Simple Poverty Scorecard® Poverty-Assessment Tool Namibia

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This document is at `SimplePovertyScorecard.com`

Abstract

The Simple Poverty Scorecard-brand poverty-assessment tool uses 10 low-cost indicators from Namibia's 2009/10 Household Income and Expenditure Survey to estimate the likelihood that a household has consumption 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 Namibia to measure poverty rates, to track changes in poverty rates over time, and to segment clients for differentiated treatment.

Simple Poverty Scorecard® Poverty-Assessment Tool

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

Indicator	Response	Points	Score
1. Does the household have only one member, or own a microwave oven, or own a motor vehicle?	A. No	0	
	B. Yes	100	
2. How many members does the household have?	A. Eight or more	0	
	B. Seven	4	
	C. Six	10	
	D. Five	13	
	E. Four	20	
	F. Three	27	
	G. One or Two	35	
3. What is the highest level of education that the female head/spouse has completed?	A. None	0	
	B. Primary school	2	
	C. No female head/spouse	4	
	D. Junior secondary (high) school	6	
	E. Senior secondary (high) school or more	14	
4. What is the main material used for the floor of the main dwelling?	A. Mud, clay, cow dung, or sand	0	
	B. Concrete, wood, or other	7	
5. How many rooms in the dwelling are used for sleeping?	A. One	0	
	B. Two	6	
	C. Three or more	11	
6. What is the main source of energy/fuel for cooking?	A. Wood, wood charcoal, coal, animal dung, solar energy, none, or other	0	
	B. Paraffin, gas, or electricity	5	
7. Does the household own a refrigerator or freezer?	A. No	0	
	B. Yes	5	
8. Does the household own a television?	A. No	0	
	B. Yes	4	
9. Does the household own a cell telephone and/or a landline telephone?	A. No	0	
	B. Only cell or only landline	4	
	C. Both	8	
10. Does the household own cattle, donkeys/mules, or horses?	A. No	0	
	B. Yes	10	

SimplePovertyScorecard.com   **Score:**

Back-page Worksheet: Household Members

At the start, write down the name, identification number, and service point of the client and of yourself as the enumerator, as well as the service point that the client uses. Record the date of the interview and the date that the client first participated with the organization. Then read the first question to the respondent: *Does the household have only one member, or own a microwave oven, or own a motor vehicle?* Circle the response for the first indicator. If Yes, then conclude the interview. If No, then continue and read: *Please tell me the name of each member of your household. A* household *consists of one or more persons, related or unrelated, who live together in the same homestead/compound, but not necessarily in the same dwelling. They have a community of life with common catering/eating arrangements, and all are answerable to the same head, and they have slept in the residence for at least eight of the past 28 nights.* Count the number of household members, write it in the scorecard header next to "# HH members:", and record the response to the second indicator.

Please always keep in mind the full definition of *household* found in the "Guidelines for the Interpretation of Scorecard Indicators".

Name of member
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
Number of household members:

Look-up table to convert scores to poverty likelihoods

Score	Poverty likelihood (%)							
	Natl.	National Upper			USAID	International 2005 PPP		
	Lower	100%	150%	200%	'Extreme'	$1.25	$2.00	$2.50
0–4	77.4	96.2	100.0	100.0	80.2	87.1	100.0	100.0
5–9	71.4	89.3	100.0	100.0	75.3	84.3	100.0	100.0
10–14	68.9	82.6	98.9	99.4	69.8	79.0	98.9	99.3
15–19	46.6	74.7	93.3	98.9	48.3	60.7	91.5	97.0
20–24	42.3	66.9	92.0	98.5	40.9	52.9	88.5	95.8
25–29	21.9	51.8	81.6	90.7	19.9	33.7	73.1	86.5
30–34	17.1	39.4	70.5	88.9	15.7	24.7	63.0	80.3
35–39	11.3	30.3	66.2	86.3	8.1	17.3	55.9	72.3
40–44	6.0	16.7	51.2	71.9	3.4	9.3	35.9	57.1
45–49	3.1	12.2	40.7	64.0	1.6	4.2	26.4	44.4
50–54	2.1	7.6	25.1	51.5	1.3	2.5	15.6	33.3
55–59	1.1	4.9	17.7	36.9	0.7	1.1	10.4	19.4
60–64	0.7	2.3	11.5	28.9	0.5	0.8	6.2	12.4
65–69	0.6	1.7	5.3	18.2	0.5	0.8	3.8	6.2
70–74	0.6	1.7	5.3	12.0	0.5	0.8	3.8	6.2
75–79	0.6	1.7	5.3	11.6	0.5	0.8	3.8	6.2
80–84	0.6	1.7	5.3	11.6	0.5	0.8	3.8	6.2
85–89	0.6	1.8	5.3	11.6	0.5	0.8	3.8	6.2
90–94	0.6	1.8	5.3	11.6	0.5	0.8	3.8	6.2
95–100	0.6	1.8	5.3	11.6	0.5	0.8	3.8	6.2

Simple Poverty Scorecard® Poverty-Assessment Tool Namibia

1. Introduction

Pro-poor programs in Namibia can use the Simple Poverty Scorecard poverty-assessment tool to estimate the likelihood that a household has consumption below a given poverty line, to estimate a population's poverty rate at a point in time, to track changes in a population's poverty rate over time, and to segment participants for differentiated treatment.

The direct approach to poverty measurement via consumption surveys is difficult and costly. As a case in point, Namibia's 2009/10 Household Income and Expenditure Survey (HIES) runs 51 pages. Enumerators interviewed about one household per day, asking hundreds of non-consumption items and about 350 non-daily consumption items. Responding households also recorded all their daily consumption over a period of four weeks.

In comparison, the indirect approach via the scorecard is simple, quick, and inexpensive. It uses ten verifiable indicators (such as "What is the main material used for the floor of the main dwelling?" and "Does the household own a television?") to get a score that is highly correlated with poverty status as measured by the exhaustive HIES survey.

The scorecard differs from "proxy means tests" (Coady, Grosh, and Hoddinott, 2004) in that it is transparent, it is freely available,[1] and 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 blunt (such as rules based on land-ownership or housing quality) or subjective and relative (such as participatory wealth ranking facilitated by skilled field workers). Estimates from these approaches may be costly, their accuracy is unknown, and they are not comparable across places, organizations, nor time.

The scorecard can be used to measure the share of a program's participants who are below a given poverty line, for example, the Millennium Development Goals' $1.25/day line at 2005 purchase-power parity (PPP). USAID's microenterprise partners in Namibia can use scoring with the $1.25/day line to report how many of their participants are very poor.[2] Scoring can also be used to measure net movement across a poverty line over time. In all these cases, the scorecard provides a consumption-based, objective tool with known accuracy. While consumption surveys are costly even for governments, some local pro-poor organizations may be able to implement an

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[1] The Simple Poverty Scorecard tool for Namibia is not, however, in the public domain. Copyright is held by the sponsor and by Microfinance Risk Management, L.L.C.
[2] USAID defines a household as *very poor* if its daily per-capita consumption is less than the highest of the $1.25/day line (NAM8.71 in average prices for all of Namibia from mid-June 2009 to mid-June 2010, Figure 1) or the USAID "extreme" line that divides people in households below the national line into two equal-size groups (NAM7.34).

inexpensive poverty-assessment tool to help with poverty monitoring and (if desired) targeting.

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, then they first must 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 they do not work, but because they are presented (when they are presented at all) as tables of regression coefficients incomprehensible to non-specialists (with cryptic indicator names such as "LGHHSZ_2" and with points with negative values and many decimal places). Thanks to the predictive-modeling phenomenon known as the "flat maximum", simple, trasparent scoring approaches can be about as accurate as complex, opaque ones (Schreiner, 2012a; Caire and Schreiner, 2012).

Beyond its simplicity and transparency, the scorecard's technical approach is innovative in how it associates scores with poverty likelihoods, in the extent of its accuracy tests, and in how it derives formulas for standard errors. Although the accuracy tests are simple and commonplace 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 data from the 2009/10 HIES from the Namibia Statistics Agency (NSA). 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
- Applicable in all regions of Namibia

All points in the scorecard are non-negative 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 about 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-adult-equivalent consumption or per-capita consumption below a given poverty line.

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

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

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

The scorecard's indicators and points are derived from household consumption data and Namibia's upper national poverty line. Scores from this one scorecard are calibrated to poverty likelihoods for eight poverty lines.

The scorecard is constructed and calibrated using half of the data from the 2009/10 HIES. The other half is used to validate the scorecard's accuracy for estimating households' poverty likelihoods, for estimating groups' poverty rates at a point in time, and for targeting.

All three scoring estimators are *unbiased*. That is, they match the true value on average in repeated samples when constructed from (and applied to) a single, unchanging population. Like all predictive models, the specific scorecard here is constructed from a single sample and so misses the mark to some unknown extent when applied to a different population or when applied after 2010.[3]

Thus, while the indirect scoring approach is less costly than the direct survey approach, it is also biased when applied in practice. (The survey approach is unbiased by definition.) There is bias because the scorecard necessarily assumes that the future relationships between indicators and poverty in all possible groups of households will be the same as in the construction data. Of course, this assumption—inevitable in predictive modeling—holds only partly.

On average when applied to the validation sample with 1,000 bootstraps of $n = 16,384$, the difference between scorecard estimates of groups' poverty rates and the true

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[3] Important examples include nationally representative samples at a later point in time or sub-groups that are not nationally representative (Tarozzi and Deaton, 2009).

rates at a point in time for the upper national poverty line is –1.4 percentage points.

The average absolute difference across all eight poverty lines is 0.7 percentage points,

and the maximum absolute difference for any poverty line is 1.4 percentage points.

These differences are due to sampling variation, not bias; the average difference would

be zero if the whole 2009/10 HIES were to be repeatedly re-fielded and divided into sub-

samples before repeating the entire process of constructing and validating scorecards.

The 90-percent confidence intervals for these estimates with $n = 16{,}384$ are ± 0.5

percentage points or less. For $n = 1{,}024$, the 90-percent intervals are ± 2.1 percentage

points or less.

Section 2 below documents data and poverty lines. Sections 3 and 4 describe

scorecard construction and offer guidelines for use in practice. Sections 5 and 6 tell how

to estimate households' poverty likelihoods and groups' poverty rates at a point in time.

Section 7 discusses estimating changes in poverty rates over time, and Section 8 covers

targeting. Section 9 places the scorecard here in the context of a similar exercise for

Namibia. The last 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 9,656 households in the 2009/10 HIES. This is Namibia's most recent national consumption survey.

For the purposes of the scorecard, the households in the 2009/10 HIES are randomly divided into two sub-samples:

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

2.2 Poverty rates

A *poverty rate* is the share of units in households in which total household consumption (divided by the number of adult equivalents or by the number of household members) is below a given poverty line. The unit is either the household itself or a person in the household. Each household member is defined to have the same poverty status (or estimated poverty likelihood) as does the household as a whole.

Suppose a program serves two households. The first household is poor (its per-adult-equivalent consumption or its per-capita consumption is less than a given poverty

line), and it has three members, one of whom is a program participant. The second household is non-poor, and it has four members, two of whom are program participants.

Poverty rates are at the level of either households or people. If the program defines its *participants* as households, then the household level is relevant. The estimated household-level poverty rate is the equal-weighted average of poverty statuses (or estimated poverty likelihoods) across participants' households. In the example here, this is $\frac{1 \cdot 1 + 1 \cdot 0}{1 + 1} = \frac{1}{2} = 0.5 = 50$ percent. In the "$1 \cdot 1$" term in the numerator, the first "1" is the first household's weight, and the second "1" is the first household's poverty status (poor). In the "$1 \cdot 0$" term in the numerator, the "1" is the second household's weight, and the "0" is the second household's poverty status (non-poor). The "$1 + 1$" in the denominator is the sum of the weights of the two households. Each household has a weight of one (1) because the unit of analysis is the household.

Alternatively, a person-level rate is relevant if a program defines all people in households that benefit from its services as *participants*. In the example here, the person-level rate is the household-size-weighted average of poverty statuses for households with participants, or $\frac{3 \cdot 1 + 4 \cdot 0}{3 + 4} = \frac{3}{7} = 0.43 = 43$ percent. In the "$3 \cdot 1$" term in the numerator, the "3" is the first household's weight because it has three members, and the "1" is its poverty status (poor). In the "$4 \cdot 0$" term in the numerator, the "4" is the second household's weight because it has four members, and the zero is its poverty status (non-poor). The "$3 + 4$" in the denominator is the sum of the weights of the two

households. A household's weight is its number of members because the unit of analysis is the household member.

As a final example—one that pertains to what is likely the most common situation in practice—a program counts as *participants* only those household members with whom it deals with directly. For the example here, this means that some—but not all—household members are counted. The person-level rate is now the participant-weighted average of the poverty statuses of households with participants, or

$\frac{1 \cdot 1 + 2 \cdot 0}{1 + 2} = \frac{1}{3} = 0.33 = 33$ percent. The first "1" in the "$1 \cdot 1$" in the numerator is the first household's weight because it has one participant, and the second "1" is its poverty status (poor). In the "$2 \cdot 0$" term in the numerator, the "2" is the second household's weight because it has two participants, and the zero is its poverty status (non-poor). The "$1 + 2$" in the denominator is the sum of the weights of the two households. Each household's weight is its number of participants because the unit of analysis is the participant.

To sum up, estimated poverty rates are weighted averages of households' poverty statuses (or estimated poverty likelihoods), where the weights are the number of relevant units in the household. When reporting, programs should explain who is counted as a *participant* and why.

Figure 1 reports poverty rates for eight poverty lines at the levels of households and people for Nambia as a whole in 2009/10 and for the construction and validation samples. (Figure 2 is similar, but reports for urban areas, rural areas, and all areas in

each of Namibia's 13 regions.) Person-level poverty rates are included in Figures 1 and 2 because these are the rates reported by governments and used in most policy discussions. Household-level poverty rates are also reported because—as shown above— household-level poverty likelihoods can be straightforwardly converted into poverty rates for other units of analysis. This is also why the scorecard is constructed, calibrated, and validated with household weights.

2.3   Poverty lines

Namibia's national poverty lines were derived for the 2003/4 HIES using the cost-of-basic-needs method (Ravallion, 1998) and then updated for changes in prices over time to 2009/10 (NSA, 2012a).[4] The first step is to define a per-adult-equivalent food line as the cost of 2,100 Calories from a food basket with the 30 most-common purchased food items and the 15 most-common home-produced food items for households in the second, third, and fourth deciles of total consumption in the 2003/4 HIES (Central Bureau of Statistics, 2008). The NSA does not report poverty rates for the food line, and the scorecard here is not calibrated to this line.

Namibia's lower and upper national lines are defined as the food line, plus a non-food component. For the lower line, the non-food component is the non-food

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[4] Namibia's poverty lines are not adjusted for regional differences in prices nor for changes in prices while the HIES was in the field from mid-June 2009 to mid-June 2010.

consumption observed for households whose *total* consumption is at the food line.[5] For

the 2009/10 HIES, the lower national line is NAD9.12, giving poverty rates of 9.7

percent for households and 15.4 percent for people (Figure 1).

For the upper national poverty line (sometimes called here "100% of the upper

national line"), the non-food component is the non-food consumption observed for

households whose *food* consumption is at the food line. For the 2009/10 HIES, the

upper line is NAD12.43, giving poverty rates of 19.6 percent for households and 28.8

percent for people (Figure 1).[6]

The scorecard is constructed using the upper national poverty line. Because

local, pro-poor programs in Namibia may want to use different or various poverty lines,

this paper calibrates scores from its single scorecard to poverty likelihoods for eight

poverty lines:

- Lower national
- 100% of upper national
- 150% of upper national
- 200% of upper national
- USAID "extreme"
- $1.25/day 2005 PPP
- $2.00/day 2005 PPP
- $2.50/day 2005 PPP

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[5] More precisely, it is the average of the median non-food consumption of five groups
(Central Bureau of Statistics, 2008). The first group is households with total
consumption (for the lower line) or food consumption (for the upper line) within ±1
percent of the food line. The second (third, etc.) group is households with total (or food)
consumption within ±2 percent (±3 percent, etc.) of the food line.
[6] NSA (2012a) reports a person-level poverty rate for the upper national line of 28.6
percent, and NSA (2012b) reports a poverty rate of 28.7 percent. The data from NSA
used in this paper give a poverty rate of 28.8 percent.

The USAID "extreme" line is defined as the median per-capita consumption (not per-adult-equivalent consumption) of people (not households) in the 2009/10 HIES who are below 100% of the upper national line (United States Congress, 2004).

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

- 2005 PPP exchange rate of NAD5.064 per $1.00 (World Bank, 2008)
- Consumer Price Index for Namibia:[7]
  - Average in 2005: 122.86
  - Average during HIES field work from mid-June 2009 to mid-June 2010: 169.0605

Using the formula from Sillers (2006), the all-Namibia $1.25/day 2005 PPP line in average prices for all of Namibia from mid-June 2009 to mid-June 2010 is:

$$
\left(2005 \text{ PPP exchange rate}\right) \cdot \$1.25 \cdot \left(\frac{\text{CPI}_{\text{during 2009/10 HIES}}}{\text{CPI}_{2005}}\right) =
$$

$$
\left(\frac{\text{NAD5.064}}{\$1.00}\right) \cdot \$1.25 \cdot \left(\frac{169.0605}{122.86}\right) = \text{NAD8.71}.
$$

USAID microenterprise partners in Namibia who use the scorecard to report poverty rates to USAID should use the $1.25/day 2005 PPP line. This is because USAID defines "very poor" as those households whose per-capita consumption is below the highest of two lines:

- $1.25/day 2005 PPP (NAD8.71, Figure 1)
- USAID "extreme" line (NAD7.34).

