Simple Poverty Scorecard® Tool
Mali

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Abstract

The Scorocs Simple Poverty Scorecard-brand poverty-assessment tool for Mali is a low-cost, transparent way for pro-poor programs to get to know the socio-economic status of their participants so as to prove and improve 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 clients for differentiated treatment.

Version note

The new scorecard here is based on data from 2016/17. It should be used from now on, replacing the old scorecard for Mali in Schreiner (2008a) that uses data from 2001. The two scorecards use different definitions of *poverty*, so their estimates cannot be compared with each other.

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Scorocs™ Simple Poverty Scorecard® Tool

			Name	Identifier
Interview ID:				
Interview date:		Participant:		
Country:	MLI	Field agent:		
Scorecard:	002	Service point:		
Sampling wgt.:		Number of household members:		

Indicator	Response	Points Score
1. In what region does the household live?	A. Sikasso	0
	B. Ségou, Koulikoro, Mopti, or Gao	6
	C. Bamako, Kayes, or Tombouctou	18
2. How many household members are 15-years-old or younger?	A. Seven or more	0
	B. Six	4
	C. Five	7
	D. Four	13
	E. Three	17
	F. Two	22
	G. One	30
	H. None	38
3. Can the male head/spouse read and write in French, Arabic, English, a national language, or some other language?	A. No	0
	B. Yes	3
	C. No male head/spouse	7
4. What is the residence's floor made of?	A. Dirt/sand, or other	0
	B. Dung	1
	C. Concrete with cement veneer, or tile	4
5. What is the residence's roof made of?	A. Straw, thatch, woven leaves, or other	0
	B. Packed earth, corrugated metal sheets, concrete slab, or tile	4
6. What toilet arrangement does the household use?	A. None/bush, or other	0
	B. Latrine, or flush toilet	9
7. Does the household have any TVs in good working order?	A. No	0
	B. Yes	7
8. Does the household have any radios (with or without cassette) or hi-fi stereos in good working order?	A. No	0
	B. Yes	5
9. Does the household have any motorcycles or scooters in good working order?	A. No	0
	B. Yes	5
10. How many cell phones does the household have in good working order?	A. None, or one	0
	B. Two or more	3

Score:

Back-page Worksheet: Household Members

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.

Record the response to the first scorecard indicator based on your knowledge of the region in which the interviewed 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. A* household *is a group of people (regardless of blood or marital relationship) who live in the same residence or compound, who eat their meals together or in small sub-groups, who share all or part of their income for the good of the entire group, and who defer in decisions regarding spending to one member of the household known as the* head.

Write down the first name/nickname and age of each member, and note who is the male head/spouse (if he exists). Record age in completed years. You need to know a member's precise age only if it may be close to 15. Mark whether each member is 15-years-old or younger. Record the number of household members in the scorecard header next to "Number of household members:". Then circle the answer to the second scorecard indicator ("How many household members are 15-years-old or younger?").

Always keep in mind and apply the detailed instructions in the "Interview Guide".

First name (or nickname)	**Age**	**15-years-old or younger?**
1.		No Yes
2.		No Yes
3.		No Yes
4.		No Yes
5.		No Yes
6.		No Yes
7.		No Yes
8.		No Yes
9.		No Yes
10.		No Yes
11.		No Yes
12.		No Yes
13.		No Yes
14.		No Yes
15.		No Yes
Number of HH members:		**Number ≤ 15:**

Look-up table to convert scores to poverty likelihoods: National poverty lines

	Poverty likelihood (%)		
	National (2016 def.)		
Score	100%	150%	200%
0–23	95.7	98.2	99.6
24–28	83.8	95.7	99.0
29–32	81.9	95.7	99.0
33–35	75.9	95.7	99.0
36–37	60.4	90.0	97.7
38–39	52.5	89.8	96.5
40–41	51.6	88.2	96.5
42–43	50.6	86.2	96.5
44–45	36.1	85.0	96.5
46–47	32.6	76.1	93.3
48–49	26.2	72.2	92.5
50–52	26.2	69.5	92.5
53–55	20.0	57.6	84.5
56–57	12.2	49.4	82.2
58–60	8.2	41.1	72.9
61–63	7.5	36.1	66.1
64–67	4.2	31.9	53.6
68–72	1.8	15.4	43.4
73–78	0.8	9.0	37.6
79–100	0.1	3.2	10.4

Look-up table to convert scores to poverty likelihoods: International 2005 and 2011 PPP lines

	Poverty likelihood (%)							
	Intl. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
Score	$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
0–23	95.4	98.2	99.5	100.0	95.4	98.5	100.0	100.0
24–28	83.4	96.7	98.9	100.0	81.7	97.5	100.0	100.0
29–32	81.2	96.7	98.9	100.0	78.9	97.5	100.0	100.0
33–35	74.0	96.7	98.9	100.0	72.0	97.5	100.0	100.0
36–37	59.0	91.6	97.1	99.8	54.7	92.4	99.8	100.0
38–39	50.7	91.6	96.4	99.6	48.5	92.4	99.2	100.0
40–41	48.9	90.9	96.4	99.6	46.6	91.3	99.0	100.0
42–43	48.9	90.0	96.4	99.6	46.6	90.1	99.0	100.0
44–45	32.2	89.7	96.4	99.6	30.7	90.1	99.0	100.0
46–47	30.5	79.0	92.7	99.6	29.0	80.5	97.8	100.0
48–49	23.3	78.3	92.0	99.5	22.1	80.5	97.8	100.0
50–52	22.4	75.3	92.0	99.4	20.1	78.1	97.8	100.0
53–55	16.6	60.3	83.3	99.2	14.9	63.7	93.3	100.0
56–57	9.5	54.5	79.6	98.2	8.7	58.1	92.9	100.0
58–60	5.9	49.0	71.2	97.4	5.7	52.8	92.9	100.0
61–63	5.9	42.1	64.6	96.1	4.1	44.2	86.2	100.0
64–67	3.5	35.5	53.6	94.0	2.9	36.3	78.4	99.8
68–72	1.6	21.4	42.5	91.8	1.6	22.7	77.2	99.5
73–78	0.8	11.5	36.4	89.1	0.8	12.9	68.4	99.5
79–100	0.1	3.4	9.8	67.0	0.1	3.9	35.8	99.2

