Simple Poverty Scorecard® Tool
Guinea-Bissau

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This document and a data-collection tool are in English at scorocs.com

Abstract

The Scorocs Simple Poverty Scorecard-brand poverty-assessment tool is a low-cost, transparent way for pro-poor programs in Guinea-Bissau to get to know their participants better and so to prove and improve their social performance. Responses to the scorecard's 10 indicators can be collected in about 10 minutes and then used to estimate consumption-based poverty rates, to track changes in poverty rates, or to segment participants for differentiated treatment.

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Scorocs® Simple Poverty Scorecard® Tool

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

Indicator	Response	Points
1. In what region does the household live?	A. Gabu	0
	B. Cacheu	4
	C. Tombali	5
	D. Biombo	6
	E. Bissau, or Quinara	7
	F. Bafatá, Oio, or Bolama	9
2. How many household members are there?	A. Eleven or more	0
	B. Ten	5
	C. Seven, eight, or nine	10
	D. Six	13
	E. Five	18
	F. Four	22
	G. One, two, or three	32
3. In their main occupation, do any household members 6-years-old or older work in agriculture/forestry/fishing?	A. Yes	0
	B. No	5
4. What is the household's main source of energy for cooking?	A. Firewood, electricity, or other	0
	B. Charcoal, or LPG	3
5. What is the household's main source of drinking water?	A. Well (protected or unprotected), river, stream, lake, or tanker truck	0
	B. Public tap or standpipe	4
	C. Piped into the residence or yard	10
6. What toilet arrangement does the household use?	A. None (bush), or other	0
	B. Traditional latrine	1
	C. Improved latrine, or modern toilet with septic tank	4
	D. Modern toilet with sewer system	12
7. What is the household's main source of energy for lighting?	A. Kerosene or fuel oil	0
	B. Candle, firewood, or other	2
	C. Electricity, generator, solar panel, or LPG	4
8. Does the household have a TV in good working order?	A. No	0
	B. Yes	8
9. How many sheep, goats, pigs, or other medium-sized food animals does the household own?	A. None, or one	0
	B. Two, or three	2
	C. Four to seven	4
	D. Eight or more	10
10. In the last 12 months, how many times did the household have to go hungry? (*Read the response options: Always, often, sometimes, rarely, or never*)	A. Always	0
	B. Often, or sometimes	3
	C. Rarely	5
	D. Never	7

Score:

Back-page Worksheet: Household Members, Ages, and Work in Agriculture/Forestry/Fishing

Fill out the scorecard header first. Include the interview's unique identifier (if known), the interview date, and the sampling weight of the participant (if known). Then record the full name and the unique identification number of the participant (who may differ from the respondent), of the participant's field agent (who may differ from you the enumerator), and of the service point that the participant uses (if known). Circle the response to the first scorecard indicator based on the region where the household lives.

Then read to the respondent: *Please tell me the first names (or nicknames) and ages of all the members of your household, starting with the head and followed by his/her spouse (if there is one). A* household *is a single person or a group of people who live together (regardless of blood or marital relationships) and who share—in full or in part—their income so as to provide for their basic needs for food and shelter. Household members must currently live and eat with the household and have done so for at least six of the last 12 months or expect to remain for a total duration of at least six months.*

Write down the first name/nickname and the age of each member. You need to know someone's precise age only if it may be close to six. Record the number of household members in the scorecard header next to "Number of household members:". Then circle the response to the second scorecard indicator about the number of household members.

For each household member who is at least 6-years-old, ask: "Did [NAME] do work of any kind in the past 7 days?" If Yes, then ask "Is [NAME's] main occupation in agriculture/forestry/fishing?" Circle the response to the third scorecard indicator based on whether any household members work in agriculture/forestry/fishing.

Read the remaining seven questions aloud, marking the responses. Always keep in mind and apply the detailed instructions in the "Interview Guide".

First name or nickname	**Age**	**If [NAME] is at least 6-years-old, then did [NAME] do work of any kind in the last 7 days?**			**If [NAME] works, then is [NAME's] main occupation in agriculture/forestry/fishing?**		
1.		< 6	No	Yes	<6 or does not work	No	Yes
2.		< 6	No	Yes	<6 or does not work	No	Yes
3.		< 6	No	Yes	<6 or does not work	No	Yes
4.		< 6	No	Yes	<6 or does not work	No	Yes
5.		< 6	No	Yes	<6 or does not work	No	Yes
6.		< 6	No	Yes	<6 or does not work	No	Yes
7.		< 6	No	Yes	<6 or does not work	No	Yes
8.		< 6	No	Yes	<6 or does not work	No	Yes
9.		< 6	No	Yes	<6 or does not work	No	Yes
10.		< 6	No	Yes	<6 or does not work	No	Yes
11.		< 6	No	Yes	<6 or does not work	No	Yes
12.		< 6	No	Yes	<6 or does not work	No	Yes
13.		< 6	No	Yes	<6 or does not work	No	Yes
14.		< 6	No	Yes	<6 or does not work	No	Yes
15.		< 6	No	Yes	<6 or does not work	No	Yes
16.		< 6	No	Yes	<6 or does not work	No	Yes
17.		< 6	No	Yes	<6 or does not work	No	Yes
18.		< 6	No	Yes	<6 or does not work	No	Yes
19.		< 6	No	Yes	<6 or does not work	No	Yes
20.		< 6	No	Yes	<6 or does not work	No	Yes
21.		< 6	No	Yes	<6 or does not work	No	Yes
Number members:		—			**Any 'Yes'?**		

Look-up table to convert scores to poverty likelihoods: International 2011 PPP lines

	Poverty likelihood (%)			
	Intl. 2011 PPP (2010 def.)			
Score	$1.90	$3.20	$5.50	$21.70
0–14	89.3	94.0	95.9	99.3
15–18	85.0	93.3	95.8	98.8
19–21	84.5	93.3	95.5	98.8
22–23	84.5	93.3	95.3	98.8
24–25	79.7	93.3	95.3	98.8
26–27	78.3	90.4	95.3	98.8
28–28	78.3	88.7	95.3	98.8
29–29	71.7	87.6	94.0	98.8
30–31	70.0	87.6	94.0	98.8
32–32	64.8	84.4	93.2	98.8
33–34	63.2	84.4	93.2	98.8
35–36	63.2	84.4	93.2	98.8
37–38	57.7	81.9	93.2	98.8
39–40	49.9	80.3	91.9	98.8
41–42	47.0	80.3	91.9	98.8
43–45	39.5	74.7	89.7	98.8
46–48	36.6	71.1	88.4	98.8
49–52	29.4	63.8	88.4	98.8
53–58	14.9	48.4	80.6	98.5
59–100	7.2	24.3	57.3	92.9

Look-up table to convert scores to poverty likelihoods: Percentile-based poverty lines

	Poverty likelihood (%)					
	Percentile-based lines (2010 def.)					
Score	10th	20th	40th	50th	60th	80th
0–14	22.9	46.3	68.9	76.7	82.5	93.2
15–18	17.0	35.2	65.3	74.6	79.1	90.7
19–21	14.3	28.1	62.7	71.4	79.1	90.7
22–23	10.6	25.6	55.3	64.0	78.4	90.7
24–25	10.6	25.6	51.6	63.8	71.9	90.6
26–27	10.6	21.8	47.8	60.8	71.9	89.4
28–28	10.6	19.7	47.8	60.8	71.9	88.7
29–29	10.6	19.7	41.2	51.3	65.6	82.9
30–31	10.6	19.7	39.9	51.3	65.1	82.9
32–32	10.6	19.7	35.8	47.3	57.0	78.3
33–34	5.7	11.1	27.6	41.1	52.8	77.6
35–36	5.7	11.1	27.6	41.1	52.8	77.0
37–38	5.7	11.1	27.6	40.9	50.1	75.1
39–40	5.3	11.1	23.8	34.7	45.6	73.9
41–42	4.8	7.5	16.4	25.6	35.8	73.9
43–45	4.1	6.5	11.4	18.2	31.3	70.2
46–48	2.4	5.4	7.8	15.5	27.8	64.3
49–52	1.5	3.4	7.8	13.3	20.4	44.7
53–58	0.7	1.8	4.3	6.4	9.0	36.5
59–100	0.0	0.0	1.5	3.9	5.1	20.4

Scorocs® Simple Poverty Scorecard® Tool
Guinea-Bissau

1. Introduction

The Scorocs Simple Poverty Scorecard poverty-assessment tool for Guinea-Bissau is a low-cost, transparent way for pro-poor programs to know their participants better and so to prove and improve their social performance.

The scorecard can be used 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 estimate the change in a population's poverty rate over time, and to segment participants for differentiated treatment.

The direct approach to poverty assessment via consumption surveys is difficult and costly. A case in point is Guinea-Bissau's 2010 Light Poverty-Assessment Survey (*Inquérito Ligeiro para a Avalição da Pobreza*, ILAP) by the *Instituto Nacional de Estatística e Censos* (INEC). It runs 12 pages and covers more than 200 questions, many of which have several follow-up questions or are repeated for each household member. Somehow, enumerators were expected to complete this "light" interview—supposing a six-person household—in about 40 minutes.

In comparison, the scorecard's indirect approach is quick and low-cost. It uses 10 verifiable indicators drawn from the 2010 ILAP (such as "What is the household's main source of energy for cooking?" and "Does the household have a TV in good working

order?"). Responses to the indicators are used to get a score that is correlated with poverty status as measured by the exhaustive ILAP 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 in Guinea-Bissau. The feasible poverty-assessment options for such 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). Poverty 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 estimate the share of a program's participants who are below a given poverty line (for example, the World Bank's "international extreme poverty" line of $1.90/day 2011 PPP). The scorecard can also be used to estimate changes in poverty rates. For all these applications, the scorecard is low-cost, consumption-based, and quantitative. While consumption surveys are costly even for governments, some pro-poor organizations may be able to implement the low-cost scorecard to help with monitoring poverty and (if desired) segmenting clients for differentiated treatment.

The technical approach aims to be understood by non-specialists. After all, if program managers are to adopt the scorecard on their own and apply it to inform their

[1] Guinea-Bissau's scorecard is not in the public domain; it is copyright © 2019 Scorocs.

decisions, then they must first trust that it works. Transparency and straightforwardness build trust. Getting "buy-in" matters; proxy-means tests and regressions on the "determinants of poverty" have been around for decades, but they are rarely used to inform decisions by pro-poor organizations. This is not because these tools do not work, but because they are often 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", straightforward, transparent approaches are usually about as accurate as complex, opaque ones (Schreiner, 2012a; Caire and Schreiner, 2012).

Beyond its low cost 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 straightforward and commonplace in statistical practice and in the for-profit field of credit-risk scorecards, the tests are rarely applied to poverty-assessment tools.

The scorecard is based on data from the 2010 ILAP from Guinea-Bissau's INEC. Indicators are selected to be:

- Inexpensive to collect, easy to answer quickly, and straightforward to verify
- Strongly correlated with socio-economic status
- Liable to change over time as socio-economic status changes
- Applicable in all regions of Guinea-Bissau

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 or on hand-held devices 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-capita consumption below a given poverty line.

Second, the scorecard can estimate the poverty rate of a population of households at a point in time. This estimate is the average of estimated poverty likelihoods among a representative sample of households from the population.

Third, the scorecard can estimate annual changes in poverty rates. With two independent samples of households from the same population, this is the difference in the average estimated poverty likelihood in the baseline sample versus the average estimated likelihood in the follow-up sample, divided by the difference (in years) between the average interview date in the baseline sample and the average interview date in the follow-up sample.

With one sample in which each household is scored twice, the estimate of the annual change in a poverty rate is the sum of the changes in each household's estimated poverty likelihood from baseline to follow-up, divided by the sum of years between each household's pair of interviews (Schreiner, 2014a).

The scorecard can also be used to segment participants for differentiated treatment. To help managers choose appropriate targeting cut-offs for their purposes, targeting accuracy is reported for a range of possible cut-offs.

This paper presents a single scorecard whose indicators and points are derived with the $1.90/day 2011 PPP poverty line and data from a random sample of about three-fifths of households in the 2010 ILAP. Scores from this one scorecard are calibrated with this same data to poverty likelihoods for 10 poverty lines. Data from the other two-fifths of households in the 2010 ILAP is used to validate the scorecard's accuracy for estimating households' poverty likelihoods, for estimating populations' poverty rates at a point in time, and for segmenting participants.

Given their assumptions, all three scorecard-based estimators (the poverty likelihood of a household, the poverty rate of a population at a point in time, and the change in a population's poverty rate over time) are *unbiased*. That is, the true value matches the average of estimates in repeated samples from a single, unchanging population in which the relationship between scorecard indicators and poverty is unchanging. Like all predictive models, the scorecard has estimation errors when applied (as in this paper) to a validation sample. Furthermore, it makes errors to some unknown extent when applied (in practice) to a different population or when applied

after 2010 (because the relationships between indicators and poverty do change over time).[2]

Thus, while the indirect-scorecard approach is less costly than the direct-survey approach, the scorecard has estimation errors when applied in practice. (Observed values from the direct-survey approach are taken as correct, ignoring sampling variation.) There are errors because the scorecard necessarily assumes that future relationships between indicators and poverty in all populations will be the same as in the construction data. Of course, this assumption—inevitable in predictive modeling—holds only partly.

The average error in the scorecard's estimated poverty rate at a point in time (that is, the average of differences between estimated and observed values across 1,000 bootstrap samples of $n = 16{,}384$ from the validation sample) for the \$1.90/day 2011 PPP poverty line is +0.3 percentage points. The average across all 10 poverty lines of the absolute values of the average error is about 0.4 percentage points, and the maximum of the absolute values of the average error is 0.7 percentage points. These estimation errors are due to sampling variation, not bias; the average error would be zero if the whole 2010 ILAP were to be repeatedly re-fielded and re-divided into sub-samples before repeating the entire process of constructing and validating the resulting scorecards.

[2] Examples include nationally representative samples at a later point in time and sub-populations that are not nationally representative (Diamond *et al.*, 2016; Tarozzi and Deaton, 2009).

With $n = 16{,}384$, the 90-percent confidence intervals are ± 0.6 percentage points or smaller. For $n = 1{,}024$, the 90-percent intervals are ± 2.3 percentage points or smaller.

The scorecard's accuracy in practice for estimating changes in poverty rates over time is not known; there is no comparable data from a post-2010 ILAP that could be used as a follow-up to estimate change against a baseline estimated from the 2010 ILAP validation sample.

Section 2 below documents data and poverty lines. Sections 3 and 4 describe scorecard construction and offer guidelines for implementation. Sections 5 and 6 tell how to estimate households' poverty likelihoods and a population's poverty rate at a point in time. Section 7 discusses estimating changes in a population's poverty rate. Section 8 covers targeting. The last section is a summary.

The "Interview Guide" (found after the References) tells how to ask questions—and how to interpret responses—so as to mimic practice in Guinea-Bissau's 2010 ILAP as closely as possible. The "Interview Guide" (and the "Back-page Worksheet") are integral parts of the scorecard for Guinea-Bissau.

2. Data and poverty lines

This section presents the data used to construct and validate the scorecard. It also documents the definition of *poverty* as well as the 10 poverty lines to which scores are calibrated.

2.1 Data

Indicators and points for the scorecard are selected (*constructed*) based on data from a random three-fifths of the 3,176 households in the 2010 ILAP, Guinea-Bissau's most-recent national household consumption survey. These same three-fifths of households are also used to associate (*calibrate*) scores with poverty likelihoods for all poverty lines.

Data from the other two-fifths of households from the 2010 ILAP is used to test (*validate*) scorecard accuracy for point-in-time estimates of poverty rates *out-of-sample*, that is, with data that is not used in construction or calibration. Data from those same two-fifths of households are also used to test out-of-sample targeting accuracy.

Field work for the 2010 ILAP took place over the month of July 2010.

2.2 Poverty rates at the household, person, and participant level

A *poverty rate* is the share of units in households in which total household consumption (divided by the number of household members) is below a given poverty line. The unit of analysis is either the household itself or a person in the household. By assumption, all members in a given household have the same poverty status (or estimated poverty likelihood).

2.2.1 Household-level estimates

To illustrate, suppose that a pro-poor program serves two households. The first household is poor (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 has four members, two of whom are program participants.

Poverty rates are in terms 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 weighted[3] average of poverty statuses (or estimated poverty likelihoods) across households with participants. 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 household-level sampling weight, and the second "1" represents the first household's poverty status (poor) or its estimated poverty likelihood. In the "$1 \cdot 0$" term in the numerator, the "1" is the second household's household-level sampling

[3] The examples here assume simple random sampling at the household level. This means that each household has the same selection probability and thus the same household-level sampling weight, taken here to be one (1).

weight, and the "0" represents the second household's poverty status (non-poor) or its estimated poverty likelihood. The "$1 + 1$" in the denominator is the sum of the household-level sampling weights of the two households. Household-level sampling weights are used because the unit of analysis is the household.

2.2.2 Person-level estimates

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

[4] Given simple random sampling at the household level, a household's person-level weight is the number of people in the household.

2.2.3 Participant-level estimates

As a final example, a pro-poor program might count as *participants* only those household members who directly participate in the program. For the example here, this means that some—but not all—household members are counted. The estimated person-level poverty rate is then the participant-weighted average[5] of the poverty statuses (or estimated poverty likelihoods) of households with participants, that is,

$\frac{1 \cdot 1 + 2 \cdot 0}{1 + 2} = \frac{1}{3} = 0.33 = 33$ percent. The first "1" in the "$1 \cdot 1$" in the numerator is the first household's participant-level sampling weight because it has one participant, and the second "1" represents its poverty status (poor) or its estimated poverty likelihood. In the "$2 \cdot 0$" term in the numerator, the "2" is the second household's participant-level sampling weight because it has two participants, and the zero represents its poverty status (non-poor) or its estimated poverty likelihood. The "$1 + 2$" in the denominator is the sum of the participant-level sampling weights of the two households. Participant-level sampling weights are used because the unit of analysis is the participant.[6]

To sum up, estimated poverty rates are weighted averages of households' poverty statuses (or estimated poverty likelihoods), where—assuming simple random sampling at the household level—the weights are the number of relevant units in the household. When reporting scorecard-based estimates, organizations should clearly state the unit of

[5] Given simple random sampling at the household level, a household's participant-level weight is the number of participants in that household.