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[7] These are monthly averages from hidden rows in the first tab of the spreadsheet at `nsa.org.na/files/downloads/ff7_NAMIBIA%20CPI%20March%202013%20excel%20tabl es.xls`, retrieved 22 July 2013.

3. Scorecard construction

For Namibia, about 110 candidate indicators are initially prepared in the areas

of:

- Household composition (such as number of members)
- Education (such as the highest level completed by the female head/spouse)
- Housing (such as the type of floor)
- Ownership of durable assets (such as televisions or refrigerators)
- Employment (such as the number of household members who work)
- Agriculture (such as ownership of cattle, donkeys/mules, or horses)

Figure 3 lists the candidate indicators, ordered by the entropy-based "uncertainty

coefficient" (Goodman and Kruskal, 1979) that measures how well a given indicator

predicts poverty on its own.

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, the type of fuel used for cooking 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 upper national poverty line and Logit

regression on the construction sub-sample. Indicator selection uses both judgment and

statistics. The first step is to use Logit to build one scorecard for each candidate

indicator. Each scorecard's power to rank households by poverty status is measured as

"c" (SAS Institute Inc., 2004).

One of these one-indicator scorecards is then selected based on several factors (Schreiner *et al.*, 2004; Zeller, 2004). These include 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, variety among indicators, applicability across regions, relevance for distinguishing among households at the low end of the distribution of consumption, and verifiability.

A series of two-indicator scorecards are then built, each based on the one-indicator scorecard selected from the first round, with a second candidate indicator added. The best two-indicator scorecard is then selected, again based on "c" and judgment about how to balance the non-statistical criteria. These steps are repeated until the scorecard has 10 indicators that work together well.

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).

This algorithm is similar to the common R^2-based stepwise least-squares regression. It differs from naïve stepwise in that the selection of indicators considers both statistical[8] and non-statistical criteria. The non-statistical criteria can improve robustness through time and help ensure that indicators are simple, sensible, and acceptable to users.

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[8] The statistical criterion for selecting an indicator is not the p value of its coefficient but rather its contribution to the ranking of households by poverty status.

The single scorecard here applies to all of Namibia. Tests for Indonesia (World Bank, 2012), Bangladesh (Sharif, 2009), India and Mexico (Schreiner, 2006 and 2005a), Sri Lanka (Narayan and Yoshida, 2005), and Jamaica (Grosh and Baker, 1995) suggest that segmenting poverty-assessment tools by urban/rural does not improve targeting accuracy much, although segmentation in general may improve the bias and precision of estimates of poverty rates (Tarozzi and Deaton, 2009).

4. Practical guidelines for scorecard use

The main challenge of scorecard design is not to maximize statistical accuracy but rather to improve the chances that the scorecard is actually used (Schreiner, 2005b). When scoring projects fail, the reason is not usually statistical inaccuracy but rather the failure of an organization to decide to do what is needed to integrate scoring in its processes and to train and convince its employees to use the scorecard properly (Schreiner, 2002). After all, most reasonable scorecards have similar targeting accuracy, thanks to the empirical phenomenon known as the "flat maximum" (Caire and Schreiner, 2012; 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 on their own and use it properly. Of course, accuracy matters, but it must be balanced with simplicity, ease-of-use, and "face validity". Organizations are more likely to collect data, compute scores, and pay attention to the results if, in their view, scoring does not imply a lot of additional work and if the whole process generally seems to make sense.

To this end, Namibia's scorecard fits on one page. The construction process, indicators, and points are simple and transparent. Additional work is minimized; non-specialists can compute scores by hand in the field because the scorecard has:

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

The scorecard (and its back-page worksheet) is ready to be photocopied. A field worker using Namibia's paper scorecard would:

- Record the names and identifiers of the participant, the field worker, and the relevant organizational service point
- Record the date of the scorecard interview
- Record the date that the participant first participated with the organization
- Complete the back-page worksheet with each household member's name
- Record household size in the scorecard header, and record the responses to the scorecard's first and second indicators based on the back-page worksheet
- If the response to the first indicator is "No", then terminate the interview
- If the response to the first indicator is "Yes, then read each of the remaining questions one-by-one from the scorecard, drawing a circle around the relevant response options and their points, and writing each point value in the far right-hand column
- Add up the points to get a total score
- Implement targeting policy (if any)
- Deliver the paper scorecard to a central office for data entry and filing

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 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).[9] IRIS Center (2007a) and Toohig (2008) are useful nuts-and-bolts guides for budgeting, training field workers and supervisors, logistics, sampling, interviewing, piloting, recording data, and controlling quality.

In particular, while collecting scorecard indicators is relatively easier than alternative ways of measuring poverty, it is still absolutely difficult. Training and explicit definitions of terms and concepts in the scorecard are essential, and field workers should scrupulously study and follow the "Guidelines for the Interpretation of Indicators" found at the end of this paper and the "Back-page worksheet", as they are an integral part of the Simple Poverty Scorecard tool.[10]

For the example of Nigeria, one study (Onwujekwe, Hanson, and Fox-Rushby, 2006) found distressingly low inter-rater and test-retest correlations for indicators as seemingly simple as whether the household owns an automobile. At the same time, Grosh and Baker (1995) suggest that gross underreporting of assets does not affect targeting. For the first stage of targeting in a conditional cash-transfer program in

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[9] If a program does not want field workers to know the points associated with responses, then it can use a version of the scorecard that does not display the points and then apply the points and compute scores later at a central office. Schreiner (2012b) argues that hiding points in Colombia (Camacho and Conover, 2011) did little to deter cheating and that, in any case, cheating by the user's central office was more damaging than cheating by field workers and respondents. Even if points are hidden, field workers and respondents can use common sense to guess which response options are linked with greater poverty.

[10] The guidelines here are the only ones that organizations should give to field workers. All other issues of interpretation are to be left to the judgment of field workers and respondents, as this seems to be what the NSA did when it fielded the 2009/10 HIES.

Mexico, Martinelli and Parker (2007, pp. 24–25) 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". Still, as is done in Mexico in the second stage of

its targeting process, most false self-reports can be corrected (or avoided in the first

place) by field workers who make a home visit. This is the recommended procedure for

local, pro-poor organizations in Namibia, if they use the scorecard for targeting.

In terms of sampling 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

In general, the sampling design should follow from the organization's goals for

the exercise, the questions to be answered, and the budget. The main goal should be to

make sure that the sample is representative of a well-defined population and that the

scorecard will inform an issue important to the organization.

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

- Employees of the organization
- Third parties

Responses, scores, and poverty likelihoods can be recorded on:

- Paper in the field, and then filed at a central office
- Paper in the field, and then keyed into a database or spreadsheet at a central office
- Portable electronic devices in the field, and then uploaded to a database

Given a population of participants relevant for a particular business question, the participants to be scored can be:

- All relevant participants (a census)
- A representative sample of relevant participants
- All relevant participants in a representative sample of relevant field offices
- A representative sample of relevant participants in a representative sample of relevant field offices

If not determined by other factors, the number of participants to be scored can be derived from sample-size formulas (presented later) to achieve a desired confidence level and a desired confidence interval. To be clear, however, the focus should not be on having a sample size large enough to achieve some arbitrary level of statistical significance but rather to get a representative sample from a well-defined population so that analysis of the resulting data can meaningfully inform questions that matter to the organization.

Frequency of application can be:

- As a once-off project (precluding measuring change)
- Every two years (or at any other fixed or variable time interval, allowing measuring change)
- Each time a field worker visits a participant at home (allowing measuring change)

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

- With a different set of participants from the same population
- With the same set of participants

An example set of choices is illustrated by BRAC and ASA, two microfinance organizations in Bangladesh who each have about 7 million participants and who apply the Simple Poverty Scorecard tool for Bangladesh (Schreiner, 2013a) with a sample of about 25,000. Their design is that all loan officers in a random sample of branches score all participants each time they visit a homestead (about once a year) as part of their standard due diligence prior to loan disbursement. They record responses on paper in the field before sending the forms to a central office to be entered into a database and converted to poverty likelihoods.

5. Estimates of household poverty likelihoods

The sum of scorecard points for a household is called the *score.* For Namibia, 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 line, the scores themselves have only relative units. For example, doubling the score decreases the likelihood of being below a given poverty line, but it does not cut it in half.

To get absolute units, scores must be converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. This is done via simple look-up tables. For the example of the upper national line, scores of 30–34 have a poverty likelihood of 39.4 percent, and scores of 35–39 have a poverty likelihood of 30.3 percent (Figure 4).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 30–34 are associated with a poverty likelihood of 39.4 percent for the upper national line but of 24.7 percent for the $1.25/day 2005 PPP line.[11]

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[11] Starting with Figure 4, many figures have eight versions, one for each of the eight poverty lines. To keep them straight, they are grouped by poverty line. Single tables pertaining to all eight lines are placed with the tables for 100% of the upper national line.

5.1 Calibrating scores with poverty likelihoods

A given score is 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 have per-adult-equivalent consumption or per-capita consumption below a given poverty line.

For the example of the upper national line, there are 7,018 (normalized) households in the calibration sub-sample with a score of 30–34 (Figure 5). Of these, 2,762 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 30–34 is then 39.4 percent, because 2,762 ÷ 7,018 = 39.4 percent.

To illustrate with the upper national line and a score of 35–39, there are 7,267 (normalized) households in the calibration sample, of whom 2,198 (normalized) are below the line (Figure 5). The poverty likelihood for this score range is then 2,198 ÷ 7,267 = 30.3 percent.

The same method is used to calibrate scores with estimated poverty likelihoods for the other seven poverty lines.[12]

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[12] To ensure that poverty likelihoods never increase as scores increase, likelihoods across series of adjacent scores are sometimes iteratively averaged before grouping scores into ranges. This preserves unbiasedness, and it keeps users from balking when sampling variation in score ranges with few households would otherwise lead to higher scores being linked with higher poverty likelihoods.

The two versions of Figure 6 show the likelihood that a given household's per-adult-equivalent consumption or per-capita consumption falls in a range demarcated by two adjacent poverty lines.

For the example of the upper national line, the version of Figure 6 for the per-adult-equivalent national poverty lines shows that the probability that a household with a score of 30–34 falls between two adjacent poverty lines is:

- 17.1 percent   below the lower national line
- 22.2 percent   between the lower natl. line and 100% of the upper natl. line
- 31.2 percent   between 100% and 150% of the upper national line
- 18.4 percent   between 150% and 200% of the upper national line
- 11.1 percent   above 200% of the upper national line

For the version of Figure 6 for international 2005 PPP poverty lines in terms of per-capita consumption, the probability that a household with a score of 30–34 falls between two adjacent poverty lines is:

- 15.7 percent   below the USAID "extreme" line
- 9.0 percent   between the USAID "extreme" line and \$1.25/day
- 38.3 percent   between \$1.25/day and \$2.00/day
- 17.3 percent   between \$2.00/day and \$2.50/day
- 19.7 percent   above \$2.50/day

Even though the scorecard is constructed partly based on judgment related to non-statistical criteria, the calibration process produces poverty likelihoods that are objective, that is, derived from quantitative poverty lines and from survey data on consumption. The calibrated poverty likelihoods would be objective even if the process of selecting indicators and points did not use any data at all. In fact, objective scorecards of proven accuracy are often constructed using only expert judgment to

select indicators and points (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 the Namibia scorecard are transformed coefficients from a Logit regression, (untransformed) 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. Going from scores to poverty likelihoods in this way requires no arithmetic at all, just a look-up table. This approach to calibration can also improve accuracy, especially with large samples.

5.2   Accuracy of estimates of households' poverty likelihoods

As long as the relationships between indicators and poverty do not change over time, and as long as the scorecard is applied to households that are representative of the same population from which the scorecard was originally constructed, then 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 value. The scorecard also produces unbiased estimates of poverty rates at a point in time and unbiased estimates of changes in poverty rates between two points in time.[13]

Of course, the relationships between indicators and poverty do change to some unknown extent over time and also across sub-groups in Namibia's population. Thus, the scorecard will generally be biased when applied after mid-June 2010 (the end of fieldwork for the 2009/10 HIES) or when applied with sub-groups that are not nationally representative.

How accurate are estimates of households' poverty likelihoods, given the assumption of unchanging relationships between indicators and poverty over time and the assumption of a sample that is representative of Namibia as a whole? To find out, the scorecard is applied to 1,000 bootstrap samples of size $n = 16,384$ from the validation sample. Bootstrapping means to:

- 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 and with consumption below a poverty line
- For each score, record the difference between the estimated poverty likelihood (Figure 4) 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 intervals containing the central 900, 950, and 990 differences between estimated and true poverty likelihoods

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

For each score range and for $n = 16{,}384$, Figure 7 shows the average difference between estimated and true poverty likelihoods as well as confidence intervals for the differences.

For the upper national line, the average poverty likelihood across bootstrap samples for scores of 30–34 in the validation sample is too high by 1.2 percentage points. For scores of 35–39, the estimate is too low by 7.5 percentage points.[14]

The 90-percent confidence interval for the differences for scores of 30–34 is ±2.6 percentage points (upper national line, Figure 7). This means that in 900 of 1,000 bootstraps, the difference between the estimate and the true value is between –1.4 and +3.8 percentage points (because +1.2 – 2.6 = –1.4, and +1.2 + 2.6 = +3.8). In 950 of 1,000 bootstraps (95 percent), the difference is +1.2 ± 3.1 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is +1.2 ± 3.9 percentage points.

Figure 7 shows some differences—usually small, but sometimes larger—between estimated poverty likelihoods and true values. There are differences is because the validation sample is a single sample that—thanks to sampling variation—differs in distribution from the construction/calibration sub-samples and from Namibia's population. For targeting, however, what matters is less the difference in all score ranges and more the difference in score ranges just above and below the targeting cut-

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

off. This mitigates the effects of bias and sampling variation on targeting (Friedman, 1997). Section 8 below looks at targeting accuracy in detail.

In addition, if estimates of groups' poverty rates are to be usefully accurate, then errors for individual households' poverty likelihoods must largely balance out. As discussed in the next section, this is generally the case.

Another possible source of differences between estimates and true values is overfitting. The scorecard here is unbiased, but it may still be *overfit* when applied after the end of the HIES fieldwork in mid-June 2010. That is, it may fit the data from the 2009/10 HIES so closely that it captures not only some real patterns but also some random patterns that, due to sampling variation, show up only in the 2009/10 HIES but not in the overall population of Namibia. Or the scorecard may be overfit in the sense that it is not robust when relationships between indicators and poverty change over time or when the scorecard is applied to non-nationally representative samples.

Overfitting can be mitigated by simplifying the scorecard and by not relying only on data but rather also considering theory, experience, and judgment. Of course, the scorecard here does this. Combining scorecards can also reduce overfitting, at the cost of greater complexity.

Most errors in individual households' likelihoods do balance out in the estimates of groups' poverty rates (see the next section). Furthermore, at least some of the differences will come from non-scorecard sources such as changes in the relationships between indicators and poverty, sampling variation, changes in poverty lines, inconsistencies in data quality across time, and imperfections in cost-of-living adjustments across time and across geographic regions. These factors can be addressed only by improving data quantity and quality (which is beyond the scope of the scorecard) 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, weighted by the number of units of analysis in each household.

To illustrate, suppose an organization samples three households on 1 January 2013 and that they have scores of 20, 30, and 40, corresponding to poverty likelihoods of 66.9, 39.4, and 16.7 percent (upper national line, Figure 4). If the unit of analysis is the household itself so that each household has the same weight, then the group's estimated poverty rate is the simple average of the households' poverty likelihoods, that is, (66.9 + 39.4 + 16.7) ÷ 3 = 41.0 percent.

Be careful; the group's poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is 30, which corresponds to a poverty likelihood of 39.4 percent. This differs from the 41.0 percent found as the average of the three individual poverty likelihoods associated with each of the three scores. Unlike poverty likelihoods, scores are ordinal symbols, like letters in the alphabet or colors in the spectrum. Because scores are not cardinal numbers, they cannot be added up or averaged across households. Only three operations are valid for scores: conversion to poverty likelihoods, analysis of distributions (Schreiner, 2012a), or comparison—if desired—with a cut-off for targeting. The safest rule to follow is: Always use poverty likelihoods, never scores.

6.1 Accuracy of estimated poverty rates at a point in time

For the Namibia scorecard applied to 1,000 bootstraps of $n = 16,384$ from the validation sample, the maximum absolute difference between the estimated poverty rate at a point in time and the true rate is 1.4 percentage points (Figure 9, summarizing Figure 8 across all eight poverty lines). The average absolute difference across poverty lines is 0.7 percentage points. At least part of these differences is due to sampling variation in the division of the 2009/10 HIES into two sub-samples.

When estimating poverty rates at a point in time, the bias reported in Figure 9 should be subtracted from the average poverty likelihood to make the estimate unbiased. For the Namibia scorecard and the upper national line, bias is –0.9 percentage points, so the unbiased estimate in the three-household example above is $41.0 – (–0.9) = 41.9$ percent.

In terms of precision, the 90-percent confidence interval for a group's estimated poverty rate at a point in time with $n = 16,384$ is ±0.5 percentage points or less (Figure 9). This means that in 900 of 1,000 bootstraps of this size, the estimate (after subtracting off bias) is within 0.5 percentage points of the true value.

For example, suppose that the average poverty likelihood in a sample of $n = 16,384$ with the Namibia scorecard and the upper national line is 41.0 percent. Then estimates in 90 percent of such samples would be expected to fall in the range of $41.0 – (–0.9) – 0.5 = 41.4$ percent to $41.0 – (–0.9) + 0.5 = 42.4$ percent, with the most likely true value being the unbiased estimate in the middle of this range, that is, $41.0 – (–0.9)$

= 41.9 percent. This is because the original (biased) estimate is 41.0 percent, bias is –

0.9 percentage points, and the 90-percent confidence interval for the upper national line

and this sample size is ±0.5 percentage points (Figure 9).