Look-up table to convert scores to poverty likelihoods: Relative and percentile-based poverty lines

	Poverty likelihood (%)						
	Poorest 1/2	Percentile-based lines (2016 def.)					
Score	< 100% Natl.	10th	20th	40th	50th	60th	80th
0–23	75.6	45.9	69.6	94.9	95.7	97.6	98.6
24–28	57.8	25.2	54.0	76.2	85.7	91.8	97.8
29–32	43.0	18.1	37.5	73.0	83.9	90.7	97.8
33–35	31.8	11.8	24.9	65.9	81.5	87.1	97.8
36–37	26.0	8.3	19.8	48.9	65.0	77.7	94.8
38–39	18.1	3.5	11.8	41.8	59.5	72.9	94.8
40–41	14.6	2.6	11.2	39.2	59.5	72.7	93.7
42–43	14.6	2.6	10.6	39.2	55.8	69.5	92.5
44–45	11.2	2.6	8.9	25.9	38.9	60.7	92.5
46–47	9.6	2.2	7.1	24.0	36.9	52.4	84.0
48–49	3.9	0.4	2.2	20.7	30.5	46.4	83.3
50–52	2.8	0.4	1.6	17.2	30.5	43.8	82.2
53–55	2.1	0.4	1.6	11.8	25.0	36.1	69.6
56–57	1.6	0.4	1.2	6.5	17.0	27.1	65.4
58–60	1.2	0.4	0.7	4.1	11.4	18.6	57.7
61–63	1.2	0.4	0.7	3.2	7.8	14.8	48.0
64–67	0.1	0.0	0.1	2.0	6.1	12.5	40.1
68–72	0.1	0.0	0.1	1.4	2.5	5.1	25.8
73–78	0.0	0.0	0.0	0.7	0.9	2.5	16.8
79–100	0.0	0.0	0.0	0.1	0.1	0.7	3.9

Scorocs™ Simple Poverty Scorecard® Tool
Mali

1. Introduction

The Scorocs Simple Poverty Scorecard poverty-assessment tool is a low-cost, transparent way for pro-poor programs in Mali to get to know their participants better and to prove and improve 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 the 2016/17 Permanent Modular Household Survey (*Enquête Modulaire et Permanente Auprès des Ménages*, EMOP) by Mali's *Institut National de la Statistique* (INSTAT). Its questionnaire has 32 pages and covers more than 200 questions, many of which are asked for each household member. Enumerators visit each household four times at three-month intervals.

In comparison, the scorecard's indirect approach is quick and low-cost. It uses 10 verifiable indicators drawn from the 2016/17 EMOP (such as "What is the residence's floor made of?" and "What toilet arrangement does the household use?") to get a score that is correlated with poverty status as measured by the exhaustive EMOP 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 Mali. 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, Mali's national line). USAID microenterprise partners in Mali can use the scorecard with the $1.90/day 2011 PPP line to report how many of their participants are "very poor".[2] 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.

[1] The Scorocs Simple Poverty Scorecard tool for Mali is not, however, in the public domain. Copyright is held by Scorocs, L.L.C.

[2] USAID defines a household as *very poor* if its daily per-capita consumption is less than the highest of the $1.90/day 2011 PPP line in 2016/17 (XOF446, Table 1) or the line that marks the poorest half of people below 100% of the national line (XOF343).

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 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 technical approach of the scorecard 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 2016/17 EMOP from Mali's INSTAT. 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 Mali

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

The scorecard can be used to estimate three basic quantities. First, it can estimate a particular household's *poverty likelihood*, that is, the probability that the household has per-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 Mali's national poverty line and data from the 2016/17 EMOP. Scores from this one scorecard are calibrated with this same data to poverty likelihoods for 18 poverty lines.

The scorecard is constructed using data from about three-fifths of the households in the 2016/17 EMOP. Data from that same three-fifths of households is also used to calibrate scores to poverty likelihoods for the 18 poverty lines. Data from the other two-fifths of households is used to validate the scorecard's accuracy for estimating households' poverty likelihoods, for estimating populations' poverty rates at a point in time, for estimating changes in poverty rates over 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 makes 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 2016/17 (because the relationships between indicators and poverty change over time).[3]

Thus, while the indirect-scorecard approach is less costly than the direct-survey approach, the scorecard makes 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 100% of the national poverty line turns out to be about zero (0.0 percentage points). The average across all 18 poverty lines of the absolute values of the average error is about 0.9 percentage points, and the maximum of the absolute values of the average error is 3.2 percentage points. These estimation errors are due to sampling variation, not bias; the average error would be zero if the whole 2016/17 EMOP were to be repeatedly re-fielded and re-

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

divided into sub-samples before repeating the entire process of constructing and validating the resulting scorecards.

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 ± 2.5 percentage points or smaller.

The scorecard's accuracy in practice for estimating changes in poverty rates over time cannot be known; there is no data from a post-2016/17 EMOP that could be used as a follow-up to estimate change against a baseline estimated from the 2016/17 EMOP 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. Section 9 places the scorecard here in the context of related exercises for Mali. 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 Mali's 2016/17 EMOP as closely as possible. The "Interview Guide" (and the "Back-page Worksheet") are integral parts of the scorecard for Mali.

2. Data and poverty lines

This section presents the data used to construct and validate the scorecard. It also documents Mali's definition of *poverty* as well as the 18 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 5,915 households in the 2016/17 EMOP, Mali's most-recent national household consumption survey. These same three-fifths of households are also used to associate (*calibrate*) scores to poverty likelihoods for all poverty lines.

