the quality of inputs. If organizations or field workers gather their own data and if they believe that they have an incentive to exaggerate poverty rates (for example, if funders reward them for higher poverty rates), then it is wise to do on-going quality control via data review and random audits (Matul and Kline, 2003).[5] IRIS Center (2007a) and Toohig (2008) are useful nuts-and-bolts guides for planning, budgeting, training field

[5] If an organization does not want field workers to know the points associated with indicators, then they can use the version of Figure 1 without points and apply the points later in a spreadsheet or database at the central office.

workers and supervisors, logistics, sampling, interviewing, piloting, recording data, and controlling quality.

In particular, while collecting scorecard indicators is relatively easier than most alternatives, it is still absolutely difficult. Training and explicit definitions of the terms and concepts in the scorecard is essential.[6] For example, one study in Nigeria finds distressingly low inter-rater and test-retest correlations for indicators as seemingly simple and obvious as whether the household owns an automobile (Onwujekwe, Hanson, and Fox-Rushby, 2006).

For self-reports in the first stage of targeting in a Mexican program, Martinelli and Parker (2007) find that "underreporting [of asset ownership] is widespread but not overwhelming, except for a few goods . . . [and] overreporting is common for a few goods, which implies that self-reporting may lead to the exclusion of deserving households" (pp. 24–25). Still, as done in the second stage of the Mexican targeting process, field agents can verify responses with a home visit and correct false reports.

[6] Appendix A is a guide for interpreting indicators in Honduras' scorecard.

4.2 Implementation and sampling

In terms of implementation and sample design, an organization must make choices about:

- Who will do the scoring
- How scores will be recorded
- What participants will be scored
- How many participants will be scored
- How frequently participants will be scored
- Whether scoring will be applied at more than one point in time
- Whether the same participants will be scored at more than one point in time

The non-specialists who apply the scorecard with participants in the field can be:

- Employees of the organization
- Third-party contractors

Responses, scores, and poverty likelihoods can be recorded:

- On paper in the field and then filed at an office
- On paper in the field and then keyed into a database or spreadsheet at an office
- On portable electronic devices in the field and then downloaded to a database

The subjects to be scored can be:

- All participants
- A representative sample of all participants
- All participants in a representative sample of branches
- A representative sample of all participants in a representative sample of branches
- A representative sample of a sub-group relevant for a particular question

If not determined by other factors, the number of participants to be scored can be derived from sample-size formulas (presented later) for a desired confidence level and a desired confidence interval.

Frequency of application can be:

- At in-take of new clients only (precluding measuring change in poverty rates)
- As a once-off project for current participants (precluding measuring change)
- Once a year or at some other fixed time interval (allowing measuring change)
- Each time a field worker visits a participant at home (allowing measuring change)

When the scorecard is applied more than once in order to measure changes in poverty rates, it can be applied:

- With different sets of participants, with each set representative of all participants
- With a single set of participants

One common bundle of implementation and design choices is illustrated by BRAC and ASA, two microlenders in Bangladesh (each with more than 7 million participants) who are applying the Simple Poverty Scorecard tool for Bangladesh (Chen and Schreiner, 2009a). Their design is that loan officers in a random sample of branches score all their clients each time they visit a homestead (about once a year) as part of their standard due diligence prior to loan disbursement. Responses in the field are recorded on paper before being sent to a central office to be entered into a database. The sampling plans of ASA and BRAC cover 50,000–100,000 participants each, far more than required to inform most relevant decisions at a typical pro-poor organization.

5. Estimates of household poverty likelihoods

The sum of scorecard points for a household is called the *score*. For Honduras, scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). While higher scores indicate less likelihood of being below a poverty line, the scores themselves have only relative units. For example, doubling the score does not double the likelihood of being above a poverty line.

To get absolute units, scores must be converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. The user does this via simple look-up tables. For the example of the national line with the September 2007 EPHPM, scores of 50–54 have a poverty likelihood of 57.0 percent, and scores of 55–59 have a poverty likelihood of 50.6 percent (Figure 5).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 50–54 are associated with a poverty likelihood of 57.0 percent for the national line but 30.4 percent for the food line.[7]

[7] Starting with Figure 5, many figures have 18 versions, one for each of the six poverty lines for the Round 35 scorecard applied to the Round 35 validation sample, one for each of the six poverty lines for the Round 35 scorecard applied to Round 31, and one for each of the six poverty lines for the Round 35 scorecard applied to Round 28. The tables are grouped by poverty line and by the data used for validation. Single tables that pertain to all poverty lines and rounds are placed with the tables for the national line and the Round 35 validation sample.

5.1 Calibrating scores with poverty likelihoods

A given score is non-parametrically associated ("calibrated") with a poverty likelihood by defining the poverty likelihood as the share of households in the calibration sub-sample who have the score and who are below a given poverty line.

For the example of the national line (Figure 6), there are 11,191 (normalized) households in the calibration sub-sample with a score of 50–54, of whom 6,383 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 50–54 is then 57.0 percent, as 6,383 ÷ 11,191 = 57.0 percent.

To illustrate further with the national line and a score of 55–59, there are 10,543 (normalized) households in the calibration sample, of whom 5,336 (normalized) are below the line (Figure 6). Thus, the poverty likelihood for this score is 5,336 ÷ 10,543 = 50.6 percent.

The same method is used to calibrate scores with estimated poverty likelihoods for all six poverty lines.

Figure 7 shows, for all scores, the likelihood that income falls in a range demarcated by two adjacent poverty lines. For example, the daily income of someone with a score of 50–54 falls in the following ranges with probability:

- 8.1 percent — below the $1.25/day 2005 PPP line
- 14.3 percent — between the $1.25/day 2005 PPP and the USAID "extreme" lines
- 5.3 percent — between the USAID "extreme" and the $2.50/day 2005 PPP lines
- 2.8 percent — between the $2.50/day 2005 PPP and the food lines
- 16.0 percent — between the food and the $3.75/day 2005 PPP lines
- 10.6 percent — between the $3.75/day 2005 PPP and the national lines
- 43.0 percent — above the national line

Even though the scorecard is constructed partly based on judgment, this calibration process produces poverty likelihoods that are objective, that is, derived from survey data on income and quantitative poverty lines. The poverty likelihoods would be objective even if indicators and/or points were selected without any data at all. In fact, objective scorecards of proven accuracy are often based only on judgment (Fuller, 2006; Caire, 2004; Schreiner *et al.*, 2004). Of course, the scorecard here is constructed with both data and judgment. The fact that this paper acknowledges that some choices in scorecard construction—as in any statistical analysis—are informed by judgment in no way impugns the objectivity of the poverty likelihoods, as this depends on using data in score calibration, not on using data (and nothing else) in scorecard construction.

Although the points in Honduras' scorecard are transformed coefficients from a Logit regression, scores are not converted to poverty likelihoods via the Logit formula of 2.718281828^{score} x $(1+ 2.718281828^{score})^{-1}$. This is because the Logit formula is esoteric and difficult to compute by hand. Non-specialists find it more intuitive to define the poverty likelihood as the share of households with a given score in the calibration sample who are below a poverty line. In the field, converting scores to poverty likelihoods requires no arithmetic at all, just a look-up table. This non-parametric calibration can also improve accuracy, especially with large calibration samples.

5.2 Accuracy of estimates of households' poverty likelihoods

As long as the relationship between indicators and poverty does not change and as long as the scorecard is applied to households who are representative of the same population from which the scorecard is constructed, this calibration process produces unbiased estimates of poverty likelihoods. *Unbiased* means that in repeated samples from the same population, the average estimate matches the true poverty likelihood. The scorecard also produces unbiased estimates of poverty rates at a point in time, as well as unbiased estimates of changes in poverty rates between two points in time.[8]

But the relationship between indicators and poverty does change with time and also across sub-groups in Honduras' population, so the scorecard will generally be biased when applied after the end date of fieldwork for the September 2007 EPHPM (as it must be applied in practice) or when applied with non-nationally representative groups (as it would be applied by local pro-poor organizations).

[8] This follows because these estimates of groups' poverty rates are linear functions of the unbiased estimates of households' poverty likelihoods.

How accurate are estimates of households' poverty likelihoods, given the assumption of representativeness? To check, the scorecard is applied to 1,000 bootstrap samples of size n = 16,384 from the Round 35 validation sub-sample. Bootstrapping entails (Efron and Tibshirani, 1993):

- Score each household in the validation sample
- Draw a new bootstrap sample *with replacement* from the validation sample
- For each score, compute the true poverty likelihood in the bootstrap sample, that is, the share of households with the score who have income below a poverty line
- For each score, record the difference between the estimated poverty likelihood (Figure 5) and the true poverty likelihood in the bootstrap sample
- Repeat the previous three steps 1,000 times
- For each score, report the average difference between estimated and true poverty likelihoods across the 1,000 bootstrap samples
- For each score, report the two-sided interval containing the central 900, 950, or 990 differences between estimated and true poverty likelihoods

For each score range and for n = 16,384, Figure 8 shows the average difference between estimated and true poverty likelihoods as well as confidence intervals for the differences.

For the national line in the Round 35 validation sample, the average poverty likelihood across bootstrap samples for scores of 50–54 is too low by 4.8 percentage points (Figure 8). For scores of 55–59, the estimate is too high by 2.7 percentage points.[9]

[9] These differences are not zero, despite the estimator's unbiasedness, because the scorecard comes from a single sample. The average difference by score would be zero if samples were repeatedly drawn from the population and split into sub-samples before repeating the entire construction and calibration process.

The 90-percent confidence interval for the differences for scores of 50–54 is +/–3.4 percentage points (Figure 8). This means that in 900 of 1,000 bootstraps, the difference between the estimate and the true value is between –8.2 and –1.4 percentage points (because –4.8 – 3.4 = –8.2, and –4.8 + 3.4 = –1.4). In 950 of 1,000 bootstraps (95 percent), the difference is –4.8 +/–3.5 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is –4.8 +/–3.9 percentage points.

For most scores, Figure 8 shows differences—some of them large—between estimated poverty likelihoods and true values. This is because the validation sub-sample is a single sample that—thanks to sampling variation—differs in distribution from the construction/calibration sub-samples and from Honduras' population. Also, some score ranges have few households in them, increasing the likelihood that sampling variation will produce large differences between estimates and true values.

For targeting, however, what matters is less the differences across all score ranges and more the differences in score ranges just above and below the targeting cut-off. This mitigates the effects of bias and sampling variation on targeting (Friedman, 1997). Section 8 below looks at targeting accuracy in detail.

Of course, if estimates of groups' poverty rates are to be usefully accurate, then errors for individual households must largely balance out. As discussed in the next section, this is generally the case in Honduras, at least for Rounds 35 and 28.

Another possible source of bias is overfitting. By construction, the scorecard here is unbiased, but it may still be *overfit* when applied after the end of fieldwork for the

September 2007 EPHPM. That is, the scorecard may fit the data from Round 35 so closely that it captures not only some real patterns but also some false patterns that, due to sampling variation, show up only in the Round 35 data. Or the scorecard may be overfit in the sense that it becomes biased as the relationships between indicators and poverty change through time. Finally, the scorecard could also be overfit when it is applied to samples from non-nationally representative sub-groups.

Overfitting can be mitigated by simplifying the scorecard and by not relying only on data but rather also considering experience, judgment, and theory. Of course, the scorecard here does this. Bootstrapping scorecard construction—which is not done here—can also mitigate overfitting by reducing (but not eliminating) dependence on a single sampling instance. Combining scorecards can also help, at the cost of complexity.

When the Round 35 scorecard is applied to Rounds 31 and 28, differences are due in part to changes in the relationships between indicators and poverty over time.

In any case, errors in individual households' likelihoods mostly balance out in the estimates of groups' poverty rates (see later sections). Furthermore, much of the differences between scorecard estimates and true values come from non-scorecard sources such as changes in the relationship between indicators and poverty, sampling variation, changes in poverty lines, inconsistencies in data quality across time, and inconsistencies/imperfections in cost-of-living adjustments across time and regions. These factors can be addressed only by improving data quantity and quality (which is

beyond the scope of the scorecard), by updating data, or by reducing overfitting (which likely has limited returns, given the scorecard's parsimony).

6. Estimates of a group's poverty rate at a point in time

A group's estimated poverty rate at a point in time is the average of the estimated poverty likelihoods of the individual households in the group.

To illustrate, suppose a program samples three households on Jan. 1, 2010 and that they have scores of 20, 30, and 40, corresponding to poverty likelihoods of 94.3, 89.8, and 76.3 percent (national line, Figure 5). The group's estimated poverty rate is the households' average poverty likelihood of $(94.3 + 89.8 + 76.3) \div 3 = 86.8$ percent.[10]

6.1 Accuracy of estimated poverty rates at a point in time

How accurate is this estimate? For a range of sample sizes, Figure 10 reports average differences between estimated and true poverty rates as well as precision (confidence intervals for the differences) for the Round 35 Honduras scorecard applied to 1,000 bootstrap samples from the Round 35 validation sample and also to the complete Rounds 31 and 28.

Summarizing Figure 10 across poverty lines and years for $n = 16{,}384$, Figure 9 shows that the absolute differences between estimated poverty rates and true rates for the Round 35 scorecard applied to the Round 35 validation sample are 1.1 percentage

[10] The group's poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is $(20 + 30 + 40) \div 3 = 30$, and the poverty likelihood associated with the average score is 89.8 percent. This is not the 86.8 percent found as the average of the three poverty likelihoods associated with each of the three scores.

points or less. The average absolute difference across the six poverty lines in this case is 0.6 percentage points.

Differences are larger for the Round 35 Honduras scorecard applied two years back to Round 31 (October 2005). The largest absolute difference is 7.7 percentage points, and the average absolute difference is 4.3 percentage points.

Round 31 seems odd. Poverty increased sharply from Round 28 to Round 31—especially for the poorest—and then reversed from Round 31 to Round 35. Such large, abrupt changes may signal issues with data or poverty lines. This is consistent with the fact that the scorecard is more accurate when applied even further back in time to Round 28 (September 2003). Four years out, the largest absolute difference is 3.2 percentage points, and the absolute average across the six lines is 1.4 percentage points. The average absolute true change in true poverty over the four years was –3.1 percentage points (Figure 2). This suggests that the poverty spike in 2005 may be an aberration—in data, poverty lines, or actual poverty—that scoring cannot be expected to capture.

In terms of precision, the 90-percent confidence interval for a group's estimated poverty rate at a point in time in any round with $n = 16{,}384$ is +/–0.6 percentage points or less (Figure 9). This means that in 900 of 1,000 bootstraps of this size, the absolute difference between the estimate and the average estimate is 0.6 percentage points or less.

In the specific case of the national line and the Round 35 validation sample, 90 percent of all samples of $n = 16{,}384$ produce estimates that differ from the true value in the range of +0.3 + 0.5 = +0.8 to +0.3 – 0.5 = –0.2 percentage points. This is because +0.3 is the average difference and +/–0.5 is its 90-percent confidence interval. The average difference is +0.3 because the average scorecard estimate is too high by 0.3 percentage points; the scorecard tends to estimate a poverty rate of 59.4 percent for the Round 35 validation sample, but the true value is 59.1 percent (Figure 2).

Regardless of whether something unusual happened in 2005, part of these differences is due to sampling variation across survey rounds and in the division of the September 2007 EPHPM into three sub-samples, as well as small design differences across rounds. And some differences are due to changes in the relationships between indicators and poverty over time. Estimates of poverty rates at a point in time will be most accurate for periods that resemble September 2007.

6.2 Standard-error formula for estimates of poverty rates at a point in time

How precise are the point-in-time estimates? Because they are averages, the estimates have a Normal distribution and can be characterized by their average difference vis-à-vis true values, along with the standard error of the average difference.

To derive a formula for the standard errors of estimated poverty rates at a point in time for indirect measurement via scorecards (Schreiner, 2008a), note that the textbook formula (Cochran, 1977) that relates confidence intervals with standard errors in the case of direct measurement of poverty rates is $c = +/- z \cdot \sigma$, where:

c is a confidence interval as a proportion (*e.g.*, 0.02 for +/–2 percentage points),

z is from the Normal distribution and is $\begin{cases} 1.64 \text{ for confidence levels of 90 percent} \\ 1.96 \text{ for confidence levels of 95 percent} \\ 2.58 \text{ for confidence levels of 99 percent} \end{cases}$,

σ is the standard error of the estimated poverty rate, that is, $\sqrt{\frac{p \cdot (1-p)}{n}}$,

p is the proportion of households below the poverty line in the sample, and

n is the sample size.

For example, with a sample $n = 16{,}384$, 90-percent confidence ($z = 1.64$), and a poverty rate p of 59.1 percent (the true rate in the Round 35 validation sample for the national line in Figure 2), the confidence interval c is

$$+/- z \cdot \sqrt{\frac{p \cdot (1-p)}{n}} = +/- 1.64 \cdot \sqrt{\frac{0.591 \cdot (1-0.591)}{16{,}384}} = +/–0.630 \text{ percentage points.}$$

The scorecard, however, does not measure poverty directly, so this formula is not applicable. To derive a formula for the Honduras scorecard, consider Figure 10, which reports empirical confidence intervals c for the differences for the scorecard applied to 1,000 bootstrap samples of various sample sizes from a validation sample. For $n =$ 16,384, the national line, and the Round 35 validation sub-sample, the 90-percent

confidence interval is +/–0.530 percentage points.[11] Thus, the ratio of confidence intervals with the scorecard and with direct measurement is 0.530 ÷ 0.630 = 0.84.

Now consider the same case, but with n = 8,192. The confidence interval under direct measurement is $+/-1.64 \cdot \sqrt{\frac{0.591 \cdot (1-0.591)}{8{,}192}}$ =+/–0.891 percentage points. The empirical confidence interval with the Honduras scorecard for the national line (Figure 10) is +/–0.800 percentage points. Thus for n = 8,192, the ratio is 0.800 ÷ 0.891 = 0.90.

This ratio of 0.90 for n = 8,192 is not too far from the ratio of 0.84 for n = 16,384. Indeed, across all sample sizes of 256 or more in Figure 10, the average ratio turns out to be 0.87, implying that confidence intervals for indirect estimates of poverty rates via the Honduras scorecard and this poverty line are about 13 percent narrower than those for direct estimates. This 0.87 appears in Figure 9 as the "α factor" because if $\alpha = 0.87$, then the formula relating confidence intervals c and standard errors σ for the Honduras scorecard is $c = +/- z \cdot \alpha \cdot \sigma$. The standard error σ for point-in-time estimates of poverty rates via scoring is $\alpha \cdot \sqrt{\frac{p \cdot (1-p)}{n}}$.

In general, α could be more or less than 1.00. When α is less than 1.00, it means that the scorecard is more precise than direct measurement. This occurs in 16 of 18 nine of line-round combinations in Figure 9.

The formula relating confidence intervals to standard errors for the scorecard can be rearranged to give a formula for determining sample size n before measurement.[12] If

[11] Due to rounding, Figure 10 displays 0.5, not 0.530.

$\hat{p}$ is the expected poverty rate before measurement, then the formula for n based on the desired confidence level that corresponds to z and the desired confidence interval $+/-c$ under the scorecard is $n = \left(\frac{\alpha \cdot z}{c}\right)^2 \cdot \hat{p} \cdot (1 - \hat{p})$.

To illustrate how to use this, suppose $c = 0.04310$ and $z = 1.64$ (90-percent confidence), and $\hat{p} = 0.586$ (the average poverty rate for the national line in the Round 35 construction and calibration sub-samples, Figure 2). Then the formula gives $n = \left(\frac{0.87 \cdot 1.64}{0.04310}\right)^2 \cdot 0.586 \cdot (1 - 0.586) = 266$, not far from to the sample size of 256 observed for these parameters in Figure 10.