6.2 Formula for standard errors for estimates of poverty rates

How precise are the point-in-time estimates? Because these estimates are

averages, they have (in "large" samples) a Normal distribution and can be characterized

by their average difference vis-à-vis true values, together 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 from indirect measurement via poverty-assessment tools (Schreiner, 2008), first note that the textbook formula (Cochran, 1977) that relates confidence intervals with standard errors in the case of direct measurement of ratios is $\pm c = \pm z \cdot \sigma$, where:

$\pm c$ is a confidence interval as a proportion (*e.g.*, 0.02 for ± 2 percentage points),

z is from the Normal distribution and is $\begin{cases} 1.04 \text{ for confidence levels of 70 percent} \\ 1.28 \text{ for confidence levels of 80 percent} \\ 1.64 \text{ for confidence levels of 90 percent} \end{cases}$,

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

$\hat{p}$ is the estimated proportion of households below the poverty line in the sample,

ϕ is the finite population correction factor $\sqrt{\dfrac{N - n}{N - 1}}$,

N is the population size, and

n is the sample size.

For example, Namibia's 2009/10 HIES gives a direct-measurement estimate of the household-level poverty rate for the upper national line of $\hat{p} = 19.6$ percent (Figure 1). If this estimate came from a sample of $n = 16{,}384$ households from a population N of 436,795 (the number of households in Namibia in 2009/10), then the finite population correction ϕ is $\sqrt{\dfrac{436{,}795 - 16{,}384}{436{,}795 - 1}} = 0.9811$, which—at a stretch—can be taken as $\phi = 1$. If the desired confidence level is 90-percent ($z = 1.64$), then the confidence interval

$$\pm c \text{ is } \pm z \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} = \pm 1.64 \cdot \sqrt{\frac{0.196 \cdot (1 - 0.196)}{16,384}} \cdot 0.9811 = \pm 0.499$$

percentage points.

The scorecard, however, does not measure poverty directly, so this formula is not applicable. To derive a formula for the Namibia scorecard, consider Figure 8, which reports empirical confidence intervals $\pm c$ for the differences for the scorecard applied to 1,000 bootstraps of various sizes from the validation sample. For example, with $n = 16,384$ and the upper national line, the 90-percent confidence interval is ± 0.460 percentage points.[15]

Thus, the 90-percent confidence interval with $n = 16,384$ is ± 0.460 percentage points for the Namibia scorecard and ± 0.499 percentage points for direct measurement. The ratio of the two intervals is $0.460 \div 0.499 = 0.92$.

Now consider the same exercise, but with $n = 8,192$. The confidence interval under direct measurement and the upper national line is

$$\pm 1.64 \cdot \sqrt{\frac{0.196 \cdot (1 - 0.196)}{8,192}} \cdot 0.9811 = \pm 0.706 \text{ percentage points. The empirical}$$

confidence interval with the Namibia scorecard (Figure 8) is ± 0.670 percentage points. Thus for $n = 8,192$, the ratio of the two intervals is $0.670 \div 0.706 = 0.95$.

This ratio of 0.95 for $n = 8,192$ is close to the ratio of 0.92 for $n = 16,384$. Across all sample sizes of 256 or more in Figure 8, the average ratio turns out to be 0.90, implying that confidence intervals for indirect estimates of poverty rates via the

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[15] Due to rounding, Figure 8 displays 0.5, not 0.460.

Namibia scorecard and the upper national poverty line are—for a given sample size—about 10-percent narrower than confidence intervals for direct estimates via the 2009/10 HIES. This 0.90 appears in Figure 9 as the "α factor" because if $\alpha = 0.90$, then the formula for confidence intervals c for the Namibia scorecard is $\pm c = \pm z \cdot \alpha \cdot \sigma$. That is, the formula for the standard error for point-in-time estimates of poverty rates via scoring is $\alpha \cdot \sqrt{\dfrac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\dfrac{N - n}{N - 1}}$.

In general, α can 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 for all eight poverty lines in Figure 9.

The formula relating confidence intervals with standard errors for the scorecard can be rearranged to give a formula for determining sample size before measurement. If $\widetilde{p}$ is the expected poverty rate before measurement, then the formula for sample size n from a population of size N that is based on the desired confidence level that corresponds to z and the desired confidence interval $\pm c$ is

$n = N \cdot \left(\dfrac{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})}{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p}) + c^2 \cdot (N - 1)} \right)$. If the population N is "large" relative to the sample size n, then the finite population correction factor ϕ can be taken as one (1), and the formula becomes $n = \left(\dfrac{\alpha \cdot z}{c} \right)^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})$.

To illustrate how to use this, suppose the population N is 436,795 (the number of households in Namibia in 2009/10), suppose $c = 0.03420$, $z = 1.64$ (90-percent

confidence), and the relevant poverty line is the upper national line so that the most

sensible expected poverty rate $\tilde{p}$ is Namibia's overall poverty rate for that line in

2009/10 (19.6 percent at the household level, Figure 1). The α factor is 0.90 (Figure 9).

Then the sample-size formula gives

$$n = 436{,}795 \cdot \left(\frac{1.64^2 \cdot 0.90^2 \cdot 0.196 \cdot (1 - 0.196)}{1.64^2 \cdot 0.90^2 \cdot 0.196 \cdot (1 - 0.196) + 0.03420^2 \cdot (436{,}795 - 1)} \right) = 294, \text{ which is}$$

not too far from the sample size of 256 observed for these parameters in Figure 8 for the

upper national line. Taking the finite population correction factor φ as one (1) gives the

same answer, as $n = \left(\dfrac{0.90 \cdot 1.64}{0.03420} \right)^2 \cdot 0.196 \cdot (1 - 0.196) = 294.$ [16]

Of course, the α factors in Figure 9 are specific to Namibia, its poverty lines, its

poverty rates, and this scorecard. The derivation of the formulas for standard errors

using the α factors, however, is valid for any scorecard following the approach in this

paper.

In practice after the end of fieldwork for the HIES in mid-June 2010, a program

would select a poverty line (say, the upper national line), note its participants'

population size (for example, $N = 10{,}000$ participants), select a desired confidence level

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[16] Although USAID has not specified required confidence levels nor intervals, IRIS
Center (2007a and 2007b) says that a sample size of $n = 300$ is sufficient for USAID
reporting. USAID microenterprise partners in Namibia should report using the
\$1.25/day 2005 PPP line. Given the α factor of 0.90 for this line (Figure 9), an expected
before-measurement household-level poverty rate of 13.2 percent (the all-Namibia rate
for the \$1.25/day line in 2009/10, Figure 1), and a confidence level of 90 percent, then n
$= 300$ implies a confidence interval of $\pm 1.64 \cdot 0.90 \cdot \sqrt{\dfrac{0.196 \cdot (1 - 0.196)}{300}} = \pm 3.4$
percentage points.

(say, 90 percent, or $z = 1.64$), select a desired confidence interval (say, ± 2.0 percentage points, or $c = \pm 0.02$), make an assumption about $\tilde{p}$ (perhaps based on a previous measurement such as the household-level poverty rate for the upper national line for Namibia of 19.6 percent in the 2009/10 HIES in Figure 1), look up α (here, 0.90 in Figure 9), assume that the scorecard will still work in the future and for non-nationally representative sub-groups,[17] and then compute the required sample size. In this illustration, $n = 10{,}000 \cdot \left(\dfrac{1.64^2 \cdot 0.90^2 \cdot 0.196 \cdot (1 - 0.196)}{1.64^2 \cdot 0.90^2 \cdot 0.196 \cdot (1 - 0.196) + 0.02^2 \cdot (10{,}000 - 1)} \right) = 791.$

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[17] This paper reports accuracy for the scorecard applied to the validation sample, but it cannot test accuracy for later years or for sub-groups. Performance after mid-June 2010 will resemble that in the 2009/10 HIES with deterioration over time to the extent that the relationships between indicators and poverty status change.

7. Estimates of changes in 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—weighted by the number of units of analysis in each household—of the households in the group. With data only from the 2009/10 HIES, this paper cannot test estimates of change over time for Namibia, and it can only suggest approximate formulas for standard errors. Nonetheless, the relevant concepts are presented here because, in practice, local pro-poor organizations can apply the scorecard to collect their own data and measure change through time.

7.1 Warning: Change is not impact

Scoring can estimate change. Of course, poverty could get better or worse, and scoring does not indicate what caused change. This point is often forgotten or confused, 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 participation 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 the impact of participation only if there is some way to know—or explicit assumptions about—what would have happened in the absence of participation. And that information must come from beyond the scorecard.

7.2   Estimating changes in poverty rates over time

Consider the illustration begun in the previous section. On 1 January 2013, an organization samples three households who score 20, 30, and 40 and so have poverty likelihoods of 66.9, 39.4, and 16.7 percent (upper national line, Figure 4). Adjusting for the known bias of –0.9 percentage points (Figure 9) and taking the household itself as the unit of analysis, the group's baseline estimated poverty rate is the households' average poverty likelihood of $[(66.9 + 39.4 + 16.7) \div 3] - (-0.9) = 41.9$ percent.

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

- Score a new, independent sample, measuring change across samples
- Score the same sample at both baseline and follow-up

By way of illustration, suppose that two years later on 1 January 2015, the organization samples three additional households who are in the same population as the three original households (or suppose that the same three original households are scored a second time) and finds that their scores are 25, 35, and 45 (poverty likelihoods of 51.8, 30.3, and 12.2 percent, upper national line, Figure 4). Adjusting for known bias, the average poverty likelihood at follow-up is $[(51.8 + 30.3 + 12.2) \div 3] - (-0.9) = 32.3$ percent, an improvement of $41.9 - 32.3 = 9.6$ percentage points.[18]

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[18] Of course, such a huge reduction in poverty in two years is highly unlikely, but this is just an example to show how the scorecard can be used to estimate change.

Thus, about one in 10 participants in this hypothetical example cross the poverty line in 2013/5.[19] Among those who start below the line, about one in five (9.6 ÷ 41.9 = 22.9 percent) on net end up above the line.[20]

With only the 2009/10 HIES, it is not possible to measure the accuracy of scorecard estimates of changes in groups' poverty rates over time. In practice, of course, local pro-poor organizations in Namibia can still use the scorecard to estimate change. The rest of this section suggests approximate formulas for standard errors that may be used until there is additional data.

7.3   Precision for estimates of change in two 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 $\pm c$ with the standard error σ of a scorecard's estimate of the change in poverty rates over time:

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

Here, c, z, $\hat{p}$ and N are defined as above, n is the sample size at both baseline and follow-up,[21] and α is the average (across a range of bootstrapped sample sizes) of

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[19] This is a net figure; some people start above the line and end below it, and vice versa.
[20] The scorecard does not reveal the reasons for this change.
[21] This means that—given precision—estimating the change in a poverty rate between two points in time requires four times as many measurements (not twice as many) as does estimating a poverty rate at a point in time.

the ratio of the observed confidence interval from a scorecard and the theoretical confidence interval under direct measurement.

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

$n = 2 \cdot N \cdot \left(\dfrac{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})}{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p}) + c^2 \cdot (N - 1)} \right)$. If ϕ can be taken as one (1), then the

formula becomes $n = 2 \cdot \left(\dfrac{\alpha \cdot z}{c} \right)^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})$.

This α has been measured for 11 countries (Schreiner, 2013a, 2013b, 2012c, 2010, 2009a, 2009b, 2009c, 2009d; Chen and Schreiner, 2009; and Schreiner and Woller, 2010a and 2010b). The simple average of α across countries—after averaging α across poverty lines and survey years within each country—is about 1.15. This is as reasonable a figure as any to use for Namibia.

To illustrate the use of this formula to determine sample size for estimating changes in poverty rates across two independent samples, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is ± 2 percentage points ($\pm c = \pm 0.02$), the poverty line is the upper national line, $\alpha = 1.15$, $\hat{p}$ = 0.196 (the household-level poverty rate in 2009/10 for the upper national line in Figure 1), and the population N is large enough relative to the expected sample size n that the finite population correction ϕ can be taken as one (1). Then the baseline

sample size is $n = 2 \cdot \left(\dfrac{1.15 \cdot 1.64}{0.02} \right)^2 \cdot 0.196 \cdot (1 - 0.196) \cdot 1 = 2{,}803$, and the follow-up

sample size is also 2,803.

7.4 Precision for estimated change for one sample, scored twice

Analogous to previous derivations, the general formula relating the confidence

interval $\pm c$ to the standard error σ when using a scorecard to estimate change for a

single group of households, all of whom are scored at two points in time, is:[22]

$$\pm\, c = \pm z \cdot \sigma = \pm z \cdot \alpha \cdot \sqrt{\frac{\hat{p}_{12} \cdot (1 - \hat{p}_{12}) + \hat{p}_{21} \cdot (1 - \hat{p}_{21}) + 2 \cdot \hat{p}_{12} \cdot \hat{p}_{21}}{n}} \cdot \sqrt{\frac{N - n}{n - 1}},$$

where c, z, α, N, and n are defined as usual, $\hat{p}_{12}$ is the share of all sampled households

that move from below the poverty line to above it, and $\hat{p}_{21}$ is the share of all sampled

households that move from above the line to below it.

The formula for confidence intervals can be rearranged to give a formula for

sample size before measurement. This requires estimates (based on information

available before measurement) of the expected shares of all households who cross the

poverty line $\tilde{p}_{12}$ and $\tilde{p}_{21}$. Before measurement, a conservative assumption is that the

change in the poverty rate will be zero, which implies $\tilde{p}_{12} = \tilde{p}_{21} = \tilde{p}_*$, giving:

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \tilde{p}_* \cdot \sqrt{\frac{N - n}{n - 1}}.$$

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

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

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

Given this, a sample-size formula for a group of households to whom the Namibia scorecard is applied twice (once after mid-June 2010 and then again later) is

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

In Peru (the only source of a data-based estimate, Schreiner, 2009e), 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 ($\pm c = \pm 0.02$), the poverty line is the upper national line, the sample will first be scored in 2013 and then again in 2016 ($y = 3$), and the population N is so large relative to the expected sample size n that the finite population correction ϕ can be taken as one (1). The pre-baseline poverty rate $p_{2009/10}$ is taken as 19.6 percent (Figure 1), and α is assumed to be 1.30. Then the baseline sample size is

$$n = 2 \cdot \left(\frac{1.30 \cdot 1.64}{0.02}\right)^2 \cdot \left\{-0.02 + 0.016 \cdot 3 + 0.47 \cdot \left[0.196 \cdot (1 - 0.196)\right]\right\} \cdot 1 = 2{,}320.$$ The same group of 2,320 households is scored at follow-up as well.

8. Targeting

When an organization 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 consumption below a poverty line). Poverty status is a fact that is defined by whether consumption is below a poverty line as directly measured by a survey. In contrast, targeting status is an organization'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 10 depicts these four possible targeting outcomes. Targeting accuracy varies by the cut-off score; a higher cut-off has better inclusion (but worse leakage), while a lower cut-off has better exclusion (but worse undercoverage).

Programs 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 11 shows the distribution of households by targeting outcome for

Namibia. For an example cut-off of 34 or less, outcomes for the upper national line in

the validation sample are:

- Inclusion: 13.1 percent are below the line and correctly targeted
- Undercoverage: 6.8 percent are below the line and mistakenly not targeted
- Leakage: 10.3 percent are above the line and mistakenly targeted
- Exclusion: 69.9 percent are above the line and correctly not targeted

Increasing the cut-off to 39 or less improves inclusion and undercoverage but

worsens leakage and exclusion:

- Inclusion: 15.5 percent are below the line and correctly targeted
- Undercoverage: 4.3 percent are below the line and mistakenly not targeted
- Leakage: 15.1 percent are above the line and mistakenly targeted
- Exclusion: 65.1 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 11 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. A

program that uses targeting—with or without scoring—should thoughtfully consider

how it values successful inclusion and 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 11 shows "Total Accuracy" for all cut-offs for the Namibia scorecard. For

the upper national line in the validation sample, total net benefit is greatest (84.4) for a

cut-off of 29 or less, with more than five in six households in Namibia 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).[23]

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[23] Figure 11 also reports BPAC, the Balanced Poverty Accuracy Criteria adopted by
USAID for certifying poverty-assessment tools. IRIS Center (2005) made BPAC to
consider accuracy in terms of estimated poverty rates and in terms of 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 12 ("% targeted who are poor") shows, for the Namibia scorecard applied to the validation sample, the expected poverty rate among households who score at or below a given cut-off. For the example of the upper national line, targeting households who score 34 or less would target 23.3 percent of all households (second column) and produce a poverty rate among those targeted of 56.0 percent (third column).

Figure 12 also reports two other measures of targeting accuracy. The first is a version of coverage ("% of poor who are targeted"). For the example of the upper national line with the validation sample and a cut-off of 34 or less, 65.8 percent of all poor households are covered.

The final targeting measure in Figure 12 is the number of poor households successfully targeted for each non-poor household mistakenly targeted (right-most column). For the upper national line with the validation sample and a cut-off of 34 or less, covering 1.3 poor households means leaking to 1 non-poor household.