Data from the other two-fifths of households from the 2016/17 EMOP 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/calibration. Data from those same households are also used to test out-of-sample targeting accuracy.

Field work for the 2016/17 EMOP took place from 1 April 2016 to 31 March 2017. Each surveyed household was visited once every three months. The survey's measure of annual consumption combines the four quarterly measures. Data for the indicators in the scorecard come from the first visit.

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[4] 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 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 weight, and the "0" represents the second household's

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

poverty status (non-poor) or its estimated poverty likelihood. The "$1 + 1$" in the denominator is the sum of the weights of the two households. Household-level 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[5] 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 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 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 weights of the two households. A household's weight is its number of members because the unit of analysis is the household member.

[5] 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 person-level rate is then the participant-weighted average[6] 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 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 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 weights of the two households. Each household's weight is its number of participants because the unit of analysis is the participant.[7]

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, organizations should clearly state the unit of analysis—whether households, household members, or participants—and explain why that unit is relevant.

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

[7] 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.

Table 1 reports poverty lines and poverty rates for households and people in the 2016/17 EMOP for Mali as a whole and for each its nine regions by urban/rural/all.[8]

Household-level poverty rates are reported because—as shown above—household-level poverty likelihoods can be straightforwardly converted into poverty rates for other units of analysis and because sampling is almost always done at the level of households. 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 Mali. 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 in Mali as a whole on average during the 2016/17 EMOP field work) is below a given poverty line. Thus, a definition of *poverty* is a poverty line together with a measure of consumption.

Backiny-Yetna *et al.* (2009, p. 5) describe the measure of *consumption* used in Mali's 2016/17 EMOP. This measure is not comparable with that in Mali's 2001 *Enquête Malienne sur l'Évaluation de la Pauvreté* (EMEP) used by Schreiner (2008a) to make Mali's old scorecard (INSTAT, 2017; World Bank, 2015; Backiny-Yetna *et al.*,

[8] The 2016/17 EMOP did not survey any households in the region of Kidal, so the scorecard does not apply to Kidal, and no poverty figures are reported for it.

2009). Thus, estimates from the old 2001 scorecard are not comparable with those of the new 2016/17 scorecard here. As documented below, the poverty lines supported for the new scorecard are defined differently than those supported for the old 2001 scorecard.

Because pro-poor programs in Mali may want to use different or various poverty lines, this paper calibrates scores from its single scorecard to poverty likelihoods for 18 lines:

- 100% of national
- 150% of national
- 200% of national
- $1.25/day 2005 PPP
- $2.00/day 2005 PPP
- $2.50/day 2005 PPP
- $5.00/day 2005 PPP
- $1.90/day 2011 PPP
- $3.20/day 2011 PPP
- $5.50/day 2011 PPP
- $21.70/day 2011 PPP
- Line marking the poorest half of people below 100% of the national line
- First-decile (10^{th}-percentile) line
- First-quintile (20^{th}-percentile) line
- Second-quintile (40^{th}-percentile) line
- Median (50^{th}-percentile) line
- Third-quintile (60^{th}-percentile) line
- Fourth-quintile (80^{th}-percentile) line

2.3.1 National poverty line

Mali's national poverty line (usually called here "100% of the national line") is derived with the cost-of-basic-needs method (Ravallion, 1998) as the sum of a minimum standard for food consumption and a minimum standard for non-food consumption (INSTAT, 2017, p. 32; Backiny-Yetna *et al.*, 2009, pp. 11–15). The food standard is the cost of 2,450 Calories——valued for a given region at prices from the 2006 *Enquête Légère Intégrée auprès des Ménages* (ELIM)—for a food basket of 20 goods that accounts for 80 percent of food consumption in the 2001 EMEP. This food standard is then adjusted according to the change in a given region's overall Consumer Prince Index (CPI) between the 2006 ELIM and the 2010 ELIM and then for the change in that region's food-price index between the 2010 ELIM and the 2016/17 EMOP.

Mali's national (food-plus-non-food) poverty line is this minimum food standard, plus a minimum non-food standard. For a given region, this is defined as the average non-food consumption of households in the 2006 ELIM for whom total (food-plus-non-food) consumption falls in a range of plus-or-minus 5 percent of the minimum food standard. A given region's non-food standard is then adjusted according to the change that region's overall Consumer Prince Index (CPI) between the 2006 ELIM and the 2010 ELIM and then for the change in that region's non-food-price index between the 2010 ELIM and the 2016/17 EMOP.

In average prices for Mali overall during field work for the 2016/17 EMOP[9], the resulting the national (food-plus-non-food) poverty line is XOF465 (Table 1), giving a household-level poverty rate of 36.3 percent and a person-level rate of 46.8 percent.[10]

150% and 200% of the national line are multiples of 100% of the national line.

2.3.2 2005 and 2011 PPP poverty lines

International 2005 and 2011 PPP lines are derived from:

- PPP exchange rates for Mali for "individual consumption expenditure by households":
  - 2005:[11] XOF289.679 per $1.00
  - 2011:[12] XOF221.868 per $1.00
- Consumer Price Index (CPI):[13]
  - Calendar-year 2005 average: 85.860
  - Calendar-year 2011 average: 102.413
  - Average during 2016/17 EMOP field work: 108.307
- Average person-weighted price deflator for Mali overall:[14] 0.970387

2.3.2.1 $1.25/day 2005 PPP line

For a given household in Mali, the $1.25/day 2005 PPP line in average prices in Mali overall during field work for the 2016/17 EMOP is

$$\frac{\$1.25 \cdot 2005 \text{ PPP factor} \cdot \left(\frac{\text{CPI}_{\text{EMOP16/17}}}{\text{CPI}_{2005}} \right) \cdot \text{Household deflator}}{\text{Average all - Mali deflator}}.$$

[9] These time/place units of prices are assumed, as they are not documented.
[10] This person-level rate matches INSTAT (2017, p. 18), suggesting that this paper uses the same data and calculations as INSTAT.
[11] World Bank, 2008.
[12] iresearch.worldbank.org/PovcalNet/Detail.aspx?Format=Detail&C0=MLI_3&PPP0=221.868&PL0=1.90&Y0=2009&NumOfCountries=1, retrieved 1 June 2018.
[13] The monthly CPI is from data.imf.org/regular.aspx?key=61545861, retrieved 22 December 2017. It is base = 100 in calendar-year 2010.
[14] Although the documentation of the derivation of poverty lines mentions only region-level price adjustments, the data have household-level adjustments.