[6] If all households with participants have (or are assumed to have) one participant each, then the participant-level poverty rate is the same as the household-level rate.

analysis—whether households, household members, or participants—and explain why that unit is relevant.

Table 1 reports poverty lines and poverty rates for households and people in the 2010 ILAP for Guinea-Bissau as a whole and for each its nine regions by urban/rural/all.

Household-level poverty rates are reported because—as shown above— sampling is almost always done at the level of households and because 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. Person-level poverty rates are also included in Table 1 because these are the rates reported by the government of Guinea-Bissau. Furthermore, popular discussions and policy discourse usually proceed in terms of person-level rates, and the goal of pro-poor programs is to help people (not households) to improve their well-being.

2.3 Definition of *poverty*, and poverty lines

A household's *poverty status* as poor or non-poor depends on whether its per-capita consumption (XOF per person per day in prices for Guinea-Bissau overall during the 2010 ILAP field work) is below a given poverty line. Thus, a definition of *poverty* is a poverty line together with a measure of consumption.

The definition of Guinea-Bissau's measure of consumption does not seem to be documented.

Because pro-poor programs in Guinea-Bissau may want to use different or various poverty lines, this paper calibrates scores from its single scorecard to poverty likelihoods for 10 lines:

- $1.90/day 2011 PPP
- $3.20/day 2011 PPP
- $5.50/day 2011 PPP
- $21.70/day 2011 PPP
- First-decile (10th-percentile) line
- First-quintile (20th-percentile) line
- Second-quintile (40th-percentile) line
- Median (50th-percentile) line
- Third-quintile (60th-percentile) line
- Fourth-quintile (80th-percentile) line

2.3.1 International 2011 PPP poverty lines

International 2011 PPP lines are derived from:

- 2011 PPP exchange rate for Guinea-Bissau for "individual consumption expenditure by households":[7] XOF248.236 per $1.00
- Consumer Price Index (CPI):[8]
  - Calendar-year 2011 average: 105.05
  - Average during the July 2010 ILAP field work: 99.78

[7] `iresearch.worldbank.org/PovcalNet/Detail.aspx?Format=Detail&CO=GNB_3&PPPO=248.236&PLO=1.90&YO=2010&NumOfCountries=1`, retrieved 12 October 2018.
[8] The monthly CPI is base = 100 on average in calendar-year 2010. `data.imf.org/regular.aspx?key=61545861`, retrieved 10 November 2017.

Given these parameters, the \$1.90/day 2011 PPP line for Guinea-Bissau in prices during field work for the 2010 ILAP is

$$\$1.90 \cdot 2011\,\text{PPP factor} \cdot \left(\frac{\text{CPI}_{\text{july2010}}}{\text{CPI}_{2011}} \right) = \$1.90 \cdot 248.236 \cdot \left(\frac{99.78}{105.05} \right) = \text{XOF448}\,.$$

Overall, the \$1.90/day line gives a household-level poverty rate of 58.4 percent and a person-level rate of 66.9 percent (Table 1).

The World Bank's PovcalNet[9] reports a \$1.90/day line of XOF449 per person per day, almost matching the XOF448 here. PovcalNet also reports a 0.2-percentage-point higher person-level poverty rate (67.1 percent). The difference does not stem from PovcalNet's higher line (which is probably results from a slightly different CPI); this is known because increasing the poverty line by XOF1 and then re-running the calculations for this paper again gives the same 66.9 percent reported here. Instead, the small difference (0.2 percentage points) must be due to PovcalNet's use of an approximation to the distribution of consumption based on the data from the 2010 ILAP, rather than estimating directly on all the household-level data.

The 2011 PPP poverty lines for \$3.20/day, \$5.50/day, and \$21.70/day are multiples of the \$1.90/day line.[10]

[9] `iresearch.worldbank.org/PovcalNet/Detail.aspx?Format=Detail&C0=GNB_3&PPP0=248.236&PL0=1.90&Y0=2010&NumOfCountries=1`, retrieved 12 October 2018.
[10] Jolliffe and Prydz (2016) discuss the World Bank's choice of the four 2011 PPP lines.

2.3.2 Percentile-based poverty lines

The scorecard for Guinea-Bissau also supports percentile-based poverty lines.[11] This facilitates a number of types of analyses. For example, the second-quintile (40th-percentile) line might be used to help track Guinea-Bissau's progress toward the World Bank's (2013) goal of "shared prosperity/inclusive economic growth", defined as income growth among the bottom 40 percent of the world's people.

The four quintile lines, analyzed together, can also be used to look at the relationship of consumption with health outcomes (or anything else related with the distribution of consumption). The scorecard thus offers an alternative for health-equity analyses that typically have used an "asset index" such as that supplied with the data from the Demographic and Health Surveys (Rutstein and Johnson, 2004) to compare some estimate of socio-economic status with health outcomes.

Of course, relative-wealth analyses were always possible (and still are possible) with scores from the scorecard. But support for relative consumption lines allows for a more straightforward use of a single tool to analyze any or all of:

- Relative wealth (via scores)
- Absolute consumption (via poverty likelihoods and absolute poverty lines)
- Relative consumption (via poverty likelihoods and percentile-based poverty lines)

[11] Following the asset index associated with the Demographic and Health Surveys, percentiles are in terms of people (not households) for Guinea-Bissau as a whole. For example, the all-Guinea-Bissau person-level poverty rate for the first-quintile (20th-percentile) poverty line is 20 percent (Table 1). The household-level poverty rate for that same line is not 20 percent but rather 15.6 percent.

Unlike the scorecard, asset indexes serve only to analyze relative wealth. Furthermore, the scorecard—unlike asset indexes based on Principal Component Analysis or similar approaches—uses a straightforward, well-understood poverty standard whose definition is external to the tool itself (consumption relative to a poverty line defined in monetary units).

In contrast, an asset index opaquely defines *poverty* in terms of its own indicators and points, without reference to an external standard. This means that two asset indexes with different indicators or different points—even if derived from the same data for a given country—imply two different definitions of *poverty*. In the same set-up, two scorecards would provide comparable estimates under a single definition of *poverty*.

3. Scorecard construction

For Guinea-Bissau, about 70 candidate indicators are initially prepared in the areas of:

- Household composition (such as the number of household members)
- Education (such as whether the (eldest) female head/spouse can read and write)
- Housing (such as the type of toilet arrangement)
- Ownership of durable assets (such as TVs and sheep, goats, or pigs)

Table 2 lists the candidate indicators, ordered by the entropy-based "uncertainty coefficient" (Goodman and Kruskal, 1979) that measures how well a given indicator predicts poverty status on its own.[12]

One possible application of the scorecard is to estimate changes in poverty rates. Thus, when selecting indicators—and holding other considerations constant—preference is given to more sensitive indicators. For example, the possession of a TV is probably more likely to change in response to changes in socio-economic status than is the age of the male head/spouse.

The scorecard itself is built using the $1.90/day 2011 PPP line and Logit regression on the construction sub-sample. Indicator selection is based on both judgment and statistics. The first step is to use Logit to build one scorecard for each candidate indicator. The power of each one-indicator scorecard to rank households by poverty status is measured as "c" (SAS Institute Inc., 2004).

[12] The uncertainty coefficient is not used when selecting scorecard indicators. It is only used as a way to order the candidate indicators listed in Table 2.

One of these one-indicator scorecards is then selected based on several factors (Schreiner *et al.*, 2014; 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 consumption, variety among types of indicators, applicability across regions, tendency to have a slow-changing relationship with poverty over time, relevance for distinguishing among households at the poorer end of the distribution of consumption, and verifiability.

A series of two-indicator scorecards are then built, each adding a second indicator to the one-indicator scorecard selected from the first stage. The best two-indicator scorecard is then selected, again using judgment to balance statistical accuracy with the non-statistical criteria. These steps are repeated until the scorecard has 10 indicators that work well together.

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 common R^2-based stepwise least-squares regression. It differs from naïve stepwise in that the selection of indicators considers both statistical[13] and non-statistical criteria. The use of non-statistical criteria can improve robustness through time and across non-nationally representative groups. It also helps ensure that indicators are straightforward, common-sense, inexpensive-to-collect, and acceptable to users.

The single scorecard here applies to all of Guinea-Bissau. Segmenting poverty-assessment tools by urban/rural does not improve targeting accuracy much. This is reported for nine countries in Sub-Saharan Africa (Brown, Ravaillon, and van de Walle, 2016)[14], 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). In general, segmenting poverty-assessment tools may improve the accuracy of estimates of poverty rates (Diamond *et al.*, 2016; Tarozzi and Deaton, 2009), but it may also increase the risk of overfitting (Haslett, 2012).

[13] The statistical criterion for selecting an indicator is not the p values of its coefficients but rather the indicator's contribution to the ranking of households by poverty status.
[14] Burkina Faso, Ethiopia, Ghana, Malawi, Mali, Niger, Nigeria, Tanzania, and Uganda. On average across these countries when targeting people in the lowest quintile or in the lowest two quintiles of scores and when 20 or 40 percent of people are poor, segmenting by urban/rural increases the number of poor people successfully targeted by about one per 200 or one per 400 poor people.

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 and used properly (Schreiner, 2005b). When scorecard 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 the scorecard 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" (Dupriez, 2018; 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 for Guinea-Bissau 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 cost, ease-of-use, and "face validity". Programs are more likely to collect data, compute scores, and pay careful attention to the results if, in their view, the scorecard does not imply a lot of additional work and if the whole process generally make sense to them.

To this end, Guinea-Bissau's scorecard fits on one page. The construction process, indicators, and points are straightforward and transparent. Additional work is

minimized; non-specialists can compute scores by hand in the field because the scorecard has:

- Only 10 indicators
- Only "multiple-choice" indicators
- Only simple points (non-negative integers, and no arithmetic beyond addition)

The scorecard (and its "Back-page Worksheet") is ready to be photocopied. A field worker using Guinea-Bissau's scorecard would:

- Record the interview identifier, interview date, country code ("GNB"), scorecard code ("001") and the sampling weight assigned to the household of the participant by the organization's survey design (if known)
- Record the names and identifiers of the participant (who is not necessarily the same as the respondent), of the field agent (if there is one) who is the participant's main point of contact with the organization (and who is not necessarily the same as the enumerator), and of the organizational service point that is relevant for the participant (if there is such a service point)
- Mark the response to the first scorecard indicator ("In what region does the household live?") based on what is known about where the interviewed household lives
- Complete the "Back-page Worksheet" with each household member's first name (or nickname), age, work status in the last seven days, and whether he/she has his/her main occupation in agriculture/forestry/fishing
- Based on the "Back-page Worksheet", record the number of household members in the scorecard header next to "Number of household members:"
- Based on the "Back-page Worksheet", mark the response to the second scorecard indicator ("How many household members are there?")
- Based on the "Back-page Worksheet", mark the response to the third scorecard indicator ("In their main occupation, do any household members 6-years-old or older work in agriculture/forestry/fishing?")
- Read the rest of the scorecard indicators to the respondent one-by-one. Circle each of the responses and their pre-printed points, and write each point value in the far right-hand column
- Add up the points to get a total score (if desired)
- Implement targeting policy (if any) based on the score
- Upload the data with a mobile data-collection tool, or 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. The training of field workers should be based solely on the "Interview Guide" found after the "References" in this document.

If organizations or field workers gather their own data and if they believe that they have an incentive to exaggerate poverty rates (for example, if managers or 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).[15] IRIS Center (2007) and Toohig (2008) are useful nuts-and-bolts guides for logistics, budgeting, training field workers and supervisors, sampling, interviewing, piloting, recording data, and controlling quality. Schreiner (2014a) explains how to compute estimates and analyze them.

[15] If a program does not want field workers or respondents to know the points associated with responses, then it can use a mobile data-collection tool or provide a version of the paper scorecard that does not display the points and then apply the points and compute scores later at a central office. Even if points are hidden, however, field workers and respondents can use common sense to guess how answers are linked with poverty. 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.

While collecting scorecard indicators is relatively easier than alternative ways of assessing poverty, it is still absolutely difficult. Training and explicit definitions of the terms and concepts in the scorecard are essential, and field workers should scrupulously study and follow the "Interview Guide" found after the "References" section in this paper, as this "Interview Guide"—along with the "Back-page Worksheet"—is an integral part of the scorecard.[16]

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 incontrovertible as whether a household owns an automobile. Yet 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 Mexico, Martinelli and Parker (2007, pp. 24–25) find that "under-reporting [of asset ownership] is widespread but not overwhelming, except for a few goods . . . [and] over-reporting is common for a few goods". 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 organizations that use the scorecard for targeting in Guinea-Bissau.

[16] The guidelines here are the only ones that organizations should give to enumerators. All other issues of interpretation should be left to the judgment of enumerators and respondents, as this seems to be what Guinea-Bissau's INEC did in the 2010 ILAP.

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

- Who will do the interviews
- Where interviews will be done
- How responses and scores will be recorded
- Which households of participants will be interviewed
- How many households of participants will be interviewed
- How frequently households of participants will be interviewed
- Whether the scorecard will be applied at more than one point in time
- Whether the same households of 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 goals should be:

- To make sure that the sample is representative of a well-defined population
- To inform issues that matter to the organization

The non-specialists who apply the scorecard in the field with the households of an organization's participants can be:

- Employees of the organization
- Third parties

There is only one correct, recommended way to do interviews: in-person, at the sampled household's residence, with an enumerator trained to follow the "Interview Guide". This is how INEC did interviews in Guinea-Bissau's 2010 ILAP, and this provides the most-accurate and most-consistent data (and thus the best estimates).

Of course, it is possible to do interviews in other ways such as:

- Without an enumerator (for example, by asking respondents to fill out paper or web forms on their own or to answer questions sent via e-mail, text messaging, or automated voice-response systems)
- Away from the residence (for example, at an organizational service point or at a group-meeting place)
- Not in-person (for example, with an enumerator interviewing by phone)

While such non-recommended methods may reduce costs, they also affect responses (Schreiner, 2015a) and thus reduce the accuracy of scorecard estimates. This is why interviewing by a trained enumerator at the residence is recommended and why other, off-label methods are not recommended.

In some contexts—such as when an organization's field agents do not already visit participants periodically at home anyway as part of their normal work—an organization might judge that the lower costs a non-recommended approach are enough to compensate for less-accurate estimates. The business wisdom of off-label methods depends on context-specific factors that an organization must judge for itself. To judge carefully, an organization that is considering a non-recommended method should test how responses differ with the non-recommended method versus with a trained enumerator at the residence. Furthermore, any reporting should note the use of the non-recommended data-collection method and discuss its possible consequences.

Responses, scores, and poverty likelihoods can be recorded by enumerators 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
- Mobile devices in the field, and then uploaded to a database[17]

Given a population of participants relevant for a particular business question, the participants whose households will be interviewed can be:

- All relevant participants (a census)
- A representative sample of relevant participants
- All relevant participants in a representative sample of relevant field offices and/or in a representative sample of relevant field agents
- A representative sample of relevant participants in a representative sample of relevant field offices and/or in a representative sample of relevant field agents

If not determined by other factors, the number of participants whose households are to be interviewed can be derived from sample-size formulas (presented later) to achieve a desired confidence level and a desired confidence interval. To have the best chance to meaningfully inform questions that matter to the organization, however, the focus should be less on having a sample size large enough to achieve some arbitrary level of statistical significance and more on having a representative sample from a well-defined population that is relevant for informing issues that matter to the organization. In practice, errors due to implementation issues and due to interviewing a non-representative sample can easily swamp errors due to having a somewhat smaller sample size.

[17] Scorocs can support organizations that want to set up a system to collect data with mobile devices or to capture data in a database at the office once paper forms come in. Support is also available for calculating estimates as well as for reporting and analysis.

The frequency of application can be:

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

If a scorecard is applied more than once in order to estimate changes in poverty rates, then it can be applied:

- With a different sample of participants from the same population
- With the same sample 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 declared their intention to apply the scorecard for Bangladesh (Schreiner, 2013a) with a sample of about 25,000 participants. Their design is that all loan officers in a random sample of branches score all participants each time the loan officers visit a homestead (about once a year) as part of their standard due diligence prior to loan disbursement. The loan officers 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 a household's poverty likelihood

The sum of scorecard points for a household is called the *score*. For Guinea-Bissau, 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 poor, 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 are converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. This is done via easy-to-use look-up tables. For the example of the $1.90/day 2011 PPP line, scores of 35–36 have a poverty likelihood of 63.2 percent, and scores of 37–38 have a poverty likelihood of 57.7 percent (Table 3).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 35–36 are associated with a poverty likelihood of 63.2 percent for the $1.90/day 2011 PPP line but of 84.4 percent for the $3.20/day 2011 PPP line.[18]

[18] From Table 3 on, many tables have 10 versions, one for each of the 10 supported poverty lines. To keep them straight, they are grouped by line. Single tables pertaining to all lines appear with the first group of tables for the $1.90/day 2011 PPP line.

5.1 Calibrating scores with poverty likelihoods

A given score is associated ("calibrated") with am estimated *poverty likelihood* that is defined as the share of households in the construction sub-sample who have the score and who have per-capita consumption below a given poverty line.

For the example of the $1.90/day 2011 PPP line and a score of 35–36 (Table 4), there are 5,290 (normalized) households in the construction sample. Of these, 3,341 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 35–36 is then 63.2 percent, because 3,341 ÷ 5,290 = 63.2 percent.

To illustrate with the $1.90/day 2011 PPP line and a score of 37–38, there are 5,952 (normalized) households in the cconstruction sub-sample, of whom 3,437 (normalized) are below the line (Table 4). The poverty likelihood for this score range is then 3,437 ÷ 5,952 = 57.7 percent.

The same method is used to calibrate scores with estimated poverty likelihoods for all 10 poverty lines.[19]

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 monetary poverty lines and from survey data on consumption. The calibrated poverty likelihoods would be objective even if the process

[19] To ensure that poverty likelihoods never increase as scores increase, likelihoods across pairs of adjacent scores may be iteratively averaged before grouping scores into ranges. This preserves unbiasedness while keeping users from balking when sampling variation in score ranges with few households would otherwise lead to higher scores being linked with higher poverty likelihoods.

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.*, 2014). 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 their objectivity depends on using data in score calibration, not on using data (and nothing else) in scorecard construction.