9. Context of poverty-assessment tools in Namibia

This section discusses an existing poverty-assessment tool for Namibia in terms of its goals, methods, definition of *poverty*, data, indicators, cost, bias, and precision. In general, the advantages of the scorecard here are its:

- Use of data from the latest nationally representative consumption survey
- Reporting of bias and precision from out-of-sample tests, including formulas for standard errors
- Feasibility for local, pro-poor programs, due to its simplicity and transparency

Gwatkin *et al.* (2007) construct a poverty-assessment tool for Namibia with an approach that they use in 56 countries with Demographic and Health Surveys (Rutstein and Johnson, 2004). They use Principal Components Analysis to make an asset index from simple, low-cost indicators available for the 6,392 households in Namibia's 2000 DHS. The PCA index is like the scorecard here except that, because the DHS does not collect data on consumption, the index is based on a different conception of poverty, its accuracy vis-à-vis consumption-based poverty is unknown, and it can only be assumed to be a proxy for long-term wealth/economic status.[24] Well-known examples of the PCA

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[24] Nevertheless, the indicators are similar and the "flat maximum" is important, so carefully built PCA indexes and consumption-based poverty-assessment tools may pick up the same underlying construct (perhaps "permanent income", see Bollen, Glanville, and Stecklov, 2007), and they may rank households much the same. Comparisons of rankings by PCA indexes and consumption-based poverty-assessment tools include Filmer and Scott (2012), Lindelow (2006), Sahn and Stifel (2003), Wagstaff and Watanabe (2003), and Montgomery *et al.* (2000).

asset-index approach include Stifel and Christiaensen (2007), Zeller *et al.* (2006), Filmer

and Pritchett (2001), and Sahn and Stifel (2000 and 2003).

The 16 indicators in Gwatkin *et al.* are similar to those in the scorecard here in

terms of their simplicity, low cost, and verifiability:

- Characteristics of the residence:
    — Type of floor
    — Type of fuel for cooking
    — Type of fuel for lighting
    — Source of drinking water
    — Type of toilet arrangement
    — Presence of electricity
    — Number of people per sleeping room
- Ownership of consumer durables:
    — Radios
    — Televisions
    — Refrigerators
    — Bicycles
    — Motorcycles/scooters
    — Cars/trucks
    — Telephones
    — Donkey carts or horses
- Whether members of the household work their own or family's agricultural land

Gwatkin *et al.* suggest three possible uses for their index:

- Segmenting households by the quintile of their index to see how health, population, and nutrition vary with socio-economic status
- Monitoring (via exit surveys) how well local health-service posts reach the poor
- Measuring local coverage of health services via small-scale surveys

The first goal is akin to targeting, and the last two goals deal with performance

monitoring, so the asset index would be used much like the scorecard.

Still, the Gwatkin *et al.* index is more difficult and costly than the scorecard.

While the scorecard requires adding up 10 positive integers, some of which are usually

zero, Gwatkin *et al.*'s asset index requires adding up 101 numbers, each with five decimal places and half with negative signs.

Unlike the asset index, the scorecard here is linked directly to a consumption-based poverty line. Thus, while both approaches can rank households, only the scorecard can estimate consumption-based poverty status.

In essence, Gwatkin *et al.*—like all asset indexes—define *poverty* in terms of the indicators and the points in the index itself. Thus, the index is not a proxy standing in for something else (such as consumption) but rather a direct measure of a non-consumption-based definition of *poverty*. There is nothing wrong—and a lot right—about defining *poverty* in this way, but it is not as common as a consumption-based definition.

The asset-index approach defines people as *poor* if their assets (physical, human, financial, and social) fall below a threshold. Arguments for the asset-based view include Carter and Barrett (2006), Schreiner and Sherraden (2006), Sahn and Stifel (2003), and Sherraden (1991). The main advantages of the asset-based view are that:

- Asset ownership is easier to measure accurately than consumption
- Access to resources in the long term—and thus capacity to produce income and to consume—depends on the control of assets
- Assets get at capability more directly, the difference between, say, "Does income permit adequate sanitation?" versus "Does the toilet drain to a septic tank?"

While the asset view and the income/consumption view are distinct, they are also tightly linked. After all, income and consumption are flows of resources received/consumed from the use of stocks of assets. Both views are low-dimensional simplifications—due to practical limits on definitions and measurement—of a higher-dimensional and more complete conception of the production of human well-being.

10. Conclusion

Pro-poor programs in Namibia can use the scorecard to segment clients for differentiated treatment as well as to estimate:

- The likelihood that a household has consumption 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 over time

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

The scorecard is constructed with half of the data from Namibia's 2009/10 HIES, calibrated to eight poverty lines, and tested on data from the other half of the HIES. Bias and precision are 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 changes are not the same as estimates of program impact. Targeting accuracy is also reported.

When the scorecard is applied to the validation sample, the maximum absolute difference between estimates versus true poverty rates for groups of households at a point in time is 1.4 percentage points. The average absolute bias across the eight poverty lines is about 0.7 percentage points. Unbiased estimates may be had by subtracting the known bias for a given poverty line from the original estimates. For $n = 16,384$ and 90-percent confidence, the precision of these differences is ± 0.5 percentage points or better.

If an organization wants to use the scorecard for targeting, then the results here provide useful information for selecting a cut-off that fits its mission and values.

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, accuracy is irrelevant if an organization feels so daunted by a scorecard's complexity or its cost that it does not even try to use it.

For this reason, the scorecard is kept simple, using ten indicators that are straightforward, low-cost, and verifiable. Points are all zeros or positive integers, and scores range from 0 (most likely below a poverty line) to 100 (least likely below a poverty line). Scores are converted to poverty likelihoods via simple look-up tables, and targeting cut-offs are likewise straightforward to apply. The design attempts to facilitate voluntary adoption by helping managers to understand and trust scoring and by allowing non-specialists to add up scores quickly in the field.

In summary, the scorecard is a practical, objective way for pro-poor programs in Namibia to estimate consumption-based poverty rates, track changes in poverty rates over time, and target services. The same approach can be applied to any country with similar data.

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Guidelines for the Interpretation
of Scorecard Indicators

The following is extracted from:

Central Bureau of Statistics. (2003) "Interviewer's Manual: Namibia Household Income
   and Expenditure Survey, 2003/4" [the *Manual*],[25]

and

Namibia Statistics Agency. (2009) "Questionnaire: National Household Income and
   Expenditure Survey, 2009/10", `microdata.nsa.org.na/index.php/`
   `catalog/6/download/25`, retrieved 21 July 2013 [the *Questionnaire*]

Guidelines to interviewing

General advice
According to p. 1 of the *Manual*, "Carefully study this *Manual* to learn how to collect
accurate data, to reduce difficulties in the field, and to understand procedures."

According to p. 4 of the *Manual*, "Conduct yourself with decency and propriety. . . .
Only ask questions as necessary to complete the questionnaire."

According to p. 5 of the *Manual*, "The information you will obtain from members of the
household is confidential. . . . You are not permitted to discuss it or to show your
records to anyone who is not authorized. . . . Do not leave your questionnaires where
unauthorized people may have access to them."

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[25] According to the NSA, the 2009/10 HIES used the same *Manual* that was originally
prepared for the 2003/4 HIES.

According to p. 9 of the *Manual*, "You must cultivate respondents' cooperation. This cooperation depends on (among other things):

- The way you dress
- The way you introduce yourself
- The identification card that you carry
- What you say about the survey
- The courtesy you show to the respondents."

According to p. 12 of the *Manual*, "Remember that you need the cooperation of the households to be successful. Thus, do not be aggressive, abrupt, unpresentable, or disrespectful to the respondents."

The following is extracted from pp. 14–16 of the *Manual*:

Building rapport
"At the beginning of the interview, you and the respondent do not know each other. The respondent's first impression of you will influence her/his willingness to co-operate. Be sure that your manner is friendly as you introduce yourself and the survey. . . . You will have a letter of introduction and a survey-identification card, but assume that the household does not know anything about the survey, and be ready to fully introduce the survey.

Balancing your formal and informal roles
"The interview is an interactive process between two parties, with three main phases:

- Introduction
- Interview
- Close

    "The interviewer has to act differently—that is, has to play different roles—in each phase. There is a *formal* role and an *informal* role.
    "The informal role is used when the goal is to make a good atmosphere for communication with the respondent. This role is mostly used during introduction and closing.
    "During the introduction, help respondents to feel relaxed. To be selected for an interview is a completely new situation for them. They may worry that this new situation will be embarrassing or that they will not be able to answer the questions. Therefore, help them to feel confidence.
    "During the closing, use the informal role. It is common that a respondent tells other people about his/her experiences of the interview.

"The formal role is mostly used during the interviewing phase. The interviewer must, as closely as possible, follow the instructions [including this one] and ask the questions as they are phrased. Even during this phase, the interviewer uses a mixture of the two roles. Probing should be used to get all required information.

"The interviewer may also have to use the informal role if the respondent loses his/her concentration. In this case, make some small talk, and then continue with the interview.

"You must always strike a good balance between the formal and the informal roles.

Make a good first impression and stress confidentiality
"What follows is a simple way of introducing yourself. After you enter the house or compound, greet the people you find there. Exchange pleasantries as is customary in that community. Then proceed to introduce yourself, for example, as follows:

'My name is <your name>. I am a representative of <your organization>. We are doing a survey to learn more about the people who participate with <your organization>. A few households have been selected for the interview. . . .

'Before I ask you any questions, I would like to assure you that the information about you and your household that I will record on the form is confidential and no one, except survey personnel, will have access to it. . . . I would now like to ask you questions, which I will record on a form.'

Question wording
"Avoid changing the wording of the questions. Do not use interpreters, because they have not been trained.

Translation
"The [survey] is in English. However, you will meet households whom you will not be able to interview in English. In such situations, you will interview in a language which the respondent knows well. You will need to translate the questions into the language of the interview. The meaning of the translation must be identical to the English version. This is why you must know the questionnaire and [these guidelines] properly.

Always be positive

"Adopt a positive, non-apologetic attitude. If you are apologetic, you may say things like 'I am sorry to take up your time', or 'Would you mind answering a few questions?' The answer could be 'Yes'; then what would you do next? Instead, tell the respondent, 'I would like to ask you some questions,' or 'I would like to talk to you'.

Answer questions from the respondent honestly

"If the respondent has any questions, answer them frankly. Be direct and pleasant when you answer.

Do not lead the respondent

"Never prompt or suggest answers to the respondent. Such comments as 'I suppose you mean . . . ?' are forbidden. Instead, probe in a way so that the respondent supplies the response.

Do not make assumptions about the respondent

"Do not form any expectations.

Try to conduct the interview away from distractions from other people

"The presence of other people during the interview can cause the respondent to give wrong answers. Ask the respondent where you can best talk without disturbance.

Handle hesitant respondents tactfully

"Hesitating or stammering respondents should be handled with tact. Do not rush the interview or make faces. Rushing the interview will affect the quality of the responses.

Always be neutral

"Try to remain neutral during the interview; otherwise, the respondent may give the answers that she/he thinks that you want to hear. Never show by your facial expressions agreement or disagreement with any answer given. Remember that any friction between you and the respondent is detrimental to the survey.

Try to spark the respondent's interest

"A respondent may reply 'I don't know', give an irrelevant answer, act bored, behave detached, contradict herself/himself, or just seem not to care. Try to stimulate her/his interest, for example, by digressing a bit and talking about other matters unrelated to the survey, such as the weather. Of course, avoid contentious subjects, such as religion or politics.

<u>Do not hurry the interview</u>
"Ask questions slowly, making sure that the respondent understands. Pause to give her/him time to think. Hurrying the respondent might cause her/him to give an inaccurate answer."

According to p. 31 of the *Manual*: "Ask every question in exactly the way it appears in the questionnaire. Do not add or skip any words or sentences. If you must probe to clarify the meaning of an answer, do so in a way which does not does not suggest a particular answer to the respondent. Follow the order of the questions strictly."

Guidelines to scorecard indicators

1. Does the household have only one member, or own a microwave oven, or own a
   motor vehicle?
   - A. No
   - B. Yes

This first question is a "gateway"; if the response is "Yes", then the score is 100, and no
more questions are asked. If the response is "No", then all the indicators are asked, and
the score is the sum of the points corresponding to the responses for all ten indicators.

The question has three elements:

- Whether the household has one member, or
- Whether the household owns a microwave oven, or
- Whether the household owns a motor vehicle

If the response to any of the three is in the affirmative, then the response is "Yes". If
none are in the affirmative, then the response is "No".

Based on the *Questionnaire*, *motor vehicle* does not include motorcycles/scooters,
tractors, nor motorboats.

According to p. 21 of the *Manual*, a *household* "consists of one or more persons, related
or unrelated, who live together in the same homestead/compound, but not necessarily in
the same dwelling unit. They have a community of life with common catering
arrangements, and all are answerable to the same head of household.
    "Remember that members who belong to the same household need not
necessarily be related by blood or marriage.

"Determination of *households* is not easy. The following examples are useful:

- A household may consist of one or more persons and may occupy a whole building, part of a building, or many buildings in a single compound/homestead
- If two or more groups of people live in the same dwelling unit, but have separate catering/eating arrangements, then they are separate households
- A domestic worker who shares meals with her/his employer should be included in her/his employer's household. However, if she/he cooks and eats on her/his own or with her/his family, then he/she is part of a separate household
- In a polygamous marriage (a man with more than one wife) in which the wives cook and eat separately, the wives are treated as separate households. But if the wives and their children share a common kitchen (eating arrangements), then they are all part of one household"

According to the NSA, to qualify as a *household member*, a person must have slept in the residence for at least eight of the past 28 nights.

In sum, members of a household must fulfill the following four criteria:

- Live in the same compound
- Share meals
- Recognize the same head
- Have slept in the residence for at least eight of the past 28 nights

According to p. 23 of the *Manual*, "If a domestic worker lives in the same dwelling unit as the main household and shares its meals, she/he can be regarded as a household member, even if she/he does not pool her/his income and does not share expenditures with the main household. . . . [But] if the domestic worker lives somewhere else and does not share the catering arrangements with the main household, then she/he belongs to another household."

According to p. 24 of the *Manual*, "A boarder who lives with the main household and who shares meals with it can be regarded as a household member, even though she/he pays for boarding and lodging, does not pool income, and does not share expenditures."

2. How many members does the household have?
   - A. Eight or more
   - B. Seven
   - C. Six
   - D. Five
   - E. Four
   - F. Three
   - G. One or two

Please refer to the definition of *household member* for the previous indicator. That definition also applies equally to this indicator.

3. What is the highest level of education that the female head/spouse has completed?
   A. None
   B. Primary school
   C. No female head/spouse
   D. Junior secondary (high) school
   E. Senior secondary (high) school or more

According to p. 48 of the *Manual*, "The purpose of this question is to establish levels of schooling. The responses refer to highest level completed and not highest level attended. For example, a person who attended Grade 9 but who left after second term—that is, did not complete Grade 9—is counted as having completed Grade 8. Similarly, person who is in Grade 9 this year is reported as having completed Grade 8."

According to p. 22 of the *Manual*, the *head of the household* is "a person, either female or male, who is looked upon by other members of household as their leader or main decision-maker."

For the purposes of the scorecard:, the *female head/spouse* is defined as:

* The household head, if the head is a woman
* The spouse/partner/companion of the household head, if the head is a man
* Non existent, if neither of the previous two criteria are met

4. How many rooms in the dwelling are used for sleeping?
    A. One
    B. Two
    C. Three or more

According to p. 21 of the *Manual*, a dwelling "may be a building, a part of a building, or a group of buildings, regardless of physical condition."

According to p. 22 of the *Manual*, a *dwelling* is "a place of residence occupied by one or more households with a private entrance. There may be many dwelling units within one structure/building."

5. What is the main material used for the floor of the main dwelling?
   A. Mud, clay, cow dung, or sand
   B. Concrete, wood, or other

According to p. 54 of the *Manual*, "If more than one material is used . . . mark the most common."

6. What is the main source of energy/fuel for cooking?
   A. Wood, wood charcoal, coal, animal dung, solar energy, none, or other
   B. Paraffin, gas, or electricity

According to p. 54 of the *Manual*, "Some households use more than one type of energy for cooking. Record the main type of energy used."

7. Does the household own a frigerator or freezer?
   A. No
   B. Yes

The *Manual* has no additional information for this indicator.

8. Does the household own a television?
    A. No
    B. Yes

The *Manual* has no additional information for this indicator.

9. Does the household own a cell telephone and/or a landline telephone?
    A. No
    B. Only cell or only landline
    C. Both

The *Manual* has no additional information for this indicator.

10. Does the household own cattle, donkeys/mules, or horses?
    A. No
    B. Yes

The *Manual* has no additional information for this indicator.