For the example of a household with a household-level deflator of 0.898164, the $1.25/day 2005 PPP line is

$$\frac{\$1.25 \cdot \left(\frac{\text{XOF289.679}}{\$1}\right) \cdot \left(\frac{108.307}{85.860}\right) \cdot 0.898164}{0.970387} = \text{XOF422.77}.$$

The average all-Mali $1.25/day 2005 PPP line is the person-weighted average of the household lines. This is XOF457 per person per day, with a household-level poverty rate of 34.8 percent and a person-level poverty rate of 45.2 percent (Table 1).

The lines for $2.00/day, $2.50/day, and $5.00/day 2005 PPP are multiples of the $1.25/day 2005 PPP line.

The World Bank's PovcalNet does not report poverty lines nor poverty rates for $1.25/day 2005 PPP based on the 2016/17 EMOP. Its most-recent, non-extrapolated figures are from the 2010 ELIM.

2.3.2.2 $1.90/day 2011 PPP line

Given the parameters in the previous sub-section, the $1.90/day 2011 PPP line for a given household in Mali is

$$\frac{\$1.90 \cdot 2011\,\text{PPP factor} \cdot \left(\frac{\text{CPI}_{\text{EMOP16/17}}}{\text{CPI}_{2011}}\right) \cdot \text{Household deflator}}{\text{Average all - Mali deflator}}$$

For the example of a household with a household-level deflator of 0.898164, the $1.90/day 2011 PPP line is

$$\frac{\$1.90 \cdot \left(\frac{\text{XOF}221.868}{\$1}\right) \cdot \left(\frac{108.307}{102.413}\right) \cdot 0.898164}{0.970387} = \text{XOF}412.63.$$

The all-Mali $1.90/day 2011 PPP line is the person-weighted average of the household lines. This is XOF446 per person per day, with a household-level poverty rate of 33.4 percent and a person-level poverty rate of 43.7 percent (Table 1).

The 2011 PPP poverty lines for $3.20/day, $5.50/day, and $21.70/day are multiples of the $1.90/day line.[15]

PovcalNet does not report poverty figures for $1.90/day 2011 PPP based on the 2016/17 EMOP. Its most-recent, non-extrapolated figures come from the 2010 ELIM.

2.3.3 USAID "very poor" line

Microenterprise programs in Mali that use the scorecard to report the number of their participants who are "very poor" to USAID should use the $1.90/day 2011 PPP line. This is because USAID defines the "very poor" as those people in households whose daily per-capita consumption is below the highest of the following two poverty lines (U.S. Congress, 2004):

- The line that marks the poorest half of people below 100% of the national line (XOF343, with a person-level poverty rate of 23.4 percent, Table 1)
- The $1.90/day 2011 PPP line (XOF446, with a person-level poverty rate of 43.7 percent)

[15] Jolliffe and Prydz (2016) discuss the World Bank's choice of the four 2011 PPP lines.

2.3.4 Percentile-based lines

The scorecard for Mali also supports percentile-based poverty lines.[16] This facilitates a number of types of analyses. For example, the second-quintile (40^{th}-percentile) line might be used to help track Mali'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 a "wealth index" such as that supplied with the data from the Demographic and Health Surveys (Rutstein and Johnson, 2004) to compare some estimate of wealth 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)

[16] Following the DHS wealth index, percentiles are in terms of people (not households) for Mali as a whole. For example, the all-Mali person-level poverty rate for the first-quintile (20^{th}-percentile) poverty line is 20 percent (Table 1). The household-level poverty rate for that same line is not 20 percent but rather 13.5 percent.

Unlike the scorecard, wealth indexes serve only to analyze relative wealth. Furthermore, the scorecard—unlike wealth 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 related to a poverty line defined in monetary units).

In contrast, a wealth index opaquely defines *poverty* in terms of its own indicators and points, without reference to an external standard. This means that two wealth 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 Mali, about 70 candidate indicators are initially prepared in the areas of:

- Household composition (such as the number of household members who are 15-year-old or younger)
- Education (such as whether the male head/spouse can read and write in French, Arabic, English, a national language, or some other language)
- Housing (such as the main material of the floor or roof)
- Ownership of durable assets (such as radios or TVs)

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.[17]

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 motorcycle is probably more likely to change in response to changes in poverty than is the age of the male head/spouse.

The scorecard itself is built using 100% of the national poverty 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).

[17] 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 round. 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[18] 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 Mali. Segmenting poverty-assessment tools by urban/rural does not improve targeting accuracy much. This is documented for Mali and eight other countries in Sub-Saharan Africa (Brown, Ravaillon, and van de Walle, 2016)[19], for Mali by Emmerling (2012), 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, segmentation 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).

[18] 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.
[19] The eight other countries are Burkina Faso, Ethiopia, Ghana, Malawi, 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 correctly 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" (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 new scorecard for Mali 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 seems to them to make sense.