Although the points in Guinea-Bissau's scorecard are transformed coefficients from a Logit regression, (untransformed) scores are not converted to poverty likelihoods via the Logit formula of $2.718281828^{\text{score}}$ x $(1 + 2.718281828^{\text{score}})^{-1}$. This is because the Logit formula is esoteric and difficult to compute by hand. It is more intuitive to define the poverty likelihood as the share of households with a given score in the construction 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 samples of households who are representative of the same population as that 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 of the estimates matches the population's true value. Given the assumptions above, the scorecard also produces unbiased estimates of poverty rates at a point in time and unbiased estimates of the change in poverty rates between two points in time.[20]

Of course, the relationships between indicators and poverty do change to some unknown extent over time, and they also vary across sub-national groups in Guinea-Bissau's population. Thus, scorecard estimates will generally have errors when applied after July 2010 (the last month of field work for the 2010 ILAP) or when applied with sub-groups that are not nationally representative.

[20] This is because these estimates of populations' poverty rates are linear functions of the unbiased estimates of households' poverty likelihoods.

How accurate are estimates of households' poverty likelihoods, given the assumption of unchanging relationships between indicators and poverty over time and the assumption of a sample that is representative of Guinea-Bissau 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 bootstrap sample *with replacement* from the validation sample, accounting for household-level sampling weights
- For each score range, compute the observed 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 range, record the difference between the estimated poverty likelihood (Table 3) and the observed poverty likelihood in the bootstrap sample
- Repeat the previous three steps 1,000 times
- For each score range, report the average difference between estimated and observed poverty likelihoods across the 1,000 bootstrap samples
- For each score range, report the intervals containing the central 900, 950, and 990 differences between estimated and observed poverty likelihoods

For each score range and for $n = 16{,}384$, Table 5 shows the errors in the estimates of poverty likelihoods, that is, the average of differences between the estimates and observed values. It also shows confidence intervals for the errors.

For the $1.90/day 2011 PPP line and on average across bootstrap samples from the validation sample, the estimated poverty likelihood for scores of 35–36 (63.2 percent, Table 3) is too high by 1.7 percentage points. For scores of 33–34, the estimate is too low by 0.9 percentage points.[21]

[21] These differences are not zero, in spite of the estimator's unbiasedness, because the scorecard comes from a single sample. The average difference by score would be zero if

The 90-percent confidence interval for the differences for scores of 35–36 is ±2.6 percentage points (Table 5). This means that in 900 of 1,000 bootstraps, the average difference between the estimate and the observed value for households in this score range is between –0.9 and +4.3 percentage points (because +1.7 – 2.6 = –0.9, and +1.7 + 2.6 = +4.3). In 950 of 1,000 bootstraps (95 percent), the difference is +1.7 ± 3.2 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is +1.7 ± 4.0 percentage points.

A few of the absolute errors between estimated and observed poverty likelihoods in Table 5 for the $1.90/day 2011 line are large. The differences are at least partly due to the fact that the validation sample is a single sample that—thanks to sampling variation—differs in distribution from the construction sub-sample and from the population of Guinea-Bissau. For targeting, however, what matters is less the difference in all score ranges and more the differences in the score ranges just above and just below the targeting cut-off. This mitigates the effects of error and sampling variation on targeting (Friedman, 1997). Section 8 below looks at targeting accuracy in detail.

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samples were repeatedly drawn from the population and split into sub-samples before repeating the entire process of scorecard construction/calibration and validation.

In addition, if estimates of populations' 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 for nationally representative samples in 2010 in Guinea-Bissau, although it will hold less well for samples from sub-national populations and in other time periods.

Another possible source of errors between estimates and observed values is overfitting. The scorecard here is unbiased, but it may still be *overfit* when applied after the end of the ILAP field work in July 2010. That is, the scorecard may fit the construction data from 2010 so closely that it captures not only some real patterns that exist in the population of Guinea-Bissau but also some random patterns that, due to sampling variation, show up only in the 2010 ILAP construction sample. 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 sub-groups that are not nationally representative.

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 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 poverty rates for nationally representative samples (see the next two sections). Furthermore, at least some of the differences in change-over-time estimates 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 price adjustments across time and across geographic regions. These factors can be addressed only by improving the availability, frequency, quantity, and quality of data from national consumption surveys (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 poverty rate at a point in time

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

To illustrate, suppose a program samples three households on 1 January 2020 and that they have scores of 20, 30, and 40, corresponding to estimated poverty likelihoods of 84.5, 70.0, and 49.9 percent ($1.90/day 2011 PPP line, Table 3). The population's estimated poverty rate is the households' average poverty likelihood of $(84.5 + 70.0 + 49.9) \div 3 = 68.1$ percent.[22]

Be careful; the population's estimated poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is 30, which corresponds to an estimated poverty likelihood of 70.0 percent. This differs from the 67.8 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, colors in the spectrum, or syllables in a solfège scale. Because scores are not cardinal numbers, they cannot meaningfully 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 segmentation. There are a few contexts in which the analysis of scores is

[22] This example assumes simple random sampling (or a census) and analysis at the level of households so that each household's household-level weight is one (1). The weights would differ by household if there were stratified sampling or—as discussed in Section 2—if the analysis were at the level of the person or at the level of the participant.

appropriate, but, in general, the safest rule to follow is: If you are not completely sure what to do, then use poverty likelihoods, not scores.

Scores from the scorecard are calibrated with data from the construction sample of the 2010 ILAP for all 10 poverty lines. The process of calibrating scores to poverty likelihoods and the approach to estimating poverty rates is exactly the same for all poverty lines. For users, the only difference in terms of what they do with one poverty line versus with another has to do with the specific look-up table used to convert scores to poverty likelihoods.

6.1 Accuracy of estimated poverty rates at a point in time

For the scorecard applied to 1,000 bootstraps of $n = 16{,}384$ for the \$1.90/day 2011 PPP line, the average error (average difference between the estimate and observed value in the validation sample) for a poverty rate at a point in time is +0.3 percentage points (Table 7, which summarizes Table 6 across all poverty lines). For the 10 poverty lines in the validation sample, the maximum of the absolute values of the error is 0.7 percentage points, and the average of the absolute values of the average errors is about 0.4 percentage points. At least part of these differences is due to sampling variation in the division of the 2010 ILAP into sub-samples.

When estimating poverty rates at a point in time for a given poverty line, the error reported in Table 7 should be subtracted from the average poverty likelihood to give a corrected estimate. For the example of the scorecard and the $1.90/day 2011 PPP line in the validation sample, the error is +0.3 percentage points, so the corrected estimate in the three-household example above is 68.1 – (+0.3) = 67.8 percent.

In terms of precision, the 90-percent confidence interval for a population's estimated poverty rate at a point in time with n = 16,384 is ±0.6 percentage points or smaller for all poverty lines (Table 7). Given the scorecard's standard assumptions, this means that in 900 of 1,000 bootstraps of this size, the estimate (after correcting for the known average error) is within 0.6 percentage points of the observed value.

For example, suppose that the (uncorrected) average poverty likelihood in a sample of n = 16,384 with the scorecard and the $1.90/day 2011 PPP line is 68.1 percent. Then estimates in 90 percent of such samples would be expected to fall in the range of 68.1 – (+0.3) – 0.5 = 67.3 percent to 68.1 – (+0.3) + 0.5 = 68.3 percent, with the most likely observed value being the corrected estimate in the middle of this range, that is, 68.1 – (+0.3) = 67.8 percent. This is because the original (uncorrected) estimate is 68.1 percent, the average error is +0.3 percentage points, and the 90-percent confidence interval for the $1.90/day 2011 PPP line in the validation sample with this sample size is ±0.5 percentage points (Table 7).

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 error (average difference vis-à-vis observed values), together with their standard error (precision, taken as the square root of the sum of the squared differences).

Schreiner (2008) proposes an approach to deriving a formula for the standard errors of estimated poverty rates at a point in time from indirect estimation via a poverty-assessment tool. It starts with Cochran's (1977) textbook formula of $\pm c = \pm z \cdot \sigma$ that relates confidence intervals with standard errors in the case of the direct measurement of ratios, 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, $\sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \phi$,

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

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

N is the population size, and

n is the sample size.

For example, Guinea-Bissau's 2010 ILAP gives a direct-measure household-level poverty rate for the \$1.90/day 2011 PPP line of $\hat{p} = 58.4$ percent (Table 1).[23] If this measure came from a sample of $n = 16{,}384$ households from a population N of 176,455 (the number of households in Guinea-Bissau in 2010 according to the ILAP sampling weights), then the finite population correction ϕ is $\sqrt{\frac{176{,}455 - 16{,}384}{176{,}455 - 1}} = 0.9524$, which is not too far from $\phi = 1$. If the desired confidence level is 90-percent ($z = 1.64$), then the confidence interval $\pm c$ is

$$\pm z \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} = \pm 1.64 \cdot \sqrt{\frac{0.584 \cdot (1 - 0.584)}{16{,}384}} \cdot \sqrt{\frac{176{,}455 - 16{,}384}{176{,}455 - 1}} = \pm 0.601$$

percentage points. If ϕ were taken as 1, then the interval would be ± 0.632 percentage points.

Unlike the 2010 ILAP, however, the scorecard does not measure poverty directly, so this formula is not applicable. To derive a formula for the scorecard, consider Table 6, which reports empirical confidence intervals $\pm c$ for the errors for the scorecard applied to 1,000 bootstrap samples of various sizes from the validation sample. For example, with $n = 16{,}384$ and the \$1.90/day 2011 PPP line in the validation sample, the 90-percent confidence interval is ± 0.542 percentage points.[24]

[23] This analysis ignores that poverty-rate estimates from the ILAP are themselves based on a sample and so have their own sampling distribution.
[24] Due to rounding, Table 6 displays 0.5, not 0.542.

Thus, the scorecard's 90-percent confidence interval with n = 16,384 is ±0.542 percentage points, while the interval for direct measurement is ±0.601 percentage points. The ratio of the two intervals is 0.542 ÷ 0.601 = 0.90.

Now consider the same exercise, but with n = 8,192. The confidence interval under direct measurement and the $1.90/day 2011 PPP in the validation sample is $\pm 1.64 \cdot \sqrt{\frac{0.584 \cdot (1-0.584)}{8{,}192}} \cdot \sqrt{\frac{176{,}455-8{,}192}{176{,}455-1}}$ = ±0.872 percentage points. The empirical confidence interval with the scorecard (Table 6) is ±0.743 percentage points. Thus for n = 8,192, the ratio of the two intervals is 0.743 ÷ 0.872 = 0.85.

This ratio of 0.85 for n = 8,192 is not far from the ratio of 0.90 for n = 16,384. Across all sample sizes of 256 or more in Table 6, these ratios are generally close to each other, and the average of these ratios in the validation sample turns out to be 0.88. This implies that confidence intervals for indirect estimates of poverty rates via Guinea-Bissau's scorecard with the $1.90/day 2011 PPP line are—for a given sample size—about 12 percent narrower than the confidence intervals for direct estimates via the 2010 ILAP. This 0.88 appears in Table 7 as the "α factor for precision" because if α = 0.88, then the formula for approximate confidence intervals $\pm c$ for the scorecard is $\pm c = \pm z \cdot \alpha \cdot \sigma$. That is, the formula for the approximate standard error σ for point-in-time estimates of poverty rates via the scorecard is $\alpha \cdot \sqrt{\frac{\hat{p} \cdot (1-\hat{p})}{n}} \cdot \sqrt{\frac{N-n}{N-1}}$.

In general, α can be greater than or less than 1.00. When α is less than 1.00, it means that the scorecard is more precise than direct measurement. It turns out that α

is less than 1.00 for eight of the 10 poverty lines in Table 7, and its highest value is 1.06.

The formula relating confidence intervals with standard errors for the scorecard can be rearranged to give a formula for determining sample size before estimation. If $\widetilde{p}$ is the expected poverty rate before estimation, 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 $n = N \cdot \left(\frac{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})}{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p}) + c^2 \cdot (N - 1)} \right)$. 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

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

To illustrate how to use this, suppose the population N is 176,455 (the number of households in Guinea-Bissau in 2010), suppose $c = 0.04685$, $z = 1.64$ (90-percent confidence), and the relevant poverty line is \$1.90/day 2011 PPP so that the most sensible expected poverty rate $\widetilde{p}$ is Guinea-Bissau's overall poverty rate for that line in 2010 (58.4 percent at the household level, Table 1). The α factor is 0.88 (Table 7). Then the sample-size formula gives

$$n = 176{,}455 \cdot \left(\frac{1.64^2 \cdot 0.88^2 \cdot 0.584 \cdot (1 - 0.584)}{1.64^2 \cdot 0.88^2 \cdot 0.584 \cdot (1 - 0.584) + 0.04685^2 \cdot (176{,}455 - 1)} \right) = 231,$$ which is not too far from the sample size of 256 observed for these parameters in Table 6 for the

$1.90/day 2011 PPP line. Taking the finite population correction factor ϕ as one (1) gives the same result, as $n = \left(\frac{0.88 \cdot 1.64}{0.04685}\right)^2 \cdot 0.584 \cdot (1 - 0.584) = 231$.

Of course, the α factors in Table 7 are specific to Guinea-Bissau, its poverty lines, its poverty rates, and this scorecard. The derivation of the formulas for approximate standard errors using the α factors, however, is valid for any poverty-assessment tool following the approach in this paper.

In practice after the end of field work for the ILAP in July 2010, a program would select a poverty line (say, $1.90/day 2011 PPP), note its participants' population size (for example, $N = 10{,}000$ participants), select a desired confidence level (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 $\widetilde{p}$ (perhaps based on a previous estimate such as the household-level poverty rate for the $1.90/day 2011 PPP line for Guinea-Bissau of 58.4 percent in the 2010 ILAP in Table 1), look up α (here, 0.88 in Table 7), assume that the scorecard will still work in the future and for sub-groups that are not nationally representative,[25] and then compute the required sample size. In this illustration, $n = 10{,}000 \cdot \left(\frac{1.64^2 \cdot 0.88^2 \cdot 0.584 \cdot (1 - 0.584)}{1.64^2 \cdot 0.88^2 \cdot 0.584 \cdot (1 - 0.584) + 0.02^2 \cdot (10{,}000 - 1)}\right) = 1{,}124$.

[25] This paper reports accuracy for the scorecard applied to its validation sample, but it does not test accuracy for later years nor for sub-populations that are not nationally representative. Performance after July 2010 will resemble that in the 2010 ILAP with deterioration over time and across non-nationally representative sub-groups 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 population's poverty rate between two points in time is estimated as the change in the average poverty likelihood of a sample of households from the population.

The accuracy of estimates of change over time in which both baseline and follow-up estimates are from Guinea-Bissau's scorecard are not tested, and this paper can only suggest approximate formulas for standard errors. Nonetheless, the relevant concepts are discussed because in practice pro-poor organizations in Guinea-Bissau can apply the scorecard to collect their own data and measure change through time.

7.1 Warning: *Change* is not necessarily *impact*

The scorecard can estimate change. Of course, poverty could get better or worse, and the scorecard does not indicate what caused change. This point is often forgotten or confused, so it bears repeating: the scorecard merely estimates change, and it does not, in and of itself, indicate the causes of change. In particular, estimating the impact of participation on poverty requires knowledge or assumptions about what would have happened to participants if they had not been participants. Making judgments or drawing conclusions about causality 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 on poverty only if

there is some way to know—or explicit assumptions about—what would have happened in the absence of participation. And that must come from beyond the scorecard.

7.2 Estimating changes in poverty rates

The rest of this section explains how to estimate changes over time.

Consider the illustration begun in the previous section. On 1 January 2020, an organization samples three households who score 20, 30, and 40 and so have poverty likelihoods of 84.5, 70.0, and 49.9 percent (the $1.90/day 2011 PPP line, Table 3). Given the known average error for this line in the validation sample of +0.3 percentage points (Table 7), the corrected baseline estimated poverty rate is the households' average poverty likelihood of [(84.5 + 70.0 + 49.9) ÷ 3] – (+0.3) = 67.8 percent.

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

- *Two independent samples*: Score a new, independent sample from the same population that was sampled from at baseline
- *One sample scored twice*: Score the same sample that was scored at baseline

7.2.1 Estimating change with two independent samples

By way of illustration, suppose that three years later on 1 January 2023, the organization draws a new, independent sample of three additional households who are in the same population as the three original households and finds that their scores are 25, 35, and 45 (poverty likelihoods of 79.7, 63.2, and 39.5 percent, $1.90/day 2011 PPP line, Table 3). Adjusting for the known average error, the average poverty likelihood at follow-up is [(79.7 + 63.2 + 39.5) ÷ 3] – (+0.3) = 60.5 percent. The reduction in the

poverty rate is then 67.8 – 60.5 = 7.3 percentage points.[26] Supposing that exactly three years passed between the average baseline interview and the average follow-up interview, the estimated annual decrease in the poverty rate is 7.3 ÷ 3 = 2.4 percentage points per year. That is, about one in 42 participants in this hypothetical example cross the poverty line each year.[27] Among those who started below the line, about one in 29 (2.4 ÷ 67.8 = 3.5 percent) on net ended up above the line each year.[28]

7.2.2 Estimating change with one sample scored twice

Alternatively, suppose that the same three original households who were scored at baseline are scored again on 1 January 2023. Given scores of 25, 35, and 45, their follow-up poverty likelihoods are 79.7, 63.2, and 39.5 percent. The average across households of the difference in each given household's baseline poverty likelihood and its follow-up poverty likelihood is [(84.5 – 79.7) + (70.0 – 63.2) + (49.9 – 39.5)] ÷ 3 = 7.3 percentage points.[29] Assuming in this example that there are exactly three years between each household's interviews, the estimated annual decrease in the poverty rate is (again) 7.3 ÷ 3 = 2.4 percentage points per year.

[26] Of course, such a large reduction in poverty in three years is unlikely, but this is just an example to show how the scorecard can be used to estimate change.
[27] This is a net figure; some start above the line and end below it, and vice versa.
[28] The scorecard does not reveal the reasons for this change.
[29] With one sample scored twice, the error for this line from Table 7 should *not* be subtracted off.

Given the assumptions of the scorecard, both approaches give unbiased estimates of the annual change in poverty rates. In general and in practice, however, they will give different estimates due to differences in the timing of interviews, in the composition of samples, and in the nature of two independent samples (each scored once) versus one sample scored twice (Schreiner, 2014a).