Figure 1: Poverty lines and poverty rates for all of Namibia and for the construction/calibration and validation sub-samples, by poverty line and by households and people

Line or rate	# HHs surveyed	% with per-adult-equivalent or per-capita daily expenditure below a poverty line							
		Natl. Lower	National Upper			USAID 'Extreme'	Intl. 2005 PPP		
			100%	150%	200%		$1.25	$2.00	$2.50
All Namibia									
Poverty line	9,656	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
Household-level poverty rate		9.7	19.6	35.9	48.2	8.8	13.2	30.3	39.2
Person-level poverty rate		15.4	28.8	48.6	60.9	14.4	20.6	42.7	52.9
Construction/calibration: Selecting indicators and points, and associating scores with likelihoods									
Household-level poverty rate	4,846	9.6	19.3	35.7	47.9	8.8	12.9	30.0	38.9
Person-level poverty rate		15.4	28.8	48.6	60.9	14.3	20.4	42.6	52.8
Validation: Measuring accuracy of 2010 scorecard									
Household-level poverty rate	4,810	9.7	19.8	36.2	48.5	8.8	13.5	30.5	39.5
Person-level poverty rate		15.5	28.8	48.6	60.9	14.5	20.9	42.8	53.0

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" poverty line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Nambia): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	4,095	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.5	9.5	17.5	26.5	3.9	5.9	13.8	19.2
		Rate (people)		7.2	14.6	25.1	35.3	6.6	9.4	20.7	27.7
Rural	2009	Line	5,561	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		13.6	27.2	50.0	64.7	12.5	18.8	42.8	54.5
		Rate (people)		20.5	37.5	63.0	76.5	19.2	27.5	56.2	68.3
All	2009	Line	9,656	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		9.7	19.6	35.9	48.2	8.8	13.2	30.3	39.2
		Rate (people)		15.5	28.8	48.6	60.9	14.4	20.6	42.7	52.9

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Caprivi): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	275	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.2	15.7	31.5	43.4	6.6	10.8	24.5	34.9
		Rate (people)		11.9	19.3	38.0	50.4	9.7	14.6	30.6	42.9
Rural	2009	Line	489	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		34.2	52.8	74.5	83.5	29.7	41.2	66.8	75.9
		Rate (people)		44.7	62.8	82.0	88.9	40.1	51.9	76.1	84.8
All	2009	Line	764	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		26.4	41.7	61.6	71.5	22.8	32.2	54.2	63.7
		Rate (people)		35.2	50.2	69.3	77.8	31.3	41.1	63.0	72.7

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Erongo): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n		% with expenditure below a poverty line (NAD)							
						National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	584	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		1.1	3.6	9.5	18.2	0.9	2.3	6.5	11.1
		Rate (people)		1.1	4.6	11.2	21.4	1.0	3.1	7.8	13.4
Rural	2009	Line	294	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		6.5	13.3	26.0	42.0	6.6	9.2	21.0	29.2
		Rate (people)		13.3	22.1	40.4	54.8	14.0	17.0	35.0	44.9
All	2009	Line	878	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		1.9	5.1	12.1	21.9	1.8	3.4	8.7	13.9
		Rate (people)		2.9	7.1	15.4	26.3	2.9	5.1	11.8	18.0

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Hardap): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	343	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.2	15.0	27.8	41.3	6.6	9.6	22.8	32.9
		Rate (people)		14.1	24.2	38.0	52.7	12.7	16.9	32.5	45.3
Rural	2009	Line	364	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		10.9	19.3	36.8	49.8	7.8	14.0	29.3	39.2
		Rate (people)		16.3	28.5	50.8	63.8	13.3	22.2	42.4	55.5
All	2009	Line	707	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		9.6	17.3	32.7	45.9	7.3	12.0	26.3	36.3
		Rate (people)		15.2	26.2	44.1	58.0	13.0	19.4	37.2	50.1

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Karas): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n		% with expenditure below a poverty line (NAD)							
						National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	349	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		3.2	8.1	17.2	27.4	3.6	5.0	11.8	19.1
		Rate (people)		6.3	17.2	29.1	42.1	7.3	10.8	21.9	31.5
Rural	2009	Line	344	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		12.9	20.1	33.2	44.6	10.9	14.0	26.4	37.3
		Rate (people)		24.1	33.7	50.2	62.8	21.1	26.5	43.6	56.7
All	2009	Line	693	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		9.1	15.4	26.9	37.8	8.0	10.4	20.6	30.2
		Rate (people)		16.8	27.0	41.6	54.4	15.5	20.1	34.7	46.4

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Kavango): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n		% with expenditure below a poverty line (NAD)							
						National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	196	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		9.4	18.6	32.8	42.0	10.2	12.1	26.5	35.5
		Rate (people)		16.6	29.8	47.9	57.4	17.1	20.0	39.8	50.7
Rural	2009	Line	578	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		26.9	48.1	73.8	84.3	26.2	37.2	66.9	77.8
		Rate (people)		38.1	59.6	82.6	91.2	37.3	48.6	77.0	87.0
All	2009	Line	774	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		24.0	43.4	67.1	77.5	23.6	33.1	60.3	71.0
		Rate (people)		34.8	55.2	77.4	86.2	34.3	44.3	71.4	81.6

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Khomas) : Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	Food	National 100%	National 150%	National 200%	USAID 'Extreme'	Intl. 2005 PPP $1.25	Intl. 2005 PPP $2.50	Intl. 2005 PPP $3.75
					% with expenditure below a poverty line (NAD)				
Urban	2009	Line	817	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		2.3	7.0	13.4	21.3	2.0	3.4	10.0	14.6
		Rate (people)		3.3	9.7	19.2	28.7	3.0	4.5	14.8	20.9
Rural	2009	Line	257	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.6	15.4	33.8	46.8	6.7	10.1	25.9	35.8
		Rate (people)		16.7	28.0	51.5	61.3	14.7	19.9	45.0	53.9
All	2009	Line	1,074	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		2.8	7.6	14.9	23.1	2.4	3.9	11.2	16.1
		Rate (people)		4.0	10.7	21.0	30.5	3.7	5.4	16.5	22.7

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Kunene): Poverty lines/rates by urban/rural/all and by household/person

| Region | Year | Line/rate | n | % with expenditure below a poverty line (NAD) | | | | | | | |
| | | | | | National | | | USAID | Intl. 2005 PPP | | |
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	194	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		14.7	23.9	34.3	48.1	11.8	18.2	33.4	37.2
		Rate (people)		23.4	36.8	47.5	61.0	18.8	29.2	46.3	51.5
Rural	2009	Line	236	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.9	12.5	29.8	46.0	4.1	8.3	25.1	34.5
		Rate (people)		12.9	26.1	48.7	64.8	11.7	17.2	43.8	55.1
All	2009	Line	430	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.6	16.8	31.5	46.8	7.0	12.0	28.2	35.6
		Rate (people)		16.9	30.2	48.2	63.3	14.4	21.8	44.8	53.8

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Ohangwena): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)				USAID	Intl. 2005 PPP		
					National						
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	142	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		0.8	2.9	13.0	28.0	0.5	1.7	7.9	15.8
		Rate (people)		0.8	5.8	21.3	39.7	0.5	2.8	15.5	29.4
Rural	2009	Line	606	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		9.1	25.3	52.6	67.8	8.8	16.3	46.1	60.0
		Rate (people)		12.4	31.1	60.9	75.7	11.7	21.5	53.9	68.7
All	2009	Line	748	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.5	23.7	49.8	64.9	8.2	15.3	43.3	56.7
		Rate (people)		11.9	30.1	59.2	74.2	11.2	20.7	52.3	67.1

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Omaheke): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	178	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		24.1	32.1	40.9	48.6	21.8	28.4	36.0	43.5
		Rate (people)		32.1	41.9	50.8	58.3	30.7	37.3	46.1	55.1
Rural	2009	Line	289	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		8.5	15.9	32.3	47.7	7.3	12.7	28.2	38.5
		Rate (people)		13.5	25.8	47.9	64.2	12.5	21.6	43.5	56.0
All	2009	Line	467	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		13.4	20.9	35.0	48.0	11.8	17.5	30.6	40.1
		Rate (people)		19.6	31.1	48.9	62.3	18.5	26.7	44.4	55.7

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Omusati): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	88	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		0.0	0.0	4.0	12.6	0.0	0.0	2.8	5.9
		Rate (people)		0.0	0.0	11.1	21.0	0.0	0.0	9.2	12.6
Rural	2009	Line	644	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.6	13.1	38.8	58.5	4.3	6.6	29.4	43.7
		Rate (people)		7.5	19.5	50.3	68.8	6.8	10.8	40.5	55.6
All	2009	Line	732	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.5	12.6	37.6	56.8	4.1	6.3	28.4	42.3
		Rate (people)		7.3	19.1	49.6	68.0	6.6	10.6	39.9	54.8

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Oshana): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	397	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		2.0	6.7	12.8	21.7	1.2	2.6	9.8	14.4
		Rate (people)		2.5	9.5	17.3	27.1	1.3	3.9	14.7	20.0
Rural	2009	Line	556	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		6.9	19.0	43.7	61.9	6.8	9.9	35.7	49.1
		Rate (people)		9.8	24.8	50.9	69.2	9.8	13.8	43.6	56.9
All	2009	Line	953	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.8	13.5	30.0	44.1	4.3	6.7	24.2	33.8
		Rate (people)		7.2	19.4	38.9	54.2	6.8	10.3	33.3	43.7

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Oshikoto): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	397	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		2.0	6.7	12.8	21.7	1.2	2.6	9.8	14.4
		Rate (people)		2.5	9.5	17.3	27.1	1.3	3.9	14.7	20.0
Rural	2009	Line	556	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		6.9	19.0	43.7	61.9	6.8	9.9	35.7	49.1
		Rate (people)		9.8	24.8	50.9	69.2	9.8	13.8	43.6	56.9
All	2009	Line	953	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		4.8	13.5	30.0	44.1	4.3	6.7	24.2	33.8
		Rate (people)		7.2	19.4	38.9	54.2	6.8	10.3	33.3	43.7

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 2 (Otjozondjupa): Poverty lines/rates by urban/rural/all and by household/person

Region	Year	Line/rate	n	% with expenditure below a poverty line (NAD)							
					National			USAID	Intl. 2005 PPP		
				Food	100%	150%	200%	'Extreme'	$1.25	$2.50	$3.75
Urban	2009	Line	182	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		5.4	11.4	24.3	33.4	5.4	6.1	19.0	24.6
		Rate (people)		6.4	15.5	29.4	40.1	6.4	8.3	23.7	32.0
Rural	2009	Line	555	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		16.7	37.6	62.8	78.9	15.3	23.7	55.7	67.1
		Rate (people)		23.7	48.4	74.8	86.3	21.2	32.8	68.9	79.1
All	2009	Line	737	9.12	12.43	18.64	24.85	7.34	8.71	13.94	17.42
		Rate (HH)		15.3	34.4	58.1	73.3	14.1	21.5	51.2	61.9
		Rate (people)		21.9	45.1	70.1	81.5	19.7	30.3	64.3	74.2

Source: Namibia's 2009/10 Household Income and Expenditure Survey

National poverty lines are in NAD per adult equivalent per day. Poverty rates are percentages.

The USAID "extreme" line and the 2005 PPP lines are in NAD per person per day. Poverty rates are percentages.

All poverty lines are in average prices for all of Namibia from mid-June 2009 to mid-June 2010.

Figure 3: Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
11,102	How many members does the household have? (Eight or more; Seven; Six; Five; Four; Three; One or Two)
9,960	How many household members are 18-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
9,772	How many household members are 17-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
9,325	How many household members are 16-years-old or younger? (Five or more; Four; Three; Two; One; None)
9,219	How many household members are 14-years-old or younger? (Five or more; Four; Three; Two; One; None)
9,123	How many household members are 15-years-old or younger? (Five or more; Four; Three; Two; One; None)
9,121	How many household members are 12-years-old or younger? (Four or more; Three; Two; One; None)
9,100	How many household members are 13-years-old or younger? (Four or more; Three; Two; One; None)
8,586	How many household members are 11-years-old or younger? (Four or more; Three; Two; One; None)
8,355	What is the highest level of education that the female head/spouse has completed? (None; Primary school; No female head/spouse; Junior secondary (high) school; Senior secondary (high) school or more)
6,261	What is the main language spoken in the household? (Khoisan, or not stated; Caprivi; Rukavango; Nama/Damara; Oshiwambo; Otjiherero; Afrikaans; Setswana; Other African; German, English, other European, or other languages)
5,860	Does the household own a stove (gas, electric, or paraffin)? (No; Yes)
5,860	Does the household own a microwave oven? (No; Yes)
5,760	What is the main material used for the floor of the main dwelling? (Mud, clay, cow dung, or sand; Concrete, wood, or other)
5,648	What is the main source of energy/fuel for cooking? (Wood, wood charcoal, coal, animal dung, solar energy, none, or other; Paraffin, gas, or electricity)
5,437	How many household members are 6-years-old or younger? (Three or more; Two; One; None)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
5,256	Are all household members ages 6 to 13 are currently attending school/educational institution? (No; Yes; No one ages 6 to 13)
5,135	Are all household members ages 6 to 14 are currently attending school/educational institution? (No; Yes; No one ages 6 to 14)
4,916	Are all household members ages 6 to 11 are currently attending school/educational institution? (No; Yes; No one ages 6 to 11)
4,871	Are all household members ages 6 to 12 are currently attending school/educational institution? (No; Yes; No one ages 6 to 12)
4,830	Are all household members ages 6 to 17 are currently attending school/educational institution? (No; Yes; No one ages 6 to 17)
4,660	Are all household members ages 6 to 15 are currently attending school/educational institution? (No; Yes; No one ages 6 to 15)
4,600	In the main job of the female head/spouse during the last seven days (or where she usually works, even if she was absent in the last seven days), did she work . . . ? (In subsistence farming; Did not work, or worked as an unpaid family worker; As a self-employed or own account worker; As a paid employee for a private employer, or as an employer; No female head/spouse; As a paid employee for government or state enterprise)
4,590	How many household members can write and read a message in at least one language with understanding? (Five or more; Four; Three; Two; One; None)
4,588	Can the female head/spouse write and read a message in at least one language with understanding? (No; Yes; No female head/spouse)
4,570	Are all household members ages 6 to 16 are currently attending school/educational institution? (No; Yes; No one ages 6 to 16)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
4,496	What kind of work did the female head/spouse do in her main job during the last seven days (or usually does, even if she was absent in the last seven days)? (Skilled agricultural and fishery worker; Did not work; Elementary occupation; Service worker and shop and market sales worker, craft and related trades worker, or plant and machine operator and assembler; No female head/spouse; Armed forces, legislator, senior official and manager, professional, technician and associate professional, or clerk)
4,371	What is the main material used for the outer walls of the main dwelling? (Sticks, mud, clay, cow dung, thatch or grass, or none; Wooden poles, sticks, and grass; Corrugated iron/zinc; Other; Cement blocks/bricks/stones, burnt bricks/face bricks, asbestos, brick tiles, or slate)
4,341	Are all household members ages 6 to 18 are currently attending school/educational institution? (No; Yes; No one ages 6 to 18)
4,221	What is the household's main source of drinking water? (Communal borehole, or flowing water/stream/river/canal; Well (protected or unprotected), spring, or other; Dam/pool/stagnant water; Neighbour's tap; Public tap; Piped (tap) water on-site or in-yard (outside), private borehole, rain-water tank on site, or water-carrier/tanker; Piped (tap) water in dwelling)
4,089	What type of toilet facility is available for this household? (Bush/no toilet, special toilet, or other; Pit latrine without ventilation pipe, or bucket toilet; Pit latrine with ventilation pipe (VIP); Flush toilet connected to a septic tank; Flush toilet connected to a public sewage system)
4,052	What is the main source of energy/fuel for lighting for this household? (None, candles, or wood or wood charcoal; Paraffin, solar energy, gas, or other; Electricity from mains or from a generator)
3,997	Does the household own a refrigerator or freezer? (No; Yes)
3,833	In the place of work where the female head/spouse had her main job during the last seven days (or usually works, even if she was absent in the last seven days), what are the main goods and services produced? What are its main functions? (Agriculture, forestry and hunting; Does not work; Other; No female head/spouse)
3,711	How many household members were skilled agricultural or fishery workers? (Two or more; One; None)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
3,165	Indicate the type of main dwelling that the household occupies. (Traditional dwelling, or other; Improvised housing unit; Detached house; Apartment; Semi-detached house/town house, guest flat, part commercial/industrial building, mobile home (caravan/tent), or single quarters)
3,159	Does the household own a telephone (landline)? (No; Yes)
3,037	What is the highest grade/standard/level of education that the male head/spouse has completed? (None; Primary school; No male head/spouse; Junior secondary (High) school; Senior secondary (High) school or more)
3,033	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), how many household members worked in agriculture, forestry or hunting? (Two or more; One; None)
3,022	Does the household own a television, video-cassette recorder/DVD, or have satellite TV (e.g. DStv)? (No television (regardless of others); Only television; Only television and video-cassette recorder/DVD; Only television and satellite TV (e.g. DStv); All of these)
2,963	Does the household own a television? (No; Yes)
2,929	What is the marital status of the female head/spouse? (Married traditionally/customarily; Widowed, divorced, or separated; Consensual union; Married with certificate; Never married; No female head/spouse)
2,896	Does the household own a cell telephone or a telephone (landline)? (No; Only cell or only landline; Both)
2,819	Does the household own a radio, tape recorder, or stereo/hi-fi? (None; Only radio, or only tape recorder; Only radio and tape recorder; Only stereo/hi-fi, or only radio and stereo/hi-fi, or only tape recorder and stereo/hi-fi; All three)
2,815	What is the main source of energy/fuel for heating for this household? (Wood or wood charcoal, coal, animal dung, solar energy, or other; None; Gas, paraffin, or electricity from mains or from generator)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
2,694	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), how many household members were unpaid family workers or in subsistence farming activities? (Two or more; One; None)
2,576	What kind of work did the male head/spouse do in his main job during the last seven days (or usually does, even if he was absent in the last seven days)? (Skilled agricultural and fishery worker; Did not work; No male head/spouse; Elementary occupation; Craft and related trades worker; Service worker and shop and market sales worker. Or plant and machine operator and assembler; Armed forces, legislator, senior official, manager, professional, technician and associate professional, or clerk)
2,449	What is the main source of income for this household? (No income, state old pension, or other; Salaries and/or wages; Cash remittances; Farming; Business activities, non-farming; Pensions from employment)
2,324	Does the household own a cell telephone? (No; Yes)
2,298	What is the one-way walking distance in kilometres to the nearest post office? (Zero; One; Two; Three to four; Five to eight; Nine to ten; 11 to 19; 20 or more)
2,273	How many children 17-years-old and younger in the household are orphans (one or both of their biological parents have passed away)? (Two or more; One; None)
2,243	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), were any household members paid employees for a government or state enterprise? (No; Yes)
2,209	In the main job of the male head/spouse during the last seven days (or where he usually works, even if he was absent in the last seven days), did he work . . . ? (In subsistence farming, or as an unpaid family worker; Did not work; No male head/spouse; As a self-employed or own account worker; As a paid employee for a private employer, or as an employer; As a paid employee for government or state enterprise)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
2,182	Can the male head/spouse write and read a message in at least one language with understanding? (No; Yes; No male head/spouse)
2,154	What is the main material used for the roof of the main dwelling? (None, or thatch or grass; Wooden poles, sticks, and grass, or sticks, mud, clay, or cow dung; Corrugated iron/zinc; Other; Cement blocks/bricks/stones, burnt bricks/face bricks, asbestos, brick tiles, or slate)
2,101	In the place of work where the male head/spouse had his main job during the last seven days (or usually works, even if he was absent in the last seven days), what are the main goods and services produced? What are its main functions? (Agriculture, forestry and hunting; Does not work; No male head/spouse; Other)
2,067	Does the household own a computer? (No; Yes)
1,972	In their main occupation in the last seven days in which they worked or held a job to which they will definitely return, how many household members were not skilled agricultural or fishery workers? (None; One; Two; Three or more)
1,971	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), how many household members worked in something other than agriculture, forestry or hunting? (None; One; Two; Three or more)
1,940	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), how many household members were paid employees for government, a state enterprise, or a private employer? (None; One; Two or more)
1,864	Does the household own a video cassette recorder/DVD? (No; Yes)
1,831	Does the household own a stereo/hi-fi? (No; Yes)
1,728	In their main occupation in the last seven days in which they worked or held a job to which they will definitely return, were any household members professionals, technicians and associate professionals, clerks, legislators, senior officials, or managers, or in the armed forces? (No; Yes)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
1,658	Does the household own or have access to grazing land or fields for crops? (Only crop access, or only crop ownership; Crop ownership, and grazing access; Only grazing access and crop access; Ownership of both grazing and crops; Only grazing access; No; Only grazing ownership, or both grazing ownership and crop access)
1,611	Is the dwelling . . .? (Owned with no outstanding debts, or other; Occupied free; Owned, but not yet fully paid-off (e.g., with a mortgage); Rented (with or without subsidy)
1,574	What is the structure of household headship? (Both male and female heads/spouses; Female head/spouse only; Male head/spouse only)
1,377	Does the household own or have access to internet service? (No; Yes)
1,374	In the last seven days, did the female head/spouse do any work for pay, profit, or household gain for at least one hour? If not, does the female head/spouse have a job, business, or other economic or farming activity that she will definitely return to? (No; Yes; No female head/spouse)
1,301	What is the marital status of the male head/spouse? (Married traditionally/customarily; Consensual union; No male head/spouse; Widowed, divorced, or separated; Married with certificate; Never married)
1,161	Does the household own a radio? (No; Yes)
1,122	Does the household own bedroom, dining-room, or kitchen furniture? (No; Yes))
1,095	Does the household have satellite TV (e.g. DStv)?
1,089	In the last seven days, how many household members did any work for pay, profit, or household gain for at least one hour, or have a job, business, or other economic or farming activity to which they will definitely return? (None; One; Two; Three or more)
951	What is the one-way walking distance in kilometres to the nearest source of drinking water? (Two or more; One; Zero)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
935	If the household owns or has access to grazing land, is agriculture its main source of income, and does it own cattle, donkeys/mules, horses, sheep, or goats? (Grazing land, and agriculture is main source of income, but no cattle, donkeys/mules, horses, sheep, nor goats owned; Grazing land, and agriculture is main source of income, and owns cattle, donkeys/mules, horses, sheep, or goats; No grazing land (regardless of others); Grazing land, but agriculture not main source of income)
924	If the household owns or has access to grazing land, is agriculture its main source of income, and does it own cattle, donkeys/mules, or horses? (Grazing land, and agriculture is main source of income, but no cattle, donkeys/mules, or horses owned; Grazing land, and agriculture is main source of income, and owns cattle, donkeys/mules, or horses; No grazing land (regardless of others); Grazing land, but agriculture not main source of income)
826	Does the household own a computer and have internet service? (No computer (regardless of internet); Only computer; Both)
777	If the household owns or has access to grazing land, is agriculture its main source of income, and does it own sheep or goats? (Grazing land, and agriculture is main source of income, but no sheep nor goats owned; Grazing land, and agriculture is main source of income, and owns sheep or goats; No grazing land (regardless of others); Grazing land, but agriculture not main source of income)
773	Does the household own a tape recorder? (No; Yes)
766	If the household owns or has access to grazing land, is agriculture its main source of income, and does it own cattle? (Grazing land, and agriculture is main source of income, but no cattle owned; Grazing land, and agriculture is main source of income, and owns cattle; No grazing land (regardless of others); Grazing land, but agriculture not main source of income)
752	Does the household own donkeys/mules or horses? (No; Yes)
731	Does the household own bicycle or a canoe/boat, a motorcycle/scooter or a motorboat, or a motor vehicle? (None; Only bicycle or a canoe/boat; Motorcycle/scooter or a motorboat, but no motor vehicle (regardless of bicycle or a canoe/boat); Motor vehicle (regardless of all others))