To this end, Mali'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 Mali's scorecard would:

- Record the interview identifier, interview date, country code ("MLI"), scorecard code ("002") 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 who is the participant's main point of contact with the organization (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)
- Complete the "Back-page Worksheet" with each household member's first name (or nickname), age, and whether the age is 15 or younger
- Based on the "Back-page Worksheet", record household size (that is, the number of household members) in the scorecard header next to "Number of household members:"
- Mark the response to the first scorecard indicator ("In what region does the household live?") based on the enumerator's knowledge of the region where the interviewed household lives
- Based on the "Back-page Worksheet", mark the response to the second scorecard indicator ("How many household members are 15-years-old or younger?")
- Read the rest of the scorecard indicators to the respondent one-by-one. Circle each of the responses and their 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
- 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).[20] IRIS Center (2007a) 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.

[20] If a program does not want field workers or respondents to know the points associated with responses, then it can give them a version of the 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 response options 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 in this paper, as this "Interview Guide"—along with the "Back-page Worksheet"—is an integral part of the scorecard.[21]

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 Mali.

[21] The guidelines here are the only ones that organizations should give to field workers. All other issues of interpretation should be left to the judgment of field workers and respondents, as this seems to be what Mali's INSTAT did in the 2016/17 EMOP.

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 and that the use of the scorecard will 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, on-label way to do interviews: in-person, at the sampled household's residence, and with an enumerator trained to follow the "Interview Guide". This is how Mali's INSTAT did interviews in the 2016/17 EMOP, 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, respondents fill out paper or web forms on their own or 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, an enumerator interviewing by phone)

While such off-label 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 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—the organization might judge that the lower costs an off-label 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 an off-label method should do a test to check how responses differ with the off-label method versus with a trained enumerator at the residence.

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
- Portable electronic devices in the field, and then uploaded to a database[22]

[22] The author of this paper can support organizations that want to set up a system to collect data with portable electronic devices in the field or to capture data in a database at the office once paper forms come in from the field. Support is also available for automating the calculation of estimates as well as for reporting and analysis.

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 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.

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 worker 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 set of participants from the same population
- With the same set of participants

An example set of choices is illustrated by BRAC and ASA, two microfinance organizations in Bangladesh who each have about 7 million participants and who 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 Mali, 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 100% of the national line, scores of 42–43 have a poverty likelihood of 50.6 percent, and scores of 44–45 have a poverty likelihood of 36.1 percent (Table 3).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 42–43 are associated with a poverty likelihood of 50.6 percent for 100% of the national line but of 46.6 percent for the $1.90/day 2011 PPP line.[23]

[23] From Table 3 on, many tables have 18 versions, one for each of the 18 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 100% of the national line.

5.1 Calibrating scores with poverty likelihoods

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

For the example of 100% of the national line (Table 4), there are 4,023 (normalized) households in the calibration sub-sample with a score of 42–43. Of these, 2,034 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 42–43 is then 50.6 percent, because 2,034 ÷ 4,023 = 50.6 percent.

To illustrate with 100% of the national line and a score of 44–45, there are 4,538 (normalized) households in the calibration sub-sample, of whom 1,637 (normalized) are below the line (Table 4). The poverty likelihood for this score range is then 1,637 ÷ 4,538 = 36.1 percent.

The same method is used to calibrate scores with estimated poverty likelihoods for all 18 poverty lines.[24]

[24] 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.

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 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 Mali's scorecard are transformed coefficients from a Logit regression, (untransformed) scores are not converted to poverty likelihoods via the Logit formula of $2.718281828^{\text{score}} \times (1 + 2.718281828^{\text{score}})^{-1}$. 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 calibration sample who are below a poverty line. Going from scores to poverty likelihoods in this way requires no arithmetic at all, just a look-up table. This approach to calibration can also improve accuracy, especially with large samples.

5.2 Accuracy of estimates of households' poverty likelihoods

As long as the relationships between indicators and poverty do not change over time, and as long as the scorecard is applied to 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 estimate 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.[25]

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 Mali's population. Thus, scorecard estimates will generally have errors when applied after March 2017 (the last month of field work for the 2016/17 EMOP) or when applied with sub-groups that are not nationally representative.

[25] 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 Mali 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 and 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 100% of the national line and on average across bootstrap samples from the validation sample, the estimated poverty likelihood for scores of 42–43 (50.6 percent, Table 3) is too high by 2.3 percentage points. For scores of 44–45, the estimate is too high by 9.6 percentage points.[26]

[26] 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 42–43 is ±3.7 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 –1.4 and +6.0 percentage points (because +2.3 – 3.7 = –1.4, and +2.3 + 3.7 = +6.0). In 950 of 1,000 bootstraps (95 percent), the difference is +2.3 ± 4.3 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is +2.3 ± 5.8 percentage points.

Some of the absolute errors between estimated and observed poverty likelihoods in Table 5 for 100% of the national 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/calibration sub-sample and from the population of Mali. 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 2016/17 in Mali, 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 EMOP field work in March 2017. That is, the scorecard may fit the construction/calibration data from 2016/17 so closely that it captures not only some real patterns that exist in the population of Mali but also some random patterns that, due to sampling variation, show up only in the 2016/17 EMOP construction/calibration data. 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 here does this. Combining scorecards can also reduce overfitting, at the cost of greater complexity.

Most errors in individual households' likelihoods do balance out in the estimates of 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 areas. 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 2019 and that they have scores of 20, 30, and 40, corresponding to estimated poverty likelihoods of 95.7, 81.9, and 51.6 percent (100% of the national line, Table 3). The population's estimated poverty rate is the households' average poverty likelihood of $(95.7 + 81.9 + 51.6) \div 3 = 76.4$ percent.[27]

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 81.9 percent. This differs from the 76.4 percent found as the average of the three individual poverty likelihoods associated with each of the three scores. Unlike poverty likelihoods, scores are ordinal symbols, like letters in the alphabet or colors in the spectrum. Because scores are not cardinal numbers, they cannot 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 appropriate, but, in general, the

[27] 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.