Of course, the α factors in Figure 9 are specific to Honduras, its poverty lines, its poverty rates, and this scorecard. The method for deriving the formulas, however, is valid for any poverty-assessment tool following the approach in this paper.

In practice after the end of the Round 35 field work in September 2007, an organization would select a poverty line (say, the national line), select a desired confidence level (say, 90 percent, or $z = 1.64$), select a desired confidence interval (say, +/–2.0 percentage points, or $c = 0.02$), make an assumption about $\hat{p}$ (perhaps based on a previous measurement such as the 58.8 percent average for the national line in

[12] IRIS Center (2007a and 2007b) says that a sample size of $n = 300$ is sufficient for reporting estimated poverty rates to USAID. If a scorecard is as precise as direct measurement, if the expected (before measurement) poverty rate is 50 percent, and if the confidence level is 90 percent, then $n = 300$ implies a confidence interval of +/–2.2 percentage points. In fact, USAID has not specified confidence levels or intervals. Furthermore, the expected poverty rate may not be 50 percent, and the scorecard could be more or less precise than direct measurement.

Round 35 in Figure 2), look up α (here, 0.87), assume that the scorecard will still work in the future and/or for non-nationally representative sub-groups,[13] and then compute the required sample size. In this illustration, $n = \left(\frac{0.87 \cdot 1.64}{0.02}\right)^2 \cdot 0.588 \cdot (1 - 0.588) =$ 1,233.

[13] This paper reports accuracy for the scorecard applied to the Round 35 validation sample and to Rounds 31 and 28, but it cannot test accuracy for later years or for other groups. Performance will deteriorate with time to the extent that the relationship between indicators and poverty changes.

7. Estimates of changes in group poverty rates over time

The change in a group's poverty rate between two points in time is estimated as the change in the average poverty likelihood of the households in the group.

7.1 Warning: Change is not impact

Scoring can estimate change. Of course, change could be for the better or for the worse, and scoring does not indicate what caused change. This point is often forgotten, confused, or ignored, so it bears repeating: the scorecard simply estimates change, and it does not, in and of itself, indicate the reason for the change. In particular, estimating the impact of program participation on poverty status requires knowing what would have happened to participants if they had not been participants. Knowing this requires either strong assumptions or a control group that resembles participants in all ways except participation. To belabor the point, the scorecard can help estimate program impact only if there is some way to know what would have happened in the absence of the program. And that information must come from somewhere beyond the scorecard.

7.2 Calculating estimated changes in poverty rates over time

Consider the illustration begun in the previous section. On Jan. 1, 2010, a program samples three households who score 20, 30, and 40 and so have poverty likelihoods of 94.3, 89.8, and 76.3 percent (national line, Figure 5). The group's baseline

estimated poverty rate is the households' average poverty likelihood of (94.3 + 89.8 + 76.3) ÷ 3 = 86.8 percent.

After baseline, two sampling approaches are possible for the follow-up round:

- Score a new, independent sample, measuring change by cohort across samples
- Score the same sample at follow-up as at baseline

By way of illustration, suppose that a year later on Jan. 1, 2011, the program samples three additional households who are in the same cohort as the three households originally sampled (or suppose that the program scores the same three original households a second time) and finds that their scores are now 25, 35, and 45 (poverty likelihoods of 93.1, 79.9, and 68.7 percent, national line, Figure 5). Their average poverty likelihood at follow-up is (93.1 + 79.9 + 68.7) ÷ 3 = 80.6 percent, an improvement of 86.8 – 80.6 = 6.2 percentage points.[14]

This suggests that about one of 16 participants crossed the poverty line in 2010. (This is a net figure; some people start above the line and end below it, and vice versa.) Among those who started below the line, about one in 14 (6.2 ÷ 86.8 = 7.0 percent) ended up above the line. Of course, the scorecard does not reveal the reasons for this change.

[14] Of course, such a huge reduction in poverty is unlikely in a year's time, but this is just an example to show how the scorecard can be used to estimate change.

7.3 Estimated changes in poverty rates in Honduras

Given the Honduras scorecard built from the construction and calibration samples of the September 2007 EPHPM (Round 35), an estimate of the change in the poverty rate is the difference between the estimated poverty rate in the Round 35 validation sample and the estimated poverty rate in Round 31 (October 2005) or Round 28 (September 2003).

In Figure 11 (summarizing Figure 12 across poverty lines), the difference between this estimate and the true value for the national line between Rounds 35 and 31 is –2.0 percentage points; the scorecard estimates a change of –6.2 percentage points, when the true change was –4.2 percentage points. Across all six lines, the scorecard consistently overestimates the reduction in poverty between the two rounds, especially for the lowest poverty lines. Even the "true" figures are a bit extreme, showing poverty reductions for the 2005 PPP lines of 8 to 10 percentage points. The data say that poverty decreased a lot from 2005 to 2007, and scoring says it decreased even more. Either the scorecard does not track change well, or the data and/or poverty lines are inconsistent between rounds. Either way, the huge reduction in poverty in Honduras in the two-year period is difficult to believe.

For Rounds 35 and 28, the scorecard estimates of change are much closer to the true values, with a maximum absolute difference of 2.2 percentage points and an average absolute difference across all six lines of 1.6 percentage points. This suggests that something about Round 31 was unusual, as that would explain the sharp decrease

in poverty—especially among the poorest—between Rounds 35 and 31 and the increase in poverty between Rounds 31 and 28.

In terms of precision, the 90-percent confidence intervals for the estimate changes across all rounds and lines with $n = 16{,}384$ is +/–0.8 percentage points or less.

Because the scorecard estimate is unbiased, these differences are due to sampling variation, changes in the relationship between indicators and poverty, changes in data collection/quality, and/or changes in poverty lines. Accuracy for Rounds 35 and 28 are like those in other tests (Schreiner, 2009a, 2009b, 2009c, 2009d, 2009e, and 2008b; Chen and Schreiner, 2009a and 2009b); Mathiassen, 2008), while the differences for Rounds 35 and 31 are much larger.

7.4 Accuracy for estimated change in two independent samples

For two equal-sized independent samples, the same logic as in the previous section can be used to derive a formula relating the confidence interval c with the standard error σ of a scorecard's estimate of the change in poverty rates over time:

$$c = +/- z \cdot \sigma = +/- z \cdot \alpha \cdot \sqrt{\frac{2 \cdot p \cdot (1 - p)}{n}} \, .$$

z, c, and p are defined as before, n is the sample size at both baseline and follow-up,[15] and α is the average (across a range of bootstrapped sample sizes) of the ratio of

[15] This means that, for a given precision and with direct measurement, estimating the change in a poverty rate over time requires four times as many measurements (not twice as many) as does estimating a poverty rate at a point in time.

the observed confidence intervals from a scorecard and the theoretical confidence intervals from the textbook formula for direct measurement for two equal-sized independent samples. All the α factors for Honduras exceed 1.00 (Figure 11), so scoring for this purpose is less precise than direct measurement, on the order of 20 to 50 percent.

The formula for standard errors can be rearranged to give a formula for sample sizes before indirect measurement via the scorecard, where $\hat{p}$ is based on previous measurements and is assumed equal at both baseline and follow-up:

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \hat{p} \cdot (1 - \hat{p}) .$$

To illustrate the use of the formula above to determine sample size for estimating changes in poverty rates across two independent samples between 2003 and 2007, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is 2 percentage points ($c = 0.02$), the poverty line is the national line, $\alpha = 1.21$ (from Figure 11), and $\hat{p} = 0.588$ (from Figure 2). Then the baseline sample size is $n = 2 \cdot \left(\frac{1.21 \cdot 1.64}{0.02} \right)^2 \cdot 0.588 \cdot (1 - 0.588) = 4{,}770$, and the follow-up sample is also 4,770.

7.5 Accuracy for estimated change for one sample, scored twice

The general formula relating the confidence interval c to the standard error σ when using scoring to estimate change for a single group of households, all of whom are scored at two points in time, is:[16]

$$c = +/- z \cdot \sigma = +/- z \cdot \alpha \cdot \sqrt{\frac{p_{12} \cdot (1 - p_{12}) + p_{21} \cdot (1 - p_{21}) + 2 \cdot p_{12} \cdot p_{21}}{n}}.$$

z, c, and α are defined as before, p_{12} is the share of all sampled households that move from below the poverty line to above it, and p_{21} is the share of all sampled households that move from above the line to below it.

As usual, the formula for σ can be rearranged to give a formula for sample size n before measurement. This requires an estimate (based on information available before measurement) of the expected shares of all households who will cross the poverty line $\hat{p}_{12}$ and $\hat{p}_{21}$. Before measurement, it is reasonable to assume that the overall change in the poverty rate will be zero, which implies $\hat{p}_{12} = \hat{p}_{21} = \hat{p}_*$, giving:

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \hat{p}_*.$$

[16] See McNemar (1947) and Johnson (2007). John Pezzullo helped find this formula.

$\hat{p}_*$ could be anything between 0 and 0.5, so more information is needed before applying this formula. Suppose that the observed relationship between $\hat{p}_*$, the number of years y between baseline and follow-up, and $p_{\text{baseline}} \cdot (1 - p_{\text{baseline}})$ is—as in Peru (Schreiner, 2009a)—close to:

$$\hat{p}_* = -0.02 + 0.016 \cdot y + 0.47 \cdot [p_{\text{baseline}} \cdot (1 - p_{\text{baseline}})] .$$

Given this, a sample-size formula for a group of households to whom the Honduras scorecard is applied twice (once after the end of field work for the September 2007 EPHPM and then again later) is:

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \{-0.02 + 0.016 \cdot y + 0.47 \cdot [p_{\text{baseline}} \cdot (1 - p_{\text{baseline}})]\}.$$

In Peru (the only other country for which there is a data-based estimate, Schreiner 2009a), the average α across years and poverty lines is about 1.30.

To illustrate the use of this formula, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is 2.0 percentage points ($c = 0.02$), the poverty line is the national line, and the sample will be scored first in 2010 and then again in 2013 ($y = 3$). The before-baseline poverty rate is 58.8 percent ($p_{2007} = 0.588$, Figure 2), and suppose $\alpha = 1.30$. Then the baseline sample size is $n = 2 \cdot \left(\frac{1.3 \cdot 1.64}{0.02} \right)^2 \cdot \{-0.02 + 0.016 \cdot 3 + 0.47 \cdot [0.588 \cdot (1 - 0.588)]\} = 3{,}225$. The same group of 3,225 households is scored at follow-up as well.

8. Targeting

When a program uses the scorecard for targeting, households with scores at or below a cut-off are labeled *targeted* and treated—for program purposes—as if they are below a given poverty line. Households with scores above a cut-off are labeled *non-targeted* and treated—for program purposes—as if they are above a given poverty line.

There is a distinction between *targeting status* (scoring at or below a targeting cut-off) and *poverty status* (having income below a poverty line). Poverty status is a fact that depends on whether income is below a poverty line as directly measured by a survey. In contrast, targeting status is a program's policy choice that depends on a cut-off and on an indirect estimate from a scorecard.

Targeting is successful when households truly below a poverty line are targeted (*inclusion*) and when households truly above a poverty line are not targeted (*exclusion*). Of course, no scorecard is perfect, and targeting is unsuccessful when households truly below a poverty line are not targeted (*undercoverage*) or when households truly above a poverty line are targeted (*leakage*).

Figure 13 depicts these four possible targeting outcomes. Targeting accuracy varies by cut-off; a higher cut-off has better inclusion (but greater leakage), while a lower cut-off has better exclusion (but higher undercoverage).

A program should weigh these trade-offs when setting a cut-off. A formal way to do this is to assign net benefits—based on a program's values and mission—to each of

the four possible targeting outcomes and then to choose the cut-off that maximizes total net benefits (Adams and Hand, 2000; Hoadley and Oliver, 1998).

Figure 14 shows the distribution of households by targeting outcome. For an example cut-off of 54 or less and the Round 35 scorecard applied to the Round 35 validation sample, outcomes for the national line are:

- Inclusion: 46.3 percent are below the line and correctly targeted
- Undercoverage: 12.8 percent are below the line and mistakenly not targeted
- Leakage: 13.3 percent are above the line and mistakenly targeted
- Exclusion: 27.6 percent are above the line and correctly not targeted

Increasing the cut-off to 59 or less improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 51.5 percent are below the line and correctly targeted
- Undercoverage: 7.6 percent are below the line and mistakenly not targeted
- Leakage: 18.6 percent are above the line and mistakenly targeted
- Exclusion: 22.3 percent are above the line and correctly not targeted

Which cut-off is preferred depends on total net benefit. If each targeting outcome has a per-household benefit or cost, then total net benefit for a given cut-off is:

(Benefit per household correctly included x Households correctly included) –
(Cost per household mistakenly not covered x Households mistakenly not covered) –
(Cost per household mistakenly leaked x Households mistakenly leaked) +
(Benefit per household correctly excluded x Households correctly excluded).

To set an optimal cut-off, a program would:

- Assign benefits and costs to possible outcomes, based on its values and mission
- Tally total net benefits for each cut-off using Figure 14 for a given poverty line
- Select the cut-off with the highest total net benefit

The most difficult step is assigning benefits and costs to targeting outcomes. Any program that uses targeting—with or without scoring—should thoughtfully consider

how it values successful inclusion or exclusion versus errors of undercoverage and leakage. It is healthy to go through a process of thinking explicitly and intentionally about how possible targeting outcomes are valued.

A common choice of benefits and costs is "Total Accuracy" (IRIS Center, 2005; Grootaert and Braithwaite, 1998). With "Total Accuracy", total net benefit is the number of households correctly included or correctly excluded:

Total Accuracy =	1	x	Households correctly included	–
	0	x	Households mistakenly undercovered	–
	0	x	Households mistakenly leaked	+
	1	x	Households correctly excluded.	

Figure 14 shows "Total Accuracy" for all cut-offs for Honduras' scorecard. For the national line in the Round 35 validation sample, total net benefit is greatest (74.0) for a cut-off of 54 or less, with about three in four households in Honduras correctly classified.

"Total Accuracy" weighs successful inclusion of households below the line the same as successful exclusion of households above the line. If a program valued inclusion more (say, twice as much) than exclusion, it could reflect this by setting the benefit for inclusion to 2 and the benefit for exclusion to 1. Then the chosen cut-off would maximize (2 x Households correctly included) + (1 x Households correctly excluded).[17]

[17] Figure 14 also reports "BPAC", the Balanced Poverty Accuracy Criteria adopted by USAID for certifying poverty-assessment tools. IRIS Center (2005) says BPAC considers accuracy in terms of the estimated poverty rate and targeting inclusion. BPAC = (Inclusion – |Undercoverage – Leakage|) x [100÷(Inclusion+Undercoverage)].

As an alternative to assigning benefits and costs to targeting outcomes and then choosing a cut-off to maximize total net benefit, a program could set a cut-off to achieve a desired poverty rate among targeted households. The third column of Figure 15 ("% targeted who are poor") shows the expected poverty rate among Honduras households who score at or below a given cut-off. For the example of the national line and the Round 35 validation sample, targeting households who score 54 or less would target 59.6 percent of all households (second column) and produce a poverty rate among those targeted of 77.8 percent (third column).

Figure 15 also reports two other measures of targeting accuracy. The first is a version of inclusion ("% of poor who are targeted"). For the example of the national line and the Round 35 validation sample with a cut-off of 54 or less, 78.4 percent of all poor households are covered.

The final targeting measure in Figure 15 is the number of successfully targeted poor households for each non-poor household mistakenly targeted (right-most column). For the national line, the Round 35 validation sample, and a cut-off of 54 or less, covering 3.5 poor households means leaking to 1 non-poor household.

9. Context of poverty-assessment tools in Honduras

This section discusses two existing Honduras poverty-assessment tools in terms of their goals, methods, poverty lines, indicators, accuracy, and precision. The relative strengths of the new scorecard here are its use of the latest nationally representative data, its out-of-sample tests of accuracy and precision, and its formulas for standard errors.

9.1 Robles

Robles (2003) uses poverty-assessment tools to construct a "poverty map" (Elbers, Lanjouw, and Lanjouw, 2003; Hentschel *et al.*, 2000) of estimated poverty rates for Honduras' 298 municipalities. The goal of the poverty map is to improve anti-poverty policy and the targeting of transfers and other government interventions.

Robles builds tools for each of Honduras' 14 largest departments using least-squares regression on the logarithm of per-capita income for households in the May 2002 EPHPM, selecting only indicators also collected by the 2001 National Census of Population and Housing.

The 14 tools are applied to 2002 census data to estimate poverty rates, using the food and national poverty lines. At the level of the municipality, the poverty-mapping estimates are more precise than direct estimates from the EPHPM. Finally, Robles makes "poverty maps" that quickly show—in a way that is clear for non-specialists—how poverty rates vary across departments and municipalities.

Poverty mapping in Robles and the scorecard in this paper are similar in that they both:

- Build poverty-assessment tools with nationally representative survey data and then apply them to other data on sub-groups that may not be nationally representative
- Use simple, verifiable indicators that are quick and inexpensive to collect
- Provide unbiased estimates when their assumptions hold
- Are used to estimate poverty rates for groups
- Seek to be useful in practice and so aim to be understood by non-specialists

Strengths of poverty mapping include that it:

- Has formally established theoretical properties
- Can be applied straightforwardly to measures of well-being beyond poverty rates
- Requires less data for scorecard construction and calibration
- Includes community-level indicators
- Uses only indicators that appear in a census

Strengths of the scorecard include that it:

- Is simpler in terms of both construction and application
- Tests accuracy empirically
- Associates poverty likelihoods with scores non-parametrically
- Uses judgment and theory in scorecard construction to reduce overfitting
- Estimates poverty likelihoods for individual households
- Reports straightforward formulas for standard errors

The basic difference between the two approaches is that poverty mapping seeks to help governments design and target pro-poor policies, while the scorecard seeks to help local pro-poor organizations manage their outreach when implementing policies.[18]

[18] Another apparent difference is that the developers of the poverty-mapping approach (Elbers, Lanjouw, and Lanjouw, 2003; Demombynes *et al.*, 2002) say that it is too inaccurate to be used for targeting individual households, while Schreiner (2008c) supports such targeting as a legitimate, potentially useful application of the scorecard. Recently, the developers of poverty mapping seem to have taken a small step away from their original position (Elbers *et al.*, 2007).

Robles' 14 tools have 20 indicators on average, selected via stepwise from:

- Household demographics:
  - Number of household members by age range:
    - 0 to 5
    - 6 to 11
    - 12 to 17
    - 18 to 24
    - 25 to 44
    - 45 to 64
    - 65 or older
  - Logarithm of the number of household members
  - Number of members who are children of the head (and its square)
- Education of household members:
  - Number of members who are illiterate and 15-years-old or older
  - Years of study by the head's spouse (and its square and cube)
  - Years of study by adults 18-years-old or older, excluding head and spouse (and its square and cube)
  - Number of members who go to
    - Primary school
    - Secondary school
    - Post-secondary school
- Characteristics of the head:
  - Whether born in a different municipality
  - Department of birth
  - Ethnic identity
  - Sex
  - Age (and its cube)
  - Marital status
  - Literacy
  - Years of study (and its square and cube)
  - Whether employed
  - Type of employment
  - Occupation
- Employment of household members:
  - Whether the head's spouse is employed
  - Number of household members who are employed by age range, excluding the head and spouse:
    - Ages 14 or older (and its square)
    - 14 to 24
    - 25 to 64

- Characteristics of the residence:
  - Type of structure
  - Tenancy status
  - Number of rooms (and its square)
  - Household members per room (and its square)
  - Type of floor
  - Type of wall
  - Source of water
  - Type of toilet arrangement
  - Source of energy for lighting
  - Means of disposal of garbage
- Asset ownership:
  - Television
  - Telephone
  - Refrigerator

Many of these indicators also enter as region-level averages from the census. The wide variation by department in the indicators selected by stepwise suggest possible overfitting.