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
723	In their main occupation in the last seven days in which they worked or held a job to which they will definitely return, how many household members were service workers and shop and market sales workers, craft and related trades workers, or in elementary occupations? (None; One; Two or more)
684	Does the household own cattle, donkeys/mules, or horses? (No; Yes)
659	Does the household own a sewing/knitting machine? (No; Yes)
639	Does the household own cattle? (No; Yes)
639	Does the household own a motorcycle/scooter or a motorboat? (No; Yes)
612	Does the household own a camera? (No; Yes)
569	Does the household own or have access to a plough? (No; Only access; Owns)
533	Does the household own a washing machine? (No; Yes)
533	Does the household own a motor vehicle? (No; Yes)
526	Does the household own or have access to a wheelbarrow? (No; Only access; Owns)
476	How many rooms in the dwelling are used for sleeping? (One; Two; Three or more)
465	If the household owns or has access to fields for crops, is agriculture its main source of income, and does it own a plough? (Fields for crops, agriculture is main source of income, but no plow owned; Fields for crops, agriculture is main source of income, and owns plow; Fields for crops, but agriculture not main source of income; No fields for crops (regardless of others))
464	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), how many household members were paid employees for a private employer? (None; One; Two or more)
421	Does the household own or have access to grazing land? (Does not own, but has access; Neither owns nor has access; Owns)
390	Does the household own sheep or goats? (No; Yes)

Figure 3 (cont.): Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
378	What is the one-way walking distance in kilometres to the nearest primary school or combined school, whichever is closest? (Zero; One; Two; Three to four; Five to ten; 11 or more)
353	Did this household in the past month make use of the services of domestic or household workers (e.g., gardeners, child minders, watchmen, or other domestic workers)? (No; Yes)
343	Does the household own pigs? (No; Yes)
298	Does the household own or have access to fields for crops? (Owns; Does not own, but has access; Neither owns nor has access)
294	Does the household own cattle, donkeys/mules, horses, sheep, or goats? (No; Yes)
289	What is the one-way walking distance in kilometres to the nearest public transport? (Zero; One; Two; Three to six; Seven to 20; 21 or more)
227	In their main occupation in the last seven days in which they worked or held a job to which they will definitely return, were any household members in elementary occupations? (Yes; No)
145	In the last seven days, did the male head/spouse do any work for pay, profit, or household gain for at least one hour? If not, does the male head/spouse have a job, business, or other economic or farming activity that he will definitely return to? (No; No male head/spouse; Yes)
110	Does the household own a bicycle or a canoe/boat? (No; Yes)
60	Does the household own poultry? (No; Yes)
15	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), did any household members work as employed persons in private households? (Yes; No)
10	In their main job during the last seven days (or where they usually work, even if they were absent in the last seven days), were any household members self-employed or own-account workers? (No; Yes)
2	Does the household own a donkey cart/ox cart? (No; Yes)

Source: 2009/10 NHIES and the upper national poverty line

Tables for
100% of the Upper National Poverty Line

(and Tables Pertaining to All Eight Poverty Lines)

Figure 4 (100% of the upper 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	96.2
5–9	89.3
10–14	82.6
15–19	74.7
20–24	66.9
25–29	51.8
30–34	39.4
35–39	30.3
40–44	16.7
45–49	12.2
50–54	7.6
55–59	4.9
60–64	2.3
65–69	1.7
70–74	1.7
75–79	1.7
80–84	1.7
85–89	1.8
90–94	1.8
95–100	1.8

Figure 5 (100% of the upper national line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	239	÷	248	=	96.2
5–9	224	÷	251	=	89.3
10–14	1,370	÷	1,659	=	82.6
15–19	2,399	÷	3,210	=	74.7
20–24	2,961	÷	4,426	=	66.9
25–29	3,379	÷	6,520	=	51.8
30–34	2,762	÷	7,018	=	39.4
35–39	2,198	÷	7,267	=	30.3
40–44	1,064	÷	6,377	=	16.7
45–49	741	÷	6,074	=	12.2
50–54	417	÷	5,475	=	7.6
55–59	214	÷	4,363	=	4.9
60–64	62	÷	2,671	=	2.3
65–69	42	÷	2,417	=	1.7
70–74	21	÷	1,186	=	1.7
75–79	14	÷	778	=	1.7
80–84	7	÷	422	=	1.7
85–89	2	÷	123	=	1.8
90–94	1	÷	33	=	1.8
95–100	691	÷	39,483	=	1.8

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

Figure 6 (National poverty lines): Probability that a given household's per-adult-equivalent consumption falls in a range demarcated by two adjacent per-adult-equivalent poverty lines

	Likelihood (%) of having per-adult-equivalent expenditure in ranges demarcated by poverty lines				
Score	<Natl. Lower <NAD9.12	≥Natl. Lower and <100% Natl. Upper ≥NAD9.12 and <NAD12.43	≥100% Natl. Upper and <150% Natl. Upper ≥NAD12.43 and <NAD18.64	≥150% Natl. Upper and <200% Natl. Upper ≥NAD18.64 and <NAD24.85	≥200% Natl. Upper ≥NAD24.85
0–4	77.4	18.8	3.8	0.0	0.0
5–9	71.4	17.8	10.7	0.0	0.0
10–14	68.9	13.7	16.3	0.6	0.6
15–19	46.6	28.2	18.6	5.5	1.1
20–24	42.3	24.6	25.1	6.4	1.6
25–29	21.9	29.9	29.7	9.2	9.3
30–34	17.1	22.2	31.2	18.4	11.1
35–39	11.3	19.0	35.9	20.2	13.7
40–44	6.0	10.7	34.5	20.7	28.1
45–49	3.1	9.1	28.5	23.3	36.0
50–54	2.1	5.5	17.4	26.4	48.5
55–59	1.1	3.8	12.8	19.2	63.1
60–64	0.7	1.6	9.2	17.3	71.1
65–69	0.6	1.1	3.6	12.8	81.9
70–74	0.6	1.1	3.6	6.7	88.0
75–79	0.6	1.1	3.6	6.3	88.4
80–84	0.6	1.1	3.6	6.3	88.4
85–89	0.6	1.1	3.6	6.3	88.4
90–94	0.6	1.1	3.6	6.3	88.4
95–100	0.6	1.1	3.6	6.3	88.4

Note: All poverty likelihoods in percentage units.

Figure 6 (International 2005 PPP poverty lines): Probability that a given household's per-capita consumption falls in a range demarcated by two adjacent per-capita poverty lines

	Likelihood (%) of having per-capita expenditure in ranges demarcated by poverty lines				
Score	<USAID	≥USAID and <$1.25/day	≥$1.25/day and <$2.00/day	≥$2.00/day and <$2.50/day	≥$2.50/day
	<NAD7.34	≥NAD7.34 and <NAD8.71	≥NAD8.71 and <NAD13.94	≥NAD13.94 and <NAD17.42	≥NAD17.42
0–4	80.2	6.9	12.9	0.0	0.0
5–9	75.3	8.9	15.8	0.0	0.0
10–14	69.8	9.1	19.9	0.5	0.7
15–19	48.3	12.4	30.8	5.5	3.0
20–24	40.9	12.0	35.6	7.4	4.2
25–29	19.9	13.9	39.4	13.4	13.5
30–34	15.7	9.0	38.3	17.3	19.7
35–39	8.1	9.2	38.6	16.3	27.7
40–44	3.4	5.9	26.5	21.2	42.9
45–49	1.6	2.6	22.2	18.0	55.6
50–54	1.3	1.3	13.1	17.6	66.7
55–59	0.7	0.3	9.3	9.0	80.6
60–64	0.5	0.3	5.4	6.2	87.6
65–69	0.5	0.2	3.0	2.4	93.8
70–74	0.5	0.2	3.0	2.4	93.8
75–79	0.5	0.2	3.0	2.4	93.8
80–84	0.5	0.2	3.0	2.4	93.8
85–89	0.5	0.2	3.0	2.4	93.8
90–94	0.5	0.2	3.0	2.4	93.8
95–100	0.5	0.3	3.0	2.4	93.8

Figure 7 (100% of the upper national line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+6.4	8.4	11.0	12.5
5–9	−5.1	6.1	6.8	8.3
10–14	+15.7	5.3	6.2	8.3
15–19	−0.2	3.6	4.3	5.2
20–24	+9.4	3.3	4.0	5.0
25–29	−1.0	2.6	3.2	4.6
30–34	+1.2	2.6	3.1	3.9
35–39	−7.5	5.2	5.4	6.0
40–44	−1.6	2.2	2.5	3.3
45–49	−8.4	5.5	5.6	6.2
50–54	−3.9	3.0	3.3	3.7
55–59	−3.6	3.0	3.4	4.1
60–64	−3.2	2.9	3.3	4.0
65–69	+0.9	0.6	0.8	0.9
70–74	+1.7	0.0	0.0	0.0
75–79	+1.7	0.0	0.0	0.0
80–84	+1.7	0.0	0.0	0.0
85–89	+1.8	0.0	0.0	0.0
90–94	+1.8	0.0	0.0	0.0
95–100	+0.0	0.3	0.3	0.4

Figure 8 (100% of the upper national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	−2.4	60.8	77.4	90.4
4	−0.5	29.1	35.3	53.4
8	−0.9	20.2	24.6	34.9
16	−0.8	14.4	17.2	24.2
32	−1.1	10.9	12.5	16.7
64	−1.2	7.3	8.6	12.0
128	−1.0	5.3	6.2	8.1
256	−1.0	3.4	4.1	5.3
512	−1.0	2.5	3.0	4.1
1,024	−1.0	1.8	2.2	2.9
2,048	−1.0	1.3	1.5	2.0
4,096	−1.0	0.9	1.1	1.5
8,192	−0.9	0.7	0.8	1.1
16,384	−0.9	0.5	0.6	0.8

Figure 9 (All poverty lines): Average differences between estimates and true values for poverty rates of a group of households at a point in time, precision, and the α factor for precision, scorecard applied to the validation sample

	Natl. Lower	National Upper 100%	National Upper 150%	National Upper 200%	USAID 'Extreme'	International 2005 PPP $1.25	International 2005 PPP $2.00	International 2005 PPP $2.50
Estimate minus true value								
Scorecard applied to 2009/10 validation sample	+0.1	−0.9	−1.4	−0.5	+0.1	−0.7	−1.1	−1.1
Precision of difference								
Scorecard applied to 2009/10 validation sample	0.3	0.5	0.5	0.5	0.3	0.4	0.5	0.5
α factor for standard errors								
Scorecard applied to 2009/10 validation sample	0.86	0.90	0.81	0.81	0.88	0.90	0.79	0.76

Differences between estimates and true values are displayed in units of percentage points.

Precision is measured as 90-percent confidence intervals in units of ± percentage points.