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 2016/17 EMOP for all 18 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 100% of the national 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 about zero (0.0 percentage points in Table 7, which summarizes Table 6 across all poverty lines). For the 18 poverty lines in the validation sample, the maximum of the absolute values of the error is 3.2 percentage points, and the average of the absolute values of the average error is about 0.9 percentage points. At least part of these differences is due to sampling variation in the division of the 2016/17 EMOP 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 100% of the national line in the validation sample, the error happens to be about zero (0.0 percentage points), so the corrected estimate in the three-household example above is 76.4 – (0.0) = 76.4 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). 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 100% of the national line is 76.4 percent. Then estimates in 90 percent of such samples would be expected to fall in the range of 76.4 – (0.0) – 0.6 = 75.8 percent to 76.4 – (0.0) + 0.6 = 77.0 percent, with the most likely observed value being the corrected estimate in the middle of this range, that is, 76.4 – (0.0) = 76.4 percent. This is because the original (uncorrected) estimate is 76.4 percent, the average error happens to be about zero (0.0 percentage points), and the 90-percent confidence interval for 100% of the national line in the validation sample with this sample size is ±0.6 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).

Schreiner (2008b) 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, Mali's 2016/17 EMOP gives a direct-measure household-level poverty rate for 100% of the national line of $\hat{p} = 36.3$ percent (Table 1).[28] If this measure came from a sample of $n = 16{,}384$ households from a population N of 2,271,959 (the number of households in Mali in 2016/17 according to the EMOP sampling weights), then the finite population correction ϕ is $\sqrt{\frac{2{,}271{,}959 - 16{,}384}{2{,}271{,}959 - 1}} = 0.9964$, which is very close to $\phi = 1$. If the desired confidence level is 90-percent ($z = 1.64$), then the confidence interval $\pm c$ is

$$\pm z \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} = \pm 1.64 \cdot \sqrt{\frac{0.363 \cdot (1 - 0.363)}{16{,}384}} \cdot \sqrt{\frac{2{,}271{,}959 - 16{,}384}{2{,}271{,}959 - 1}} = \pm 0.614$$

percentage points. If ϕ were taken as 1, then the interval is ± 0.616 percentage points.

Unlike the 2016/17 EMOP, 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 100% of the national line in the validation sample, the 90-percent confidence interval is ± 0.611 percentage points.[29]

Thus, the 90-percent confidence interval with $n = 16{,}384$ is ± 0.611 percentage points for the scorecard and ± 0.616 percentage points for direct measurement. The ratio of the two intervals is $0.611 \div 0.616 = 0.99$.

[28] The analysis here ignores that poverty-rate estimates from the EMOP are themselves based on a sample and so have their own sampling distribution.
[29] Due to rounding, Table 6 displays 0.6, not 0.611.

Now consider the same exercise, but with $n = 8{,}192$. The confidence interval under direct measurement and 100% of the national line in the validation sample is $\pm 1.64 \cdot \sqrt{\frac{0.363 \cdot (1 - 0.363)}{8{,}192}} \cdot \sqrt{\frac{2{,}271{,}959 - 8{,}192}{2{,}271{,}959 - 1}} = \pm 0.870$ percentage points. The empirical confidence interval with the scorecard (Table 6) is ±0.871 percentage points. Thus for $n = 8{,}192$, the ratio of the two intervals is $0.871 \div 0.870 = 1.00$.

This ratio of 1.00 for $n = 8{,}192$ is close to the ratio of 0.99 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 0.98. This implies that confidence intervals for indirect estimates of poverty rates via Mali's scorecard and 100% of the national line are—for a given sample size—about the same as the confidence intervals for direct estimates via the 2016/17 EMOP. This 0.98 appears in Table 7 as the "α factor for precision" because if $\alpha = 0.98$, 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 13 of the 18 poverty lines in Table 7, and its highest value is 1.11.

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 $\tilde{p}$

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 2,271,959 (the number of households in Mali in 2016/17), suppose $c = 0.04633$, $z = 1.64$ (90-percent confidence), and the relevant poverty line is 100% of the national line so that the most sensible expected poverty rate $\widetilde{p}$ is Mali's overall poverty rate for that line in 2016/17 (36.3 percent at the household level, Table 1). The α factor is 0.98 (Table 7). Then the sample-size formula gives

$$n = 2{,}271{,}959 \cdot \left(\frac{1.64^2 \cdot 0.98^2 \cdot 0.363 \cdot (1 - 0.363)}{1.64^2 \cdot 0.98^2 \cdot 0.363 \cdot (1 - 0.363) + 0.04633^2 \cdot (2{,}271{,}959 - 1)} \right) = 279,$$ which not too far from the sample size of 256 observed for these parameters in Table 6 for 100% of the national line. Taking the finite population correction factor ϕ as one (1) gives the same result, as $n = \left(\frac{0.98 \cdot 1.64}{0.04633} \right)^2 \cdot 0.363 \cdot (1 - 0.363) = 279$.[30]

[30] Although USAID has not specified confidence levels nor intervals, IRIS Center (2007a and 2007b) says that a sample size of $n = 300$ is sufficient for USAID reporting. USAID's microenterprise partners in Mali should report using the $1.90/day 2011 PPP

Of course, the α factors in Table 7 are specific to Mali, 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 EMOP in March 2017, a program would select a poverty line (say, 100% of the national line), 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 100% of the national line for Mali of 36.3 percent in the 2016/17 EMOP in Table 1), look up α (here, 0.98 in Table 7), assume that the scorecard will still work in the future and for sub-groups that are not nationally representative,[31] and then compute the required sample size. In this illustration, $n = 10{,}000 \cdot \left(\frac{1.64^2 \cdot 0.98^2 \cdot 0.363 \cdot (1 - 0.363)}{1.64^2 \cdot 0.98^2 \cdot 0.363 \cdot (1 - 0.363) + 0.02^2 \cdot (10{,}000 - 1)} \right) = 1{,}300.$

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line. Given the α factor of 1.00 for this line (Table 7), an expected before-measurement household-level poverty rate of 33.4 percent (the all-Mali rate for this line in 2016/17, Table 1), and a confidence level of 90 percent ($z = 1.64$), then $n = 300$ implies a confidence interval of $\pm 1.64 \cdot 1.00 \cdot \sqrt{\frac{0.334 \cdot (1 - 0.334)}{300}} = \pm 4.5$ percentage points.