7.3 Precision for estimated changes

7.3.1 Precision when scoring two independent samples

For two equal-sized independent samples, the same logic as in the previous section can be used to derive a formula relating the confidence interval $\pm c$ with the standard error σ of a poverty-assessment tool'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, z, c, $\hat{p}$ and N are defined as above, n is the sample size at both baseline and follow-up,[30] and α is the average (across a range of bootstrapped sample sizes) of the ratio of the observed confidence interval from a scorecard divided by the theoretical confidence interval under direct measurement.

[30] This means that—for a given level of precision—estimating the change in a poverty rate between two points in time requires four times as many interviews (not twice as many) as does estimating a poverty rate at a point in time.

As before, the formula for standard errors can be rearranged to give a formula for sample sizes before indirect estimation via a poverty-assessment tool, where $\widetilde{p}$ is based on previous estimates and is assumed equal at both baseline and follow-up: $n = 2 \cdot N \cdot \left(\frac{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})}{z^2 \cdot \alpha^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p}) + c^2 \cdot (N - 1)} \right)$. If ϕ can be taken as one (1), then the formula becomes $n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot \widetilde{p} \cdot (1 - \widetilde{p})$.

With two independent samples, α has been estimated for scorecards for 19 countries (Schreiner 2018, 2017a, 2017b, 2017c, 2016a, 2016b, 2016c, 2016d, 2015b, 2015c, 2015d, 2015e, 2013a, 2013b, 2012c, 2010, 2009a, 2009b, and Chen and Schreiner, 2009). The unweighted average of α across these 19 countries—after averaging α across poverty lines and pairs of survey rounds within each country—is 1.08. This rough figure is as reasonable as any to use for Guinea-Bissau (or any other scorecard) from now on.

To illustrate the use of this formula to determine sample size for estimating changes in poverty rates with 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 \$1.90/day 2011 PPP, $\alpha = 1.08$, $\widetilde{p} = 0.584$ (the household-level poverty rate in 2010 for the \$1.90/day 2011 PPP line in Table 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

$n = 2 \cdot \left(\frac{1.08 \cdot 1.64}{0.02} \right)^2 \cdot 0.584 \cdot (1 - 0.584) \cdot 1 = 3{,}811$, and the follow-up sample size is also 3,811.

7.3.2 Precision with 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 one sample scored twice is:[31]

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

where z, c, 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 re-arranged to give a formula for sample size before estimation. This requires an estimate (based on information available before sampling) of the expected shares of all households who will cross the poverty line $\tilde{p}_{12}$ and $\tilde{p}_{21}$. Before sampling, an agnostic assumption is that the change in the poverty rate will be zero, which implies $\tilde{p}_{12} = \tilde{p}_{21} = \tilde{p}_*$, giving:

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

[31] 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. The average observed relationship in Niger (Schreiner, 2018) and Peru (Schreiner, 2009c) between $\widetilde{p}_*$, the number of years y between baseline and follow-up, and $p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})$ is close to:

$$\widetilde{p}_* = -0.01 + 0.016 \cdot y + 0.56 \cdot [p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})].$$

Given this approximate result, a sample-size formula for a sample of households to whom the Guinea-Bissau scorecard is applied twice (once after July 2010 and then again later) is

$$n = 2 \cdot \left(\frac{\alpha \cdot z}{c} \right)^2 \cdot [-0.01 + 0.016 \cdot y + 0.56 \cdot p_{\text{pre-baseline}} \cdot (1 - p_{\text{pre-baseline}})] \cdot \sqrt{\frac{N - n}{n - 1}}.$$

The average α across poverty lines for Niger and Peru is about 1.14. This 1.14 figure for α is as reasonable as any other for the Guinea-Bissau scorecard (as well as for other scorecards in general).

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 \$1.90/day 2011 PPP line, the sample will first be scored in 2020 and then again in 2023 ($y = 3$), 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 household-level poverty rate p_{2020} is taken as 58.4 percent (Table 1), and α is assumed to be 1.14. Then the baseline sample size is $n = 2 \cdot \left(\frac{1.14 \cdot 1.64}{0.02} \right)^2 \cdot \{-0.01 + 0.016 \cdot 3 + [0.56 \cdot 0.584 \cdot (1 - 0.584)]\} \cdot 1 = 3{,}042$. The same group of 3,042 households is scored at follow-up as well.

8. Targeting

When a program uses the scorecard for segmenting clients for differentiated treatment (*targeting*), households with scores at or below a cut-off are labeled *targeted* and given one type of treatment by the program. Households with scores above a cut-off are labeled *non-targeted* and given another type of treatment.

There is a distinction between *targeting status* (having a score 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 a program's policy choice that depends on a cut-off and on an indirect estimate from a poverty-assessment tool.

Households that score at or below a given cut-off should be labeled as *targeted*,[32] not as *poor*. After all, unless all targeted households have poverty likelihoods of 100 percent, it is possible that at least some of them are non-poor (their consumption is above a given poverty line). In the context of the scorecard, the terms *poor* and *non-poor* have specific definitions. Using these same terms for targeting status is incorrect and misleading.

[32] Other labels can be meaningful as long as they describe the segment and do not confuse targeting status (having a score below a program-selected cut-off) with poverty status (having consumption below an externally-defined poverty line). Examples include: *Groups A, B, and C*; *Households with scores of 29 or less, 30 to 69, or 70 or more*; and *Households that qualify for reduced fees, or that do not qualify.*

Targeting is successful to the extent that households truly below a poverty line are targeted (*inclusion*) or households truly above a poverty line are not targeted (*exclusion*). Of course, no poverty-assessment tool is perfect, and targeting is unsuccessful to the extent that households truly below a poverty line are not targeted (*undercoverage*) or households truly above a poverty line are targeted (*leakage*).

Table 8 depicts these four possible targeting outcomes. Targeting accuracy varies by the cut-off score. A higher cut-off has better inclusion and better undercoverage (but worse exclusion and worse leakage), while a lower cut-off has better exclusion and better leakage (but worse inclusion and 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 the sum of net benefits (Adams and Hand, 2000; Hoadley and Oliver, 1998).

Table 9 shows the distribution of households by targeting outcome for Guinea-Bissau. For an example cut-off of 36 or less, outcomes for the $1.90/day 2011 PPP line in the validation sample are:

- Inclusion: 44.9 percent are below the line and correctly targeted
- Undercoverage: 13.5 percent are below the line and mistakenly not targeted
- Leakage: 14.5 percent are above the line and mistakenly targeted
- Exclusion: 27.0 percent are above the line and correctly not targeted

Increasing the cut-off to 38 or less improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 47.6 percent are below the line and correctly targeted
- Undercoverage: 10.8 percent are below the line and mistakenly not targeted
- Leakage: 17.0 percent are above the line and mistakenly targeted
- Exclusion: 24.6 percent are above the line and correctly not targeted

Which cut-off is preferred depends on the sum of net benefits. 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 Table 9 for a chosen 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 the scorecard—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 the "hit rate", where total net benefit is the number of households correctly included or correctly excluded:

Hit rate =	1	x	Households correctly included	–
	0	x	Households mistakenly undercovered	–
	0	x	Households mistakenly leaked	+
	1	x	Households correctly excluded.	

Table 9 shows the hit rate for all cut-offs for the scorecard. For the example of the $1.90/day 2011 PPP line in the validation sample, total net benefit under the hit rate for a cut-off of 36 or less is 71.9 percent, with more than two in three households in Guinea-Bissau correctly classified.

The hit rate weighs successful inclusion of households below the poverty line the same as successful exclusion of households above the line. If a program values inclusion more (say, twice as much) than exclusion, then it can reflect this by setting the benefit for inclusion to 2 and the benefit for exclusion to 1. Then the chosen cut-off will maximize (2 x Households correctly included) + (1 x Households correctly excluded).[33]

[33] Table 9 also reports BPAC, the Balanced Poverty Accuracy Criterion adopted by USAID for certifying poverty-assessment tools for use by its microenterprise partners. IRIS Center (2005) made BPAC to consider accuracy in terms of the errors in estimated poverty rates and in terms of targeting inclusion. BPAC = (Inclusion – |Undercoverage – Leakage|) ÷ (Population poverty rate), with all components in percentages. Schreiner (2014b) explains why BPAC does not add information over-and-above that provided by the more-standard, more-disaggregated measures used here.

As an alternative to assigning benefits and costs to targeting outcomes and then choosing a cut-off to maximize total net benefits, a program could set a cut-off to achieve a desired poverty rate among targeted households. The third column of Table 10 ("% targeted HHs who are poor") shows, for the scorecard applied to the validation sample, the estimated poverty rate among households who score at or below a given cut-off. For the example of the $1.90/day 2011 PPP line, targeting households who score 36 or less would target 59.4 percent of all households (second column) and would be associated with an estimated poverty rate among those targeted of 75.6 percent (third column).

Table 10 also reports two other measures of targeting accuracy. The first is a version of coverage ("% poor HHs who are targeted"). For the example of the $1.90/day 2011 PPP line with the validation sample and a cut-off of 36 or less, 76.8 percent of all poor households are covered.

The final targeting measure in Table 10 is the number of successfully targeted poor households for each non-poor household mistakenly targeted (right-most column). For the $1.90/day 2011 PPP line with the validation sample and a cut-off of 36 or less, covering about 3.1 poor households means leaking to 1 non-poor household.

9. Summary

The scorecard helps pro-poor programs in Guinea-Bissau to get to know their participants better so as to prove and improve their social performance.

The scorecard can segment clients for differentiated treatment as well as 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

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

The scorecard is constructed with data from about three-fifths of the households in Guinea-Bissau's 2010 ILAP. Those households' scores are then calibrated to poverty likelihoods for 10 poverty lines. The scorecard's accuracy (errors and standard errors) is tested out-of-sample on data that was not used to make the scorecard.

When the scorecard is applied to the 10 poverty lines in the validation sample, the maximum of the absolute values of the average error for point-in-time estimates of poverty rates is 0.7 percentage points, and the average of the absolute values of the average error across the 10 lines is about 0.4 percentage points. Corrected estimates may be found by subtracting the known error for a given poverty line from original, uncorrected estimates.

For $n = 16{,}384$ and 90-percent confidence, the confidence intervals for point-in-time estimates of poverty rates are ± 0.6 percentage points or better. With $n = 1{,}024$, the 90-percent confidence intervals are ± 2.3 percentage points or better.

If an organization wants to use the scorecard for segmenting clients for differentiated treatment, then this paper provides useful information for selecting a targeting cut-off that fits its values and mission.

Although the statistical technique is innovative, and although technical accuracy is important, the design of the scorecard focuses on low-cost, transparency, and ease-of-use. After all, accuracy is irrelevant if an organization's managers feel so daunted by a tool's complexity or by its cost that they do not even try to use it.

For this reason, the scorecard uses 10 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 look-up tables, and targeting cut-offs are likewise straightforward to apply. The design attempts to facilitate voluntary adoption by helping program managers to understand and to trust the scorecard and by allowing non-specialists to add up scores quickly in the field.

In summary, the scorecard is a low-cost, practical, objective, transparent way for pro-poor programs in Guinea-Bissau to estimate consumption-based poverty rates, track changes in poverty rates over time, and segment participants for differentiated treatment. A scorecard can be made for any country with similar data.

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Interview Guide

The excerpts quoted here are from:

Instituto Nacional de Estatística e Censos. (2001) "Manual do Inquiridor: Inquérito Ligeiro sobre as Condições de Vida da População 2001" [the *Manual*].

Basic interview instructions

The scorecard can be filled out on paper, with responses entered later in a spreadsheet or your own database. Alternatively, Scorocs' cloud-based data-collection tool works in a web browser or an Android app, allowing data entry in the field or in the office. If there is no connection, then the tool stores data locally until it can connect. Test the data-collection tool, or ask about a private account.

The scorecard should be completed in-person at the participant's residence by an enumerator trained to follow this "Guide".

Fill out the scorecard header and the "Back-page Worksheet" first, following the directions on the "Back-page Worksheet".

In the scorecard header, fill in the number of household members based on the list you made as part of the "Back-page Worksheet".

Do not directly ask the first scorecard indicator ("In what region does the household live?"). Instead, fill in the answer based on your knowledge of the region where the household lives.

In the same way, do not directly ask the the second scorecard indicator ("How many household members are there?"). Instead, mark the response based on the number of household members that you listed on the "Back-page Worksheet".

Likewise, do not directly ask the third scorecard indicator ("In their main occupation, do any household members 6-years-old or older work in agriculture/forestry/fishing?"). Instead, mark the response based on the answers that you have already recorded on the "Back-page Worksheet".

Ask all of the remaining scorecard questions directly of the respondent.

General interviewing advice

Study this "Guide" carefully, and carry it with you while you work. Follow the instructions in this "Guide" (including this one).

Remember that the respondent for the interview need not be the household member who is a participant with your organization.

Likewise, the field agent to be recorded in the scorecard header is not necessarily the same as you the enumerator who does the interview. Rather, the field agent is the employee of the pro-poor program with whom the participant has an on-going relationship. If there is no such field agent, then leave those spaces in the scorecard header blank.

Read each question word-for-word, in the order presented in the scorecard. Do not read the response options aloud, except as indicated for the tenth indicator ("In the last 12 months, how many times did the household have to go hungry? (*Read the response options: Always, often, sometimes, rarely, or never*)").

When you mark a response to a scorecard indicator, circle the spelled-out response option and its point value, and write the point value in the "Score" column, like this:

9. How many sheep, goats, pigs, or other medium-sized food animals does the household own?	A. None, or one	0	
	B. Two, or three	2	
	C. Four to seven	4	4
	D. Eight or more	10	

To help to reduce errors, you should:

- Circle the pre-printed response option
- Circle the pre-printed points on the scorecard, and
- Circle the hand-written points that correspond to the response

When an issue comes up that is not addressed here, its resolution should be left to the unaided judgment of the enumerator, as that apparently was the practice of INEC in the 2010 ILAP. That is, an organization using the scorecard should not promulgate any definitions or rules (other than those in this "Guide") to be used by all its enumerators. Anything not explicitly addressed in this "Guide" is to be left to the unaided judgment of each individual enumerator.

Do not read the response options to the respondent (except as indicated for the tenth indicator, "In the last 12 months, how many times did the household have to go hungry? (*Read the response options: Always, often, sometimes, rarely, or never*)". Simply read the question, and then stop; wait for a response. If the respondent asks for clarification or otherwise hesitates or seems confused, then read the question again or provide additional assistance based on this "Guide" or as you, the enumerator, deem appropriate.

In general, you should accept the responses given by the respondent. Nevertheless, if the respondent says something—or if you see or sense something—that suggests that the response may not be accurate, that the respondent is uncertain, or that the respondent desires assistance in figuring out how to respond, then you should read the question again and provide whatever help you deem appropriate based on this "Guide".

While most indicators in the scorecard are verifiable, in most cases you do not need to verify responses. You should verify only if something suggests to you that a response may be inaccurate and thus that verification might improve data quality. For example, you might choose to verify if the respondent hesitates, seems nervous, or otherwise gives signals that he/she may be lying, confused, or uncertain. Likewise, verification is probably appropriate if a child in the household or a neighbor says something that does not square with a respondent's answer. Verification is also a good idea if you can see something yourself—such as a consumer durable that the respondent avers not to possess, or a child eating in the room who has not been counted as a member of the household—that suggests that a response may be inaccurate.

In general, the application of the scorecard should mimic as closely as possible the application of the 2010 ILAP by Guinea-Bissau's INEC. For example, interviews should done in-person by a trained enumerator at the participant's residence because that is what INEC did in the 2010 ILAP.

Translation:

As of this writing, the scorecard itself, the "Back-page Worksheet", and this "Guide" are available only in English, Portuguese, and Crioulo. There are not yet official, professional translations to other languages spoken in Guinea-Bissau such as Fula or Balanta. Users should check `scorocs.com` to see what translations have been done since this writing.

If there is not yet an official, professional translation to a desired language, then users should contact Scorocs for help in creating such a translation.

Who should be the respondent?

Remember that the respondent does not need to be the household member who is a participant with your organization (although the respondent may be that person).

According to p. 12 of the *Manual*, "The main respondent should be the head of the household or his/her representative (for example, a spouse, a son or daughter, a grandchild, or a brother or sister). Other members of the household may participate in the interview by verifying or refining the responses provided by the main respondent, especially for questions that pertain specifically to that other member."

Who is the head of the household?

Note that the head of the household may or may not be the household member who is a participant with your organization (although the head may be that person).

According to pp. 9 and 13 of the *Manual*, "In essence, the *head of the household* is the member who is in charge of the household. . . . The head of the household may be a man or a woman."

Guidelines for each indicator in the scorecard

1. In what region does the household live?
    A. Gabu
    B. Cacheu
    C. Tombali
    D. Biombo
    E. Bissau, or Quinara
    F. Bafatá, Oio, or Bolama

Unless you need to, do not ask this indicator directly of the respondent. Instead, mark the response based on your knowledge of the region in which the interviewed household lives.

2. How many household members are there?
    A. Eleven or more
    B. Ten
    C. Seven, eight, or nine
    D. Six
    E. Five
    F. Four
    G. One, two, or three

According to pp. 12–15 of the *Manual* "A *household* is a group of people who live together and who share—in full or in part—their income so as to satisfy their basic needs for food and shelter. Household members recognize the authority of one member, the head.

"A household may consist of a single person who lives alone. Members of a household need not be related by blood or marriage.

"Household members must currently live and eat with the household and have done so for at least six of the last 12 months or expect to remain with the household for a total duration of at least six months. Thus, you should count as household members any newly-weds, people who recently joined the household for work-related reasons or because they moved, and newborns whose parents are household members.

"Make the list of household members carefully so that you do not miss anyone. In particular, pay close attention to two cases that are sometimes incorrectly left out:

- People who are temporarily absent but who nevertheless are household members
- Newborns and other very young children

"Conversely, former members who have left the household to join or form another household are not counted as members of the interviewed household, even if they just left yesterday."

3. In their main occupation, do any household members 6-years-old or older work in agriculture/forestry/fishing?
    A. Yes
    B. No

According to p. 25 of the *Manual*, "*Agriculture* covers productive activities that mainly or exclusively involve agriculture (farming or animal husbandry).

"*Forestry* encompasses timber harvesting, forest conservation, tree nursuries, planting and transplanting operations, and management of standing forests and their ecosystems.

"*Fishing* includes capturing marine or freshwater species in the open ocean, coastal areas, or in-land in salt, fresh, or brackish water. It also covers fishing-related services."

According to p. 25 of the *Manual*, the concept of *work* "encompasses both formal and informal work, both paid or unpaid work, and agricultural work.