Differences and precision estimated from 1,000 bootstrap samples 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 (All poverty lines): Possible targeting outcomes

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

Figure 11 (100% of the upper national line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	19.6	0.0	80.1	80.4	−97.6
≤9	0.5	19.4	0.0	80.1	80.6	−95.1
≤14	1.7	18.2	0.5	79.7	81.4	−80.7
≤19	4.1	15.7	1.3	78.9	83.0	−52.3
≤24	6.9	13.0	2.9	77.2	84.1	−16.0
≤29	10.3	9.5	6.0	74.1	84.4	+34.2
≤34	13.1	6.8	10.3	69.9	82.9	+48.2
≤39	15.5	4.3	15.1	65.1	80.6	+24.1
≤44	16.9	2.9	20.1	60.1	77.0	−1.3
≤49	18.0	1.9	25.1	55.1	73.0	−26.5
≤54	18.5	1.3	30.0	50.2	68.7	−51.3
≤59	18.8	1.0	34.1	46.1	64.9	−71.8
≤64	18.9	0.9	36.6	43.5	62.4	−84.8
≤69	18.9	0.9	39.0	41.1	60.1	−96.8
≤74	18.9	0.9	40.2	39.9	58.9	−102.8
≤79	18.9	0.9	41.0	39.2	58.1	−106.7
≤84	18.9	0.9	41.4	38.7	57.7	−108.8
≤89	18.9	0.9	41.5	38.6	57.6	−109.4
≤94	18.9	0.9	41.6	38.6	57.5	−109.6
≤100	19.8	0.0	80.2	0.0	19.8	−304.2

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

Figure 12 (100% of the upper national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	92.0	1.2	11.5:1
≤9	0.5	92.8	2.3	12.8:1
≤14	2.2	77.6	8.4	3.5:1
≤19	5.4	76.4	20.7	3.2:1
≤24	9.8	70.1	34.6	2.3:1
≤29	16.3	63.1	51.9	1.7:1
≤34	23.3	56.0	65.8	1.3:1
≤39	30.6	50.8	78.4	1.0:1
≤44	37.0	45.7	85.2	0.8:1
≤49	43.0	41.7	90.5	0.7:1
≤54	48.5	38.2	93.3	0.6:1
≤59	52.9	35.6	94.8	0.6:1
≤64	55.6	34.0	95.3	0.5:1
≤69	58.0	32.7	95.5	0.5:1
≤74	59.2	32.0	95.5	0.5:1
≤79	59.9	31.6	95.5	0.5:1
≤84	60.4	31.4	95.5	0.5:1
≤89	60.5	31.3	95.5	0.5:1
≤94	60.5	31.3	95.5	0.5:1
≤100	100.0	19.8	100.0	0.2:1

Tables for

the Lower National Poverty Line

Figure 4 (Lower 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	77.4
5–9	71.4
10–14	68.9
15–19	46.6
20–24	42.3
25–29	21.9
30–34	17.1
35–39	11.3
40–44	6.0
45–49	3.1
50–54	2.1
55–59	1.1
60–64	0.7
65–69	0.6
70–74	0.6
75–79	0.6
80–84	0.6
85–89	0.6
90–94	0.6
95–100	0.6

Figure 7 (Lower national line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| Score | Diff. | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
		90-percent	95-percent	99-percent
0–4	+1.4	11.5	13.5	18.5
5–9	−0.4	11.6	14.0	18.5
10–14	+19.3	5.4	6.6	8.4
15–19	−8.5	6.2	6.5	7.2
20–24	+5.1	3.1	3.6	4.7
25–29	−3.5	2.9	3.1	3.6
30–34	+4.2	1.7	2.0	2.6
35–39	−6.2	4.3	4.6	4.9
40–44	+1.9	1.0	1.1	1.5
45–49	+1.3	0.7	0.8	1.1
50–54	−0.4	0.9	1.0	1.4
55–59	+0.4	0.5	0.5	0.7
60–64	+0.7	0.1	0.1	0.1
65–69	+0.0	0.5	0.6	0.7
70–74	+0.6	0.0	0.0	0.0
75–79	+0.6	0.0	0.0	0.0
80–84	+0.6	0.0	0.0	0.0
85–89	+0.6	0.0	0.0	0.0
90–94	+0.6	0.0	0.0	0.0
95–100	+0.1	0.2	0.2	0.2

Figure 8 (Lower national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	−1.7	50.0	65.5	84.1
4	−0.1	22.2	29.7	43.0
8	−0.2	14.5	17.5	27.9
16	−0.1	10.6	12.8	17.2
32	+0.0	7.6	9.3	12.7
64	+0.0	5.4	6.5	8.9
128	+0.1	3.6	4.2	5.9
256	+0.1	2.6	3.1	4.0
512	+0.1	1.8	2.2	2.8
1,024	+0.1	1.3	1.5	2.0
2,048	+0.1	0.9	1.1	1.5
4,096	+0.1	0.6	0.8	1.0
8,192	+0.1	0.5	0.6	0.7
16,384	+0.1	0.3	0.4	0.5

Figure 11 (Lower national line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	9.5	0.1	90.2	90.4	−95.5
≤9	0.4	9.3	0.1	90.2	90.5	−91.1
≤14	1.3	8.4	0.9	89.4	90.7	−64.6
≤19	3.0	6.7	2.3	88.0	91.0	−13.5
≤24	4.8	4.9	5.0	85.3	90.1	+48.7
≤29	6.5	3.2	9.8	80.5	87.1	−0.8
≤34	7.6	2.1	15.7	74.6	82.2	−62.1
≤39	8.6	1.1	22.0	68.3	77.0	−126.6
≤44	9.0	0.7	28.0	62.3	71.3	−188.6
≤49	9.1	0.6	33.9	56.4	65.5	−249.7
≤54	9.3	0.4	39.2	51.1	60.4	−304.5
≤59	9.4	0.3	43.5	46.8	56.1	−348.9
≤64	9.4	0.3	46.2	44.1	53.5	−376.4
≤69	9.4	0.3	48.6	41.7	51.1	−401.1
≤74	9.4	0.3	49.8	40.5	49.9	−413.3
≤79	9.4	0.3	50.6	39.7	49.1	−421.3
≤84	9.4	0.3	51.0	39.3	48.7	−425.7
≤89	9.4	0.3	51.1	39.2	48.6	−427.0
≤94	9.4	0.3	51.1	39.2	48.5	−427.3
≤100	9.7	0.0	90.3	0.0	9.7	−831.2

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

Figure 12 (Lower national line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	75.9	1.9	3.1:1
≤9	0.5	72.5	3.7	2.6:1
≤14	2.2	59.1	13.2	1.4:1
≤19	5.4	56.3	31.2	1.3:1
≤24	9.8	49.2	49.7	1.0:1
≤29	16.3	40.1	67.4	0.7:1
≤34	23.3	32.6	78.5	0.5:1
≤39	30.6	28.2	89.0	0.4:1
≤44	37.0	24.3	92.7	0.3:1
≤49	43.0	21.2	94.2	0.3:1
≤54	48.5	19.2	95.9	0.2:1
≤59	52.9	17.7	96.4	0.2:1
≤64	55.6	16.8	96.5	0.2:1
≤69	58.0	16.2	96.7	0.2:1
≤74	59.2	15.9	96.7	0.2:1
≤79	59.9	15.6	96.7	0.2:1
≤84	60.4	15.5	96.7	0.2:1
≤89	60.5	15.5	96.7	0.2:1
≤94	60.5	15.5	96.7	0.2:1
≤100	100.0	9.7	100.0	0.1:1

Tables for

150% of the Upper National Poverty Line

Figure 4 (150% of upper 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	100.0
5–9	100.0
10–14	98.9
15–19	93.3
20–24	92.0
25–29	81.6
30–34	70.5
35–39	66.2
40–44	51.2
45–49	40.7
50–54	25.1
55–59	17.7
60–64	11.5
65–69	5.3
70–74	5.3
75–79	5.3
80–84	5.3
85–89	5.3
90–94	5.3
95–100	5.3

Figure 7 (150% of upper national line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, scorecard applied to the validation sample

Score	Diff.	Difference between estimate and true value		
		Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
0–4	+0.0	0.0	0.0	0.0
5–9	+0.0	0.0	0.0	0.0
10–14	+5.6	2.5	2.9	3.9
15–19	−1.9	1.7	1.8	2.3
20–24	+0.7	1.9	2.4	3.0
25–29	−4.4	3.1	3.2	3.5
30–34	+4.9	2.5	2.9	4.0
35–39	−2.9	2.7	3.0	3.8
40–44	−1.8	2.7	3.3	4.1
45–49	−8.2	5.5	5.8	6.4
50–54	−2.3	2.8	3.4	4.4
55–59	−5.2	4.2	4.5	4.9
60–64	−2.4	3.3	4.0	5.3
65–69	+0.4	1.5	1.8	2.5
70–74	+0.7	2.4	2.9	3.8
75–79	+5.3	0.0	0.0	0.0
80–84	+5.3	0.0	0.0	0.0
85–89	+5.3	0.0	0.0	0.0
90–94	+5.3	0.0	0.0	0.0
95–100	−0.7	0.6	0.7	0.9

Figure 8 (150% of upper national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (± percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	−2.9	70.6	82.6	90.7
4	−2.1	31.1	37.7	51.6
8	−1.9	22.3	27.4	38.6
16	−1.7	16.1	19.2	25.8
32	−1.6	11.4	14.0	18.1
64	−1.6	7.5	9.4	11.9
128	−1.4	5.5	6.5	8.7
256	−1.4	3.9	4.5	6.5
512	−1.4	2.8	3.4	4.5
1,024	−1.4	2.0	2.4	3.1
2,048	−1.4	1.4	1.6	2.2
4,096	−1.4	1.0	1.2	1.4
8,192	−1.4	0.7	0.8	1.1
16,384	−1.4	0.5	0.6	0.8

Figure 11 (150% of upper national line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	36.0	0.0	63.8	64.0	−98.6
≤9	0.5	35.7	0.0	63.8	64.3	−97.2
≤14	2.0	34.2	0.1	63.6	65.7	−88.5
≤19	5.0	31.2	0.3	63.5	68.5	−71.2
≤24	9.1	27.1	0.7	63.1	72.2	−47.8
≤29	14.6	21.6	1.7	62.1	76.7	−14.6
≤34	19.4	16.8	4.0	59.8	79.2	+17.9
≤39	24.2	12.0	6.4	57.4	81.6	+51.3
≤44	27.6	8.7	9.4	54.4	81.9	+74.0
≤49	30.3	5.9	12.8	51.0	81.3	+64.7
≤54	31.7	4.5	16.8	47.0	78.7	+53.6
≤59	32.8	3.4	20.1	43.7	76.5	+44.5
≤64	33.2	3.0	22.4	41.4	74.6	+38.3
≤69	33.4	2.8	24.6	39.2	72.6	+32.1
≤74	33.5	2.8	25.7	38.1	71.5	+29.0
≤79	33.5	2.8	26.5	37.3	70.8	+26.9
≤84	33.5	2.8	26.9	36.9	70.3	+25.7
≤89	33.5	2.8	27.0	36.8	70.2	+25.4
≤94	33.5	2.8	27.1	36.7	70.2	+25.3
≤100	36.2	0.0	63.8	0.0	36.2	−76.1

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

Figure 12 (150% of upper national line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	100.0	0.7	Only poor targeted
≤9	0.5	100.0	1.4	Only poor targeted
≤14	2.2	93.6	5.6	14.7:1
≤19	5.4	94.0	13.9	15.7:1
≤24	9.8	92.9	25.1	13.0:1
≤29	16.3	89.6	40.4	8.6:1
≤34	23.3	83.1	53.5	4.9:1
≤39	30.6	79.1	66.8	3.8:1
≤44	37.0	74.5	76.1	2.9:1
≤49	43.0	70.3	83.6	2.4:1
≤54	48.5	65.4	87.6	1.9:1
≤59	52.9	62.0	90.6	1.6:1
≤64	55.6	59.8	91.7	1.5:1
≤69	58.0	57.6	92.2	1.4:1
≤74	59.2	56.5	92.4	1.3:1
≤79	59.9	55.8	92.4	1.3:1
≤84	60.4	55.4	92.4	1.2:1
≤89	60.5	55.3	92.4	1.2:1
≤94	60.5	55.3	92.4	1.2:1
≤100	100.0	36.2	100.0	0.6:1

Tables for

200% of the Upper National Poverty Line

Figure 4 (200% of upper 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	100.0
5–9	100.0
10–14	99.4
15–19	98.9
20–24	98.5
25–29	90.7
30–34	88.9
35–39	86.3
40–44	71.9
45–49	64.0
50–54	51.5
55–59	36.9
60–64	28.9
65–69	18.2
70–74	12.0
75–79	11.6
80–84	11.6
85–89	11.6
90–94	11.6
95–100	11.6

Figure 7 (200% of upper national line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16,384$, scorecard applied to the validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+0.0	0.0	0.0	0.0
5–9	+0.0	0.0	0.0	0.0
10–14	+0.8	1.1	1.3	1.8
15–19	−0.8	0.5	0.5	0.6
20–24	−0.8	0.6	0.7	0.8
25–29	−5.0	3.0	3.1	3.2
30–34	+0.8	1.7	2.0	2.8
35–39	−1.9	1.7	1.9	2.7
40–44	+3.3	2.8	3.2	4.0
45–49	−1.5	2.8	3.3	4.2
50–54	−5.0	4.1	4.4	4.9
55–59	−0.1	3.4	4.0	5.4
60–64	+9.9	3.6	4.3	5.5
65–69	+4.9	2.7	3.2	4.1
70–74	+4.6	2.7	3.2	4.5
75–79	+11.4	0.2	0.3	0.3
80–84	+3.2	5.9	7.4	9.9
85–89	+11.6	0.0	0.0	0.0
90–94	+11.6	0.0	0.0	0.0
95–100	−1.1	0.9	1.0	1.2

Figure 8 (200% of upper national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size n	Diff.	Difference between estimate and true value Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	−3.2	76.2	83.8	89.6
4	−1.4	32.5	39.7	48.1
8	−0.8	22.2	26.3	38.7
16	−0.5	15.9	18.8	27.5
32	−0.6	11.8	14.0	18.5
64	−0.7	8.2	9.7	13.4
128	−0.6	6.0	7.1	9.6
256	−0.5	4.2	4.9	6.7
512	−0.5	3.0	3.5	4.6
1,024	−0.6	2.1	2.7	3.3
2,048	−0.6	1.5	1.8	2.2
4,096	−0.5	1.0	1.2	1.6
8,192	−0.5	0.7	0.9	1.2
16,384	−0.5	0.5	0.6	0.8

Figure 11 (200% of upper national line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	48.3	0.0	51.5	51.7	−99.0
≤9	0.5	48.0	0.0	51.5	52.0	−97.9
≤14	2.1	46.4	0.0	51.5	53.6	−91.1
≤19	5.3	43.2	0.0	51.4	56.8	−78.0
≤24	9.7	38.8	0.1	51.4	61.1	−59.8
≤29	15.9	32.6	0.4	51.1	67.0	−33.6
≤34	22.1	26.5	1.3	50.2	72.3	−6.4
≤39	28.3	20.2	2.3	49.2	77.6	+21.5
≤44	32.9	15.6	4.1	47.4	80.3	+44.1
≤49	36.8	11.7	6.3	45.2	82.0	+64.6
≤54	39.9	8.6	8.6	42.9	82.8	+82.2
≤59	41.7	6.8	11.2	40.3	82.0	+76.9
≤64	42.3	6.2	13.2	38.3	80.6	+72.7
≤69	42.8	5.7	15.2	36.3	79.0	+68.6
≤74	42.9	5.6	16.3	35.2	78.1	+66.4
≤79	42.9	5.6	17.0	34.4	77.3	+64.9
≤84	42.9	5.6	17.4	34.1	77.0	+64.0
≤89	42.9	5.6	17.6	33.9	76.9	+63.8
≤94	42.9	5.6	17.6	33.9	76.8	+63.7
≤100	48.5	0.0	51.5	0.0	48.5	−6.2

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

Figure 12 (200% of upper national line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	100.0	0.5	Only poor targeted
≤9	0.5	100.0	1.0	Only poor targeted
≤14	2.2	98.9	4.4	91.3:1
≤19	5.4	99.1	11.0	111.6:1
≤24	9.8	99.1	20.0	107.9:1
≤29	16.3	97.5	32.8	38.5:1
≤34	23.3	94.5	45.5	17.2:1
≤39	30.6	92.6	58.4	12.5:1
≤44	37.0	89.0	67.9	8.1:1
≤49	43.0	85.5	75.8	5.9:1
≤54	48.5	82.3	82.3	4.6:1
≤59	52.9	78.8	85.9	3.7:1
≤64	55.6	76.2	87.3	3.2:1
≤69	58.0	73.7	88.2	2.8:1
≤74	59.2	72.5	88.4	2.6:1
≤79	59.9	71.6	88.4	2.5:1
≤84	60.4	71.1	88.5	2.5:1
≤89	60.5	71.0	88.5	2.4:1
≤94	60.5	70.9	88.5	2.4:1
≤100	100.0	48.5	100.0	0.9:1

Tables for

the USAID "Extreme" Poverty Line

Figure 4 (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	80.2
5–9	75.3
10–14	69.8
15–19	48.3
20–24	40.9
25–29	19.9
30–34	15.7
35–39	8.1
40–44	3.4
45–49	1.6
50–54	1.3
55–59	0.7
60–64	0.5
65–69	0.5
70–74	0.5
75–79	0.5
80–84	0.5
85–89	0.5
90–94	0.5
95–100	0.5

Figure 7 (USAID "extreme" line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+6.3	11.5	13.6	19.0
5–9	+12.0	13.2	15.4	20.1
10–14	+21.1	5.4	6.4	8.2
15–19	–7.3	5.6	5.9	6.5
20–24	+8.0	3.0	3.5	4.5
25–29	–5.2	3.7	4.0	4.7
30–34	+4.1	1.6	1.9	2.4
35–39	–5.7	4.0	4.2	4.7
40–44	–0.1	1.0	1.1	1.4
45–49	–0.1	0.7	0.8	1.1
50–54	+0.8	0.3	0.4	0.5
55–59	+0.1	0.4	0.5	0.6
60–64	+0.5	0.0	0.0	0.0
65–69	+0.5	0.0	0.0	0.0
70–74	+0.5	0.0	0.0	0.0
75–79	+0.5	0.0	0.0	0.0
80–84	+0.5	0.0	0.0	0.0
85–89	+0.5	0.0	0.0	0.0
90–94	+0.5	0.0	0.0	0.0
95–100	+0.1	0.1	0.2	0.2

Figure 8 (USAID "extreme" line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size n	Diff.	Difference between estimate and true value		
		Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	−1.6	39.5	62.6	84.7
4	+0.0	21.1	26.3	41.6
8	−0.1	13.4	17.6	24.3
16	+0.0	9.6	11.9	16.5
32	+0.0	7.2	8.9	12.3
64	+0.1	5.1	6.0	8.2
128	+0.1	3.3	4.1	5.7
256	+0.1	2.4	2.9	3.7
512	+0.1	1.8	2.1	2.8
1,024	+0.1	1.3	1.5	1.9
2,048	+0.1	0.9	1.1	1.5
4,096	+0.1	0.6	0.7	1.0
8,192	+0.1	0.5	0.6	0.7
16,384	+0.1	0.3	0.4	0.5