The poverty-map tools are not intended for field use by local pro-poor organizations. While many indicators are simple and verifiable, other require calculating ratios, logarithms, squares, and cubes. The tools vary by department, and the values of region-level indicators vary within departments. The tools are presented as tables of regression coefficients with negative values, 3 decimal places, and indicator labels such as "`de65amas`" and "`anoesc3`".

Because the 2001 census does not measure income, Robles cannot test accuracy *out-of-sample*, that is, using data that was not used to construct the tool. While Robles does report standard errors (a central feature of poverty maps), he does not report

sample sizes, so the precision of the estimates of poverty rates there cannot be compared with those in this paper.

9.2 Olinto, Shapiro, and Skoufias

Olinto, Shapiro, and Skoufias ("OSS", 2006) construct a poverty-assessment tool[19] to simulate potential welfare gains due to adding household-level targeting to the geographic targeting used in Honduras' Family Allowances Program. They find that "by denying transfers to the wealthy and increasing the size of transfers to the poor, household targeting could decrease the budget of the program by 5–10 percent without affecting its welfare impact". Still, OSS believes (in line with Gelbach and Pritchett, 2000) that household-level targeting might erode the program's political support and thus that the expected gains from targeting might not be worth the risk.

Like Robles, OSS select simple indicators in the 2001 census, so applying their tool would not require any additional data collection. They test all combinations of eight candidate indicators (type of roof, type of wall, persons per room, source of electricity, and ownership of a large cooking pot, colander, corn mill, and oil/gas lamp), judging each tool by how much its use in targeting would improve welfare. OSS find that most power comes from a single indicator (persons per room), although including five or more indicators is better than using just this one.

[19] OSS uses the term *proxy means test*.

Because the measure of targeting accuracy reported in OSS differs from those here, accuracy comparisons are not possible.

10. Conclusion

Pro-poor programs in Honduras can use the scorecard to segment clients for targeted services as well as to estimate:

- The likelihood that a household has income below a given poverty line
- The poverty rate of a population at a point in time
- The change in the poverty rate of a population between two points in time

The scorecard is inexpensive to use and can be understood by non-specialists. It is designed to be practical for local pro-poor organizations who want to improve how they measure and manage their social performance.

The scorecard is built with a sub-sample of data from the September 2007 EPHPM, calibrated to six poverty lines, and tested on a different sub-sample from the September 2008 EPHPM, the entire October 2005 EPHPM, and the entire September 2003 EPHPM.

Accuracy is reported for estimates of households' poverty likelihoods, groups' poverty rates at a point in time, and changes in groups' poverty rates over time. Of course, the scorecard's estimates of change are not the same as estimates of program impact. Targeting accuracy and formula for standard errors are also reported.

When the scorecard is applied to the September 2007 validation sample with $n =$ 16,384, the absolute difference between estimates and true poverty rates at a point in time is 1.1 percentage points or less and averages—across the six poverty lines—0.6 percentage points. With 90-percent confidence, the precision of these differences for all

lines and rounds is +/–0.6 percentage points or less. Scoring's point-in-time estimates are usually more precise than direct measurement.

When used to measure change across independent samples of $n = 16{,}384$ between the Round 35 validation sample and Rounds 31 and 28, the average absolute difference between estimates and true changes is large (4.2 percentage points) for Round 31 but small (1.6 percentage points) for Round 28. This may be due to data issues or to October 2005 being unusual. Scoring's estimates of changes through time are less precise than direct measurement.

For targeting, programs can use the results reported here to select a cut-off that fits their values and mission.

Although the statistical technique is innovative, and although technical accuracy is important, the design of the scorecard focuses on transparency and ease-of-use. After all, a perfectly accurate scorecard is worthless if programs feel so daunted by its complexity or its cost that they do not even try to use it. For this reason, the scorecard is kept simple, using ten indicators that are inexpensive to collect and straightforward to verify. Points are all zeros or positive integers, and scores range from 0 to 100. Scores are related to poverty likelihoods via simple look-up tables, and targeting cut-offs are likewise simple to apply. The design attempts to facilitate adoption by helping managers understand and trust scoring and by allowing non-specialists to generate scores quickly in the field.

In sum, the scorecard is a practical, objective way for pro-poor programs in Honduras to measure poverty rates, track changes in poverty rates over time, and target services, provided that it is applied during a period similar to that of September 2007, the point in time when the data used to construct the scorecard was collected. The same approach can be applied to any country with similar data from a national income or expenditure survey.

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Appendix A:
Guide to Interpretation of Scorecard Indicators

The following information comes from:

Instituto Nacional de Estadística. (2007) "Manual de Encuestador, XXXV Encuesta Permanente de Hogares de Propósitos Múltiples", Tegucigalpa. ("the manual")

1. How many household members are 14-years-old or younger?

According to page 13 of the manual, "*household members* are those who have eaten and slept in the residence for the past six months; eaten and slept in the residence for less than six months, but who currently live in the residence and plan to continue; and those who, because of work, only spend weekends at the residence."

2. What is the highest educational level that the female head/spouse has reached?

According to page 18 of the manual, the response options are defined as follows:

None: The person has never gone to school or attended a literacy program

Literacy program: Programs to help adults learn basic reading and writing

Preschool: Pre-primary school, also known as pre-kindergarten and kindergarten. The classes teach children social habits and psycho-motor skills

Primary: The first six grades of formal schooling. It includes "basic education" educational institutions that offer nine grades

Common cycle: A three-year course of studies called the "basic plan" or the "common cycle of general culture". The prerequisite is having passed sixth grade

Diversified: A four-year course of studies whose prerequisite is having passed the common cycle or ninth grade. It includes the specialties of salesperson, public accountant, primary teacher, artist, secretary, computer technician, business administration, etc.

Higher than diversified includes the following:

Technical school: Two-year college programs for mid-level professionals. The prerequisite is having passed diversified. Majors include sales, education, etc.

Non-college post-secondary: This covers students and graduates of the National Agricultural School in Catacamas, the National School of Forestry Science in Siguatepeque, the Panamerican Agricultural College (Zamorano), military and police academies, Our Lady of Suyapa Seminary, the Center of Construction and Architectural Design, etc. It also includes graduates of the former Francisco Morazán College.

College: Public and private universities that train professionals

Graduate school: Courses of study completed after having obtained an initial college degree. The courses of study last from one to five years

3. What is the main occupation of the male head/ spouse?

According to page 33 in the manual, an *occupation* "is the type of work that the person does . . . the *main occupation* is the one that the respondent considers to be the main one." Specific definitions follow the third revision of the *CIUO*.

4. How many household members receive a salary in their main occupation?

According to pages 33–34 of the manual, this includes "blue- or white-collar public employees, blue- or white-collar private employees, and domestic servants"

A blue- or white-collar public employee is "someone who works for the government and whose salary is paid by the State, including people in the armed forces"

A blue- or white-collar private employee is "someone who works in a privately owned business"

A domestic servant "does housework for monthly remuneration. Examples are maids, cooks, washerpeople, nannies, gardeners, and chauffeurs"

5. How many rooms does the household use as bedrooms?

According to pages 10–11 of the manual, this includes "all rooms used for sleeping, regardless of whether they are used for some other purpose during the day."

A *room* is a "space demarcated by walls that reach from the floor to the roof. Folding screens or thin partitions do not count as walls."

6. What is the main construction material of the floors of the residence?

According to page 6 of the manual, "If the residence has different types of floors, record the main type."

7. What is the household's source of water?

According to page 7 in the manual, the relevant source is that which "provides the majority of water used by the household."

Public network covers water supplied by "SANAA and the municipal governments".

Not public network covers piped water provided privately, bucket-drawn wells, pump wells, rivers, creeks, springs, water-tank trucks, pickups with barrels/drums of water, public/community spigots, or others (including getting water from a neighbor).

8. Does any household member have a working refrigerator?

The manual does not provide any additional information about this indicator.

9. Does any household member have a working stove with four burners?

The manual does not provide any additional information about this indicator.

10. Does any household member have a working television with or without cable?

The manual does not provide any additional information about this indicator.

Figure 2: Sample sizes and household poverty rates by sub-sample and poverty line

			% with income below a poverty line					
				National	USAID	International 2005 PPP		
Sub-sample	**Round**	**Households**	**National**	**Food**	**'Extreme'**	**$1.25/day**	**$2.50/day**	**$3.75/day**
All Honduras	35	21,630	58.8	38.1	28.0	14.2	34.7	51.6
	31	7,174	63.3	41.2	29.9	22.4	44.5	59.6
	28	8,057	60.8	42.2	28.7	15.7	40.1	57.6
Construction								
Selecting indicators and weights	35	7,251	58.6	38.0	28.0	14.0	34.8	51.6
Calibration								
Associating scores with likelihoods	35	7,156	58.6	38.0	28.2	13.9	34.8	51.4
Validation								
Measuring accuracy	35	7,223	59.1	38.4	27.8	14.5	34.5	51.9
Change in poverty rate (percentage points)								
From 35 construction/calibration to 35 validation			–0.6	–0.4	+0.3	–0.6	+0.4	–0.4
From 35 validation to 31 for all Honduras			–4.2	–2.7	–2.1	–7.9	–10.1	–7.6
From 35 validation to 28 for all Honduras			–1.6	–3.7	–0.9	–1.1	–5.7	–5.7

Source: *Encuesta Permanente de Hogares*, Round 35 (September 2007), Round 31 (October 2005), and Round 28 (September 2003)

Figure 3: Poverty lines and poverty rates for urban areas, rural areas, and all of Honduras, rounds 35, 31, and 28, at the household level

Urban, rural, or all	Round	Line or rate	Poverty line (HNL/person/day) and poverty rate (%)					
			National	National Food	USAID 'Extreme'	International 2005 PPP		
						$1.25/day	$2.50/day	$3.75/day
Urban	35	Line	67.58	33.79	37.04	19.01	38.02	57.03
		Rate	53.1	22.8	25.8	9.3	26.8	45.2
	31	Line	56.19	28.09	27.62	16.92	33.84	50.76
		Rate	55.6	27.1	26.5	13.1	34.8	51.3
	28	Line	48.39	24.19	22.36	14.41	28.82	43.23
		Rate	52.7	28.0	25.2	13.0	35.0	50.6
Rural	35	Line	34.62	25.93	13.85	9.74	19.48	29.22
		Rate	64.2	53.0	30.1	18.8	42.3	57.8
	31	Line	28.36	21.24	9.05	8.54	17.08	25.62
		Rate	71.0	61.3	33.4	31.8	54.4	97.8
	28	Line	23.98	17.96	10.68	7.14	14.28	21.42
		Rate	68.3	55.5	32.0	18.2	45.0	64.2
All Honduras	35	Line	49.62	29.51	24.41	13.96	27.92	41.88
		Rate	58.8	38.1	28.0	14.2	34.7	51.6
	31	Line	41.10	24.38	17.55	12.37	24.75	37.12
		Rate	63.3	44.2	29.9	22.4	44.5	59.6
	28	Line	35.09	20.80	15.99	10.45	20.90	31.35
		Rate	60.8	42.2	28.7	15.7	40.1	57.6

Figure 3: Poverty lines and poverty rates for urban areas, rural areas, and all of Honduras, rounds 35, 31, and 28, at the person level

Urban, rural, or all	Round	Line or rate	Poverty line (HNL/person/day) and poverty rate (%)					
			National	National Food	USAID 'Extreme'	International 2005 PPP		
						$1.25/day	$2.50/day	$3.75/day
Urban	35	Line	67.58	33.79	37.04	19.01	38.02	57.03
		Rate	58.4	25.7	29.2	10.5	30.5	50.1
	31	Line	56.19	28.09	27.62	16.92	33.84	50.76
		Rate	61.5	31.4	30.6	15.5	39.9	57.1
	28	Line	48.39	24.19	22.36	14.41	28.82	43.23
		Rate	58.9	32.5	29.4	15.3	40.1	56.9
Rural	35	Line	34.62	25.93	13.85	9.74	19.48	29.22
		Rate	69.3	58.3	34.6	22.1	47.6	63.0
	31	Line	28.36	21.24	9.05	8.54	17.08	25.62
		Rate	76.2	66.5	38.1	36.4	59.5	73.3
	28	Line	23.98	17.96	10.68	7.14	14.28	21.42
		Rate	74.7	62.2	37.3	22.0	51.1	70.7
All Honduras	35	Line	49.62	29.51	24.41	13.96	27.92	41.88
		Rate	64.3	43.5	32.2	16.9	39.8	57.2
	31	Line	41.10	24.38	17.55	12.37	24.75	37.12
		Rate	69.5	50.4	34.7	26.8	50.5	65.9
	28	Line	35.09	20.80	15.99	10.45	20.90	31.35
		Rate	67.5	48.7	33.7	19.0	46.1	64.4

Figure 4: Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
918	What is the main fuel used for cooking? (Firewood; Kerosene; LPG, electricity, other, or does not cook)
893	What is the highest educational level reached by someone in the household? (None, literacy program, preschool, primary, or common cycle; Diversified; Secondary technical; Non-university secondary, university, graduate school, does not know/does not answer, or no data)
885	What is the main construction material of the floors of the residence? (Dirt, other, or no data; Mud bricks, poured concrete, or wood; Cement bricks; Ceramic tile or granite)
833	Does any household member have a working refrigerator? (No; Yes)
831	Does any household member have a working stove with 4 burners? (No; Yes)
831	Does any household member have a working television with or without cable? (No; Yes, without cable; Yes, with cable)
822	How many household members in their main occupation are professionals, technicians or related jobs, directors, managers, administrators, or office workers? (None; One; Two or more)
815	What is the highest educational level that the female head/spouse has reached? (None, pre-school, or literacy program; Primary school; No female head/spouse, common cycle, or no data; Diversified or higher)
777	How many household members are 14-years-old or younger? (Five or more; Four; Three; Two; One; None)
767	How many household members are 15-years-old or younger? (Five or more; Four; Three; Two; One; None)
761	How many household members are 13-years-old or younger? (Four or more; Three; Two; One; None)
756	How many household members are 12-years-old or younger? (Four or more; Three; Two; One; None)
754	How many household members are 16-years-old or younger? (Five or more; Four; Three; Two; One; None)
737	What type of toilet arrangement does the household have? (Not a flush toilet connected to sewer or septic tank; Flush toilet connected to sewer or septic tank)
723	How many household members are 11-years-old or younger? (Four or more; Three; Two; One; None)
719	How many household members are 17-years-old or younger? (Five or more; Four; Three; Two; One; None)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
696	What is the main occupation of the female head/spouse? (Farmer, rancher, agricultural worker, worker in graphics, chemicals, food processing, transport and storage operators, service worker, o no data; There is no female head/spouse; Shop owner, salesperson, transportation operator, or worker in textiles, construction, mechanics, etc.; Professional, technician, director, manager, administrator, office worker, or related job)
696	How many household members are 18-years-old or younger? (Five or more; Four; Three; Two; One; None)
694	What is the household's source of water? (Not public network; Public network)
655	Does any household member have a working television? (No; Sí)
652	What is the main construction material of the walls? (Adobe, prefabricated material, wood, wattle and daub, sticks, bamboo, scraps, other, or no data; Brick, stone, or cinder block)
637	How many household members are 20-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
636	Does any household member have cable television? (No; Yes)
633	Does any household member have a working stereo system? (No; Yes)
616	Does any household member have a working car for personal or business use? (No; Yes)
577	What type of lighting does the residence have? (Not public grid; Public grid)
572	What is the highest educational level that male head/spouse reached? (None, literacy program, or preschool; Primary; There is no male head/spouse, does not know/does not answer, or no data; Common cycle, diversified, secondary technical, non-university secondary, university, or graduate school)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
567	What does the firm, business, or farm mainly produce where the male head/spouse works? (Agriculture, forestry, hunting, fishing, or mining; Other not well-specified activities or no data; There is no male head/spouse; Construction, retail and wholesale trade, hotels, or restaurants; Manufacturing, electricity, gas, and water, transportation, logistics, and communications, financial firms, insurance, real estate, and business services)
565	How many household members in their main occupation are farmers, ranchers or agricultural workers? (One or more; None)
545	How many family members work for a firm, business, or farm in the areas of agriculture, forestry, hunting, or fishing? (Two or more; One; None)
541	If any household members receive a salary in their main line of work, do any receive their pay monthly or twice a month? (No, or no salaried members; Yes)
525	Does any household member have a working computer? (No; Yes)
519	How many household members are 25-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
517	If any household members receive a salary in their main line of work, do any receive their pay monthly, twice a month, or weekly? (No, or no salaried members; Yes)
515	What is the main occupation of the male head/spouse? (No data; There is no male head/spouse, or farmer, rancher, agricultural worker; Worker in graphics, chemicals, food processing, logistics, service worker, shop owner, salesperson, or worker in textiles, construction, mechanics, etc.; Professional, technician, director, manager, administrator, office worker, or related job, or transportation operator)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
503	What is the working arrangement of the female head/spouse in her main line of work? (No data or unremunerated worker; Unremunerated worker in the family business, farmer, or self-employed; There is no female head/spouse; Salaried employee)
502	How many rooms does the residence have (including the kitchen but excluding any bathrooms)? (One to four; Five; Six or more)
466	Does any household member have a working fixed-line phone? (No; Yes)
429	How often is the female head/spouse paid in her main line of work? (Daily or no data; There is no female head/spouse; Twice a month or weekly; Monthly)
414	What does the firm, business, or farm mainly produce where the female head/spouse works? (Agriculture, forestry, hunting, fishing, mining, o other not well-specified activities or undefined activities; Manufacturing, electricity, gas, or water; There is no female head/spouse; Mining, construction, retail and wholesale trade, hotels, restaurants, transportation, logistics, communications, financial firms, insurance, real estate, and business services)
413	How many household members are 6-years-old or younger? (Two or more; One; None)
380	How many members does the household have? (Seven or more; Six; Five; Four; Three; Two; One; None)
378	Does anyone in the household receive a snack at school? (Yes; No)
373	What is the main construction material of the roof? (Mud covering, leaves, thatch, or the like, scrap material, or no data; Wood, tin sheets, *aluzín* sheets, or other; Asbestos or concrete)
360	What is the working arrangement of the male head/spouse in her main line of work? (Unremunerated worker (family business or otherwise), or no data; Farmer; There is no male head/spouse; Salaried employee; Self-employed)
356	Does the female head/spouse know how to read and write? (No; Yes; There is no female head/spouse)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
356	Do all household members ages 7 to 14 attend school? (No; Yes; No members ages 7 to 14)
347	In the past week, did the female head/spouse spend one hour or more working or in some activity paid in money or in kind, or did she receive some income, or did she help someone else do some work without pay (except household chores), or even though she did not work in the past week, does she have a job or a business that she plans to return to soon? (No; Yes or no female head/spouse)
344	Do all household members ages 7 to 12 attend school? (No; Yes; No members ages 7 to 12)
336	Do all household members ages 7 to 15 attend school? (No; Yes; No members ages 7 to 15)
333	Do all household members ages 7 to 13 attend school? (No; Yes; No members ages 7 to 13)
330	Do all household members ages 7 to 16 attend school? (No; Yes; No members ages 7 to 16)
327	Do all household members ages 7 to 11 attend school? (No; Yes; No members ages 7 to 11)
324	How often is the male head/spouse paid in his main line of work? (Daily; No data; Weekly; There is no male head/spouse; Twice a month; Monthly)
299	Do all household members ages 7 to 17 attend school? (No; Yes; No members ages 7 to 17)
285	How many household members in their main occupation are self-employed in agriculture? (One or more; None)
283	How many rooms does the household use as bedrooms? (One; Two; Three; Four or more)
280	Do all household members ages 7 to 18 attend school? (No; Yes; No members ages 7 to 18)
277	How many household members receive a salary in their main occupation? (None; One; Two or more)
236	Does the male head/spouse know how to read and write? (No; Yes or there is no male head/spouse)
222	Do all household members ages 7 to 20 attend school? (No; Yes; No members ages 7 to 20)
203	Does anyone in the household go to a private school? (No; Yes)
187	How many working cellular telephones do members of the household have? (None; One; Two or more)
180	Does any household member have a working air conditioner? (No; Yes)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
173	Does this residence have formal title? (No or no data; Yes)
125	Do all household members ages 7 to 25 attend school? (No; Yes; No members ages 7 to 25)
116	What is the tenancy status of the residence? (Owned free-and-clear, squatter with legal rights, squatter without legal rights, transferred without compensation or received as payment for services, or no data; Rented or owned with an outstanding mortgage)
100	In the past week, how many household members spent one hour or more working or in some activity paid in money or in kind, or received some income, or helped someone else do some work without pay (except household chores), or even though they did not work in the past week, had a job or a business that they planned to return to soon? (None; One; Two or more)
79	How many household members in their main occupation are self-employed outside the agricultural sector? (None; One; Two or more)
71	Does any household member have a working motorcycle for personal or business use? (No; Yes)
64	If any household members receive a salary in their main line of work, how many have permanent employment? (No one receives a salary, or all who receive a salary have a temporary contract; One or more)
63	How old is the residence? (0 to 4 years; 5 to 8 years; 9 to 12 years; 13 or more years; No data;)
62	In what room or place does the household cook food? (In a room also used as a bedroom or in the yard, pathway, or other place; In a room dedicated to cooking, in the dining room, or does not cook)
45	What is the current marital status of the female head/spouse? (Married or cohabitating; Widowed, separated, or never-married; There is no female head/spouse, or divorced)
43	How old is the female head/spouse? (61 years or older; 60 years or younger; There is no female head/spouse)
42	What is the structure of household headship? (Both male and female heads/spouses; Female head/spouse only; Male head/spouse only)