"The concept of *work* further encompasses any livelihood activity pursued by the household or its members, whether as an employee or hired person in a business run by someone else, self-employment, or unpaid work in an activity run by the household (except for household chores and other domestic labor).

"The following cases are counted as *working*:

- Women who—in addition to their domestic chores—sell things, take in sewing, work in agriculture, or do any other activity that contributes to the household's income
- Household members who—without being remunerated—help the head of the household in his/her farm work, office job, store, and so on

"If a person worked at all in the past seven days (even if only for one or two days), then he/she is still counted as having worked."

4. What is the household's main source of energy for cooking?
    A. Firewood, electricity, or other
    B. Charcoal, or LPG

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

5. What is the household's main source of drinking water?
    A. Well (protected or unprotected), river, stream, lake, or tanker truck
    B. Public tap or standpipe
    C. Piped into the residence or yard

According to p. 33 of the *Manual*, "If the household uses more than one source of drinking water, then record the main source."

6. What toilet arrangement does the household use?
    A. None (bush), or other
    B. Traditional latrine
    C. Improved latrine, or modern toilet with septic tank
    D. Modern toilet with sewer system

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

7. What is the household's main source of energy for lighting?
    A. Kerosene or fuel oil
    B. Candle, firewood, or other
    C. Electricity, generator, solar panel, or LPG

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

8. Does the household have a TV in good working order?
    A. No
    B. Yes

According to pp. 6 and 32 of the *Manual*, "You should only count TVs that are in good working order."

9. How many sheep, goats, pigs, or other medium-sized food animals does the household own?
    A. None, or one
    B. Two, or three
    C. Four to seven
    D. Eight or more

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

10. In the last 12 months, how many times did the household have to go hungry? (*Read the response options: Always, often, sometimes, rarely, or never*)
    A. Always
    B. Often, or sometimes
    C. Rarely
    D. Never

According to p. 32 of the *Manual*, "Tell the respondent to consider the household's food situation during the past 12 months and to assess to what extent the household had difficulties in meeting its requirements. Tell the respondent to choose the response option that best describes the household's situation in the past 12 months."

Table 1 (Guinea-Bissau): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	1,512	46.5	72.3	89.3	98.9
	Rate	People		55.6	79.8	93.3	99.2
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	1,664	68.1	83.8	91.4	98.1
	Rate	People		74.7	87.3	93.2	98.1
All	Line	People		448	755	1,297	5,116
	Rate	Households	3,176	58.4	78.6	90.4	98.5
	Rate	People		66.9	84.2	93.2	98.5

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Guinea-Bissau): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	1,512	2.3	6.7	19.0	27.8	37.9	64.5
	Rate	People		2.7	8.9	24.4	34.8	46.0	73.2
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	1,664	12.3	22.9	43.8	53.6	62.8	80.1
	Rate	People		15.0	27.7	50.9	60.5	69.7	84.7
All	Line	People		128	179	270	328	391	639
	Rate	Households	3,176	7.8	15.6	32.6	42.0	51.6	73.1
	Rate	People		10.0	20.0	40.1	50.0	60.0	80.0

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bafatá): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	90	46.7	78.9	94.4	98.9
	Rate	People		53.8	81.2	96.5	99.2
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	240	71.7	88.3	96.3	99.2
	Rate	People		80.0	93.0	98.0	99.6
All	Line	People		448	755	1,297	5,116
	Rate	Households	330	64.7	85.7	95.7	99.1
	Rate	People		74.1	90.4	97.7	99.5

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bafatá): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	90	2.2	4.4	18.9	30.0	34.4	65.6
	Rate	People		3.6	6.7	23.0	36.7	40.7	71.2
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	240	8.3	18.8	41.3	53.8	65.4	85.0
	Rate	People		11.6	22.8	48.6	61.6	74.4	90.2
All	Line	People		128	179	270	328	391	639
	Rate	Households	330	6.6	14.8	35.1	47.2	56.8	79.6
	Rate	People		9.8	19.2	42.8	56.0	66.8	85.9

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Biombo): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	30	63.3	76.7	80.0	93.3
	Rate	People		64.7	74.9	79.1	90.6
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	225	57.3	77.3	87.6	98.7
	Rate	People		63.5	79.7	89.4	98.4
All	Line	People		448	755	1,297	5,116
	Rate	Households	255	58.1	77.3	86.6	98.0
	Rate	People		63.7	79.0	87.9	97.3

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Biombo): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Percentile-based lines (2010 def.) 10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	30	6.7	16.7	30.0	46.7	53.3	70.0
	Rate	People		7.7	18.3	39.1	51.5	56.2	69.4
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	225	5.3	9.8	28.9	39.6	50.7	72.0
	Rate	People		5.8	11.0	33.8	45.6	57.1	75.6
All	Line	People		128	179	270	328	391	639
	Rate	Households	255	5.5	10.6	29.0	40.4	51.0	71.8
	Rate	People		6.1	12.0	34.6	46.4	57.0	74.7

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bissau): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	1,066	38.3	67.2	87.2	99.0
	Rate	People		46.5	75.7	92.1	99.3
Rural	Line	People		—	—	—	—
	Rate	Households	225	—	—	—	—
	Rate	People		—	—	—	—
All	Line	People		448	755	1,297	5,116
	Rate	Households	1,066	38.3	67.2	87.2	99.0
	Rate	People		46.5	75.7	92.1	99.3

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bissau): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	1,066	0.4	3.3	12.8	20.0	30.1	58.8
	Rate	People		0.4	4.6	16.5	24.9	36.6	68.0
Rural	Line	People		—	—	—	—	—	—
	Rate	Households	225	—	—	—	—	—	—
	Rate	People		—	—	—	—	—	—
All	Line	People		128	179	270	328	391	639
	Rate	Households	1,066	0.4	3.3	12.8	20.0	30.1	58.8
	Rate	People		0.4	4.6	16.5	24.9	36.6	68.0

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bolama): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	15	26.7	33.3	93.3	93.3
	Rate	People		40.8	45.6	87.4	87.4
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	45	46.7	62.2	73.3	84.4
	Rate	People		50.2	62.4	71.4	85.0
All	Line	People		448	755	1,297	5,116
	Rate	Households	60	41.6	54.9	78.4	86.7
	Rate	People		47.7	57.9	75.7	85.7

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Bolama): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Percentile-based lines (2010 def.) 10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	15	0.0	0.0	6.7	13.3	13.3	33.3
	Rate	People		0.0	0.0	16.5	24.3	24.3	45.6
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	45	15.6	20.0	26.7	28.9	40.0	53.3
	Rate	People		20.9	26.1	32.4	33.8	43.6	56.4
All	Line	People		128	179	270	328	391	639
	Rate	Households	60	11.6	14.9	21.6	24.9	33.2	48.3
	Rate	People		15.3	19.1	28.1	31.2	38.4	53.5

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Cacheu): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	87	71.3	89.7	94.1	98.7
	Rate	People		79.7	94.2	97.9	99.8
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	302	68.5	87.7	95.0	99.3
	Rate	People		76.2	92.6	97.6	99.6
All	Line	People		448	755	1,297	5,116
	Rate	Households	389	69.1	88.1	94.8	99.2
	Rate	People		77.0	92.9	97.6	99.7

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Cacheu): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	87	9.4	17.8	34.7	53.4	63.5	81.7
	Rate	People		9.0	20.0	38.1	60.1	70.8	88.1
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	302	14.7	27.5	45.3	55.6	61.9	83.4
	Rate	People		17.6	33.7	53.7	63.0	69.2	89.7
All	Line	People		128	179	270	328	391	639
	Rate	Households	389	13.5	25.3	42.9	55.1	62.3	83.0
	Rate	People		15.7	30.6	50.2	62.4	69.5	89.3

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Gabu): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	105	75.2	91.4	99.0	100.0
	Rate	People		83.6	96.2	99.5	100.0
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	255	78.0	91.0	93.3	100.0
	Rate	People		82.4	92.4	94.2	100.0
All	Line	People		448	755	1,297	5,116
	Rate	Households	360	77.2	91.1	95.0	100.0
	Rate	People		82.7	93.4	95.7	100.0

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Gabu): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	105	3.8	12.4	36.2	46.7	66.7	88.6
	Rate	People		5.2	13.5	41.2	52.5	75.9	93.1
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	255	13.3	28.6	54.9	61.2	72.5	87.8
	Rate	People		17.6	35.3	60.6	66.0	77.4	90.3
All	Line	People		128	179	270	328	391	639
	Rate	Households	360	10.5	23.8	49.3	56.9	70.8	88.1
	Rate	People		14.2	29.4	55.3	62.3	77.0	91.1

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Oio): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	60	58.3	76.7	93.3	100.0
	Rate	People		71.2	85.9	97.3	100.0
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	329	66.3	80.3	91.8	99.4
	Rate	People		71.8	83.6	93.2	99.4
All	Line	People		448	755	1,297	5,116
	Rate	Households	389	65.1	79.7	92.1	99.5
	Rate	People		71.7	84.0	93.9	99.5

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Oio): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Percentile-based lines (2010 def.) 10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	60	15.0	26.7	40.0	45.0	53.3	73.3
	Rate	People		14.2	30.8	52.7	59.6	66.5	84.3
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	329	18.5	26.2	45.0	55.0	63.8	76.9
	Rate	People		21.3	29.1	51.4	60.9	70.2	81.1
All	Line	People		128	179	270	328	391	639
	Rate	Households	389	18.0	26.3	44.2	53.5	62.2	76.4
	Rate	People		20.2	29.4	51.6	60.7	69.6	81.6

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Quinara): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	30	70.0	83.3	86.7	100.0
	Rate	People		78.5	86.9	88.5	100.0
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	105	68.6	79.0	83.8	91.4
	Rate	People		69.0	78.4	82.8	88.5
All	Line	People		448	755	1,297	5,116
	Rate	Households	135	68.9	80.0	84.5	93.4
	Rate	People		70.7	79.9	83.8	90.6

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Quinara): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates: Percentile-based lines (2010 def.) 10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	30	0.0	10.0	43.3	46.7	56.7	76.7
	Rate	People		0.0	20.0	54.6	58.1	66.2	84.2
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	105	10.9	27.6	50.5	60.0	63.8	77.1
	Rate	People		10.6	29.0	52.5	62.2	64.2	76.9
All	Line	People		128	179	270	328	391	639
	Rate	Households	135	8.5	23.6	48.9	57.0	62.2	77.0
	Rate	People		8.6	27.4	52.9	61.4	64.6	78.2

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Tombali): International 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates Intl. 2011 PPP (2010 def.) $1.90	$3.20	$5.50	$21.70
Urban	Line	People		448	755	1,297	5,116
	Rate	Households	29	62.2	79.5	89.8	100.0
	Rate	People		57.0	73.5	87.7	100.0
Rural	Line	People		448	755	1,297	5,116
	Rate	Households	163	70.5	83.4	88.3	95.7
	Rate	People		75.0	85.3	90.8	96.6
All	Line	People		448	755	1,297	5,116
	Rate	Households	192	69.2	82.8	88.5	96.3
	Rate	People		72.1	83.4	90.3	97.2

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 1 (Tombali): Percentile-based poverty lines and poverty rates for households and people by urban/rural/all

Area	Line or Rate	Households or People	*n*	Poverty lines and poverty rates					
				Percentile-based lines (2010 def.)					
				10th	20th	40th	50th	60th	80th
Urban	Line	People		128	179	270	328	391	639
	Rate	Households	29	6.8	10.3	24.0	44.8	51.7	79.5
	Rate	People		3.6	7.2	20.0	47.7	50.5	73.5
Rural	Line	People		128	179	270	328	391	639
	Rate	Households	163	8.6	20.3	46.1	57.1	65.6	81.5
	Rate	People		11.5	26.4	52.6	62.9	70.3	84.2
All	Line	People		128	179	270	328	391	639
	Rate	Households	192	8.3	18.8	42.7	55.2	63.5	81.2
	Rate	People		10.2	23.3	47.4	60.4	67.1	82.5

Source: 2010 ILAP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in average prices in Guinea-Bissau during the 2010 ILAP field work.

Table 2: Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
928	How many household members are 15-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
911	How many household members are 18-years-old or younger? (Nine or more; Eight; Seven; Six; Five; Four; Three; Two; One; None)
908	How many household members are there? (Eleven or more; Ten; Seven, eight, or nine; Six; Five ; Four; Três; Dois; Um; Nenhum)
902	How many household members are 16-years-old or younger? (Eight or more; Seven; Six; Five; Four; One, two, or three)
902	How many household members are 17-years-old or younger? (Eight or more; Seven; Six; Five; Four; Three; Two; One; None)
888	How many household members are 14-years-old or younger? (Seven or more; Six; Five; Four, One, two, or three)
861	How many household members are 13-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
814	How many household members are 12-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
796	How many household members are 11-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
712	If any household members 6-years-old or older work in their main occupation in agriculture/forestry/fishing, then how many hectares of land does the household own? (Someone works in agriculture, and the household owns >5 Ha; Someone works in agriculture, and the household owns >3.0 to 5.0 Ha; Someone works in agriculture, and the household owns >2.0 to 3.0 Ha; Someone works in agriculture, and the household owns >1.5 to 2.0 Ha; Someone works in agriculture, and the household owns >0.9 to 1.5 Ha; Someone works in agriculture, and the household owns >0 to 0.9 Ha; Someone works in agriculture, but the household does not own land; No members work in agriculture/forestry/fishing)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
646	If any household members 6-years-old or older work in their main occupation in agriculture/forestry/fishing, then how many medium-sized food animals does the household own? (Someone works in agriculture, but the household does not own any medium-sized food animals; Someone works in agriculture, and the household owns one medium-sized food animal; Someone works in agriculture, and the household owns 2 or 3 medium-sized food animals; Someone works in agriculture, and the household owns 4 to 7 medium-sized food animals; Someone works in agriculture, and the household owns 8 to 15 medium-sized food animals; Someone works in agriculture, and the household owns 16 or more medium-sized food animals; No members work in agriculture/forestry/fishing)
632	How many household members are 6-years-old or younger? (Four; Three; Two; One; None)
629	If any household members 6-years-old or older work in their main occupation in agriculture/forestry/fishing, then how many oxen, cows, or other large animals does the household own? (Someone works in agriculture, and the household owns 11 or more large food or draft animals; Someone works in agriculture, and the household owns 4 to 10 large food or draft animals; Someone works in agriculture, and the household owns 1 to 4 large food or draft animals; Someone works in agriculture, but the household does not own oxen, cows, or other large food or draft animals; No members work in agriculture/forestry/fishing)
620	In their main occupation, do any household members 6-years-old or older work in agriculture/forestry/fishing? (Yes; No)
603	What is the highest level in school that the (eldest) female head/spouse has completed? (None; Pre-school, or grades 1 or 2; Grade 3, 4, or 5; Grade 6, 7, 8, or 9; No female head/spouse; Grade 10 or 11, post-secondary, or other)
586	What is the household's main source of energy for cooking? (Firewood, electricity, or other; Charcoal, or LPG)
566	What is the tenancy status of the household in its residence? (Owned, or tent/temporary; Used without payment; Rented)
529	Do all household members ages 7 to 15 currently go to school? (No; Yes; No members in that age range)
506	Do all household members ages 7 to 16 currently go to school? (No; Yes; No members in that age range)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
488	Do all household members ages 7 to 12 currently go to school? (No; Yes; No members in that age range)
482	Do all household members ages 7 to 11 currently go to school? (No; Yes; No members in that age range)
476	Do all household members ages 7 to 18 currently go to school? (No; Yes; No members in that age range)
469	Do all household members ages 7 to 14 currently go to school? (No; Yes; No members in that age range)
462	Do all household members ages 7 to 13 currently go to school? (No; Yes; No members in that age range)
459	Do all household members ages 7 to 17 currently go to school? (No; Yes; No members in that age range)
422	What toilet arrangement does the household use? (None (bush), or other; Traditional latrine; Improved latrine, or modern toilet with septic tank; Modern toilet with sewer system)
412	In what region does the household live? (Gabu; Cacheu; Tombali; Biombo; Bissau, or Quinara; Bafatá, Oio, or Bolama)
402	How may household members 6-years-old or older are unpaid workers in a family business/farm in their main occupation? (None; One; Two; Three; Four; Five; Six; Seven or more)
399	How many hectares of land does the household own? (Five or more; More than three, to five; More than two, to three; More than 1.5, to 2; More than 0.9, to 1.5; More than zero, to 0.9; None)
393	In what sector is the main occupation of the male head/spouse? (Agriculture, forestry, or fishing; Does not work; No male head/spouse; Other)
388	In what sector is the main occupation of the (eldest) female head/spouse? (Agriculture, forestry, or fishing; Does not work; No female head/spouse; Other)
360	In the past 7 days, how many household members who are 6-years-old or older did work of any kind? (None; One; Two; Three; Four; Five; Six; Seven; Eight or more)
356	Does the household have a TV in good working order? (No; Yes)
340	Can the (eldest) female head/spouse read and write? (No; Yes; No female head/spouse)
336	Does the household have a gas or electric stove in good working order? (No; Yes)
321	What is the highest level in school that the male head/spouse has completed? (None; Pre-school, or grade 1, 2, or 3; Grade 4 or 5; No male head/spouse; Grade 6, 7, 8, or 9; Grade 10 or 11, post-secondary, or other)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
308	How many household members contribute to the household's income? (None, or one; Two; Three; Four; Five; Six; Seven; Eight; Nine or more)
277	What is the household's main source of drinking water? (Well (protected or unprotected), river, stream, lake, or tanker truck; Public tap or standpipe; Piped into the residence or yard)
271	Does the household have an electrical connection? (No; Yes)
267	Does the household have an electric clothes iron in good working order? (No; Yes)
253	How many rooms does the residence have? (None, or one; Two; Three; Four; Five; Six; Seven or more)
250	What is the marital status of the (eldest) female head/spouse? (Married (polygamous); Married (monogamous); Widow; No female head/spouse; Single/never-married, or divorced or separated)
230	What is the male head/spouse's status in his main occupation? (Unpaid work in family business/farm; Does not work; Self-employed; No male head/spouse; Wage/salary in cash or kind, or task based (hour or day))
226	What is the (eldest) female head/spouse's status in her main occupation? (Unpaid work in family business/farm; Does not work; Self-employed; No female head/spouse; Wage/salary in cash or kind, or task based (hour or day))
211	Does the household have a bicycle, motorcycle/scooter, or car or truck in good working order? (None; Only bicycle; Motorcycle, but not car nor truck (regardless of bicycle); Car or truck (regardless of any others))
181	Does the household have a refrigerator or freezer in good working order? (No; Yes)
164	What is the marital status of the male head/spouse? (Married (polygamous); Married (monogamous); No male head/spouse; Single/never-married, widower, or divorced or separated)
158	Does the household have a bicycle in good working order? (No; Yes)
149	What is the household's main source of energy for lighting? (Kerosene or fuel oil; Candle, firewood, or other; Electricity, generator, solar panel, or LPG)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
143	In the last 12 months, how many times did the household have to go hungry? (Always; Often, or sometimes; Rarely; Never)
142	Can the male head/spouse read and write? (No; Yes; No male head/spouse)
138	Does the household head have a spouse/conjugal partner? (Yes; Male head without a spouse/conjugal partner; Female head without a spouse/conjugal partner)
138	Is the main activity of the male head/spouse or the female head/spouse self-employment in non-agriculture? (No; Yes)
134	Are any household members 6-years-old or older paid a wage or salary in-cash or in-kind in their main occupation? (No; Yes)
118	What is the main construction material of the roof? (Thatch, fiberglass sheets, or other; Metal sheets, or tiles)
106	Does the household have a wrist watch or a wall clock in good working order? (No; Yes)
95	Does the (eldest) female head/spouse contribute to the household's income? (No; Yes; No female head/spouse)
85	Does the (eldest) female head/spouse have a mental or physical handicap? (Yes; No; No female head/spouse)
85	In the last 7 days, did the (eldest) female head/spouse do work of any kind? (No; Yes; No female head/spouse)
75	Does the household have a car or truck in good working order? (No; Yes)
59	In the last 7 days, did the male head/spouse do work of any kind? (No; Yes; No male head/spouse)
53	Does the household have a sewing machine in good working order? (No; Yes)
50	How many sheep, goats, pigs, or other medium-sized food animals does the household own? (None, or one; Two, or three; Four to seven; Eight or more)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
46	How many oxen, cows, or other large animals does the household own? (11 or more; Five to ten; One to four; None)
34	Does the household have a radio in good working order? (No; Yes)
34	Does the male head/spouse contribute to the household's income? (No; Yes; No male head/spouse)
31	Does the male head/spouse have a mental or physical handicap? (Yes; No; No male head/spouse)
7	Does the household have a mattress or bed in good working order? (No; Yes)
7	What is the main construction material of the walls? (Planks, wattle, wattle and daub, or plant material; Adobe or mud blocks, cinder blocks, bricks, or stones)
2	Do any household members have a mental or physical handicap? (Yes; No)
0	Does the household have a motorcycle/scooter in good working order? (No; Yes)
0	Are any household members 6-years-old or older self-employed in their main occupation? (No; Yes)