Figure 11 (USAID "extreme" line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	8.6	0.1	91.2	91.3	−95.1
≤9	0.3	8.4	0.2	91.1	91.4	−90.5
≤14	1.2	7.5	0.9	90.3	91.5	−61.7
≤19	3.0	5.8	2.4	88.8	91.8	−5.1
≤24	4.5	4.2	5.2	86.0	90.5	+40.2
≤29	6.2	2.5	10.0	81.2	87.4	−14.9
≤34	7.2	1.5	16.1	75.1	82.3	−84.2
≤39	8.0	0.8	22.6	68.6	76.6	−158.5
≤44	8.3	0.5	28.7	62.6	70.8	−227.9
≤49	8.4	0.3	34.6	56.6	65.0	−296.0
≤54	8.5	0.3	40.0	51.2	59.6	−358.0
≤59	8.5	0.3	44.4	46.9	55.3	−407.4
≤64	8.5	0.3	47.0	44.2	52.7	−438.0
≤69	8.5	0.3	49.5	41.8	50.3	−465.6
≤74	8.5	0.3	50.6	40.6	49.1	−479.2
≤79	8.5	0.3	51.4	39.8	48.3	−488.1
≤84	8.5	0.3	51.8	39.4	47.9	−492.9
≤89	8.5	0.3	52.0	39.3	47.8	−494.3
≤94	8.5	0.3	52.0	39.2	47.7	−494.7
≤100	8.7	0.0	91.2	0.0	8.7	−943.3

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

Figure 12 (USAID "extreme" line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	72.2	2.0	2.6:1
≤9	0.5	66.6	3.8	2.0:1
≤14	2.2	56.6	14.0	1.3:1
≤19	5.4	55.1	33.8	1.2:1
≤24	9.8	46.3	51.9	0.9:1
≤29	16.3	38.3	71.4	0.6:1
≤34	23.3	30.9	82.4	0.4:1
≤39	30.6	26.0	91.1	0.4:1
≤44	37.0	22.4	94.6	0.3:1
≤49	43.0	19.5	96.1	0.2:1
≤54	48.5	17.4	96.6	0.2:1
≤59	52.9	16.1	97.1	0.2:1
≤64	55.6	15.3	97.1	0.2:1
≤69	58.0	14.6	97.1	0.2:1
≤74	59.2	14.4	97.1	0.2:1
≤79	59.9	14.2	97.1	0.2:1
≤84	60.4	14.1	97.1	0.2:1
≤89	60.5	14.0	97.1	0.2:1
≤94	60.5	14.0	97.1	0.2:1
≤100	100.0	8.7	100.0	0.1:1

Tables for

the $1.25/day 2005 PPP Poverty Line

Figure 4 ($1.25/day 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	87.1
5–9	84.3
10–14	79.0
15–19	60.7
20–24	52.9
25–29	33.7
30–34	24.7
35–39	17.3
40–44	9.3
45–49	4.2
50–54	2.5
55–59	1.1
60–64	0.8
65–69	0.8
70–74	0.8
75–79	0.8
80–84	0.8
85–89	0.8
90–94	0.8
95–100	0.8

Figure 7 ($1.25/day line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| Score | Diff. | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
		90-percent	95-percent	99-percent
0–4	+5.1	10.1	12.0	15.5
5–9	+12.4	11.6	14.0	18.5
10–14	+17.4	5.4	6.5	8.4
15–19	−5.3	4.5	4.8	5.6
20–24	+5.4	3.2	3.7	4.6
25–29	−3.1	2.9	3.2	4.2
30–34	+0.3	2.2	2.6	3.6
35–39	−7.2	4.9	5.1	5.7
40–44	−0.3	1.7	2.2	2.9
45–49	−1.8	1.7	1.8	2.2
50–54	−3.2	2.4	2.5	2.8
55–59	+0.1	0.5	0.6	0.7
60–64	−4.4	3.5	3.9	4.5
65–69	−0.1	0.6	0.8	0.9
70–74	+0.8	0.0	0.0	0.0
75–79	+0.8	0.0	0.0	0.0
80–84	+0.8	0.0	0.0	0.0
85–89	+0.8	0.0	0.0	0.0
90–94	+0.8	0.0	0.0	0.0
95–100	+0.1	0.2	0.2	0.2

Figure 8 ($1.25/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

| Sample Size n | Difference between estimate and true value | | | |
| | | Confidence interval ($\pm$ percentage points) | | |
	Diff.	90-percent	95-percent	99-percent
1	−2.2	54.5	67.8	89.1
4	−0.5	26.5	34.0	47.2
8	−0.9	18.4	22.2	31.1
16	−0.8	12.3	15.0	19.3
32	−0.8	8.9	10.4	13.8
64	−0.8	6.1	7.7	9.7
128	−0.7	4.4	5.3	6.8
256	−0.7	3.0	3.5	4.5
512	−0.8	2.1	2.6	3.4
1,024	−0.7	1.5	1.8	2.4
2,048	−0.8	1.1	1.3	1.7
4,096	−0.7	0.8	0.9	1.2
8,192	−0.7	0.5	0.6	0.9
16,384	−0.7	0.4	0.5	0.6

Figure 11 ($1.25/day line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	13.3	0.0	86.5	86.7	−96.6
≤9	0.4	13.1	0.1	86.4	86.8	−93.5
≤14	1.5	12.0	0.7	85.8	87.3	−73.0
≤19	3.6	9.9	1.8	84.7	88.3	−33.5
≤24	5.9	7.6	3.9	82.6	88.5	+16.4
≤29	8.4	5.1	7.9	78.6	86.9	+41.1
≤34	10.1	3.4	13.2	73.3	83.4	+2.1
≤39	11.6	1.9	19.0	67.5	79.2	−40.6
≤44	12.3	1.2	24.7	61.8	74.1	−83.0
≤49	12.6	0.9	30.4	56.1	68.7	−125.4
≤54	12.9	0.6	35.6	50.9	63.8	−163.9
≤59	13.0	0.5	39.9	46.6	59.5	−195.8
≤64	13.0	0.5	42.5	44.0	57.0	−215.1
≤69	13.1	0.4	44.9	41.6	54.7	−232.7
≤74	13.1	0.4	46.1	40.4	53.5	−241.5
≤79	13.1	0.4	46.9	39.6	52.7	−247.3
≤84	13.1	0.4	47.3	39.2	52.3	−250.4
≤89	13.1	0.4	47.4	39.1	52.2	−251.3
≤94	13.1	0.4	47.4	39.1	52.1	−251.6
≤100	13.5	0.0	86.5	0.0	13.5	−541.1

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

Figure 12 ($1.25/day line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	82.1	1.5	4.6:1
≤9	0.5	75.6	2.8	3.1:1
≤14	2.2	69.1	11.1	2.2:1
≤19	5.4	67.1	26.7	2.0:1
≤24	9.8	60.3	43.8	1.5:1
≤29	16.3	51.3	62.0	1.1:1
≤34	23.3	43.4	75.0	0.8:1
≤39	30.6	38.0	86.1	0.6:1
≤44	37.0	33.2	91.0	0.5:1
≤49	43.0	29.3	93.6	0.4:1
≤54	48.5	26.6	95.6	0.4:1
≤59	52.9	24.5	96.1	0.3:1
≤64	55.6	23.5	96.6	0.3:1
≤69	58.0	22.6	96.9	0.3:1
≤74	59.2	22.1	96.9	0.3:1
≤79	59.9	21.8	96.9	0.3:1
≤84	60.4	21.7	96.9	0.3:1
≤89	60.5	21.6	96.9	0.3:1
≤94	60.5	21.6	96.9	0.3:1
≤100	100.0	13.5	100.0	0.2:1

Tables for

the $2.00/day 2005 PPP Poverty Line

Figure 4 ($2.00/day 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	100.0
5–9	100.0
10–14	98.9
15–19	91.5
20–24	88.5
25–29	73.1
30–34	63.0
35–39	55.9
40–44	35.9
45–49	26.4
50–54	15.6
55–59	10.4
60–64	6.2
65–69	3.8
70–74	3.8
75–79	3.8
80–84	3.8
85–89	3.8
90–94	3.8
95–100	3.8

Figure 7 ($2.00/day line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| | | Difference between estimate and true value | | |
| | | Confidence interval ($\pm$ percentage points) | | |
Score	Diff.	90-percent	95-percent	99-percent
0–4	+0.0	0.0	0.0	0.0
5–9	+0.0	0.0	0.0	0.0
10–14	+5.6	2.5	2.9	3.9
15–19	+0.6	2.1	2.5	3.6
20–24	−0.9	2.1	2.4	3.0
25–29	−4.0	3.1	3.3	3.6
30–34	+3.1	2.5	3.0	4.1
35–39	−3.9	3.2	3.4	4.0
40–44	−4.8	3.7	4.0	4.5
45–49	−6.1	4.4	4.7	5.4
50–54	−2.9	2.7	3.0	3.9
55–59	−4.4	3.6	4.0	4.5
60–64	−1.9	2.7	3.2	4.3
65–69	+1.7	1.0	1.2	1.6
70–74	+0.8	2.2	2.6	3.3
75–79	+3.8	0.0	0.0	0.0
80–84	+3.8	0.0	0.0	0.0
85–89	+3.8	0.0	0.0	0.0
90–94	+3.8	0.0	0.0	0.0
95–100	+0.2	0.4	0.5	0.7

Figure 8 ($2.00/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size n	Diff.	Difference between estimate and true value		
		Confidence interval ($\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	−2.7	64.8	78.4	93.1
4	−1.8	29.5	36.9	48.0
8	−1.7	21.1	25.8	35.4
16	−1.4	15.3	18.2	23.7
32	−1.4	10.1	12.6	17.8
64	−1.4	7.1	8.2	10.5
128	−1.2	4.9	6.0	7.7
256	−1.2	3.6	4.3	5.6
512	−1.3	2.7	3.0	4.3
1,024	−1.2	1.8	2.2	3.0
2,048	−1.2	1.3	1.6	2.2
4,096	−1.2	1.0	1.1	1.4
8,192	−1.2	0.7	0.8	1.0
16,384	−1.1	0.5	0.6	0.8

Figure 11 ($2.00/day line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	30.3	0.0	69.5	69.7	−98.4
≤9	0.5	30.0	0.0	69.5	70.0	−96.7
≤14	2.0	28.5	0.1	69.3	71.4	−86.3
≤19	4.9	25.6	0.4	69.0	74.0	−66.2
≤24	8.9	21.6	0.9	68.6	77.5	−38.8
≤29	13.9	16.7	2.5	67.0	80.9	−1.1
≤34	18.2	12.4	5.2	64.3	82.5	+36.0
≤39	22.2	8.3	8.4	61.1	83.4	+72.6
≤44	25.0	5.6	12.0	57.5	82.4	+60.6
≤49	26.8	3.7	16.2	53.3	80.1	+46.9
≤54	27.8	2.7	20.7	48.8	76.6	+32.1
≤59	28.4	2.1	24.5	45.0	73.4	+19.8
≤64	28.6	1.9	26.9	42.6	71.2	+11.8
≤69	28.7	1.8	29.3	40.2	68.9	+4.1
≤74	28.7	1.8	30.4	39.1	67.8	+0.3
≤79	28.7	1.8	31.2	38.3	67.0	−2.2
≤84	28.7	1.8	31.6	37.9	66.6	−3.6
≤89	28.7	1.8	31.7	37.7	66.5	−4.0
≤94	28.7	1.8	31.8	37.7	66.5	−4.1
≤100	30.5	0.0	69.5	0.0	30.5	−127.6

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

Figure 12 ($2.00/day line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	100.0	0.8	Only poor targeted
≤9	0.5	100.0	1.6	Only poor targeted
≤14	2.2	93.6	6.6	14.7:1
≤19	5.4	92.0	16.2	11.5:1
≤24	9.8	90.7	29.1	9.7:1
≤29	16.3	85.0	45.4	5.6:1
≤34	23.3	77.9	59.5	3.5:1
≤39	30.6	72.7	72.9	2.7:1
≤44	37.0	67.5	81.8	2.1:1
≤49	43.0	62.4	88.0	1.7:1
≤54	48.5	57.3	91.1	1.3:1
≤59	52.9	53.7	93.1	1.2:1
≤64	55.6	51.5	93.8	1.1:1
≤69	58.0	49.5	94.1	1.0:1
≤74	59.2	48.6	94.2	0.9:1
≤79	59.9	48.0	94.2	0.9:1
≤84	60.4	47.6	94.2	0.9:1
≤89	60.5	47.5	94.2	0.9:1
≤94	60.5	47.5	94.2	0.9:1
≤100	100.0	30.5	100.0	0.4:1

Tables for

the $2.50/day 2005 PPP Poverty Line

Figure 4 ($2.50/day 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	100.0
5–9	100.0
10–14	99.3
15–19	97.0
20–24	95.8
25–29	86.5
30–34	80.3
35–39	72.3
40–44	57.1
45–49	44.4
50–54	33.3
55–59	19.4
60–64	12.4
65–69	6.2
70–74	6.2
75–79	6.2
80–84	6.2
85–89	6.2
90–94	6.2
95–100	6.2

Figure 7 ($2.50/day line): Average differences by score range between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of $n = 16{,}384$, scorecard applied to the validation sample

| Score | Diff. | Difference between estimate and true value Confidence interval ($\pm$ percentage points) | | |
		90-percent	95-percent	99-percent
0–4	+0.0	0.0	0.0	0.0
5–9	+0.0	0.0	0.0	0.0
10–14	+2.7	1.8	2.1	2.5
15–19	−1.0	1.0	1.1	1.6
20–24	−0.7	1.2	1.4	1.7
25–29	−4.6	3.0	3.1	3.4
30–34	+2.8	2.3	2.7	3.3
35–39	−4.3	3.2	3.4	4.0
40–44	+0.2	2.7	3.2	4.1
45–49	−6.9	4.9	5.2	5.7
50–54	+1.2	3.0	3.7	4.8
55–59	−3.3	3.2	3.6	4.5
60–64	−1.5	3.3	3.9	5.0
65–69	+1.2	1.5	1.8	2.3
70–74	+1.7	2.3	2.8	3.7
75–79	+6.2	0.0	0.0	0.0
80–84	−2.3	5.9	7.4	9.9
85–89	+6.2	0.0	0.0	0.0
90–94	+6.2	0.0	0.0	0.0
95–100	−0.5	0.6	0.7	0.8

Figure 8 ($2.50/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, scorecard applied to the validation sample

Sample Size	Difference between estimate and true value			
		Confidence interval (± percentage points)		
n	Diff.	90-percent	95-percent	99-percent
1	–2.3	61.9	83.0	90.2
4	–1.7	29.8	35.7	47.8
8	–1.5	21.2	26.0	35.6
16	–1.3	15.6	18.7	24.2
32	–1.4	11.1	12.9	17.6
64	–1.3	7.4	8.7	11.2
128	–1.2	5.2	6.3	8.0
256	–1.1	3.8	4.5	5.7
512	–1.1	2.7	3.2	4.1
1,024	–1.1	1.9	2.3	3.1
2,048	–1.1	1.3	1.5	2.0
4,096	–1.1	0.9	1.1	1.4
8,192	–1.1	0.7	0.8	1.1
16,384	–1.1	0.5	0.6	0.8

Figure 11 ($2.50/day line): Shares of households by cut-off score and targeting classification, along with "Total Accuracy" and BPAC, scorecard applied to the validation sample

Score cut-off	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
≤4	0.2	39.3	0.0	60.5	60.7	−98.7
≤9	0.5	39.0	0.0	60.5	61.0	−97.5
≤14	2.1	37.4	0.1	60.4	62.5	−89.2
≤19	5.2	34.3	0.1	60.3	65.6	−73.2
≤24	9.5	30.0	0.3	60.2	69.7	−51.2
≤29	15.3	24.2	1.0	59.5	74.9	−19.9
≤34	20.8	18.7	2.5	58.0	78.8	+11.7
≤39	26.2	13.3	4.4	56.1	82.4	+43.9
≤44	30.0	9.5	7.0	53.5	83.4	+69.4
≤49	32.9	6.6	10.2	50.3	83.2	+74.2
≤54	34.6	4.9	13.9	46.6	81.2	+64.8
≤59	35.7	3.9	17.2	43.3	78.9	+56.4
≤64	36.1	3.4	19.5	41.0	77.1	+50.7
≤69	36.3	3.2	21.7	38.8	75.1	+45.1
≤74	36.3	3.2	22.8	37.7	74.0	+42.2
≤79	36.3	3.2	23.6	36.9	73.2	+40.3
≤84	36.4	3.1	24.0	36.5	72.9	+39.3
≤89	36.4	3.1	24.1	36.4	72.7	+39.0
≤94	36.4	3.1	24.1	36.3	72.7	+38.9
≤100	39.5	0.0	60.5	0.0	39.5	−53.1

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

Figure 12 ($2.50/day line): Share of all households who are targeted (that is, score at or below the cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), scorecard applied to the 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
≤4	0.2	100.0	0.6	Only poor targeted
≤9	0.5	100.0	1.3	Only poor targeted
≤14	2.2	97.0	5.3	32.9:1
≤19	5.4	97.3	13.2	36.3:1
≤24	9.8	96.8	24.0	30.2:1
≤29	16.3	94.0	38.8	15.8:1
≤34	23.3	89.2	52.7	8.3:1
≤39	30.6	85.8	66.4	6.0:1
≤44	37.0	81.0	75.8	4.3:1
≤49	43.0	76.3	83.2	3.2:1
≤54	48.5	71.3	87.6	2.5:1
≤59	52.9	67.4	90.3	2.1:1
≤64	55.6	64.9	91.3	1.9:1
≤69	58.0	62.6	91.8	1.7:1
≤74	59.2	61.4	92.0	1.6:1
≤79	59.9	60.6	92.0	1.5:1
≤84	60.4	60.3	92.1	1.5:1
≤89	60.5	60.1	92.1	1.5:1
≤94	60.5	60.1	92.1	1.5:1
≤100	100.0	39.5	100.0	0.7:1