Figure 4 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
38	Does anyone in the household know how to read and write? (No; Yes)
36	Does any household member have a working cellular phone? (No; Sí)
34	How old is the male head/spouse? (63 years or older; 36 to 45 years; There is no male head/spouse; 35 years or younger; 46 to 62 years)
19	Type of residence? (Detached house, house made of collected natural materials (country house), improvised house made of scrap materials, building not made for human habitation but used as shelter, or no data; Apartment, room in a boarding house or bunkhouse, or lodging house)
16	What is the current marital status of the male head/spouse? (Married or cohabitating; Widowed, separated, divorced, never-married, or there is no male head/spouse)
13	In the past week, did the male head/spouse spend one hour or more working or in some activity paid in money or in kind, or did he receive some income, or did he help someone else do some work without pay (except household chores), or even though he did not work in the past week, does he have a job or a business that he plans to return to soon? (No; Yes or no male head/spouse)
10	Does any household member have a working bicycle? (No; Yes)
6	Does any household member have a working radio or a radio/tape player? (Yes; No)
5	How many family members work in construction? (One or more; None)
3	If any household members receive a salary in their main line of work, do any receive their pay monthly? (No; Yes, or no salaried members)
1	How many household members in their main occupation work in services? (None; One or more)

Source: *Encuesta Permanente de Hogares* from September 2007 and the national poverty line.

National Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

(and tables pertaining to all six poverty lines)

Figure 5 (National line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	100.0
10–14	97.3
15–19	97.0
20–24	94.3
25–29	93.1
30–34	89.8
35–39	79.9
40–44	76.3
45–49	68.7
50–54	57.0
55–59	50.6
60–64	38.2
65–69	28.0
70–74	21.0
75–79	21.1
80–84	11.4
85–89	9.9
90–94	12.2
95–100	2.7

Figure 6 (National line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	10	÷	16	=	66.7
5–9	374	÷	374	=	100.0
10–14	649	÷	666	=	97.3
15–19	1,594	÷	1,644	=	97.0
20–24	2,626	÷	2,784	=	94.3
25–29	4,663	÷	5,011	=	93.1
30–34	6,708	÷	7,468	=	89.8
35–39	7,244	÷	9,065	=	79.9
40–44	8,280	÷	10,856	=	76.3
45–49	7,227	÷	10,514	=	68.7
50–54	6,383	÷	11,191	=	57.0
55–59	5,336	÷	10,543	=	50.6
60–64	3,310	÷	8,660	=	38.2
65–69	1,919	÷	6,844	=	28.0
70–74	1,193	÷	5,671	=	21.0
75–79	777	÷	3,679	=	21.1
80–84	300	÷	2,642	=	11.4
85–89	127	÷	1,279	=	9.9
90–94	78	÷	645	=	12.2
95–100	12	÷	447	=	2.7

Number of all households normalized to sum to 100,000.

Figure 7 (All poverty lines): Distribution of household poverty likelihoods across ranges demarcated by poverty lines

	Likelihood of having income in range demarcated by poverty lines per day per capita						
	<$1.25/day	=>$1.25/day and <USAID	=>USAID and <$2.50/day	=>$2.50/day and <Food	=>Food and <$3.75/day	=>$3.75/day and <National	=>National
Score	<HNL14.30	=>HNL14.30 and <HNL25.26	=>HNL25.26 and <HNL28.60	=>HNL28.60 and <HNL29.80	=>HNL29.80 and <HNL42.90	=>HNL42.90 and <HNL50.83	=>HNL50.83
0–4	66.7	0.0	0.0	0.0	0.0	0.0	33.3
5–9	42.9	38.1	14.3	4.8	0.0	0.0	0.0
10–14	55.2	15.5	16.0	2.7	5.3	2.7	2.7
15–19	61.1	16.3	11.4	4.6	1.5	2.1	3.0
20–24	45.0	18.7	15.2	10.1	2.2	3.2	5.7
25–29	39.2	22.9	15.1	6.5	6.1	3.3	7.0
30–34	32.9	22.9	14.4	6.2	9.6	3.8	10.2
35–39	20.0	18.7	12.8	10.2	10.3	7.8	20.1
40–44	14.6	23.8	9.9	5.4	14.9	7.7	23.7
45–49	10.1	18.0	6.3	4.8	19.6	9.9	31.3
50–54	8.1	14.3	5.3	2.8	16.0	10.6	43.0
55–59	4.2	12.4	3.2	0.4	20.7	9.7	49.4
60–64	2.6	9.2	1.8	0.0	17.0	7.7	61.8
65–69	2.7	4.1	0.6	0.0	12.7	8.0	72.0
70–74	2.9	2.3	0.5	0.0	9.8	5.5	79.0
75–79	3.3	2.6	0.8	0.0	9.6	4.9	78.9
80–84	3.9	0.9	0.9	0.0	2.8	2.8	88.6
85–89	1.5	2.3	0.0	0.0	2.4	3.7	90.1
90–94	7.0	3.4	0.0	0.0	1.8	0.0	87.9
95–100	0.0	0.0	0.0	0.0	2.7	0.0	97.3

Note: All poverty likelihoods in percentage units.

Figure 8 (National line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+4.2	4.3	5.0	6.2
10–14	–0.3	2.5	2.7	3.4
15–19	+1.8	2.1	2.6	3.4
20–24	+1.8	2.1	2.5	3.3
25–29	+4.5	1.8	2.2	2.8
30–34	+0.7	1.4	1.8	2.3
35–39	–4.0	2.8	2.9	3.2
40–44	–0.0	1.7	1.9	2.5
45–49	+2.9	1.9	2.3	3.0
50–54	–4.8	3.4	3.5	3.9
55–59	+2.7	1.9	2.3	3.0
60–64	+1.1	2.1	2.5	3.3
65–69	–1.1	2.4	2.8	3.6
70–74	–1.9	2.2	2.7	3.7
75–79	+9.9	2.1	2.5	3.3
80–84	+1.1	2.4	3.0	4.2
85–89	+0.6	3.1	3.6	4.7
90–94	+3.5	4.4	5.2	7.3
95–100	–3.1	4.6	5.3	7.4

Figure 9 (All poverty lines): Differences, precision of differences, and sample-size α for bootstrapped estimates of poverty rates for groups of households at a point in time for the Round 35 scorecard applied to the Round 25 validation sample and to Rounds 31 and 28

	Poverty line				
		National	USAID	International 2005 PPP	
	National	Food	'Extreme'	$1.25/day	$2.50/day	$3.75/day
Estimate minus true value						
35 scorecard applied to 35 validation	+0.3	–0.6	+1.1	–0.7	+0.8	+0.2
35 scorecard applied to Round 31	–1.7	–3.7	+0.8	–7.7	–6.9	–5.1
35 scorecard applied to Round 28	+2.1	+0.2	+3.2	+0.9	–0.6	–1.6
Precision of difference						
35 scorecard applied to 35 validation	0.5	0.5	0.5	0.4	0.5	0.5
35 scorecard applied to Round 31	0.5	0.6	0.6	0.5	0.6	0.5
35 scorecard applied to Round 28	0.5	0.5	0.5	0.4	0.6	0.5
α factor						
35 scorecard applied to 35 validation	0.87	0.83	0.93	0.95	0.89	0.87
35 scorecard applied to Round 31	0.84	0.86	0.95	1.11	0.93	0.84
35 scorecard applied to Round 28	0.82	0.86	0.94	1.02	0.93	0.85
Precision is measured as 90-percent confidence intervals in units of +/– percentage points.						
Differences and precision estimated from 1,000 bootstraps of size n = 16,384.						
α is estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.						

Figure 10 (National line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.8	69.0	75.9	86.0
4	+0.3	33.8	39.4	51.5
8	+0.1	24.9	29.0	39.4
16	+0.3	17.2	20.3	25.3
32	+0.3	12.4	15.0	18.4
64	+0.3	8.9	10.4	13.3
128	+0.3	6.4	7.5	10.1
256	+0.4	4.3	5.1	6.9
512	+0.3	3.1	3.9	5.2
1,024	+0.3	2.3	2.7	3.6
2,048	+0.3	1.5	1.8	2.4
4,096	+0.3	1.1	1.4	1.8
8,192	+0.3	0.8	1.0	1.3
16,384	+0.3	0.5	0.6	0.9

Figure 11 (All poverty lines): Differences, precision of differences, and sample-size α for bootstrapped estimates of changes in poverty rates for groups of households between two points in time for the Round 35 scorecard applied to Rounds 31 and 28

	Poverty line				
		National	USAID	International 2005 PPP	
	National	Food	'Extreme'	$1.25/day	$2.50/day	$3.75/day
Estimated change minus true change						
35 scorecard applied to Round 31	–2.0	–3.1	–0.3	–7.0	–7.7	–5.3
35 scorecard applied to Round 28	+1.7	+0.8	+2.2	+1.5	–1.4	–1.9
Precision of estimated change minus true change						
35 scorecard applied to Round 31	0.7	0.8	0.7	0.6	0.8	0.8
35 scorecard applied to Round 28	0.7	0.8	0.8	0.6	0.8	0.8
α factor						
35 scorecard applied to Round 31	1.17	1.19	1.33	1.50	1.26	1.21
35 scorecard applied to Round 28	1.21	1.20	1.32	1.40	1.30	1.21
Precision is measured as 90-percent confidence intervals in units of +/– percentage points.						
Differences and precision estimated from 1,000 bootstraps of size n = 16,384.						
α is estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.						

Figure 12 (National line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

By definition, this table does not exist for the Round 35 scorecard applied to the Round 35 validation sample.

Figure 13 (All poverty lines): Possible outcomes from targeting by poverty score

True poverty status		Targeting segment: Targeted	Targeting segment: Non-targeted
		Inclusion	**Undercoverage**
	Below poverty line	Under poverty line Correctly Targeted	Under poverty line Mistakenly Non-targeted
		Leakage	**Exclusion**
	Above poverty line	Above poverty line Mistakenly Targeted	Above poverty line Correctly Non-targeted

Figure 14 (National line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	59.1	0.0	40.9	40.9	–99.9
5–9	0.4	58.8	0.0	40.8	41.2	–98.7
10–14	1.0	58.1	0.0	40.8	41.9	–96.5
15–19	2.6	56.5	0.1	40.8	43.3	–91.1
20–24	5.2	54.0	0.3	40.6	45.7	–82.0
25–29	9.6	49.5	0.9	40.0	49.6	–66.0
30–34	16.3	42.9	1.7	39.2	55.5	–42.1
35–39	23.9	35.2	3.1	37.7	61.7	–13.9
40–44	32.3	26.9	5.6	35.3	67.5	+18.7
45–49	39.3	19.8	9.1	31.8	71.1	+48.3
50–54	46.3	12.8	13.3	27.6	74.0	+77.6
55–59	51.5	7.6	18.6	22.3	73.8	+68.5
60–64	54.8	4.3	24.0	16.9	71.7	+59.5
65–69	56.9	2.3	28.8	12.1	68.9	+51.3
70–74	58.2	0.9	33.1	7.8	66.0	+44.0
75–79	58.6	0.5	36.3	4.5	63.2	+38.5
80–84	58.9	0.2	38.7	2.2	61.1	+34.5
85–89	59.1	0.1	39.9	1.0	60.1	+32.6
90–94	59.1	0.0	40.4	0.4	59.5	+31.6
95–100	59.1	0.0	40.9	0.0	59.1	+30.9

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (National line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.0	Only poor targeted
5–9	0.4	96.0	0.6	23.8:1
10–14	1.1	97.0	1.7	32.6:1
15–19	2.7	95.9	4.4	23.6:1
20–24	5.5	94.3	8.7	16.5:1
25–29	10.5	91.6	16.3	10.9:1
30–34	18.0	90.6	27.5	9.7:1
35–39	27.0	88.5	40.4	7.7:1
40–44	37.9	85.2	54.6	5.8:1
45–49	48.4	81.2	66.5	4.3:1
50–54	59.6	77.8	78.4	3.5:1
55–59	70.1	73.5	87.1	2.8:1
60–64	78.8	69.6	92.7	2.3:1
65–69	85.6	66.4	96.1	2.0:1
70–74	91.3	63.7	98.4	1.8:1
75–79	95.0	61.7	99.2	1.6:1
80–84	97.6	60.4	99.6	1.5:1
85–89	98.9	59.7	99.9	1.5:1
90–94	99.6	59.4	100.0	1.5:1
95–100	100.0	59.1	100.0	1.4:1

Food Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

Figure 5 (Food line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	100.0
10–14	89.4
15–19	93.4
20–24	89.0
25–29	83.7
30–34	76.4
35–39	61.8
40–44	53.6
45–49	39.2
50–54	30.4
55–59	20.2
60–64	11.5
65–69	6.5
70–74	5.3
75–79	5.3
80–84	4.9
85–89	3.8
90–94	10.4
95–100	0.0

Figure 8 (Food line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+4.2	4.3	5.0	6.2
10–14	–8.3	5.3	5.3	5.3
15–19	+2.0	2.8	3.2	4.3
20–24	+7.2	3.0	3.8	4.9
25–29	+5.4	2.3	2.8	3.7
30–34	–3.4	2.6	2.8	3.1
35–39	–6.3	4.1	4.3	4.5
40–44	–0.6	2.0	2.3	3.0
45–49	+0.1	2.0	2.3	3.2
50–54	–3.1	2.4	2.6	2.9
55–59	+2.5	1.5	1.8	2.5
60–64	–0.5	1.4	1.7	2.2
65–69	–2.8	2.1	2.3	2.5
70–74	–0.6	1.3	1.5	1.9
75–79	+4.0	0.7	0.9	1.2
80–84	+1.9	1.3	1.6	2.3
85–89	–0.9	2.3	2.7	3.6
90–94	+7.1	2.8	3.6	4.3
95–100	–2.4	2.8	3.3	3.8

Figure 10 (Food line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–1.0	65.7	78.1	91.9
4	–0.4	33.8	39.4	48.7
8	–0.4	23.2	27.4	36.3
16	–0.6	16.8	20.2	25.3
32	–0.7	12.4	14.5	19.0
64	–0.8	8.5	10.0	12.9
128	–0.7	6.0	7.2	9.4
256	–0.7	4.1	5.1	6.6
512	–0.6	3.0	3.6	5.0
1,024	–0.6	2.0	2.4	3.1
2,048	–0.6	1.5	1.7	2.2
4,096	–0.6	1.0	1.2	1.6
8,192	–0.6	0.7	0.9	1.1
16,384	–0.6	0.5	0.6	0.9

Figure 14 (Food line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	38.4	0.0	61.6	61.6	–99.9
5–9	0.4	38.1	0.0	61.6	61.9	–98.0
10–14	1.0	37.4	0.0	61.5	62.6	–94.6
15–19	2.5	35.9	0.2	61.4	63.9	–86.4
20–24	4.8	33.6	0.7	60.9	65.7	–73.2
25–29	8.7	29.7	1.8	59.8	68.5	–50.0
30–34	14.7	23.8	3.3	58.3	72.9	–15.1
35–39	20.8	17.6	6.2	55.3	76.1	+24.4
40–44	26.6	11.8	11.3	50.3	76.9	+67.8
45–49	30.7	7.7	17.7	43.9	74.6	+54.0
50–54	34.4	4.1	25.2	36.3	70.7	+34.4
55–59	36.2	2.2	33.9	27.6	63.8	+11.7
60–64	37.2	1.2	41.6	20.0	57.2	–8.2
65–69	37.9	0.6	47.8	13.8	51.6	–24.3
70–74	38.2	0.2	53.1	8.5	46.6	–38.2
75–79	38.2	0.2	56.7	4.8	43.1	–47.6
80–84	38.3	0.1	59.3	2.3	40.6	–54.3
85–89	38.4	0.0	60.5	1.1	39.5	–57.4
90–94	38.4	0.0	61.1	0.4	38.9	–59.1
95–100	38.4	0.0	61.6	0.0	38.4	–60.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (Food line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.0	Only poor targeted
5–9	0.4	96.0	1.0	23.8:1
10–14	1.1	97.0	2.7	32.6:1
15–19	2.7	93.6	6.6	14.7:1
20–24	5.5	87.6	12.5	7.1:1
25–29	10.5	83.1	22.7	4.9:1
30–34	18.0	81.6	38.1	4.4:1
35–39	27.0	76.9	54.1	3.3:1
40–44	37.9	70.2	69.2	2.4:1
45–49	48.4	63.4	79.9	1.7:1
50–54	59.6	57.7	89.4	1.4:1
55–59	70.1	51.6	94.2	1.1:1
60–64	78.8	47.2	96.9	0.9:1
65–69	85.6	44.2	98.5	0.8:1
70–74	91.3	41.8	99.4	0.7:1
75–79	95.0	40.3	99.5	0.7:1
80–84	97.6	39.3	99.7	0.6:1
85–89	98.9	38.8	99.9	0.6:1
90–94	99.6	38.6	100.0	0.6:1
95–100	100.0	38.4	100.0	0.6:1