Source: 2010 ILAP with the $1.90/day 2011 PPP poverty line

Tables for
$1.90/day 2011 PPP Poverty Line

(and Tables Pertaining
to All Poverty Lines)

Table 3 ($1.90/day 2011 PPP line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	89.3
15–18	85.0
19–21	84.5
22–23	84.5
24–25	79.7
26–27	78.3
28–28	78.3
29–29	71.7
30–31	70.0
32–32	64.8
33–34	63.2
35–36	63.2
37–38	57.7
39–40	49.9
41–42	47.0
43–45	39.5
46–48	36.6
49–52	29.4
53–58	14.9
59–100	7.2

Table 4 ($1.90/day 2011 PPP line): Derivation of estimated poverty likelihoods

Score	Households in range and < poverty line		All households in range		Poverty likelihood (%)
0–14	2,776	÷	3,109	=	89.3
15–18	4,393	÷	5,168	=	85.0
19–21	6,104	÷	7,224	=	84.5
22–23	3,114	÷	3,685	=	84.5
24–25	4,945	÷	6,205	=	79.7
26–27	3,937	÷	5,030	=	78.3
28–28	2,728	÷	3,485	=	78.3
29–29	2,793	÷	3,894	=	71.7
30–31	4,293	÷	6,130	=	70.0
32–32	2,163	÷	3,336	=	64.8
33–34	3,946	÷	6,248	=	63.2
35–36	3,341	÷	5,290	=	63.2
37–38	3,437	÷	5,952	=	57.7
39–40	1,751	÷	3,506	=	49.9
41–42	2,137	÷	4,545	=	47.0
43–45	1,677	÷	4,246	=	39.5
46–48	2,003	÷	5,474	=	36.6
49–52	1,444	÷	4,911	=	29.4
53–58	889	÷	5,981	=	14.9
59–100	473	÷	6,580	=	7.2

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

Table 5 ($1.90/day 2011 PPP line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–3.3	2.4	2.6	2.8
15–18	0.0	2.1	2.7	3.3
19–21	+4.1	2.0	2.4	3.1
22–23	+1.1	2.3	2.7	3.4
24–25	+1.0	2.3	2.8	3.9
26–27	+5.3	2.2	2.6	3.4
28–28	0.0	2.7	3.1	4.2
29–29	–2.8	3.0	3.7	4.7
30–31	–4.8	3.7	4.0	4.4
32–32	+3.1	3.1	3.7	5.6
33–34	–0.9	2.8	3.3	4.3
35–36	+1.7	2.6	3.2	4.0
37–38	+4.6	2.8	3.5	4.6
39–40	–10.7	6.9	7.3	7.8
41–42	–6.4	4.7	4.9	5.5
43–45	–5.8	4.4	4.6	5.2
46–48	+3.3	2.6	3.0	4.3
49–52	+2.7	2.4	3.0	4.0
53–58	+4.0	1.6	1.9	2.3
59–100	+3.3	1.1	1.3	1.7

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 ($1.90/day 2011 PPP line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+1.4	69.4	72.8	85.1
4	+0.5	35.0	41.3	50.8
8	+0.6	25.2	29.8	34.8
16	+0.7	18.0	21.9	27.5
32	+0.2	12.8	15.1	20.1
64	+0.2	9.0	10.8	13.5
128	+0.4	6.6	7.7	9.8
256	+0.3	4.7	5.5	6.9
512	+0.3	3.2	3.9	5.2
1,024	+0.3	2.2	2.6	3.5
2,048	+0.3	1.5	1.8	2.3
4,096	+0.3	1.1	1.3	1.7
8,192	+0.4	0.7	0.9	1.2
16,384	+0.3	0.5	0.6	0.9

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 7 (International 2011 PPP lines): Errors in households' estimated poverty rates at a point in time, precision, and the α factor for precision

	Poverty lines			
	Intl. 2011 PPP (2010 def.)			
	$1.90	$3.20	$5.50	$21.70
Error (estimate minus observed value)	+0.3	+0.7	–0.1	0.0
Precision of estimate	0.5	0.5	0.4	0.2
Alpha factor for precision	0.88	0.91	0.99	1.06

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.
Errors (differences between estimates and observed values) are in units of percentage points.
Precision is measured as 90-percent confidence intervals in units of ± percentage points.
Errors and precision estimated from 1,000 bootstraps with n = 16,384.
Alpha is based on 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Table 7 (Percentile-based lines): Errors in households' estimated poverty rates at a point in time, precision, and the α factor for precision

	Poverty lines					
	Percentile-based lines (2010 def.)					
	10th	20th	40th	50th	60th	80th
Error (estimate minus observed value)	+0.1	+0.6	+0.4	+0.6	–0.3	+0.6
Precision of estimate	0.3	0.5	0.6	0.6	0.6	0.5
Alpha factor for precision	1.06	0.99	0.95	0.90	0.89	0.89

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.
Errors (differences between estimates and observed values) are in units of percentage points.
Precision is measured as 90-percent confidence intervals in units of ± percentage points.
Errors and precision estimated from 1,000 bootstraps with n = 16,384.
Alpha is based on 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Table 8 (All poverty lines): Possible targeting outcomes

Observed poverty status	Targeting segment: Targeted	Targeting segment: Non-targeted
Poor	**Inclusion** Poor correctly targeted	**Undercoverage** Poor mistakenly not targeted
Non-poor	**Leakage** Non-poor mistakenly targeted	**Exclusion** Non-poor correctly not targeted

Table 9 ($1.90/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.1	54.3	0.3	41.2	45.4	–85.3
<=18	8.3	50.1	1.1	40.5	48.8	–69.6
<=21	13.4	45.0	2.3	39.2	52.7	–50.1
<=23	17.4	41.1	3.1	38.5	55.9	–35.2
<=25	21.6	36.9	4.2	37.3	58.9	–18.9
<=27	26.2	32.2	6.0	35.6	61.8	0.0
<=28	29.1	29.3	6.8	34.8	63.9	+11.3
<=29	31.8	26.6	7.7	33.9	65.7	+22.2
<=31	35.8	22.7	9.1	32.5	68.2	+38.1
<=32	38.0	20.4	10.5	31.1	69.1	+47.9
<=34	41.5	16.9	12.4	29.1	70.7	+63.3
<=36	44.9	13.5	14.5	27.0	71.9	+75.1
<=38	47.6	10.8	17.0	24.6	72.2	+71.0
<=40	50.0	8.4	18.5	23.0	73.0	+68.3
<=42	52.3	6.1	20.6	21.0	73.3	+64.8
<=45	54.4	4.0	23.2	18.4	72.8	+60.3
<=48	56.2	2.3	26.8	14.8	71.0	+54.2
<=52	57.6	0.8	30.6	11.0	68.6	+47.6
<=58	58.3	0.2	36.0	5.6	63.9	+38.5
<=100	58.4	0.0	41.6	0.0	58.4	+28.9

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 ($1.90/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	92.5	7.1	12.3:1
<=18	9.4	88.5	14.3	7.7:1
<=21	15.8	85.2	23.0	5.8:1
<=23	20.5	84.9	29.7	5.6:1
<=25	25.8	83.6	36.9	5.1:1
<=27	32.2	81.4	44.9	4.4:1
<=28	35.9	81.1	49.8	4.3:1
<=29	39.5	80.5	54.5	4.1:1
<=31	44.9	79.7	61.2	3.9:1
<=32	48.4	78.4	65.0	3.6:1
<=34	53.9	77.0	71.0	3.3:1
<=36	59.4	75.6	76.8	3.1:1
<=38	64.6	73.7	81.5	2.8:1
<=40	68.5	73.0	85.6	2.7:1
<=42	72.9	71.8	89.5	2.5:1
<=45	77.6	70.1	93.1	2.3:1
<=48	82.9	67.7	96.1	2.1:1
<=52	88.2	65.3	98.6	1.9:1
<=58	94.2	61.8	99.7	1.6:1
<=100	100.0	58.4	100.0	1.4:1

Scorecard applied to the validation sample.

Tables for
$3.20/day 2011 PPP Poverty Line

Table 3 ($3.20/day 2011 PPP line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	94.0
15–18	93.3
19–21	93.3
22–23	93.3
24–25	93.3
26–27	90.4
28–28	88.7
29–29	87.6
30–31	87.6
32–32	84.4
33–34	84.4
35–36	84.4
37–38	81.9
39–40	80.3
41–42	80.3
43–45	74.7
46–48	71.1
49–52	63.8
53–58	48.4
59–100	24.3

Table 5 ($3.20/day 2011 PPP line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–4.2	2.5	2.6	2.7
15–18	+3.3	1.8	2.1	3.0
19–21	–1.5	1.3	1.4	1.7
22–23	+0.8	1.6	1.9	2.4
24–25	+7.5	2.0	2.4	3.0
26–27	+2.6	1.7	2.0	2.5
28–28	+0.3	2.2	2.6	3.4
29–29	–3.1	2.5	2.7	3.1
30–31	–8.1	4.5	4.6	4.9
32–32	+5.8	2.8	3.3	4.4
33–34	–0.2	1.9	2.3	3.0
35–36	+2.8	2.2	2.7	3.3
37–38	–3.3	2.6	2.8	3.3
39–40	–6.0	4.1	4.3	4.7
41–42	+7.0	2.7	3.2	4.4
43–45	+3.8	2.6	3.0	4.1
46–48	+7.7	2.6	3.3	4.1
49–52	–7.1	4.7	5.0	5.5
53–58	+6.6	2.6	3.1	4.2
59–100	–0.8	2.3	2.7	3.9

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 ($3.20/day 2011 PPP line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+0.2	60.3	71.0	84.5
4	+0.8	28.8	33.6	45.8
8	+1.0	20.0	24.4	31.6
16	+0.9	15.3	18.0	22.5
32	+0.7	11.2	13.5	17.1
64	+0.8	7.7	9.2	11.6
128	+0.8	5.2	6.3	8.6
256	+0.8	3.7	4.3	5.8
512	+0.8	2.6	3.2	4.2
1,024	+0.7	1.8	2.2	2.9
2,048	+0.7	1.3	1.6	2.1
4,096	+0.7	0.9	1.1	1.4
8,192	+0.7	0.7	0.8	1.0
16,384	+0.7	0.5	0.6	0.7

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 ($3.20/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.4	74.1	0.1	21.4	25.8	–88.7
<=18	8.8	69.7	0.6	20.9	29.8	–76.7
<=21	14.8	63.6	0.9	20.6	35.4	–61.0
<=23	19.2	59.3	1.3	20.3	39.5	–49.4
<=25	23.8	54.7	2.0	19.5	43.3	–36.8
<=27	29.4	49.1	2.8	18.7	48.2	–21.5
<=28	32.7	45.8	3.2	18.3	51.0	–12.6
<=29	36.0	42.5	3.5	18.0	54.0	–3.7
<=31	41.1	37.4	3.8	17.7	58.9	+9.6
<=32	43.9	34.6	4.5	17.0	60.9	+17.7
<=34	48.6	29.9	5.4	16.2	64.7	+30.6
<=36	53.1	25.4	6.4	15.2	68.2	+43.4
<=38	57.5	21.0	7.1	14.4	71.9	+55.6
<=40	60.9	17.6	7.6	13.9	74.8	+64.9
<=42	64.1	14.4	8.8	12.7	76.8	+74.5
<=45	67.4	11.0	10.2	11.3	78.8	+84.8
<=48	70.8	7.7	12.1	9.4	80.1	+84.5
<=52	74.5	3.9	13.7	7.9	82.4	+82.6
<=58	77.1	1.4	17.1	4.4	81.4	+78.2
<=100	78.5	0.0	21.5	0.0	78.5	+72.6

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 ($3.20/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	98.1	5.6	52.6:1
<=18	9.4	93.8	11.3	15.1:1
<=21	15.8	94.2	18.9	16.2:1
<=23	20.5	93.9	24.5	15.3:1
<=25	25.8	92.2	30.3	11.8:1
<=27	32.2	91.4	37.5	10.6:1
<=28	35.9	91.1	41.7	10.2:1
<=29	39.5	91.1	45.9	10.2:1
<=31	44.9	91.6	52.4	10.9:1
<=32	48.4	90.7	56.0	9.7:1
<=34	53.9	90.1	61.9	9.1:1
<=36	59.4	89.3	67.6	8.4:1
<=38	64.6	89.0	73.3	8.1:1
<=40	68.5	88.9	77.6	8.0:1
<=42	72.9	87.9	81.6	7.3:1
<=45	77.6	86.9	85.9	6.6:1
<=48	82.9	85.4	90.2	5.8:1
<=52	88.2	84.5	95.0	5.5:1
<=58	94.2	81.8	98.2	4.5:1
<=100	100.0	78.5	100.0	3.6:1

Scorecard applied to the validation sample.

Tables for
$5.50/day 2011 PPP Poverty Line

Table 3 ($5.50/day 2011 PPP line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	95.9
15–18	95.8
19–21	95.5
22–23	95.3
24–25	95.3
26–27	95.3
28–28	95.3
29–29	94.0
30–31	94.0
32–32	93.2
33–34	93.2
35–36	93.2
37–38	93.2
39–40	91.9
41–42	91.9
43–45	89.7
46–48	88.4
49–52	88.4
53–58	80.6
59–100	57.3

Table 5 ($5.50/day 2011 PPP line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–2.2	1.5	1.6	1.7
15–18	+5.8	1.8	2.1	3.0
19–21	–0.6	1.0	1.2	1.4
22–23	+0.9	1.4	1.6	2.2
24–25	0.0	1.2	1.5	1.9
26–27	–0.6	1.0	1.2	1.7
28–28	–0.1	1.4	1.7	2.2
29–29	+1.1	1.8	2.1	2.8
30–31	–6.0	3.0	3.0	3.0
32–32	+7.6	2.4	2.9	4.0
33–34	–0.6	1.3	1.6	2.0
35–36	+4.2	1.8	2.1	2.7
37–38	+1.2	1.6	1.9	2.5
39–40	–2.1	1.9	2.0	2.5
41–42	+2.5	1.9	2.3	3.1
43–45	–3.0	2.3	2.4	2.6
46–48	–2.4	2.0	2.1	2.6
49–52	–2.0	1.9	2.1	2.8
53–58	+3.9	2.2	2.6	3.6
59–100	–8.2	5.3	5.6	6.0

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 ($5.50/day 2011 PPP line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	–0.3	52.0	67.9	69.1
4	–0.2	17.8	25.8	33.9
8	–0.1	14.9	16.7	23.8
16	0.0	11.1	13.5	17.8
32	–0.1	8.5	10.0	13.4
64	–0.1	5.8	6.7	8.2
128	–0.1	4.1	4.7	6.0
256	–0.1	2.9	3.5	4.4
512	–0.1	2.1	2.5	3.3
1,024	–0.2	1.4	1.7	2.2
2,048	–0.2	1.0	1.2	1.6
4,096	–0.1	0.7	0.9	1.2
8,192	–0.1	0.5	0.6	0.8
16,384	–0.1	0.4	0.4	0.6

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 ($5.50/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.4	86.4	0.1	9.1	13.5	–90.3
<=18	8.8	81.9	0.6	8.6	17.5	–79.9
<=21	14.9	75.9	0.8	8.4	23.3	–66.2
<=23	19.4	71.4	1.1	8.1	27.5	–56.1
<=25	24.5	66.3	1.3	7.9	32.4	–44.6
<=27	30.6	60.2	1.6	7.6	38.2	–30.8
<=28	34.2	56.6	1.8	7.5	41.6	–22.8
<=29	37.5	53.2	2.0	7.2	44.8	–15.1
<=31	42.9	47.9	2.0	7.2	50.1	–3.3
<=32	45.9	44.8	2.5	6.7	52.6	+4.0
<=34	51.1	39.7	2.8	6.4	57.5	+15.7
<=36	56.0	34.8	3.4	5.8	61.8	+27.2
<=38	60.7	30.0	3.8	5.4	66.1	+38.1
<=40	64.5	26.3	4.1	5.1	69.6	+46.5
<=42	68.3	22.4	4.5	4.7	73.0	+55.5
<=45	72.8	18.0	4.9	4.4	77.1	+65.7
<=48	77.6	13.2	5.3	3.9	81.4	+76.8
<=52	82.4	8.4	5.8	3.4	85.8	+87.9
<=58	87.0	3.8	7.2	2.0	89.0	+92.0
<=100	90.8	0.0	9.2	0.0	90.8	+89.8

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 ($5.50/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	98.1	4.8	52.6:1
<=18	9.4	93.8	9.7	15.1:1
<=21	15.8	94.7	16.4	17.9:1
<=23	20.5	94.7	21.4	17.9:1
<=25	25.8	94.8	27.0	18.3:1
<=27	32.2	95.1	33.7	19.2:1
<=28	35.9	95.1	37.6	19.4:1
<=29	39.5	94.9	41.4	18.7:1
<=31	44.9	95.5	47.2	21.3:1
<=32	48.4	94.8	50.6	18.3:1
<=34	53.9	94.7	56.3	17.9:1
<=36	59.4	94.2	61.7	16.3:1
<=38	64.6	94.1	66.9	15.8:1
<=40	68.5	94.0	71.0	15.8:1
<=42	72.9	93.8	75.3	15.0:1
<=45	77.6	93.7	80.1	14.9:1
<=48	82.9	93.6	85.4	14.5:1
<=52	88.2	93.4	90.7	14.1:1
<=58	94.2	92.3	95.8	12.0:1
<=100	100.0	90.8	100.0	9.8:1

Scorecard applied to the validation sample.