[31] 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 March 2017 will resemble that in the 2016/17 EMOP 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 are not tested here[32], and this paper can only suggest approximate formulas for standard errors. Nonetheless, the relevant concepts are presented here because in practice pro-poor organizations in Mali 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 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 only if there is some way to

[32] In particular, the accuracy of estimates of change over time from the new scorecard cannot estimated with data from the 2016/17 validation sample and from the 2001 EMEP because the two surveys use different definitions of *poverty*.

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 2019, an organization samples three households who score 20, 30, and 40 and so have poverty likelihoods of 95.7, 81.9, and 51.6 percent (100% of the national line, Table 3). Given the known average error for this line in the validation sample of about zero (0.0 percentage points, Table 7), the corrected baseline estimated poverty rate is the households' average poverty likelihood of [(95.7 + 81.9 + 51.6) ÷ 3] – (0.0) = 76.4 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
- *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 2022, 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 83.8, 75.9, and 36.1 percent, 100% of the national line, Table 3). Adjusting for the known average error, the average poverty likelihood at

follow-up is [(83.8 + 75.9 + 36.1) ÷ 3] – (0.0) = 65.3 percent. The reduction in the poverty rate is then 76.4 – 65.3 = 11.1 percentage points.[33] 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 11.1 ÷ 3 = 3.7 percentage points per year. That is, about one in 27 participants in this hypothetical example cross the poverty line each year.[34] Among those who start below the line, about one in 21 (3.7 ÷ 76.4 = 4.8 percent) on net end up above the line each year.[35]

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 2022. Given scores of 25, 35, and 45, their follow-up poverty likelihoods are 83.8, 75.9, and 36.1 percent. The average across households of the difference in each given household's baseline poverty likelihood and its follow-up poverty likelihood is [(95.7 – 83.8) + (81.9 – 75.9) + (51.6 – 36.1)] ÷ 3 = 11.1 percentage points.[36] 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) 11.1 ÷ 3 = 3.7 percentage points per year.

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

[33] 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.
[34] This is a net figure; some start above the line and end below it, and vice versa.
[35] The scorecard does not reveal the reasons for this change.
[36] With one sample scored twice, the error for this line in Table 7 should *not* be subtracted off.

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,[37] 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.

[37] 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 previously estimated 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 Mali (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 100% of the national line, $\alpha = 1.08$, $\widetilde{p} = 0.363$ (the household-level poverty rate in 2016/17 for 100% of the national 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

$n = 2 \cdot \left(\frac{1.08 \cdot 1.64}{0.02} \right)^2 \cdot 0.363 \cdot (1 - 0.363) \cdot 1 = 3{,}628$, and the follow-up sample size is also 3,628.

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:[38]

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

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 estimation) of the expected shares of all households who will cross the poverty line $\tilde{p}_{12}$ and $\tilde{p}_{21}$. Before estimation, 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:

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

[38] 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 Mali scorecard is applied twice (once after March 2017 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 is as reasonable as any other assumption for α for the Mali scorecard here (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 100% of the national line, the sample will first be scored in 2019 and then again in 2022 ($y = 3$), 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_{2019} is taken as 36.3 percent (Table 1), and α is assumed to be 1.14. Then the baseline sample size is

$n = 2 \cdot \left(\frac{1.14 \cdot 1.64}{0.02} \right)^2 \cdot \{-0.01 + 0.016 \cdot 3 + [0.56 \cdot 0.363 \cdot (1 - 0.363)]\} \cdot 1 = 2{,}928$. The same group of 2,928 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*,[39] 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.

[39] Other labels are 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 total net benefits (Adams and Hand, 2000; Hoadley and Oliver, 1998).

Table 9 shows the distribution of households by targeting outcome for Mali. For an example cut-off of 43 or less, outcomes for 100% of the national line in the validation sample are:

- Inclusion: 27.4 percent are below the line and correctly targeted
- Undercoverage: 8.9 percent are below the line and mistakenly not targeted
- Leakage: 10.8 percent are above the line and mistakenly targeted
- Exclusion: 52.9 percent are above the line and correctly not targeted

Increasing the cut-off to 45 or less improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 29.0 percent are below the line and correctly targeted
- Undercoverage: 7.2 percent are below the line and mistakenly not targeted
- Leakage: 14.1 percent are above the line and mistakenly targeted
- Exclusion: 49.6 percent are above the line and correctly not targeted

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

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

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

- Assign benefits and costs to possible outcomes, based on its values and mission
- Tally total net benefits for each cut-off using 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 100% of the national line in the validation sample, total net benefit under the hit rate is highest (80.9) for a cut-off of 39 or less, with about four in five households in Mali 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).[40]

[40] 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|) x [100 ÷ (Inclusion + Undercoverage)]. Schreiner (2014b) explains why BPAC does not add information over-and-above that provided by the other, more-standard, 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 100% of the national line, targeting households who score 43 or less would target 38.2 percent of all households (second column) and would be associated with an estimated poverty rate among those targeted of 71.8 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 100% of the national line with the validation sample and a cut-off of 43 or less, 75.5 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 100% of the national line with the validation sample and a cut-off of 43 or less, covering about 2.5 poor households means leaking to 1 non-poor household.