USAID "Extreme" Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

Figure 5 (USAID "extreme" line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	81.0
10–14	70.7
15–19	77.4
20–24	63.7
25–29	62.1
30–34	55.8
35–39	38.7
40–44	38.3
45–49	28.1
50–54	22.4
55–59	16.6
60–64	11.8
65–69	6.8
70–74	5.2
75–79	5.8
80–84	4.9
85–89	3.8
90–94	10.4
95–100	0.0

Figure 8 (USAID "extreme" line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	–2.3	7.7	9.4	12.7
10–14	–15.0	10.2	10.7	11.3
15–19	+0.4	4.1	5.0	6.7
20–24	+0.2	3.6	4.4	5.6
25–29	+6.0	2.8	3.2	4.2
30–34	+2.3	2.4	2.8	3.6
35–39	–3.1	2.6	2.7	3.1
40–44	+6.6	1.8	2.2	3.0
45–49	+0.9	1.7	2.0	3.0
50–54	–0.1	1.6	1.8	2.6
55–59	+1.4	1.3	1.6	2.2
60–64	+0.6	1.4	1.6	2.1
65–69	–3.2	2.3	2.5	2.7
70–74	–0.3	1.2	1.4	1.8
75–79	+3.5	1.0	1.2	1.6
80–84	+1.5	1.4	1.7	2.3
85–89	–0.9	2.3	2.7	3.6
90–94	+5.6	3.3	4.1	5.0
95–100	–2.4	2.8	3.3	3.8

Figure 10 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.8	66.7	75.2	79.3
4	+1.0	32.4	39.4	49.7
8	+1.1	24.5	28.1	34.7
16	+1.3	17.0	19.8	26.2
32	+1.2	12.6	15.6	19.1
64	+1.1	8.6	10.0	12.9
128	+1.1	6.3	7.4	9.3
256	+1.1	4.3	5.1	6.3
512	+1.1	2.9	3.5	5.0
1,024	+1.1	2.2	2.6	3.4
2,048	+1.1	1.6	1.8	2.3
4,096	+1.1	1.0	1.2	1.7
8,192	+1.1	0.7	0.9	1.2
16,384	+1.1	0.5	0.6	0.8

Figure 14 (USAID "extreme" line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	27.8	0.0	72.2	72.2	–99.9
5–9	0.3	27.5	0.1	72.1	72.5	–97.4
10–14	0.9	26.9	0.2	72.0	72.9	–93.0
15–19	2.2	25.6	0.5	71.7	73.8	–82.5
20–24	3.9	23.9	1.5	70.7	74.6	–66.1
25–29	6.8	21.0	3.7	68.5	75.3	–37.9
30–34	10.8	17.0	7.2	65.0	75.8	+3.4
35–39	14.7	13.1	12.4	59.8	74.5	+50.0
40–44	18.2	9.6	19.7	52.5	70.8	+29.3
45–49	21.2	6.6	27.2	45.0	66.3	+2.3
50–54	23.8	4.0	35.8	36.4	60.2	–28.7
55–59	25.5	2.3	44.6	27.6	53.0	–60.6
60–64	26.5	1.3	52.3	19.9	46.4	–88.2
65–69	27.2	0.6	58.5	13.7	40.9	–110.3
70–74	27.5	0.3	63.8	8.4	35.9	–129.5
75–79	27.6	0.2	67.4	4.8	32.4	–142.4
80–84	27.7	0.1	69.9	2.3	29.9	–151.6
85–89	27.8	0.0	71.2	1.0	28.8	–155.9
90–94	27.8	0.0	71.8	0.4	28.2	–158.1
95–100	27.8	0.0	72.2	0.0	27.8	–159.7

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (USAID "extreme" line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.4	83.9	1.2	5.2:1
10–14	1.1	85.1	3.2	5.7:1
15–19	2.7	80.3	7.8	4.1:1
20–24	5.5	71.9	14.2	2.6:1
25–29	10.5	64.5	24.4	1.8:1
30–34	18.0	60.1	38.8	1.5:1
35–39	27.0	54.3	52.8	1.2:1
40–44	37.9	48.1	65.6	0.9:1
45–49	48.4	43.9	76.4	0.8:1
50–54	59.6	40.0	85.7	0.7:1
55–59	70.1	36.3	91.7	0.6:1
60–64	78.8	33.6	95.2	0.5:1
65–69	85.6	31.7	97.7	0.5:1
70–74	91.3	30.1	98.9	0.4:1
75–79	95.0	29.1	99.3	0.4:1
80–84	97.6	28.4	99.6	0.4:1
85–89	98.9	28.1	99.8	0.4:1
90–94	99.6	27.9	100.0	0.4:1
95–100	100.0	27.8	100.0	0.4:1

$1.25/Day 2005 PPP Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

Figure 5 ($1.25/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	42.9
10–14	55.2
15–19	61.1
20–24	45.0
25–29	39.2
30–34	32.9
35–39	20.0
40–44	14.6
45–49	10.1
50–54	8.1
55–59	4.2
60–64	2.6
65–69	2.7
70–74	2.9
75–79	3.3
80–84	3.9
85–89	1.5
90–94	7.0
95–100	0.0

Figure 8 ($1.25/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	–24.6	17.0	17.9	20.1
10–14	–9.0	8.2	9.3	11.8
15–19	+0.4	4.9	5.8	7.6
20–24	+5.6	3.9	4.7	6.0
25–29	+1.2	2.7	3.3	3.8
30–34	+1.4	2.2	2.6	3.5
35–39	–3.7	2.8	3.0	3.3
40–44	–2.1	1.8	1.9	2.3
45–49	–0.0	1.2	1.4	1.7
50–54	–1.6	1.3	1.5	1.8
55–59	–1.1	1.0	1.0	1.3
60–64	–0.7	0.7	0.9	1.1
65–69	–0.6	0.8	1.0	1.3
70–74	–0.3	0.9	1.1	1.3
75–79	+2.5	0.6	0.7	0.9
80–84	+2.7	0.8	1.0	1.2
85–89	–3.2	2.9	3.1	3.6
90–94	+7.0	0.0	0.0	0.0
95–100	–2.4	2.8	3.3	3.8

Figure 10 ($1.25/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.3	62.3	64.6	79.1
4	+0.0	26.4	31.6	45.8
8	+0.0	18.4	21.5	29.3
16	–0.3	13.9	16.1	20.2
32	–0.4	10.0	11.4	14.7
64	–0.6	7.0	8.1	10.8
128	–0.7	4.9	5.7	7.5
256	–0.7	3.6	4.2	5.4
512	–0.6	2.4	2.9	3.8
1,024	–0.7	1.7	2.0	2.7
2,048	–0.7	1.2	1.4	1.9
4,096	–0.7	0.9	1.0	1.3
8,192	–0.7	0.6	0.7	1.0
16,384	–0.7	0.4	0.5	0.7

Figure 14 ($1.25/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	14.5	0.0	85.5	85.5	–99.8
5–9	0.3	14.3	0.1	85.3	85.6	–95.5
10–14	0.7	13.8	0.4	85.1	85.8	–87.9
15–19	1.7	12.9	1.0	84.4	86.1	–69.8
20–24	2.8	11.8	2.7	82.8	85.6	–43.1
25–29	4.7	9.8	5.8	79.7	84.4	+4.5
30–34	7.0	7.5	10.9	74.5	81.6	+24.9
35–39	9.2	5.4	17.8	67.6	76.8	–22.7
40–44	11.0	3.5	26.9	58.6	69.6	–84.9
45–49	12.1	2.5	36.3	49.1	61.2	–149.8
50–54	13.1	1.4	46.5	39.0	52.1	–219.5
55–59	13.7	0.9	56.5	29.0	42.7	–288.2
60–64	14.0	0.6	64.8	20.6	34.6	–345.7
65–69	14.2	0.3	71.4	14.0	28.2	–391.1
70–74	14.4	0.1	76.9	8.5	22.9	–428.8
75–79	14.4	0.1	80.6	4.9	19.3	–453.9
80–84	14.5	0.1	83.2	2.3	16.8	–471.8
85–89	14.5	0.0	84.4	1.1	15.6	–480.1
90–94	14.5	0.0	85.0	0.4	15.0	–484.6
95–100	14.5	0.0	85.5	0.0	14.5	–487.6

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($1.25/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.4	68.4	1.8	2.2:1
10–14	1.1	66.0	4.8	1.9:1
15–19	2.7	62.7	11.6	1.7:1
20–24	5.5	50.9	19.2	1.0:1
25–29	10.5	44.7	32.3	0.8:1
30–34	18.0	39.2	48.4	0.6:1
35–39	27.0	34.0	63.1	0.5:1
40–44	37.9	29.0	75.6	0.4:1
45–49	48.4	24.9	82.9	0.3:1
50–54	59.6	22.0	90.3	0.3:1
55–59	70.1	19.5	94.0	0.2:1
60–64	78.8	17.7	96.1	0.2:1
65–69	85.6	16.6	97.7	0.2:1
70–74	91.3	15.8	99.0	0.2:1
75–79	95.0	15.2	99.2	0.2:1
80–84	97.6	14.8	99.5	0.2:1
85–89	98.9	14.7	99.9	0.2:1
90–94	99.6	14.6	99.9	0.2:1
95–100	100.0	14.5	100.0	0.2:1

$2.50/Day 2005 PPP Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

Figure 5 ($2.50/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	95.2
10–14	86.7
15–19	88.8
20–24	78.9
25–29	77.2
30–34	70.1
35–39	51.5
40–44	48.2
45–49	34.4
50–54	27.6
55–59	19.9
60–64	13.5
65–69	7.4
70–74	5.7
75–79	6.6
80–84	5.7
85–89	3.8
90–94	10.4
95–100	0.0

Figure 8 ($2.50/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+3.7	5.8	7.0	9.2
10–14	–6.2	5.1	5.4	6.5
15–19	+4.2	3.6	4.5	5.9
20–24	+4.5	3.4	4.0	5.3
25–29	+5.0	2.6	3.1	3.9
30–34	+2.5	2.2	2.6	3.5
35–39	–4.7	3.4	3.6	4.0
40–44	+2.8	1.9	2.4	3.1
45–49	–0.3	1.9	2.2	2.9
50–54	+0.1	1.8	2.0	2.9
55–59	+1.5	1.5	1.9	2.6
60–64	+1.5	1.4	1.7	2.2
65–69	–2.8	2.2	2.3	2.5
70–74	–0.2	1.3	1.4	1.7
75–79	+4.2	1.0	1.2	1.6
80–84	+2.4	1.4	1.7	2.3
85–89	–0.9	2.3	2.7	3.6
90–94	+5.6	3.3	4.1	5.0
95–100	–2.4	2.8	3.3	3.8

Figure 10 ($2.50/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.4	62.0	78.3	86.6
4	+0.4	33.1	40.8	49.0
8	+1.0	24.0	28.2	36.9
16	+0.9	17.3	20.4	27.0
32	+0.8	12.7	15.1	19.3
64	+0.8	8.4	10.2	12.8
128	+0.7	6.3	7.3	9.4
256	+0.7	4.5	5.4	7.2
512	+0.8	3.2	3.8	5.0
1,024	+0.8	2.1	2.5	3.4
2,048	+0.8	1.5	1.8	2.4
4,096	+0.8	1.1	1.3	1.7
8,192	+0.8	0.8	0.9	1.2
16,384	+0.8	0.5	0.7	0.9

Figure 14 ($2.50/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	34.5	0.0	65.5	65.5	–99.9
5–9	0.4	34.1	0.0	65.5	65.9	–97.8
10–14	1.0	33.5	0.1	65.4	66.4	–94.1
15–19	2.4	32.1	0.3	65.2	67.6	–85.3
20–24	4.4	30.0	1.0	64.5	68.9	–71.2
25–29	8.1	26.4	2.4	63.1	71.2	–46.1
30–34	13.1	21.3	4.8	60.7	73.8	–9.8
35–39	18.3	16.2	8.8	56.8	75.0	+31.4
40–44	23.2	11.2	14.6	50.9	74.1	+57.5
45–49	27.0	7.5	21.4	44.1	71.1	+37.9
50–54	30.1	4.4	29.5	36.0	66.1	+14.4
55–59	32.1	2.4	38.1	27.5	59.5	–10.4
60–64	33.1	1.4	45.7	19.9	53.0	–32.5
65–69	33.8	0.6	51.8	13.7	47.5	–50.3
70–74	34.2	0.3	57.1	8.4	42.6	–65.7
75–79	34.3	0.2	60.7	4.8	39.1	–76.1
80–84	34.4	0.1	63.3	2.3	36.6	–83.5
85–89	34.4	0.0	64.5	1.0	35.5	–87.0
90–94	34.5	0.0	65.1	0.4	34.9	–88.8
95–100	34.5	0.0	65.5	0.0	34.5	–90.1

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($2.50/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.0	Only poor targeted
5–9	0.4	91.9	1.0	11.4:1
10–14	1.1	92.6	2.8	12.5:1
15–19	2.7	87.8	6.9	7.2:1
20–24	5.5	81.0	12.9	4.3:1
25–29	10.5	76.9	23.4	3.3:1
30–34	18.0	73.1	38.1	2.7:1
35–39	27.0	67.6	53.0	2.1:1
40–44	37.9	61.3	67.4	1.6:1
45–49	48.4	55.7	78.3	1.3:1
50–54	59.6	50.5	87.3	1.0:1
55–59	70.1	45.7	93.0	0.8:1
60–64	78.8	42.0	96.1	0.7:1
65–69	85.6	39.5	98.1	0.7:1
70–74	91.3	37.4	99.1	0.6:1
75–79	95.0	36.1	99.4	0.6:1
80–84	97.6	35.2	99.7	0.5:1
85–89	98.9	34.8	99.9	0.5:1
90–94	99.6	34.6	100.0	0.5:1
95–100	100.0	34.5	100.0	0.5:1

$3.75/Day 2005 PPP Poverty Line

Round 35 Scorecard
Applied to the Round 35 Validation Sample

Figure 5 ($3.75/day 2005 PPP line): Estimated poverty likelihoods associated with scores

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	66.7
5–9	100.0
10–14	94.7
15–19	94.9
20–24	91.2
25–29	89.7
30–34	86.0
35–39	72.1
40–44	68.5
45–49	58.8
50–54	46.5
55–59	40.9
60–64	30.5
65–69	20.1
70–74	15.5
75–79	16.2
80–84	8.5
85–89	6.2
90–94	12.2
95–100	2.7

Figure 8 ($3.75/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to the Round 35 validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+4.2	4.3	5.0	6.2
10–14	–3.0	2.7	2.7	3.4
15–19	+1.7	2.5	2.9	3.8
20–24	+5.3	2.7	3.3	4.0
25–29	+5.4	2.0	2.4	3.0
30–34	+0.8	1.7	2.1	2.8
35–39	–5.6	3.6	3.8	4.1
40–44	+0.1	1.9	2.2	2.8
45–49	–1.0	2.0	2.4	3.2
50–54	–4.2	3.1	3.3	3.7
55–59	+3.1	1.9	2.3	2.9
60–64	+1.9	2.0	2.3	3.2
65–69	–0.2	2.1	2.4	2.9
70–74	+0.0	1.9	2.3	3.0
75–79	+9.5	1.6	1.9	2.7
80–84	+1.2	2.1	2.4	3.4
85–89	–0.7	2.7	3.2	4.0
90–94	+5.2	4.0	4.8	6.3
95–100	–3.1	4.6	5.3	7.4

Figure 10 ($3.75/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to the Round 35 validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.4	69.0	76.0	87.8
4	+0.1	34.7	41.6	51.1
8	–0.0	24.6	29.6	37.4
16	+0.1	17.8	21.0	27.0
32	+0.1	13.6	15.8	19.6
64	+0.1	9.0	10.4	13.4
128	+0.2	6.2	7.3	9.9
256	+0.3	4.5	5.5	6.8
512	+0.3	3.3	3.9	4.9
1,024	+0.3	2.2	2.6	3.5
2,048	+0.3	1.6	1.9	2.4
4,096	+0.2	1.2	1.4	1.8
8,192	+0.2	0.8	1.0	1.2
16,384	+0.2	0.5	0.6	0.9

Figure 14 ($3.75/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to the Round 35 validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	51.9	0.0	48.1	48.1	–99.9
5–9	0.4	51.5	0.0	48.1	48.4	–98.5
10–14	1.0	50.9	0.0	48.1	49.1	–96.0
15–19	2.6	49.4	0.1	47.9	50.5	–89.9
20–24	5.0	47.0	0.5	47.6	52.5	–79.9
25–29	9.2	42.7	1.3	46.8	56.0	–62.1
30–34	15.6	36.4	2.4	45.7	61.2	–35.4
35–39	22.6	29.3	4.4	43.7	66.3	–4.3
40–44	30.2	21.8	7.7	40.3	70.5	+31.0
45–49	36.6	15.3	11.8	36.3	72.9	+63.7
50–54	42.3	9.6	17.3	30.8	73.2	+66.8
55–59	46.4	5.5	23.7	24.4	70.8	+54.3
60–64	49.0	3.0	29.8	18.3	67.2	+42.5
65–69	50.4	1.5	35.3	12.8	63.2	+32.1
70–74	51.3	0.6	40.0	8.0	59.3	+22.9
75–79	51.5	0.4	43.4	4.6	56.2	+16.3
80–84	51.7	0.2	45.9	2.2	53.9	+11.6
85–89	51.8	0.1	47.1	1.0	52.9	+9.4
90–94	51.9	0.0	47.7	0.4	52.3	+8.2
95–100	51.9	0.0	48.1	0.0	51.9	+7.4

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($3.75/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to the Round 35 validation sample

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.0	Only poor targeted
5–9	0.4	96.0	0.7	23.8:1
10–14	1.1	97.0	2.0	32.6:1
15–19	2.7	94.8	4.9	18.1:1
20–24	5.5	90.3	9.5	9.3:1
25–29	10.5	87.5	17.7	7.0:1
30–34	18.0	86.6	30.0	6.5:1
35–39	27.0	83.8	43.6	5.2:1
40–44	37.9	79.6	58.1	3.9:1
45–49	48.4	75.6	70.5	3.1:1
50–54	59.6	71.1	81.6	2.5:1
55–59	70.1	66.2	89.4	2.0:1
60–64	78.8	62.1	94.3	1.6:1
65–69	85.6	58.8	97.0	1.4:1
70–74	91.3	56.2	98.8	1.3:1
75–79	95.0	54.3	99.3	1.2:1
80–84	97.6	53.0	99.7	1.1:1
85–89	98.9	52.4	99.9	1.1:1
90–94	99.6	52.1	100.0	1.1:1
95–100	100.0	51.9	100.0	1.1:1

National Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 (National line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+0.0	0.0	0.0	0.0
10–14	+2.3	2.9	3.3	4.2
15–19	+2.1	1.9	2.2	3.0
20–24	–0.6	1.5	1.8	2.4
25–29	–1.4	1.2	1.5	2.0
30–34	+0.9	1.4	1.6	2.2
35–39	–7.1	4.3	4.4	4.6
40–44	–2.6	2.1	2.2	2.7
45–49	–3.3	2.5	2.7	3.1
50–54	–4.9	3.4	3.6	3.8
55–59	+1.1	2.2	2.6	3.3
60–64	–0.6	2.2	2.7	3.7
65–69	–1.6	2.4	2.8	3.7
70–74	–4.1	3.3	3.6	4.2
75–79	+10.4	2.2	2.6	3.4
80–84	+4.6	2.0	2.4	3.2
85–89	–6.2	5.4	5.8	7.0
90–94	+9.4	2.3	2.7	3.4
95–100	+0.6	2.5	2.8	3.5