Tables for
$21.70/day 2011 PPP Poverty Line

Table 3 ($21.70/day 2011 PPP line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	99.3
15–18	98.8
19–21	98.8
22–23	98.8
24–25	98.8
26–27	98.8
28–28	98.8
29–29	98.8
30–31	98.8
32–32	98.8
33–34	98.8
35–36	98.8
37–38	98.8
39–40	98.8
41–42	98.8
43–45	98.8
46–48	98.8
49–52	98.8
53–58	98.5
59–100	92.9

Table 5 ($21.70/day 2011 PPP line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	+1.1	0.8	1.0	1.2
15–18	+2.1	1.1	1.2	1.6
19–21	+0.1	0.6	0.7	0.9
22–23	+0.6	0.8	0.9	1.3
24–25	–1.2	0.6	0.6	0.6
26–27	+0.1	0.6	0.7	0.9
28–28	–1.2	0.6	0.6	0.6
29–29	+1.1	1.1	1.3	1.5
30–31	–1.2	0.6	0.6	0.6
32–32	+3.4	1.5	1.7	2.4
33–34	+1.8	0.9	1.1	1.5
35–36	+1.9	0.9	1.1	1.5
37–38	+0.7	0.9	1.0	1.3
39–40	–1.2	0.6	0.6	0.6
41–42	–1.2	0.6	0.6	0.6
43–45	+0.9	0.9	1.1	1.4
46–48	–1.2	0.6	0.6	0.6
49–52	–0.1	0.6	0.7	0.8
53–58	–1.5	0.7	0.7	0.7
59–100	–4.8	2.8	2.8	3.0

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 ($21.70/day 2011 PPP line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	–0.3	3.2	3.2	52.9
4	–0.3	0.9	13.7	15.3
8	–0.1	7.1	7.3	12.8
16	–0.1	3.7	3.9	7.0
32	–0.1	3.3	3.6	5.3
64	–0.1	2.4	2.6	3.4
128	0.0	1.7	2.1	2.6
256	0.0	1.2	1.5	2.0
512	0.0	0.9	1.1	1.4
1,024	0.0	0.6	0.8	1.0
2,048	0.0	0.5	0.6	0.7
4,096	0.0	0.3	0.4	0.5
8,192	0.0	0.2	0.3	0.4
16,384	0.0	0.2	0.2	0.3

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 ($21.70/day 2011 PPP line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.4	94.1	0.1	1.4	5.8	–91.0
<=18	9.2	89.4	0.3	1.2	10.4	–81.1
<=21	15.4	83.1	0.3	1.1	16.6	–68.4
<=23	20.1	78.5	0.4	1.1	21.1	–58.9
<=25	25.4	73.1	0.4	1.1	26.5	–48.0
<=27	31.7	66.8	0.5	1.0	32.7	–35.1
<=28	35.4	63.1	0.5	1.0	36.4	–27.6
<=29	39.0	59.6	0.6	0.9	39.9	–20.3
<=31	44.3	54.2	0.6	0.9	45.2	–9.5
<=32	47.7	50.8	0.8	0.7	48.4	–2.4
<=34	53.0	45.5	0.9	0.6	53.6	+8.5
<=36	58.3	40.2	1.1	0.4	58.7	+19.5
<=38	63.4	35.1	1.2	0.3	63.7	+29.9
<=40	67.4	31.2	1.2	0.3	67.7	+37.9
<=42	71.7	26.8	1.2	0.3	72.0	+46.7
<=45	76.4	22.2	1.3	0.2	76.6	+56.3
<=48	81.6	16.9	1.3	0.2	81.9	+67.0
<=52	86.9	11.7	1.3	0.1	87.0	+77.7
<=58	92.9	5.6	1.3	0.1	93.0	+89.9
<=100	98.5	0.0	1.5	0.0	98.5	+98.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 ($21.70/day 2011 PPP line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	98.1	4.4	52.6:1
<=18	9.4	97.3	9.3	36.7:1
<=21	15.8	97.9	15.7	46.3:1
<=23	20.5	98.0	20.4	48.1:1
<=25	25.8	98.4	25.8	60.9:1
<=27	32.2	98.4	32.2	63.4:1
<=28	35.9	98.6	35.9	70.8:1
<=29	39.5	98.5	39.5	66.6:1
<=31	44.9	98.7	45.0	75.7:1
<=32	48.4	98.4	48.4	63.4:1
<=34	53.9	98.3	53.8	57.7:1
<=36	59.4	98.2	59.2	53.8:1
<=38	64.6	98.2	64.4	54.0:1
<=40	68.5	98.3	68.4	57.4:1
<=42	72.9	98.4	72.8	61.0:1
<=45	77.6	98.4	77.5	60.4:1
<=48	82.9	98.5	82.9	64.6:1
<=52	88.2	98.5	88.2	65.1:1
<=58	94.2	98.6	94.3	69.6:1
<=100	100.0	98.5	100.0	66.8:1

Scorecard applied to the validation sample.

Tables for
the First-Decile (10^{th}-Percentile) Poverty Line

Table 3 (First-decile (10th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	22.9
15–18	17.0
19–21	14.3
22–23	10.6
24–25	10.6
26–27	10.6
28–28	10.6
29–29	10.6
30–31	10.6
32–32	10.6
33–34	5.7
35–36	5.7
37–38	5.7
39–40	5.3
41–42	4.8
43–45	4.1
46–48	2.4
49–52	1.5
53–58	0.7
59–100	0.0

Table 5 (First-decile (10th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	+2.2	2.5	3.0	3.8
15–18	+1.8	2.2	2.6	3.4
19–21	+2.1	1.7	2.0	2.7
22–23	+1.3	1.7	2.0	2.6
24–25	–2.5	2.2	2.3	2.6
26–27	–2.8	2.2	2.4	2.7
28–28	–0.5	2.2	2.6	3.5
29–29	+3.7	1.7	2.1	2.5
30–31	–5.3	3.6	3.8	4.3
32–32	–0.4	2.2	2.6	3.3
33–34	–0.5	1.4	1.6	2.1
35–36	+1.0	1.1	1.4	1.9
37–38	–3.0	2.3	2.5	2.9
39–40	+3.1	1.0	1.2	1.7
41–42	+0.7	1.3	1.5	1.9
43–45	+2.8	0.7	0.8	1.0
46–48	+0.6	0.8	0.9	1.2
49–52	–0.1	0.7	0.9	1.2
53–58	+0.7	0.0	0.0	0.0
59–100	0.0	0.0	0.0	0.0

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (First-decile (10th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+1.0	51.3	56.1	58.6
4	+0.6	16.7	26.3	30.6
8	+0.7	14.1	15.7	21.9
16	+0.4	10.5	11.9	15.1
32	+0.3	8.0	9.7	11.1
64	+0.1	5.8	6.9	8.5
128	+0.1	4.0	4.7	5.9
256	+0.1	2.9	3.4	4.3
512	+0.1	2.0	2.5	3.0
1,024	+0.1	1.4	1.7	2.2
2,048	+0.1	1.0	1.2	1.6
4,096	+0.1	0.7	0.8	1.2
8,192	+0.1	0.5	0.6	0.8
16,384	+0.1	0.3	0.4	0.6

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (First-decile (10th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	0.9	6.8	3.5	88.8	89.7	–29.8
<=18	1.7	6.0	7.7	84.6	86.2	–0.7
<=21	2.4	5.2	13.3	79.0	81.4	–73.3
<=23	2.9	4.8	17.6	74.7	77.6	–129.1
<=25	3.6	4.1	22.3	70.0	73.6	–189.7
<=27	4.4	3.3	27.8	64.5	68.9	–261.9
<=28	4.8	2.9	31.1	61.2	66.0	–304.8
<=29	5.1	2.6	34.5	57.8	62.8	–348.9
<=31	5.8	1.9	39.0	53.3	59.1	–407.4
<=32	6.2	1.5	42.2	50.1	56.3	–449.0
<=34	6.5	1.2	47.4	44.9	51.5	–516.0
<=36	6.8	0.9	52.6	39.7	46.5	–584.3
<=38	7.2	0.5	57.4	35.0	42.2	–645.8
<=40	7.3	0.4	61.2	31.1	38.4	–696.2
<=42	7.5	0.2	65.4	26.9	34.4	–750.4
<=45	7.5	0.2	70.1	22.2	29.7	–811.3
<=48	7.6	0.1	75.3	17.0	24.6	–878.9
<=52	7.7	0.0	80.5	11.8	19.5	–946.7
<=58	7.7	0.0	86.5	5.8	13.5	–1,025.0
<=100	7.7	0.0	92.3	0.0	7.7	–1,100.3

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (First-decile (10th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	20.7	12.1	0.3:1
<=18	9.4	17.8	21.8	0.2:1
<=21	15.8	15.5	31.8	0.2:1
<=23	20.5	14.0	37.3	0.2:1
<=25	25.8	13.8	46.2	0.2:1
<=27	32.2	13.6	57.2	0.2:1
<=28	35.9	13.4	62.5	0.2:1
<=29	39.6	12.8	65.8	0.1:1
<=31	44.8	13.0	75.8	0.1:1
<=32	48.4	12.8	80.5	0.1:1
<=34	53.9	12.1	84.8	0.1:1
<=36	59.4	11.4	88.1	0.1:1
<=38	64.6	11.2	93.6	0.1:1
<=40	68.5	10.6	94.7	0.1:1
<=42	72.8	10.2	96.9	0.1:1
<=45	77.6	9.7	97.8	0.1:1
<=48	82.9	9.2	98.9	0.1:1
<=52	88.2	8.7	100.0	0.1:1
<=58	94.2	8.2	100.0	0.1:1
<=100	100.0	7.7	100.0	0.1:1

Scorecard applied to the validation sample.

Tables for
the First-Quintile (20th-Percentile) Poverty Line

Table 3 (First-quintile (20th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	46.3
15–18	35.2
19–21	28.1
22–23	25.6
24–25	25.6
26–27	21.8
28–28	19.7
29–29	19.7
30–31	19.7
32–32	19.7
33–34	11.1
35–36	11.1
37–38	11.1
39–40	11.1
41–42	7.5
43–45	6.5
46–48	5.4
49–52	3.4
53–58	1.8
59–100	0.0

Table 5 (First-quintile (20th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–0.9	3.1	3.7	4.7
15–18	+3.0	2.8	3.3	4.4
19–21	–1.6	2.4	2.8	3.7
22–23	+2.8	2.5	3.0	4.2
24–25	–2.0	2.5	2.9	3.6
26–27	–1.7	2.1	2.6	3.5
28–28	–5.0	4.0	4.3	4.9
29–29	+8.3	2.2	2.7	3.4
30–31	–3.3	2.9	3.1	4.0
32–32	+4.7	2.5	2.9	3.7
33–34	–3.0	2.5	2.7	3.3
35–36	+3.2	1.5	1.8	2.4
37–38	+0.6	1.8	2.1	2.9
39–40	+5.1	1.6	1.8	2.5
41–42	–0.7	1.8	2.1	2.6
43–45	+3.8	0.9	1.1	1.5
46–48	+3.6	0.8	0.9	1.2
49–52	+1.7	0.7	0.9	1.2
53–58	+0.7	0.5	0.6	0.8
59–100	–1.6	1.2	1.2	1.4

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (First-quintile (20th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+2.4	56.7	57.8	67.6
4	+1.3	27.9	30.7	36.7
8	+1.6	19.8	22.6	30.3
16	+1.1	14.0	16.9	22.1
32	+0.8	10.3	12.3	16.9
64	+0.6	7.4	9.0	11.8
128	+0.7	5.3	6.1	7.8
256	+0.6	3.7	4.3	5.7
512	+0.6	2.5	2.9	3.8
1,024	+0.6	1.8	2.2	2.8
2,048	+0.6	1.3	1.5	2.1
4,096	+0.6	0.9	1.1	1.4
8,192	+0.6	0.6	0.8	1.0
16,384	+0.6	0.5	0.5	0.7

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (First-quintile (20th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	2.1	13.2	2.4	82.3	84.4	–57.1
<=18	3.7	11.6	5.7	79.0	82.7	–14.3
<=21	5.6	9.8	10.2	74.5	80.0	+33.4
<=23	6.6	8.7	13.9	70.8	77.4	+9.6
<=25	8.1	7.3	17.7	67.0	75.1	–15.3
<=27	9.6	5.8	22.6	62.1	71.7	–47.3
<=28	10.5	4.8	25.4	59.3	69.8	–65.5
<=29	10.9	4.4	28.6	56.1	67.0	–86.6
<=31	12.1	3.2	32.8	51.9	64.0	–113.7
<=32	12.6	2.7	35.8	48.9	61.5	–133.6
<=34	13.4	2.0	40.5	44.1	57.5	–164.5
<=36	13.8	1.5	45.6	39.1	52.8	–197.7
<=38	14.3	1.0	50.3	34.4	48.7	–228.0
<=40	14.5	0.8	54.0	30.7	45.2	–252.2
<=42	14.9	0.5	58.0	26.7	41.5	–278.3
<=45	15.0	0.3	62.6	22.1	37.1	–308.4
<=48	15.1	0.2	67.8	16.9	32.0	–342.4
<=52	15.2	0.2	73.0	11.7	26.8	–376.4
<=58	15.2	0.1	79.0	5.7	21.0	–415.2
<=100	15.3	0.0	84.7	0.0	15.3	–452.5

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (First-quintile (20th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	47.2	13.8	0.9:1
<=18	9.4	39.3	24.2	0.6:1
<=21	15.8	35.3	36.3	0.5:1
<=23	20.5	32.4	43.3	0.5:1
<=25	25.7	31.4	52.7	0.5:1
<=27	32.1	29.8	62.5	0.4:1
<=28	35.9	29.2	68.4	0.4:1
<=29	39.5	27.6	71.1	0.4:1
<=31	44.8	27.0	78.9	0.4:1
<=32	48.4	26.0	82.2	0.4:1
<=34	53.9	24.8	87.2	0.3:1
<=36	59.4	23.2	89.9	0.3:1
<=38	64.6	22.1	93.2	0.3:1
<=40	68.5	21.2	94.8	0.3:1
<=42	72.8	20.4	97.0	0.3:1
<=45	77.6	19.3	97.9	0.2:1
<=48	82.9	18.2	98.5	0.2:1
<=52	88.2	17.2	99.0	0.2:1
<=58	94.2	16.2	99.5	0.2:1
<=100	100.0	15.3	100.0	0.2:1

Scorecard applied to the validation sample.

Tables for
the Second-Quintile (40th-Percentile) Poverty Line

Table 3 (Second-quintile (40th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	68.9
15–18	65.3
19–21	62.7
22–23	55.3
24–25	51.6
26–27	47.8
28–28	47.8
29–29	41.2
30–31	39.9
32–32	35.8
33–34	27.6
35–36	27.6
37–38	27.6
39–40	23.8
41–42	16.4
43–45	11.4
46–48	7.8
49–52	7.8
53–58	4.3
59–100	1.5

Table 5 (Second-quintile (40th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–1.1	2.9	3.4	4.3
15–18	+4.1	3.0	3.4	4.5
19–21	+10.3	2.6	3.0	4.1
22–23	–0.9	3.0	3.5	4.7
24–25	–0.6	2.7	3.2	4.1
26–27	–7.0	4.7	5.0	5.5
28–28	+3.2	3.3	3.9	5.3
29–29	–0.3	3.3	3.9	5.2
30–31	+3.8	2.8	3.3	4.7
32–32	+0.4	3.2	3.8	5.0
33–34	–3.2	2.8	3.0	3.8
35–36	+6.9	2.2	2.6	3.3
37–38	+2.8	2.5	3.1	3.6
39–40	+2.0	2.6	3.2	4.2
41–42	–10.3	6.6	6.9	7.2
43–45	–4.7	3.4	3.7	4.1
46–48	–3.3	2.6	2.8	3.1
49–52	+1.5	1.4	1.7	2.2
53–58	+2.1	0.8	0.9	1.1
59–100	–0.1	0.7	0.8	1.1

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (Second-quintile (40th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+1.8	67.6	70.8	80.6
4	+0.1	35.8	41.6	54.3
8	+0.9	25.6	30.3	38.1
16	+0.8	18.1	21.1	26.8
32	+0.2	13.1	15.3	19.4
64	+0.2	8.7	10.6	13.7
128	+0.3	6.5	7.6	9.8
256	+0.3	4.4	5.2	6.7
512	+0.4	3.3	4.0	5.1
1,024	+0.4	2.2	2.7	3.5
2,048	+0.4	1.6	1.9	2.4
4,096	+0.4	1.1	1.3	1.8
8,192	+0.4	0.8	0.9	1.2
16,384	+0.4	0.6	0.7	0.9

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (Second-quintile (40th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	3.0	29.5	1.3	66.1	69.2	–77.2
<=18	6.1	26.5	3.3	64.2	70.3	–52.6
<=21	9.4	23.1	6.3	61.2	70.6	–22.9
<=23	12.1	20.5	8.3	59.1	71.2	–0.2
<=25	14.8	17.7	10.9	56.6	71.4	+24.7
<=27	18.3	14.2	13.8	53.7	72.0	+55.1
<=28	20.0	12.6	15.9	51.6	71.6	+51.3
<=29	21.5	11.0	18.0	49.5	71.0	+44.7
<=31	23.4	9.1	21.4	46.0	69.4	+34.1
<=32	24.7	7.9	23.8	43.7	68.3	+27.0
<=34	26.3	6.2	27.6	39.9	66.2	+15.3
<=36	27.5	5.1	31.9	35.5	63.0	+1.8
<=38	28.7	3.9	35.9	31.6	60.3	–10.2
<=40	29.6	3.0	39.0	28.5	58.0	–19.7
<=42	30.7	1.9	42.2	25.3	56.0	–29.6
<=45	31.4	1.1	46.2	21.3	52.7	–41.8
<=48	32.0	0.5	50.9	16.6	48.6	–56.4
<=52	32.3	0.2	55.9	11.6	43.9	–71.7
<=58	32.5	0.1	61.7	5.7	38.2	–89.7
<=100	32.5	0.0	67.5	0.0	32.5	–107.3

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (Second-quintile (40th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.4	69.4	9.4	2.3:1
<=18	9.3	65.0	18.7	1.9:1
<=21	15.7	59.9	28.9	1.5:1
<=23	20.4	59.2	37.1	1.4:1
<=25	25.7	57.6	45.6	1.4:1
<=27	32.1	57.1	56.4	1.3:1
<=28	35.9	55.8	61.4	1.3:1
<=29	39.5	54.4	66.1	1.2:1
<=31	44.8	52.2	71.9	1.1:1
<=32	48.4	50.9	75.7	1.0:1
<=34	53.9	48.8	80.9	1.0:1
<=36	59.4	46.2	84.4	0.9:1
<=38	64.6	44.4	88.1	0.8:1
<=40	68.5	43.1	90.8	0.8:1
<=42	72.8	42.1	94.2	0.7:1
<=45	77.6	40.5	96.6	0.7:1
<=48	82.9	38.6	98.3	0.6:1
<=52	88.2	36.7	99.3	0.6:1
<=58	94.2	34.5	99.7	0.5:1
<=100	100.0	32.5	100.0	0.5:1

Scorecard applied to the validation sample.

Tables for the Median (50^{th}-Percentile) Poverty Line

Table 3 (Median (50th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	76.7
15–18	74.6
19–21	71.4
22–23	64.0
24–25	63.8
26–27	60.8
28–28	60.8
29–29	51.3
30–31	51.3
32–32	47.3
33–34	41.1
35–36	41.1
37–38	40.9
39–40	34.7
41–42	25.6
43–45	18.2
46–48	15.5
49–52	13.3
53–58	6.4
59–100	3.9

Table 5 (Median (50th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–0.9	2.6	3.2	4.0
15–18	+8.3	2.8	3.2	4.3
19–21	+5.7	2.6	3.0	4.2
22–23	–9.5	6.2	6.4	6.9
24–25	+4.0	2.7	3.2	4.3
26–27	–2.2	2.4	2.8	3.8
28–28	+0.8	3.1	3.8	5.1
29–29	–9.0	6.1	6.5	7.0
30–31	–1.2	2.8	3.5	4.5
32–32	+2.9	3.4	4.0	5.2
33–34	+2.3	2.7	3.1	4.4
35–36	+8.3	2.6	3.1	4.2
37–38	+1.7	2.8	3.4	4.3
39–40	–0.8	3.2	3.7	5.0
41–42	–11.4	7.3	7.5	8.1
43–45	–2.4	2.4	2.8	3.7
46–48	+1.5	2.0	2.4	3.1
49–52	+2.4	1.7	2.1	2.6
53–58	+3.1	0.9	1.0	1.3
59–100	0.0	1.1	1.3	1.7

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (Median (50th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+1.4	61.6	72.9	81.7
4	+0.4	35.8	41.8	55.0
8	+1.0	25.2	29.2	39.3
16	+1.1	18.4	22.2	27.2
32	+0.4	13.2	15.8	20.7
64	+0.4	9.4	11.2	14.3
128	+0.5	6.6	7.8	10.2
256	+0.5	4.4	5.3	7.3
512	+0.6	3.2	3.7	5.0
1,024	+0.5	2.3	2.7	3.5
2,048	+0.5	1.6	2.0	2.6
4,096	+0.5	1.1	1.3	1.8
8,192	+0.6	0.8	0.9	1.2
16,384	+0.6	0.6	0.7	0.9

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (Median (50th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	3.5	38.4	1.0	57.2	60.6	–81.0
<=18	6.7	35.1	2.7	55.5	62.2	–61.4
<=21	10.9	30.9	4.9	53.3	64.2	–36.2
<=23	14.4	27.4	6.1	52.1	66.5	–16.6
<=25	17.6	24.2	8.2	49.9	67.5	+3.8
<=27	21.6	20.2	10.6	47.5	69.1	+28.7
<=28	23.8	18.0	12.1	46.1	69.9	+42.9
<=29	26.0	15.8	13.5	44.7	70.6	+56.5
<=31	28.7	13.1	16.1	42.0	70.8	+61.5
<=32	30.3	11.5	18.1	40.1	70.4	+56.7
<=34	32.4	9.4	21.5	36.7	69.1	+48.7
<=36	34.2	7.6	25.2	33.0	67.2	+39.8
<=38	36.2	5.6	28.3	29.8	66.1	+32.3
<=40	37.6	4.2	30.9	27.3	64.9	+26.1
<=42	39.2	2.7	33.7	24.5	63.7	+19.5
<=45	40.2	1.7	37.4	20.7	60.9	+10.5
<=48	40.9	1.0	42.0	16.2	57.0	–0.4
<=52	41.4	0.4	46.7	11.4	52.9	–11.7
<=58	41.7	0.2	52.6	5.6	47.3	–25.6
<=100	41.8	0.0	58.2	0.0	41.8	–39.0

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (Median (50th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	77.5	8.3	3.4:1
<=18	9.4	71.6	16.1	2.5:1
<=21	15.8	69.2	26.1	2.2:1
<=23	20.5	70.3	34.4	2.4:1
<=25	25.8	68.1	42.0	2.1:1
<=27	32.2	67.0	51.6	2.0:1
<=28	35.9	66.3	56.9	2.0:1
<=29	39.5	65.8	62.1	1.9:1
<=31	44.8	64.0	68.7	1.8:1
<=32	48.4	62.6	72.4	1.7:1
<=34	53.9	60.2	77.5	1.5:1
<=36	59.4	57.6	81.8	1.4:1
<=38	64.6	56.1	86.6	1.3:1
<=40	68.5	54.9	89.9	1.2:1
<=42	72.8	53.8	93.6	1.2:1
<=45	77.6	51.8	96.0	1.1:1
<=48	82.9	49.3	97.7	1.0:1
<=52	88.2	47.0	99.1	0.9:1
<=58	94.2	44.2	99.6	0.8:1
<=100	100.0	41.8	100.0	0.7:1

Scorecard applied to the validation sample.

Tables for the Third-Quintile (60^{th}-Percentile) Poverty Line

Table 3 (Third-quintile (60th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	82.5
15–18	79.1
19–21	79.1
22–23	78.4
24–25	71.9
26–27	71.9
28–28	71.9
29–29	65.6
30–31	65.1
32–32	57.0
33–34	52.8
35–36	52.8
37–38	50.1
39–40	45.6
41–42	35.8
43–45	31.3
46–48	27.8
49–52	20.4
53–58	9.0
59–100	5.1

Table 5 (Third-quintile (60th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–8.2	5.0	5.1	5.4
15–18	+2.2	2.5	2.8	3.9
19–21	+5.5	2.5	2.8	3.7
22–23	–1.4	2.4	3.0	3.9
24–25	+1.2	2.5	2.9	3.9
26–27	+6.3	2.4	2.9	3.7
28–28	–6.3	4.6	4.7	5.2
29–29	–6.5	4.9	5.2	5.8
30–31	–1.4	2.7	3.3	4.2
32–32	+1.6	3.4	4.1	5.4
33–34	+2.0	2.7	3.2	4.4
35–36	–0.4	2.7	3.2	4.0
37–38	+4.2	2.8	3.4	4.6
39–40	–5.6	4.4	4.6	5.5
41–42	–11.0	7.1	7.4	8.0
43–45	–0.5	2.7	3.3	4.2
46–48	+1.0	2.5	3.1	4.1
49–52	–1.5	2.3	2.8	3.5
53–58	+0.8	1.4	1.7	2.1
59–100	+1.2	1.1	1.3	1.7

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (Third-quintile (60th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+0.3	68.1	75.6	82.2
4	–0.4	37.1	43.6	53.1
8	–0.1	25.2	29.4	37.8
16	+0.1	18.1	21.0	26.7
32	–0.4	13.0	15.2	18.7
64	–0.5	9.3	10.5	14.1
128	–0.4	6.5	7.5	10.3
256	–0.4	4.7	5.5	6.7
512	–0.3	3.3	4.0	5.3
1,024	–0.4	2.2	2.7	3.6
2,048	–0.4	1.6	1.9	2.5
4,096	–0.3	1.1	1.3	1.7
8,192	–0.3	0.8	0.9	1.3
16,384	–0.3	0.6	0.7	0.9

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (Third-quintile (60th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.0	48.0	0.4	47.6	51.6	–83.6
<=18	7.8	44.2	1.6	46.4	54.3	–66.8
<=21	12.5	39.5	3.3	44.7	57.2	–45.7
<=23	16.3	35.7	4.2	43.8	60.1	–29.3
<=25	20.1	31.9	5.7	42.2	62.3	–11.8
<=27	24.2	27.8	8.0	40.0	64.3	+8.5
<=28	27.1	24.9	8.8	39.2	66.3	+21.2
<=29	29.8	22.2	9.8	38.2	68.0	+33.3
<=31	33.2	18.8	11.6	36.3	69.6	+50.3
<=32	35.2	16.8	13.2	34.8	70.0	+60.9
<=34	38.0	14.0	15.9	32.1	70.1	+69.4
<=36	40.9	11.1	18.5	29.5	70.4	+64.4
<=38	43.3	8.7	21.3	26.7	69.9	+59.0
<=40	45.3	6.7	23.3	24.7	70.0	+55.2
<=42	47.3	4.7	25.6	22.4	69.7	+50.8
<=45	48.8	3.2	28.9	19.1	67.9	+44.5
<=48	50.2	1.9	32.8	15.2	65.4	+37.0
<=52	51.3	0.7	36.9	11.1	62.4	+29.1
<=58	51.8	0.2	42.4	5.6	57.4	+18.5
<=100	52.0	0.0	48.0	0.0	52.0	+7.7

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (Third-quintile (60th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	90.6	7.8	9.6:1
<=18	9.4	83.2	15.1	5.0:1
<=21	15.8	79.4	24.0	3.8:1
<=23	20.5	79.6	31.3	3.9:1
<=25	25.8	77.7	38.6	3.5:1
<=27	32.2	75.3	46.6	3.0:1
<=28	35.9	75.6	52.2	3.1:1
<=29	39.5	75.3	57.2	3.0:1
<=31	44.9	74.1	63.9	2.9:1
<=32	48.4	72.7	67.7	2.7:1
<=34	53.9	70.5	73.1	2.4:1
<=36	59.4	68.9	78.7	2.2:1
<=38	64.6	67.0	83.2	2.0:1
<=40	68.5	66.0	87.0	1.9:1
<=42	72.9	64.9	90.9	1.8:1
<=45	77.6	62.8	93.8	1.7:1
<=48	82.9	60.5	96.4	1.5:1
<=52	88.2	58.2	98.7	1.4:1
<=58	94.2	55.0	99.7	1.2:1
<=100	100.0	52.0	100.0	1.1:1

Scorecard applied to the validation sample.

Tables for
the Fourth-Quintile (80th-Percentile) Poverty Line

Table 3 (Fourth-quintile (80th-percentile) line): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–14	93.2
15–18	90.7
19–21	90.7
22–23	90.7
24–25	90.6
26–27	89.4
28–28	88.7
29–29	82.9
30–31	82.9
32–32	78.3
33–34	77.6
35–36	77.0
37–38	75.1
39–40	73.9
41–42	73.9
43–45	70.2
46–48	64.3
49–52	44.7
53–58	36.5
59–100	20.4

Table 5 (Fourth-quintile (80th-percentile) line): Errors in a household's poverty likelihood (average of differences between estimated and observed values) by score range, with confidence intervals

	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
Score	Error	90-percent	95-percent	99-percent
0–14	–3.2	2.2	2.2	2.4
15–18	+0.7	1.8	2.1	3.0
19–21	+1.3	1.6	1.9	2.6
22–23	+1.9	1.9	2.4	2.9
24–25	+5.9	2.0	2.5	3.2
26–27	+1.6	1.7	2.0	2.5
28–28	+2.5	2.4	2.8	3.6
29–29	–7.7	4.9	5.0	5.4
30–31	–8.9	5.1	5.3	5.5
32–32	+7.0	3.1	3.6	5.1
33–34	–2.8	2.5	2.6	3.6
35–36	–0.2	2.4	2.8	3.4
37–38	–7.3	4.7	4.9	5.4
39–40	–2.9	2.7	3.1	4.0
41–42	+7.1	2.9	3.5	4.7
43–45	+8.4	2.9	3.5	4.4
46–48	+8.0	2.9	3.4	4.1
49–52	–9.7	6.3	6.5	6.9
53–58	+5.4	2.3	2.8	3.8
59–100	+5.6	1.9	2.3	3.0

Scorecard applied to 1,000 bootstraps of n = 16,384 from the validation sample.

Table 6 (Fourth-quintile (80th-percentile) line): Errors in households' poverty rates at a point in time (average of differences between estimated and observed values), by sample size and with confidence intervals

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+0.4	66.8	72.4	85.1
4	+0.5	29.3	34.3	45.5
8	+0.8	21.8	26.4	33.8
16	+0.8	15.6	18.3	24.0
32	+0.5	11.3	13.7	17.9
64	+0.6	8.0	9.8	12.5
128	+0.7	5.7	6.7	8.5
256	+0.7	4.0	4.9	6.2
512	+0.6	2.8	3.4	4.3
1,024	+0.5	2.0	2.4	3.0
2,048	+0.6	1.4	1.6	2.1
4,096	+0.6	1.0	1.2	1.5
8,192	+0.6	0.7	0.8	1.1
16,384	+0.6	0.5	0.6	0.7

Scorecard applied to 1,000 bootstraps from the validation sample.

Table 9 (Fourth-quintile (80th-percentile) line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC

Targeting cut-off	Inclusion: Poor correctly targeted	Undercoverage: Poor mistakenly not targeted	Leakage: Non-poor mistakenly targeted	Exclusion: Non-poor correctly not targeted	Hit rate Inclusion + Exclusion	BPAC See text
<=14	4.3	68.8	0.2	26.7	31.0	–88.0
<=18	8.8	64.3	0.7	26.2	35.0	–75.1
<=21	14.4	58.7	1.3	25.6	40.0	–58.7
<=23	18.6	54.5	1.8	25.1	43.7	–46.5
<=25	23.2	49.9	2.7	24.2	47.4	–33.0
<=27	28.8	44.3	3.4	23.5	52.2	–16.5
<=28	32.0	41.1	3.9	23.0	55.0	–7.1
<=29	35.3	37.8	4.3	22.6	57.9	+2.4
<=31	40.2	32.9	4.7	22.2	62.3	+16.4
<=32	42.7	30.4	5.7	21.2	63.9	+24.8
<=34	47.2	25.9	6.8	20.1	67.2	+38.3
<=36	51.4	21.7	8.1	18.8	70.3	+51.7
<=38	55.7	17.4	8.9	18.0	73.6	+64.6
<=40	58.7	14.4	9.9	17.0	75.7	+74.1
<=42	61.6	11.5	11.3	15.6	77.1	+84.0
<=45	64.5	8.6	13.1	13.8	78.3	+82.1
<=48	67.4	5.7	15.4	11.5	78.9	+78.9
<=52	70.4	2.7	17.8	9.1	79.4	+75.6
<=58	72.3	0.8	21.9	5.0	77.2	+70.0
<=100	73.1	0.0	26.9	0.0	73.1	+63.2

Inclusion, undercoverage, leakage, and exclusion normalized to sum to 100. Scorecard applied to the validation sample.

Table 10 (Fourth-quintile (80th-percentile) line): Share of all households who are targeted (that is, score at or below a cut-off), share of targeted households who are poor, share of poor households who are targeted, and number of poor households successfully targeted per non-poor household mistakenly targeted

Targeting cut-off	% all HHs who are targeted	% targeted HHs who are poor	% poor HHs who are targeted	Poor HHs targeted per non-poor HH targeted
<=14	4.5	96.3	5.9	25.8:1
<=18	9.4	92.9	12.0	13.1:1
<=21	15.8	91.5	19.7	10.8:1
<=23	20.5	91.0	25.5	10.1:1
<=25	25.8	89.7	31.7	8.7:1
<=27	32.2	89.3	39.4	8.4:1
<=28	35.9	89.0	43.8	8.1:1
<=29	39.6	89.2	48.3	8.3:1
<=31	44.9	89.5	55.0	8.5:1
<=32	48.5	88.1	58.5	7.4:1
<=34	54.0	87.4	64.5	6.9:1
<=36	59.5	86.5	70.3	6.4:1
<=38	64.6	86.2	76.2	6.2:1
<=40	68.6	85.6	80.3	5.9:1
<=42	72.9	84.5	84.2	5.4:1
<=45	77.6	83.1	88.2	4.9:1
<=48	82.9	81.4	92.3	4.4:1
<=52	88.2	79.8	96.3	3.9:1
<=58	94.2	76.7	98.9	3.3:1
<=100	100.0	73.1	100.0	2.7:1

Scorecard applied to the validation sample.