Figure 10 (National line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.9	69.0	75.9	85.2
4	–0.4	35.1	40.6	53.8
8	–1.2	23.7	26.6	37.0
16	–1.2	16.1	18.9	26.6
32	–1.5	11.9	13.9	17.0
64	–1.6	8.2	10.0	13.8
128	–1.6	6.1	7.4	9.2
256	–1.6	4.3	5.0	6.5
512	–1.6	3.0	3.7	4.7
1,024	–1.6	2.2	2.5	3.3
2,048	–1.6	1.4	1.8	2.3
4,096	–1.7	1.1	1.2	1.7
8,192	–1.7	0.8	0.9	1.2
16,384	–1.7	0.5	0.6	0.8

Figure 12 (National line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.1	100.0	103.8	105.9
4	–0.7	50.1	54.1	76.4
8	–1.3	35.4	40.0	55.1
16	–1.5	23.5	28.2	36.6
32	–1.8	16.3	19.5	26.5
64	–1.9	11.5	13.9	17.8
128	–1.9	8.5	9.8	12.6
256	–2.0	6.0	7.1	9.6
512	–1.9	4.3	5.2	6.9
1,024	–1.9	3.1	3.6	4.7
2,048	–2.0	2.0	2.4	3.3
4,096	–2.0	1.4	1.7	2.3
8,192	–2.0	1.0	1.3	1.7
16,384	–2.0	0.7	0.8	1.2

Figure 14 (National line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	63.2	0.0	36.7	36.8	–99.9
5–9	0.5	62.8	0.0	36.7	37.2	–98.4
10–14	1.4	61.8	0.0	36.7	38.1	–95.4
15–19	3.5	59.7	0.2	36.6	40.1	–88.6
20–24	6.4	56.9	0.3	36.4	42.8	–79.3
25–29	12.1	51.2	0.6	36.1	48.2	–60.7
30–34	19.8	43.5	1.6	35.1	54.9	–34.9
35–39	28.1	35.1	2.8	33.9	62.1	–6.7
40–44	37.1	26.2	5.1	31.6	68.7	+25.4
45–49	44.5	18.7	7.9	28.8	73.4	+53.2
50–54	51.5	11.8	11.9	24.8	76.3	+81.2
55–59	56.2	7.1	16.5	20.2	76.4	+73.9
60–64	59.5	3.8	21.5	15.2	74.7	+66.0
65–69	61.3	2.0	25.8	10.9	72.3	+59.3
70–74	62.5	0.8	29.2	7.5	70.0	+53.8
75–79	62.9	0.4	32.3	4.4	67.3	+48.9
80–84	63.1	0.2	34.5	2.2	65.3	+45.5
85–89	63.2	0.0	35.5	1.2	64.5	+43.9
90–94	63.3	0.0	36.3	0.5	63.7	+42.7
95–100	63.3	0.0	36.7	0.0	63.3	+42.0

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (National line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.0	Only poor targeted
5–9	0.5	100.0	0.8	Only poor targeted
10–14	1.5	96.8	2.3	30.3:1
15–19	3.7	95.7	5.6	22.2:1
20–24	6.7	95.3	10.1	20.4:1
25–29	12.8	94.9	19.2	18.7:1
30–34	21.4	92.6	31.3	12.5:1
35–39	30.9	91.0	44.5	10.1:1
40–44	42.2	87.9	58.7	7.3:1
45–49	52.4	85.0	70.4	5.6:1
50–54	63.4	81.2	81.3	4.3:1
55–59	72.7	77.3	88.8	3.4:1
60–64	81.0	73.4	94.0	2.8:1
65–69	87.1	70.4	96.9	2.4:1
70–74	91.7	68.1	98.8	2.1:1
75–79	95.2	66.0	99.4	1.9:1
80–84	97.6	64.6	99.7	1.8:1
85–89	98.8	64.0	99.9	1.8:1
90–94	99.5	63.6	100.0	1.7:1
95–100	100.0	63.3	100.0	1.7:1

Food Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 (Food line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+3.2	3.5	3.9	4.6
10–14	–5.7	4.2	4.4	4.7
15–19	+2.8	2.5	3.0	3.9
20–24	+1.6	2.4	2.8	4.0
25–29	–5.1	3.4	3.5	3.8
30–34	–2.1	1.9	2.2	2.9
35–39	–7.8	4.9	5.1	5.4
40–44	–5.9	3.8	4.0	4.4
45–49	–8.3	5.2	5.3	5.8
50–54	–5.0	3.5	3.6	4.0
55–59	–1.1	1.8	2.1	2.8
60–64	–4.3	3.0	3.2	3.5
65–69	–1.9	1.6	1.8	2.1
70–74	–0.3	1.4	1.6	2.1
75–79	+2.8	1.0	1.2	1.7
80–84	+4.0	0.7	0.9	1.1
85–89	–1.3	2.7	3.2	3.9
90–94	+10.4	0.0	0.0	0.0
95–100	–2.1	2.5	2.8	3.5

Figure 10 (Food line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–1.6	65.7	78.1	91.5
4	–2.1	33.5	40.3	50.9
8	–3.4	22.5	27.6	37.6
16	–3.8	17.1	20.3	25.5
32	–3.7	12.1	13.9	17.9
64	–3.7	8.5	10.2	14.4
128	–3.7	6.3	7.4	9.6
256	–3.8	4.5	5.3	6.9
512	–3.7	3.0	3.5	4.8
1,024	–3.7	2.1	2.5	3.4
2,048	–3.7	1.5	1.7	2.3
4,096	–3.7	1.0	1.2	1.7
8,192	–3.7	0.8	0.9	1.2
16,384	–3.7	0.6	0.6	0.8

Figure 12 (Food line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.6	102.3	105.1	107.3
4	–1.7	50.7	55.5	68.0
8	–3.0	33.7	40.8	51.3
16	–3.2	23.0	26.9	36.8
32	–2.9	16.7	20.3	28.6
64	–3.0	12.5	14.4	18.5
128	–3.0	8.5	9.9	13.6
256	–3.1	6.0	7.5	9.8
512	–3.1	4.2	5.5	6.9
1,024	–3.1	2.9	3.4	4.4
2,048	–3.1	2.1	2.5	3.1
4,096	–3.1	1.4	1.6	2.2
8,192	–3.1	1.1	1.2	1.6
16,384	–3.1	0.8	0.9	1.2

Figure 14 (Food line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	44.1	0.0	55.8	55.9	–99.9
5–9	0.5	43.7	0.0	55.8	56.3	–97.7
10–14	1.4	42.7	0.1	55.8	57.2	–93.4
15–19	3.4	40.7	0.3	55.6	59.0	–83.9
20–24	6.0	38.1	0.7	55.2	61.2	–71.2
25–29	11.4	32.7	1.4	54.5	65.9	–45.2
30–34	18.2	26.0	3.2	52.6	70.8	–10.4
35–39	24.8	19.4	6.2	49.7	74.5	+26.1
40–44	31.4	12.7	10.8	45.0	76.5	+66.8
45–49	36.2	8.0	16.2	39.6	75.8	+63.2
50–54	40.0	4.2	23.4	32.4	72.4	+47.0
55–59	41.9	2.2	30.8	25.1	67.0	+30.4
60–64	43.2	1.0	37.8	18.1	61.3	+14.4
65–69	43.7	0.4	43.4	12.4	56.1	+1.7
70–74	44.0	0.2	47.8	8.1	52.0	–8.2
75–79	44.1	0.1	51.2	4.7	48.7	–15.9
80–84	44.1	0.1	53.5	2.4	46.5	–21.1
85–89	44.1	0.0	54.6	1.2	45.4	–23.7
90–94	44.1	0.0	55.4	0.5	44.6	–25.4
95–100	44.2	0.0	55.8	0.0	44.2	–26.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (Food line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.5	96.9	1.1	31.8:1
10–14	1.5	95.7	3.2	22.5:1
15–19	3.7	92.5	7.7	12.3:1
20–24	6.7	90.0	13.7	9.0:1
25–29	12.8	89.4	25.9	8.4:1
30–34	21.4	84.9	41.2	5.6:1
35–39	30.9	80.1	56.1	4.0:1
40–44	42.2	74.4	71.2	2.9:1
45–49	52.4	69.0	81.9	2.2:1
50–54	63.4	63.1	90.6	1.7:1
55–59	72.7	57.7	94.9	1.4:1
60–64	81.0	53.3	97.8	1.1:1
65–69	87.1	50.2	99.0	1.0:1
70–74	91.7	47.9	99.6	0.9:1
75–79	95.2	46.3	99.8	0.9:1
80–84	97.6	45.2	99.8	0.8:1
85–89	98.8	44.7	100.0	0.8:1
90–94	99.5	44.4	100.0	0.8:1
95–100	100.0	44.2	100.0	0.8:1

USAID "Extreme" Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 (USAID "extreme" line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+0.5	7.5	8.8	11.2
10–14	–9.3	7.2	7.6	8.6
15–19	–1.5	3.6	4.1	5.2
20–24	–4.1	3.8	4.2	5.2
25–29	+2.9	2.5	3.2	4.2
30–34	+5.5	2.2	2.7	3.5
35–39	–0.5	2.1	2.5	3.2
40–44	+4.5	1.8	2.2	2.9
45–49	–3.5	2.6	2.8	3.1
50–54	–0.3	1.6	2.0	2.6
55–59	+0.7	1.6	1.9	2.3
60–64	–0.4	1.4	1.7	2.4
65–69	–0.1	1.3	1.5	1.9
70–74	+0.5	1.2	1.5	2.0
75–79	+3.9	0.9	1.1	1.2
80–84	+4.0	0.7	0.9	1.1
85–89	–1.3	2.7	3.2	3.9
90–94	+10.4	0.0	0.0	0.0
95–100	–2.1	2.5	2.8	3.5

Figure 10 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+2.3	66.7	71.3	84.1
4	+2.4	34.0	39.6	50.2
8	+1.7	25.0	29.3	38.0
16	+1.0	17.7	20.6	27.9
32	+0.9	12.4	14.5	19.8
64	+0.7	8.7	10.4	13.5
128	+0.8	6.3	7.1	9.6
256	+0.8	4.5	5.4	7.0
512	+0.8	3.2	3.7	5.0
1,024	+0.8	2.1	2.5	3.4
2,048	+0.8	1.5	1.8	2.3
4,096	+0.8	1.1	1.3	1.7
8,192	+0.8	0.8	0.9	1.3
16,384	+0.8	0.6	0.7	0.9

Figure 12 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+3.1	102.7	103.2	100.0
4	+1.5	50.8	54.4	75.0
8	+0.6	33.9	39.9	50.2
16	–0.4	23.5	29.3	37.6
32	–0.3	17.4	20.9	27.7
64	–0.4	11.9	14.1	18.6
128	–0.2	8.8	10.1	13.2
256	–0.4	6.5	7.3	9.8
512	–0.3	4.4	5.2	6.7
1,024	–0.3	3.1	3.6	4.6
2,048	–0.2	2.2	2.6	3.2
4,096	–0.3	1.5	1.7	2.4
8,192	–0.3	1.1	1.3	1.7
16,384	–0.3	0.7	0.9	1.2

Figure 14 (USAID "extreme" line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	29.9	0.0	70.1	70.1	–99.8
5–9	0.4	29.5	0.1	70.0	70.4	–96.8
10–14	1.2	28.7	0.3	69.8	71.0	–91.0
15–19	2.9	27.0	0.8	69.3	72.2	–77.9
20–24	5.0	25.0	1.7	68.3	73.3	–61.0
25–29	8.6	21.3	4.2	65.9	74.5	–28.6
30–34	13.0	17.0	8.4	61.6	74.6	+14.8
35–39	16.8	13.1	14.1	56.0	72.8	+52.9
40–44	20.8	9.2	21.5	48.6	69.4	+28.4
45–49	24.1	5.9	28.4	41.7	65.7	+5.3
50–54	26.6	3.3	36.8	33.3	59.9	–22.8
55–59	28.1	1.8	44.6	25.5	53.6	–48.9
60–64	29.1	0.8	51.9	18.2	47.3	–73.2
65–69	29.5	0.4	57.6	12.5	42.0	–92.2
70–74	29.8	0.2	62.0	8.1	37.9	–107.0
75–79	29.8	0.1	65.4	4.7	34.5	–118.4
80–84	29.9	0.1	67.7	2.4	32.2	–126.1
85–89	29.9	0.0	68.8	1.2	31.2	–129.8
90–94	29.9	0.0	69.6	0.5	30.4	–132.4
95–100	29.9	0.0	70.1	0.0	29.9	–134.0

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (USAID "extreme" line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.5	81.7	1.4	4.5:1
10–14	1.5	80.8	4.0	4.2:1
15–19	3.7	79.6	9.8	3.9:1
20–24	6.7	74.3	16.6	2.9:1
25–29	12.8	67.3	28.7	2.1:1
30–34	21.4	60.6	43.3	1.5:1
35–39	30.9	54.4	56.2	1.2:1
40–44	42.2	49.2	69.4	1.0:1
45–49	52.4	45.9	80.3	0.8:1
50–54	63.4	42.0	88.9	0.7:1
55–59	72.7	38.7	93.8	0.6:1
60–64	81.0	36.0	97.2	0.6:1
65–69	87.1	33.9	98.7	0.5:1
70–74	91.7	32.4	99.4	0.5:1
75–79	95.2	31.3	99.7	0.5:1
80–84	97.6	30.6	99.8	0.4:1
85–89	98.8	30.3	100.0	0.4:1
90–94	99.5	30.1	100.0	0.4:1
95–100	100.0	29.9	100.0	0.4:1

$1.25/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 ($1.25/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	–37.6	22.3	23.0	24.0
10–14	–24.9	15.0	15.3	16.3
15–19	–14.1	8.8	9.1	9.7
20–24	–19.7	11.6	12.0	12.4
25–29	–16.4	9.5	9.8	10.4
30–34	–10.9	6.5	6.8	7.1
35–39	–10.4	6.2	6.4	6.8
40–44	–10.9	6.3	6.5	6.8
45–49	–9.5	5.6	5.7	6.0
50–54	–4.7	3.0	3.2	3.5
55–59	–3.1	2.1	2.2	2.4
60–64	–3.0	2.0	2.2	2.5
65–69	+0.3	0.8	0.9	1.2
70–74	+0.3	1.0	1.2	1.6
75–79	+2.5	0.6	0.7	0.8
80–84	+3.5	0.5	0.6	0.7
85–89	+0.7	1.0	1.2	1.6
90–94	+7.0	0.0	0.0	0.0
95–100	+0.0	0.0	0.0	0.0

Figure 10 ($1.25/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–5.2	62.3	64.6	79.0
4	–6.3	29.0	34.2	43.9
8	–7.2	22.1	24.9	34.0
16	–7.6	16.5	19.2	25.5
32	–7.7	11.7	14.0	17.3
64	–7.7	8.2	9.5	13.1
128	–7.7	5.8	7.0	9.0
256	–7.7	4.1	5.0	6.2
512	–7.7	3.0	3.3	4.4
1,024	–7.6	2.0	2.5	3.0
2,048	–7.7	1.4	1.6	2.1
4,096	–7.7	1.0	1.2	1.5
8,192	–7.7	0.7	0.9	1.2
16,384	–7.7	0.5	0.6	0.8

Figure 12 ($1.25/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–4.9	100.0	102.3	106.4
4	–6.4	40.6	51.9	67.7
8	–7.2	30.5	34.0	46.0
16	–7.3	21.0	24.7	34.5
32	–7.3	15.3	18.2	23.4
64	–7.1	10.9	13.1	17.3
128	–7.0	7.4	9.3	11.9
256	–7.1	5.5	6.5	8.7
512	–7.1	3.8	4.4	6.0
1,024	–7.0	2.6	3.1	4.3
2,048	–7.0	1.9	2.2	2.8
4,096	–7.0	1.4	1.7	2.1
8,192	–7.0	1.0	1.1	1.5
16,384	–7.0	0.6	0.8	1.1

Figure 14 ($1.25/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	22.4	0.0	77.6	77.6	–99.7
5–9	0.4	22.0	0.1	77.5	77.9	–95.8
10–14	1.2	21.2	0.3	77.3	78.5	–88.0
15–19	2.9	19.6	0.8	76.7	79.6	–70.8
20–24	4.8	17.6	1.9	75.7	80.4	–48.8
25–29	8.2	14.3	4.6	73.0	81.1	–6.7
30–34	11.9	10.5	9.5	68.1	80.1	+48.6
35–39	14.8	7.6	16.1	61.5	76.3	+28.3
40–44	17.7	4.7	24.5	53.1	70.8	–9.3
45–49	19.7	2.8	32.8	44.8	64.5	–46.0
50–54	21.0	1.4	42.4	35.2	56.2	–88.9
55–59	21.7	0.8	51.0	26.5	48.2	–127.4
60–64	22.1	0.3	58.9	18.7	40.8	–162.3
65–69	22.3	0.2	64.8	12.7	35.0	–189.0
70–74	22.4	0.1	69.4	8.2	30.6	–209.2
75–79	22.4	0.0	72.8	4.7	27.1	–224.6
80–84	22.4	0.0	75.1	2.4	24.9	–234.9
85–89	22.4	0.0	76.3	1.2	23.7	–240.2
90–94	22.4	0.0	77.1	0.5	22.9	–243.6
95–100	22.4	0.0	77.6	0.0	22.4	–245.7

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($1.25/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.5	81.7	1.9	4.5:1
10–14	1.5	80.8	5.4	4.2:1
15–19	3.7	77.4	12.7	3.4:1
20–24	6.7	71.5	21.4	2.5:1
25–29	12.8	64.0	36.4	1.8:1
30–34	21.4	55.8	53.2	1.3:1
35–39	30.9	48.0	66.1	0.9:1
40–44	42.2	42.0	79.0	0.7:1
45–49	52.4	37.5	87.6	0.6:1
50–54	63.4	33.1	93.6	0.5:1
55–59	72.7	29.8	96.6	0.4:1
60–64	81.0	27.3	98.6	0.4:1
65–69	87.1	25.6	99.2	0.3:1
70–74	91.7	24.4	99.8	0.3:1
75–79	95.2	23.5	99.9	0.3:1
80–84	97.6	23.0	99.9	0.3:1
85–89	98.8	22.7	100.0	0.3:1
90–94	99.5	22.5	100.0	0.3:1
95–100	100.0	22.4	100.0	0.3:1

$2.50/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 ($2.50/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+1.7	4.5	5.5	6.8
10–14	–5.0	4.3	4.5	5.9
15–19	–1.5	2.6	3.0	3.9
20–24	–5.1	3.8	4.1	4.7
25–29	–7.4	4.6	4.8	5.1
30–34	–1.9	2.0	2.4	3.2
35–39	–13.8	8.0	8.1	8.4
40–44	–7.6	4.7	4.9	5.1
45–49	–14.7	8.3	8.5	8.9
50–54	–9.9	5.9	6.1	6.4
55–59	–5.5	3.6	3.8	4.3
60–64	–4.8	3.3	3.4	3.7
65–69	–4.8	3.2	3.4	3.7
70–74	–4.7	3.3	3.5	3.8
75–79	+3.1	1.2	1.4	1.8
80–84	+3.2	1.3	1.5	2.2
85–89	–2.1	2.9	3.4	4.3
90–94	+10.4	0.0	0.0	0.0
95–100	–2.1	2.5	2.8	3.5

Figure 10 ($2.50/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–5.0	62.0	76.7	86.6
4	–5.4	34.9	40.9	51.8
8	–6.6	24.8	29.1	37.9
16	–7.1	18.0	21.3	28.1
32	–7.2	12.5	15.4	18.7
64	–7.2	9.1	11.2	14.7
128	–7.1	6.4	7.7	10.4
256	–7.0	4.6	5.4	7.0
512	–7.0	3.3	3.9	5.0
1,024	–6.9	2.2	2.6	3.5
2,048	–6.9	1.6	1.8	2.4
4,096	–6.9	1.1	1.3	1.8
8,192	–7.0	0.8	0.9	1.1
16,384	–6.9	0.6	0.7	0.9

Figure 12 ($2.50/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–4.6	100.8	103.7	109.3
4	–5.8	49.8	60.8	69.2
8	–7.6	35.2	41.0	53.7
16	–8.0	23.6	29.0	38.4
32	–7.9	17.5	21.1	28.5
64	–7.9	12.2	14.4	18.6
128	–7.8	8.9	10.7	13.3
256	–7.8	6.3	7.7	9.9
512	–7.7	4.4	5.3	6.8
1,024	–7.7	3.1	3.7	4.7
2,048	–7.7	2.2	2.5	3.5
4,096	–7.7	1.5	1.8	2.3
8,192	–7.7	1.1	1.3	1.6
16,384	–7.7	0.8	0.9	1.1

Figure 14 ($2.50/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	44.5	0.0	55.5	55.5	–99.9
5–9	0.5	44.1	0.0	55.4	55.9	–97.7
10–14	1.4	43.2	0.1	55.3	56.7	–93.5
15–19	3.4	41.2	0.3	55.1	58.5	–84.2
20–24	5.9	38.6	0.8	54.6	60.5	–71.7
25–29	11.0	33.5	1.7	53.7	64.8	–46.6
30–34	17.3	27.3	4.1	51.3	68.6	–13.2
35–39	23.6	21.0	7.4	48.1	71.7	+22.3
40–44	30.0	14.6	12.3	43.2	73.2	+62.1
45–49	35.0	9.6	17.5	38.0	73.0	+60.8
50–54	39.1	5.4	24.3	31.2	70.3	+45.5
55–59	41.5	3.1	31.2	24.3	65.8	+30.0
60–64	43.0	1.5	38.0	17.5	60.5	+14.8
65–69	43.8	0.8	43.3	12.1	55.9	+2.7
70–74	44.3	0.3	47.5	8.0	52.3	–6.6
75–79	44.4	0.1	50.8	4.6	49.0	–14.1
80–84	44.5	0.1	53.1	2.4	46.8	–19.2
85–89	44.5	0.0	54.2	1.2	45.8	–21.7
90–94	44.5	0.0	55.0	0.5	45.0	–23.5
95–100	44.5	0.0	55.5	0.0	44.5	–24.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($2.50/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.5	93.9	1.1	15.4:1
10–14	1.5	92.5	3.1	12.4:1
15–19	3.7	91.1	7.5	10.3:1
20–24	6.7	87.9	13.2	7.3:1
25–29	12.8	86.4	24.8	6.4:1
30–34	21.4	80.7	38.8	4.2:1
35–39	30.9	76.2	52.9	3.2:1
40–44	42.2	71.0	67.3	2.4:1
45–49	52.4	66.7	78.5	2.0:1
50–54	63.4	61.7	87.8	1.6:1
55–59	72.7	57.1	93.2	1.3:1
60–64	81.0	53.1	96.6	1.1:1
65–69	87.1	50.3	98.3	1.0:1
70–74	91.7	48.3	99.4	0.9:1
75–79	95.2	46.6	99.7	0.9:1
80–84	97.6	45.6	99.8	0.8:1
85–89	98.8	45.1	100.0	0.8:1
90–94	99.5	44.7	100.0	0.8:1
95–100	100.0	44.5	100.0	0.8:1

$3.75/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 31

Figure 8 ($3.75/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 31

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	–33.3	16.7	16.7	16.7
5–9	+3.2	3.5	3.9	4.6
10–14	–0.4	2.9	3.3	4.2
15–19	+0.5	2.0	2.3	2.9
20–24	–1.8	1.8	2.3	2.9
25–29	–3.6	2.4	2.5	2.8
30–34	–1.6	1.5	1.7	2.2
35–39	–12.4	6.9	7.1	7.3
40–44	–6.7	4.2	4.3	4.6
45–49	–6.6	4.3	4.5	4.8
50–54	–11.3	6.7	6.8	7.1
55–59	–1.4	2.1	2.5	3.2
60–64	–3.2	2.7	2.9	3.5
65–69	–6.0	4.2	4.4	4.8
70–74	–5.8	4.2	4.5	5.0
75–79	+7.9	1.9	2.2	2.9
80–84	+3.2	1.8	2.1	2.9
85–89	–9.0	6.9	7.3	8.5
90–94	+10.8	1.6	1.8	2.3
95–100	+0.6	2.5	2.8	3.5

Figure 10 ($3.75/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–4.0	69.0	76.0	87.8
4	–3.4	35.0	42.2	55.9
8	–4.5	23.5	27.3	35.4
16	–4.6	16.6	20.1	25.8
32	–4.8	11.6	13.8	18.1
64	–5.0	8.8	10.3	13.6
128	–4.9	6.5	7.6	9.9
256	–5.0	4.5	5.3	6.9
512	–5.0	3.1	3.7	4.8
1,024	–5.0	2.2	2.6	3.4
2,048	–5.0	1.5	1.7	2.3
4,096	–5.1	1.0	1.2	1.6
8,192	–5.1	0.8	0.9	1.2
16,384	–5.1	0.5	0.6	0.8

Figure 12 ($3.75/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 31

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–3.6	100.0	104.9	106.6
4	–3.5	50.9	61.5	76.9
8	–4.5	33.3	42.6	52.2
16	–4.7	23.7	27.2	35.6
32	–4.9	17.4	20.2	26.6
64	–5.0	12.3	14.6	18.0
128	–5.1	8.7	10.2	12.4
256	–5.2	6.4	7.4	9.8
512	–5.2	4.5	5.4	7.0
1,024	–5.2	3.2	3.8	4.9
2,048	–5.3	2.2	2.6	3.3
4,096	–5.3	1.5	1.8	2.4
8,192	–5.3	1.1	1.3	1.7
16,384	–5.3	0.8	0.9	1.2

Figure 14 ($3.75/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 31

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	59.5	0.0	40.4	40.5	–99.9
5–9	0.5	59.1	0.0	40.4	40.9	–98.3
10–14	1.4	58.1	0.1	40.4	41.8	–95.1
15–19	3.5	56.1	0.2	40.2	43.7	–87.9
20–24	6.3	53.3	0.4	40.0	46.3	–78.2
25–29	12.0	47.6	0.8	39.6	51.6	–58.5
30–34	19.5	40.0	1.9	38.6	58.1	–31.3
35–39	27.6	31.9	3.3	37.1	64.8	–1.7
40–44	36.2	23.4	6.0	34.4	70.6	+31.7
45–49	43.0	16.6	9.5	31.0	73.9	+60.1
50–54	49.4	10.1	14.0	26.5	75.9	+76.6
55–59	53.4	6.1	19.2	21.2	74.6	+67.7
60–64	56.3	3.3	24.7	15.8	72.1	+58.6
65–69	57.9	1.6	29.2	11.3	69.2	+51.0
70–74	58.9	0.6	32.8	7.6	66.6	+44.9
75–79	59.2	0.3	36.0	4.4	63.7	+39.6
80–84	59.4	0.2	38.2	2.2	61.6	+35.9
85–89	59.5	0.0	39.2	1.2	60.8	+34.2
90–94	59.6	0.0	40.0	0.5	60.0	+32.9
95–100	59.6	0.0	40.4	0.0	59.6	+32.1

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($3.75/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 31

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	100.0	0.1	Only poor targeted
5–9	0.5	96.9	0.8	31.8:1
10–14	1.5	95.7	2.4	22.5:1
15–19	3.7	94.9	5.9	18.7:1
20–24	6.7	94.0	10.6	15.7:1
25–29	12.8	93.7	20.1	15.0:1
30–34	21.4	91.3	32.8	10.5:1
35–39	30.9	89.3	46.4	8.4:1
40–44	42.2	85.7	60.8	6.0:1
45–49	52.4	82.0	72.1	4.5:1
50–54	63.4	78.0	83.0	3.5:1
55–59	72.7	73.5	89.7	2.8:1
60–64	81.0	69.5	94.5	2.3:1
65–69	87.1	66.5	97.3	2.0:1
70–74	91.7	64.2	99.0	1.8:1
75–79	95.2	62.2	99.5	1.6:1
80–84	97.6	60.9	99.7	1.6:1
85–89	98.8	60.3	100.0	1.5:1
90–94	99.5	59.8	100.0	1.5:1
95–100	100.0	59.6	100.0	1.5:1

National Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 (National line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+7.9	37.5	41.3	50.0
5–9	+5.4	4.8	6.0	7.1
10–14	+2.4	2.9	3.4	4.6
15–19	+1.7	1.6	1.8	2.4
20–24	+1.3	1.9	2.2	2.9
25–29	+2.6	1.5	1.7	2.4
30–34	+1.8	1.5	1.7	2.2
35–39	–3.3	2.5	2.6	2.9
40–44	+0.1	1.6	2.0	2.7
45–49	+3.7	2.1	2.4	3.1
50–54	+5.0	1.9	2.4	3.1
55–59	+1.5	2.2	2.7	3.5
60–64	+4.2	2.3	2.8	3.8
65–69	+0.4	2.3	2.6	3.5
70–74	+3.2	2.4	2.9	4.0
75–79	+8.0	2.4	2.8	3.8
80–84	+3.6	2.5	2.9	3.9
85–89	+5.3	2.6	3.2	4.2
90–94	+7.4	3.2	3.8	4.8
95–100	+2.7	0.0	0.0	0.0

Figure 10 (National line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+0.2	65.9	70.8	86.3
4	+1.8	32.2	38.0	50.0
8	+1.7	23.8	27.7	36.6
16	+2.1	17.1	20.3	27.8
32	+1.8	12.0	14.0	17.1
64	+2.0	8.5	10.2	12.8
128	+2.1	5.8	7.0	9.2
256	+2.0	4.2	4.9	6.2
512	+2.0	2.9	3.6	4.8
1,024	+2.1	2.1	2.5	3.1
2,048	+2.1	1.5	1.7	2.4
4,096	+2.1	1.0	1.3	1.7
8,192	+2.1	0.7	0.9	1.2
16,384	+2.1	0.5	0.6	0.8

Figure 12 (National line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+1.0	103.2	104.4	106.2
4	+1.4	50.2	55.5	77.2
8	+1.6	33.8	40.2	54.8
16	+1.8	24.6	29.4	42.0
32	+1.5	17.1	19.9	26.6
64	+1.7	11.6	14.1	18.5
128	+1.7	8.3	9.5	13.1
256	+1.7	5.9	7.1	9.5
512	+1.7	4.6	5.3	6.7
1,024	+1.7	3.2	3.7	4.8
2,048	+1.7	2.2	2.6	3.4
4,096	+1.7	1.6	1.8	2.4
8,192	+1.8	1.1	1.3	1.8
16,384	+1.7	0.7	0.9	1.2

Figure 14 (National line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	60.7	0.0	39.2	39.2	–99.9
5–9	0.3	60.4	0.0	39.2	39.6	–98.8
10–14	1.4	59.4	0.1	39.1	40.5	–95.3
15–19	4.4	56.4	0.2	39.0	43.3	–85.2
20–24	7.2	53.5	0.5	38.8	46.0	–75.5
25–29	13.0	47.8	1.1	38.1	51.1	–55.5
30–34	21.4	39.4	2.3	37.0	58.3	–25.9
35–39	29.2	31.5	3.9	35.4	64.6	+2.6
40–44	38.2	22.6	6.6	32.6	70.8	+36.5
45–49	44.8	16.0	10.0	29.2	74.0	+63.9
50–54	50.6	10.2	15.1	24.1	74.7	+75.2
55–59	55.2	5.6	19.8	19.5	74.7	+67.5
60–64	57.5	3.2	24.2	15.0	72.6	+60.2
65–69	59.3	1.5	28.7	10.5	69.8	+52.8
70–74	60.1	0.7	32.3	7.0	67.0	+46.9
75–79	60.5	0.2	35.2	4.0	64.5	+42.0
80–84	60.7	0.1	37.2	2.0	62.7	+38.7
85–89	60.7	0.0	38.3	1.0	61.7	+37.0
90–94	60.8	0.0	39.0	0.2	61.0	+35.8
95–100	60.8	0.0	39.2	0.0	60.8	+35.4

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (National line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	63.6	0.0	1.7:1
5–9	0.4	91.2	0.6	10.4:1
10–14	1.5	93.8	2.3	15.1:1
15–19	4.6	94.6	7.2	17.5:1
20–24	7.7	93.8	11.9	15.2:1
25–29	14.1	92.1	21.3	11.6:1
30–34	23.7	90.4	35.2	9.4:1
35–39	33.1	88.3	48.1	7.6:1
40–44	44.8	85.2	62.8	5.8:1
45–49	54.8	81.7	73.7	4.5:1
50–54	65.7	77.0	83.2	3.3:1
55–59	74.9	73.6	90.8	2.8:1
60–64	81.7	70.4	94.7	2.4:1
65–69	88.0	67.4	97.6	2.1:1
70–74	92.4	65.1	98.9	1.9:1
75–79	95.8	63.2	99.6	1.7:1
80–84	97.9	62.0	99.9	1.6:1
85–89	99.0	61.3	99.9	1.6:1
90–94	99.8	60.9	100.0	1.6:1
95–100	100.0	60.8	100.0	1.5:1

Food Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 (Food line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	**Diff.**	**90-percent**	**95-percent**	**99-percent**
0–4	+7.9	37.5	41.3	50.0
5–9	+21.0	9.3	10.7	13.9
10–14	–3.8	3.5	4.0	5.1
15–19	+5.1	2.5	2.8	3.5
20–24	+5.8	2.7	3.1	4.0
25–29	+5.6	2.0	2.3	3.3
30–34	+0.8	1.8	2.2	2.9
35–39	–4.6	3.3	3.5	3.8
40–44	–1.0	1.9	2.3	3.0
45–49	+0.6	2.0	2.4	3.0
50–54	+1.9	1.8	2.2	2.8
55–59	–2.8	2.4	2.6	2.8
60–64	–1.0	1.7	1.9	2.7
65–69	–3.3	2.4	2.7	3.0
70–74	–0.3	1.4	1.7	2.2
75–79	+0.7	1.4	1.7	2.3
80–84	+2.9	1.3	1.5	2.1
85–89	+2.8	1.2	1.4	1.7
90–94	+7.4	2.4	2.9	3.6
95–100	+0.0	0.0	0.0	0.0

Figure 10 (Food line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–1.1	65.7	81.7	93.4
4	–0.1	33.7	40.3	54.6
8	+0.2	24.3	28.7	35.6
16	+0.3	18.3	21.8	28.2
32	+0.0	13.1	15.2	18.6
64	+0.2	9.1	10.3	13.7
128	+0.2	6.6	7.8	10.1
256	+0.3	4.4	5.2	6.8
512	+0.2	3.1	3.7	4.9
1,024	+0.2	2.1	2.5	3.4
2,048	+0.2	1.5	1.8	2.2
4,096	+0.2	1.1	1.3	1.7
8,192	+0.2	0.8	0.9	1.2
16,384	+0.2	0.5	0.6	0.8

Figure 12 (Food line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–0.0	104.1	105.1	107.3
4	+0.3	50.5	54.9	75.6
8	+0.5	33.7	39.3	51.7
16	+0.8	25.3	28.9	40.3
32	+0.7	17.4	21.0	28.6
64	+1.0	12.6	14.8	17.9
128	+0.9	8.4	10.1	13.0
256	+0.9	6.0	7.0	10.1
512	+0.9	4.5	5.4	7.2
1,024	+0.8	2.9	3.5	4.6
2,048	+0.8	2.1	2.5	3.2
4,096	+0.8	1.5	1.8	2.5
8,192	+0.8	1.0	1.3	1.6
16,384	+0.8	0.8	0.9	1.1

Figure 14 (Food line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	42.1	0.0	57.8	57.9	–99.8
5–9	0.3	41.9	0.1	57.8	58.1	–98.4
10–14	1.3	40.8	0.2	57.7	59.0	–93.4
15–19	4.0	38.1	0.6	57.3	61.3	–79.5
20–24	6.6	35.6	1.1	56.7	63.3	–66.1
25–29	11.5	30.6	2.6	55.3	66.8	–39.3
30–34	18.7	23.5	5.0	52.9	71.6	+0.5
35–39	24.9	17.2	8.2	49.7	74.6	+37.6
40–44	31.3	10.9	13.5	44.3	75.6	+67.9
45–49	35.1	7.0	19.7	38.2	73.3	+53.4
50–54	38.2	3.9	27.4	30.4	68.6	+34.9
55–59	40.3	1.9	34.7	23.2	63.5	+17.8
60–64	41.1	1.1	40.6	17.2	58.3	+3.6
65–69	41.7	0.5	46.3	11.5	53.2	–9.8
70–74	41.9	0.2	50.4	7.4	49.3	–19.6
75–79	42.1	0.1	53.7	4.2	46.3	–27.3
80–84	42.1	0.0	55.8	2.1	44.2	–32.3
85–89	42.1	0.0	56.9	1.0	43.1	–34.9
90–94	42.2	0.0	57.6	0.2	42.4	–36.7
95–100	42.2	0.0	57.8	0.0	42.2	–37.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (Food line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	63.6	0.1	1.7:1
5–9	0.4	78.1	0.7	3.6:1
10–14	1.5	88.8	3.1	7.9:1
15–19	4.6	87.7	9.6	7.1:1
20–24	7.7	85.7	15.6	6.0:1
25–29	14.1	81.8	27.3	4.5:1
30–34	23.7	79.0	44.3	3.8:1
35–39	33.1	75.3	59.1	3.1:1
40–44	44.8	69.8	74.2	2.3:1
45–49	54.8	64.1	83.4	1.8:1
50–54	65.7	58.2	90.6	1.4:1
55–59	74.9	53.8	95.6	1.2:1
60–64	81.7	50.3	97.5	1.0:1
65–69	88.0	47.4	98.9	0.9:1
70–74	92.4	45.4	99.5	0.8:1
75–79	95.8	43.9	99.8	0.8:1
80–84	97.9	43.0	99.9	0.8:1
85–89	99.0	42.6	99.9	0.7:1
90–94	99.8	42.3	100.0	0.7:1
95–100	100.0	42.2	100.0	0.7:1

USAID "Extreme" Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 (USAID "extreme" line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+8.2	37.7	41.3	50.0
5–9	+21.0	11.0	13.0	17.4
10–14	+2.1	5.8	7.0	9.6
15–19	+11.8	3.6	4.2	6.0
20–24	+3.6	3.7	4.3	5.4
25–29	+8.0	2.5	3.1	3.7
30–34	+5.5	2.1	2.5	3.4
35–39	−1.6	2.0	2.4	3.2
40–44	+2.3	1.8	2.2	2.9
45–49	+3.1	1.7	2.1	2.6
50–54	+4.8	1.4	1.8	2.4
55–59	+1.6	1.5	1.9	2.4
60–64	+3.0	1.4	1.7	2.2
65–69	−1.4	1.4	1.7	2.4
70–74	+1.7	1.1	1.4	1.8
75–79	+1.9	1.3	1.5	2.0
80–84	+2.9	1.3	1.5	2.1
85–89	+2.8	1.2	1.4	1.7
90–94	+7.4	2.4	2.9	3.6
95–100	+0.0	0.0	0.0	0.0

Figure 10 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+0.9	69.9	72.7	85.3
4	+2.8	36.2	42.2	51.8
8	+3.3	24.9	29.9	36.7
16	+3.2	17.8	20.6	28.3
32	+3.1	12.6	14.8	19.3
64	+3.3	8.9	10.2	13.4
128	+3.3	6.4	7.8	9.7
256	+3.3	4.5	5.3	7.0
512	+3.2	3.2	3.9	5.0
1,024	+3.2	2.1	2.5	3.3
2,048	+3.2	1.6	1.9	2.3
4,096	+3.2	1.1	1.3	1.7
8,192	+3.2	0.7	0.9	1.2
16,384	+3.2	0.5	0.6	0.8

Figure 12 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+1.8	102.9	105.1	100.0
4	+1.8	50.8	55.6	74.0
8	+2.2	34.8	40.3	52.8
16	+1.9	24.2	29.0	38.9
32	+1.9	17.4	20.8	27.7
64	+2.2	12.3	14.2	20.1
128	+2.3	8.7	10.0	13.2
256	+2.2	5.9	7.1	10.0
512	+2.1	4.5	5.3	7.0
1,024	+2.2	3.2	3.7	4.6
2,048	+2.2	2.2	2.5	3.2
4,096	+2.1	1.5	1.7	2.3
8,192	+2.1	1.0	1.2	1.6
16,384	+2.2	0.8	0.9	1.1

Figure 14 (USAID "extreme" line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	28.7	0.0	71.3	71.3	–99.7
5–9	0.2	28.5	0.1	71.1	71.4	–97.9
10–14	1.0	27.8	0.5	70.8	71.7	–91.5
15–19	3.0	25.7	1.6	69.7	72.7	–73.5
20–24	4.8	23.9	2.8	68.4	73.3	–56.4
25–29	8.3	20.4	5.8	65.5	73.8	–22.1
30–34	13.2	15.6	10.5	60.8	73.9	+28.2
35–39	17.0	11.7	16.1	55.2	72.2	+44.0
40–44	21.3	7.4	23.5	47.8	69.1	+18.2
45–49	23.9	4.8	30.9	40.4	64.3	–7.6
50–54	25.9	2.9	39.8	31.5	57.3	–38.6
55–59	27.3	1.4	47.7	23.6	50.9	–66.0
60–64	27.9	0.9	53.9	17.4	45.3	–87.6
65–69	28.4	0.4	59.6	11.6	40.0	–107.7
70–74	28.5	0.2	63.8	7.4	35.9	–122.3
75–79	28.6	0.1	67.1	4.2	32.8	–133.7
80–84	28.7	0.0	69.2	2.1	30.7	–141.0
85–89	28.7	0.0	70.3	1.0	29.7	–144.8
90–94	28.7	0.0	71.1	0.2	28.9	–147.4
95–100	28.7	0.0	71.3	0.0	28.7	–148.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 (USAID "extreme" line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	61.1	0.1	1.6:1
5–9	0.4	61.1	0.8	1.6:1
10–14	1.5	65.3	3.4	1.9:1
15–19	4.6	65.1	10.4	1.9:1
20–24	7.7	63.0	16.9	1.7:1
25–29	14.1	58.9	28.9	1.4:1
30–34	23.7	55.6	45.8	1.3:1
35–39	33.1	51.4	59.3	1.1:1
40–44	44.8	47.5	74.1	0.9:1
45–49	54.8	43.6	83.2	0.8:1
50–54	65.7	39.4	90.0	0.6:1
55–59	74.9	36.4	95.0	0.6:1
60–64	81.7	34.1	97.0	0.5:1
65–69	88.0	32.2	98.7	0.5:1
70–74	92.4	30.9	99.3	0.4:1
75–79	95.8	29.9	99.7	0.4:1
80–84	97.9	29.3	99.9	0.4:1
85–89	99.0	29.0	99.9	0.4:1
90–94	99.8	28.8	100.0	0.4:1
95–100	100.0	28.7	100.0	0.4:1

$1.25/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 ($1.25/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+8.2	37.7	41.3	50.0
5–9	–3.3	11.3	13.3	16.8
10–14	+1.0	6.2	7.4	9.5
15–19	+9.2	3.7	4.3	5.8
20–24	+5.0	3.6	4.3	5.9
25–29	+8.5	2.4	2.9	4.0
30–34	+5.6	1.8	2.1	2.6
35–39	+0.4	1.7	2.0	2.6
40–44	–3.4	2.4	2.6	2.8
45–49	–1.6	1.4	1.6	2.0
50–54	+0.3	1.0	1.3	1.7
55–59	–4.0	2.6	2.7	3.0
60–64	–0.5	0.9	1.1	1.4
65–69	–0.9	1.0	1.1	1.5
70–74	+0.7	0.9	1.1	1.4
75–79	+1.3	0.9	1.0	1.4
80–84	+2.6	1.1	1.3	1.6
85–89	+0.5	1.2	1.4	1.7
90–94	+5.4	1.7	1.9	2.5
95–100	+0.0	0.0	0.0	0.0

Figure 10 ($1.25/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+0.4	62.3	67.5	79.2
4	+0.7	30.1	34.8	45.4
8	+0.7	20.8	25.1	31.9
16	+0.8	14.8	17.4	24.3
32	+0.7	10.9	13.4	17.0
64	+0.9	7.3	9.0	12.6
128	+1.0	5.2	6.2	8.2
256	+1.0	3.7	4.3	5.8
512	+0.9	2.7	3.2	4.2
1,024	+0.9	1.9	2.2	2.7
2,048	+0.9	1.3	1.6	2.0
4,096	+0.9	0.9	1.2	1.5
8,192	+0.9	0.7	0.8	1.0
16,384	+0.9	0.4	0.5	0.7

Figure 12 ($1.25/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	+0.7	100.0	102.7	106.4
4	+0.6	39.2	51.8	65.6
8	+0.7	27.9	33.3	43.2
16	+1.0	19.5	22.6	31.4
32	+1.1	14.4	16.8	21.6
64	+1.5	10.0	12.0	16.1
128	+1.7	7.2	8.1	10.6
256	+1.6	5.0	6.1	7.6
512	+1.5	3.7	4.5	5.7
1,024	+1.5	2.5	2.9	3.9
2,048	+1.5	1.7	2.1	2.5
4,096	+1.5	1.3	1.5	1.9
8,192	+1.5	0.9	1.0	1.4
16,384	+1.5	0.6	0.8	1.0

Figure 14 ($1.25/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	15.6	0.0	84.3	84.3	–99.5
5–9	0.2	15.5	0.2	84.1	84.3	–96.4
10–14	0.8	14.9	0.7	83.6	84.4	–85.7
15–19	2.4	13.3	2.2	82.1	84.4	–55.5
20–24	3.6	12.1	4.1	80.2	83.8	–27.9
25–29	5.5	10.1	8.5	75.8	81.3	+25.2
30–34	8.2	7.5	15.5	68.9	77.0	+1.2
35–39	10.1	5.6	23.0	61.3	71.4	–47.0
40–44	12.2	3.5	32.6	51.7	63.9	–108.2
45–49	13.4	2.3	41.4	42.9	56.3	–164.3
50–54	14.3	1.4	51.4	32.9	47.2	–228.2
55–59	15.0	0.7	59.9	24.4	39.4	–282.7
60–64	15.2	0.5	66.5	17.8	33.0	–324.8
65–69	15.4	0.2	72.6	11.8	27.2	–363.2
70–74	15.5	0.1	76.8	7.5	23.1	–390.5
75–79	15.6	0.1	80.1	4.2	19.8	–411.7
80–84	15.6	0.0	82.3	2.1	17.7	–425.3
85–89	15.6	0.0	83.4	1.0	16.6	–432.2
90–94	15.7	0.0	84.1	0.2	15.9	–437.0
95–100	15.7	0.0	84.3	0.0	15.7	–438.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($1.25/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	61.1	0.2	1.6:1
5–9	0.4	48.8	1.2	1.0:1
10–14	1.5	51.6	4.9	1.1:1
15–19	4.6	51.2	15.1	1.0:1
20–24	7.7	46.8	23.0	0.9:1
25–29	14.1	39.4	35.4	0.6:1
30–34	23.7	34.6	52.2	0.5:1
35–39	33.1	30.4	64.3	0.4:1
40–44	44.8	27.2	77.6	0.4:1
45–49	54.8	24.5	85.6	0.3:1
50–54	65.7	21.7	91.0	0.3:1
55–59	74.9	20.0	95.8	0.3:1
60–64	81.7	18.6	97.1	0.2:1
65–69	88.0	17.5	98.5	0.2:1
70–74	92.4	16.8	99.2	0.2:1
75–79	95.8	16.3	99.7	0.2:1
80–84	97.9	16.0	99.8	0.2:1
85–89	99.0	15.8	99.9	0.2:1
90–94	99.8	15.7	100.0	0.2:1
95–100	100.0	15.7	100.0	0.2:1

$2.50/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 ($2.50/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+7.9	37.5	41.3	50.0
5–9	+24.9	10.4	12.4	14.9
10–14	+4.5	4.9	5.7	8.1
15–19	+9.0	3.1	3.7	4.9
20–24	+6.1	3.1	3.7	5.0
25–29	+7.8	2.3	2.7	3.6
30–34	+4.9	2.0	2.4	3.2
35–39	–7.9	5.0	5.1	5.3
40–44	–2.3	2.1	2.3	3.1
45–49	–3.4	2.7	2.8	3.2
50–54	–1.8	1.8	2.1	2.7
55–59	–5.1	3.5	3.6	4.0
60–64	–1.6	1.8	2.2	3.0
65–69	–5.6	3.7	3.9	4.3
70–74	–1.3	1.6	1.8	2.4
75–79	+2.1	1.4	1.7	2.2
80–84	+3.0	1.5	1.8	2.2
85–89	+2.8	1.2	1.4	1.7
90–94	+7.4	2.4	2.9	3.6
95–100	+0.0	0.0	0.0	0.0

Figure 10 ($2.50/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–3.6	71.3	78.7	90.9
4	–1.9	37.2	44.4	54.8
8	–1.1	26.0	31.2	40.9
16	–0.6	19.8	23.1	27.6
32	–0.9	13.1	16.0	20.5
64	–0.6	9.2	11.4	14.3
128	–0.7	6.7	8.0	10.6
256	–0.6	4.7	5.8	7.4
512	–0.6	3.4	3.9	5.3
1,024	–0.6	2.2	2.6	3.5
2,048	–0.6	1.6	1.9	2.5
4,096	–0.7	1.1	1.3	1.8
8,192	–0.6	0.8	0.9	1.3
16,384	–0.6	0.6	0.7	0.9

Figure 12 ($2.50/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–3.2	103.1	103.9	109.3
4	–2.3	51.9	57.6	78.7
8	–2.1	35.0	44.2	55.0
16	–1.5	25.7	29.9	39.7
32	–1.7	18.5	22.2	28.5
64	–1.3	12.9	15.8	21.4
128	–1.4	8.8	10.4	14.1
256	–1.3	6.9	8.1	10.3
512	–1.4	4.6	5.5	7.5
1,024	–1.4	3.1	3.8	4.8
2,048	–1.4	2.2	2.7	3.4
4,096	–1.5	1.5	1.8	2.5
8,192	–1.4	1.1	1.3	1.7
16,384	–1.4	0.8	0.9	1.2

Figure 14 ($2.50/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	40.1	0.0	59.9	59.9	–99.8
5–9	0.3	39.9	0.1	59.8	60.0	–98.4
10–14	1.2	39.0	0.3	59.6	60.7	–93.4
15–19	3.6	36.5	1.0	58.9	62.5	–79.5
20–24	5.9	34.3	1.8	58.0	63.9	–66.2
25–29	10.3	29.9	3.8	56.1	66.3	–39.4
30–34	16.5	23.6	7.1	52.8	69.3	+0.2
35–39	22.2	17.9	10.9	49.0	71.2	+37.8
40–44	28.2	11.9	16.6	43.3	71.5	+58.7
45–49	32.1	8.0	22.7	37.2	69.3	+43.5
50–54	35.4	4.7	30.3	29.6	65.0	+24.6
55–59	37.8	2.4	37.2	22.7	60.4	+7.3
60–64	38.8	1.4	43.0	16.9	55.7	–7.1
65–69	39.6	0.6	48.4	11.5	51.0	–20.7
70–74	39.9	0.3	52.5	7.4	47.3	–30.8
75–79	40.0	0.1	55.7	4.2	44.2	–38.8
80–84	40.1	0.0	57.8	2.1	42.1	–44.1
85–89	40.1	0.0	58.9	1.0	41.1	–46.8
90–94	40.1	0.0	59.6	0.2	40.4	–48.7
95–100	40.1	0.0	59.9	0.0	40.1	–49.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($2.50/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	63.6	0.1	1.7:1
5–9	0.4	70.2	0.7	2.4:1
10–14	1.5	78.1	2.9	3.6:1
15–19	4.6	78.8	9.0	3.7:1
20–24	7.7	76.1	14.6	3.2:1
25–29	14.1	72.9	25.6	2.7:1
30–34	23.7	69.9	41.2	2.3:1
35–39	33.1	67.1	55.4	2.0:1
40–44	44.8	63.0	70.3	1.7:1
45–49	54.8	58.6	80.1	1.4:1
50–54	65.7	53.9	88.2	1.2:1
55–59	74.9	50.4	94.1	1.0:1
60–64	81.7	47.4	96.6	0.9:1
65–69	88.0	45.0	98.6	0.8:1
70–74	92.4	43.2	99.4	0.8:1
75–79	95.8	41.8	99.8	0.7:1
80–84	97.9	40.9	99.9	0.7:1
85–89	99.0	40.5	99.9	0.7:1
90–94	99.8	40.2	100.0	0.7:1
95–100	100.0	40.1	100.0	0.7:1

$3.75/Day 2005 PPP Poverty Line

Round 35 Scorecard Applied to Round 28

Figure 8 ($3.75/day 2005 PPP line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals, Round 35 scorecard applied to Round 28

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	+7.9	37.5	41.3	50.0
5–9	+10.6	6.8	8.0	10.8
10–14	+1.5	3.3	4.0	5.1
15–19	+1.0	1.8	2.1	2.4
20–24	+0.9	2.1	2.4	3.2
25–29	+2.8	1.7	2.0	2.7
30–34	+0.6	1.5	1.8	2.3
35–39	–6.9	4.3	4.5	4.8
40–44	–3.4	2.5	2.7	3.1
45–49	–0.8	2.1	2.5	3.2
50–54	–2.7	2.3	2.5	3.1
55–59	–4.3	3.3	3.5	3.9
60–64	–0.1	2.3	2.8	3.7
65–69	–5.3	3.8	4.0	4.4
70–74	–1.1	2.3	2.8	3.9
75–79	+4.2	2.3	2.7	3.6
80–84	+0.7	2.4	2.9	3.9
85–89	+1.6	2.6	3.2	4.2
90–94	+9.2	2.4	2.9	3.6
95–100	+2.7	0.0	0.0	0.0

Figure 10 ($3.75/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–4.2	63.8	77.7	88.8
4	–2.1	34.0	40.3	50.3
8	–2.0	24.7	29.1	38.4
16	–1.5	17.5	20.8	28.4
32	–1.8	12.2	14.1	18.6
64	–1.6	8.8	10.6	13.4
128	–1.5	6.1	7.3	9.7
256	–1.6	4.4	5.2	6.7
512	–1.6	3.1	3.5	4.9
1,024	–1.6	2.1	2.6	3.3
2,048	–1.6	1.5	1.9	2.5
4,096	–1.6	1.1	1.3	1.6
8,192	–1.6	0.8	1.0	1.2
16,384	–1.6	0.5	0.6	0.8

Figure 12 ($3.75/day 2005 PPP line): Differences and precision of differences for bootstrapped estimates of changes in poverty rates for groups of households between two points in time, by sample size, Round 35 scorecard applied to Round 28

Sample Size	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–3.9	101.9	104.9	107.0
4	–2.2	50.6	55.9	78.8
8	–2.0	33.7	41.5	56.0
16	–1.6	25.2	29.0	39.3
32	–1.8	17.6	20.6	26.3
64	–1.7	12.8	14.6	17.9
128	–1.7	8.6	10.1	13.0
256	–1.8	6.2	7.5	10.0
512	–1.9	4.5	5.3	7.1
1,024	–1.8	3.2	3.8	4.9
2,048	–1.8	2.2	2.7	3.5
4,096	–1.9	1.6	1.9	2.5
8,192	–1.8	1.1	1.3	1.9
16,384	–1.9	0.8	0.9	1.3

Figure 14 ($3.75/day 2005 PPP line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, Round 35 scorecard applied to Round 28

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: => poverty line mistakenly targeted	Exclusion: => poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.0	57.6	0.0	42.4	42.4	–99.9
5–9	0.3	57.3	0.1	42.4	42.7	–98.8
10–14	1.4	56.2	0.1	42.3	43.6	–95.1
15–19	4.3	53.3	0.3	42.1	46.3	–84.6
20–24	7.0	50.6	0.7	41.7	48.8	–74.4
25–29	12.5	45.1	1.5	40.9	53.4	–53.8
30–34	20.7	36.9	2.9	39.5	60.2	–23.0
35–39	28.2	29.4	4.9	37.5	65.7	+6.4
40–44	36.6	21.0	8.1	34.3	70.9	+41.4
45–49	42.8	14.8	12.0	30.4	73.1	+69.4
50–54	48.2	9.4	17.4	25.0	73.2	+69.7
55–59	52.5	5.1	22.4	20.0	72.5	+61.0
60–64	54.6	3.0	27.1	15.3	69.9	+52.9
65–69	56.2	1.4	31.8	10.6	66.9	+44.9
70–74	57.0	0.6	35.4	7.0	64.0	+38.6
75–79	57.4	0.2	38.4	4.0	61.4	+33.4
80–84	57.5	0.1	40.4	2.0	59.5	+29.9
85–89	57.6	0.0	41.4	1.0	58.5	+28.1
90–94	57.6	0.0	42.2	0.2	57.8	+26.8
95–100	57.6	0.0	42.4	0.0	57.6	+26.4

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100.

Figure 15 ($3.75/day 2005 PPP line): For a given score cut-off, the percentage of all households who are targeted, the percentage of targeted households who are poor, the percentage of poor households who are targeted, and the number of poor households who are successful targeted (inclusion) per non-poor household mistakenly targeted (leakage), Round 35 scorecard applied to Round 28

Targeting cut-off	% all households who are targeted	% targeted who are poor	% of poor who are targeted	Poor households targeted per non-poor household targeted
0–4	0.0	63.6	0.1	1.7:1
5–9	0.4	86.8	0.6	6.6:1
10–14	1.5	91.3	2.3	10.5:1
15–19	4.6	92.5	7.4	12.4:1
20–24	7.7	91.5	12.2	10.8:1
25–29	14.1	89.1	21.8	8.2:1
30–34	23.7	87.6	36.0	7.1:1
35–39	33.1	85.2	48.9	5.8:1
40–44	44.8	81.8	63.6	4.5:1
45–49	54.8	78.0	74.2	3.5:1
50–54	65.7	73.5	83.7	2.8:1
55–59	74.9	70.1	91.2	2.3:1
60–64	81.7	66.8	94.9	2.0:1
65–69	88.0	63.9	97.6	1.8:1
70–74	92.4	61.7	98.9	1.6:1
75–79	95.8	59.9	99.6	1.5:1
80–84	97.9	58.8	99.9	1.4:1
85–89	99.0	58.2	100.0	1.4:1
90–94	99.8	57.7	100.0	1.4:1
95–100	100.0	57.6	100.0	1.4:1