9. Context of poverty-assessment tools in Mali

This section discusses four existing poverty-assessment tools for Mali in terms of their goals, methods, definitions of *poverty*, data, indicators, errors, precision, and cost. In general, the strengths of the scorecard are its:

- Using data from the most-recent nationally representative consumption survey
- Having fewer and lower-cost indicators
- Using a consumption-based definition of *poverty* that is widely understood and that is used by the government of Mali
- Reporting errors and precision for estimates of poverty rates at a point in time from out-of-sample tests, including formulas for approximate standard errors
- Reporting targeting accuracy from out-of-sample tests, and having targeting accuracy that is similar to that of alternative approaches
- Being feasible for pro-poor programs in Mali, due to its low cost and transparency

9.1 Gwatkin *et al.*

Gwatkin *et al.* (2007) construct a poverty-assessment tool for Mali with an approach that they use in 56 countries with Demographic and Health Surveys (Rutstein and Johnson, 2004). They use Principal Component Analysis to make an asset index from low-cost indicators available for the 12,331 households in Mali's 2001 DHS.[41] The PCA index is like the scorecard here except that—because the DHS does not collect data on consumption—the index uses a different (asset-based) definition of *poverty*, its accuracy vis-à-vis consumption-based poverty is unknown, and it can only be assumed

[41] DHS data for Mali since 1995/6 include each household's asset-index value (`dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm`, retrieved 31 May 2018).

to be a proxy for long-term wealth/economic status.[42] Well-known examples of the PCA asset-index approach include Stifel and Christiaensen (2007), Zeller *et al.* (2006), Sahn and Stifel (2003 and 2000), Henry *et al.* (2003), and Filmer and Pritchett (2001).

The 19 indicators in Gwatkin *et al.* are similar to those in the scorecard in terms of their ease-of-collection and verifiability:

- Characteristics of the residence:
  - — Presence of electricity
  - — Type of floor
  - — Source of drinking water
  - — Type of cooking fuel
  - — Type of toilet arrangement
- Ownership of consumer durables:
  - — Radios
  - — Televisions
  - — Refrigerators
  - — Telephones
  - — Bicycles
  - — Motorcycles or scooters
  - — Cars or trucks
  - — Horse-drawn carts
  - — Wheelbarrows
  - — Plows
- Ownership of livestock:
  - — Horses
  - — Donkeys
- Employment of a domestic worker not related to the head
- Whether a household member works his/her own or family's agricultural land

[42] Nevertheless, the indicators are similar and the "flat maximum" is important, so carefully built PCA indexes and consumption-based poverty-assessment tools rank households much the same and may pick up the same underlying construct (perhaps "permanent income", see Bollen, Glanville, and Stecklov, 2007). Comparisons of rankings of households by PCA indexes, directly-measured consumption, and consumption-based poverty-assessment tools include Ngo and Christiaensen (2018), Filmer and Scott (2012), Howe *et al.* (2009), Lindelow (2006), Sahn and Stifel (2003), Wagstaff and Watanabe (2003), and Montgomery *et al.* (2000).

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

- Segmenting households by the quintile of their index value to see how health varies with socio-economic status
- Monitoring (via exit surveys) how well local health-service posts reach the poor
- Estimating local coverage of health services via small-scale surveys

The first goal is segmentation, and the last two goals deal with performance monitoring, so in those ways the asset index would be used much like the scorecard. In particular, the scorecard's support for relative (percentile-based) poverty lines allows for the segmentation of households by quintile of consumption to see how health (or other things) vary with consumption. Of course, it is also possible to segment households by quintiles based on scores from the scorecard to see how health (or other things) vary with wealth.

The Gwatkin *et al.* index is more costly and difficult-to-use than the scorecard. The index has 19 indicators (versus 10), and while the scorecard requires adding up 10 integers (some of them usually zeroes), Gwatkin *et al.*'s index requires adding up 59 numbers, each with five decimal places and most with negative signs.

A strength of asset indexes is that, because they do not require consumption data, they can be constructed with data from a wide array of "light" surveys such as censuses, Demographic and Health Surveys, Welfare Monitoring Surveys, and Core Welfare Indicator Questionnaires. In comparison, the scorecard is linked directly to a consumption-based poverty line. Thus, while both approaches can rank households based on the internal definitions of *poverty* implied by their paricular indicators and

points, only the scorecard can also estimate consumption-based poverty status based on externally-defined poverty lines.

In essence, Gwatkin *et al.*—like all asset indexes—define *poverty* in terms of the indicators and points in the index itself. Thus, the index is not a proxy standing in for something else (such as consumption). Rather, it is a direct measure of an asset-based (non-consumption-based) definition of *poverty*. There is nothing wrong—and a lot right—about defining *poverty* in this way, but it is not as common as a consumption-based definition. It also means that results are not comparable across different asset indexes because the definition of *poverty* varies with a given index's indicators and points. And an asset index can estimate only the direction of change in its definition of *poverty* over time, not the magnitude of change (or at least not in units with a straightforward interpretation).

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

- Asset ownership is easier to measure accurately than consumption
- Access to resources in the long term—and thus capacity to produce income and to consume—depends on the control of assets
- Assets get at specific capabilities more directly, the difference between, say, "Can you afford adequate sanitation on your income?" versus "Do you have a flush toilet?"

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

9.2 Sahn and Stifel (2000)

Sahn and Stifel (2000) use factor analysis (a close relative of PCA that gives similar results) to construct an asset index for Mali meant to measure poverty in terms of long-term wealth. Their purpose relates to assessment (to inform governments and donors about the broad progress of poverty reduction in Africa) rather than accountability and management (to help pro-poor organizations prove and improve their social performance).

Sahn and Stifel construct their index by pooling data from Mali's DHS in 1987 and 2005/6. Defining poverty status according to lines set at the 25^{th} and 40^{th} percentiles of their index, they then compare the distribution of the index and poverty rates over time (within Mali) and across countries (Mali and 10 other sub-Saharan countries).

For the cross-country analysis, Sahn and Stifel construct a single cross-country index from pooled DHS data for 11 countries—including Mali—with multiple DHS

rounds (plus five others for which only a single DHS round is available). Pooling is possible because the DHS generally uses a common set of indicators.

The eight indicators in Sahn and Stifel are similar to those in Gwatkin *et al.* and in the scorecard here in terms of their ease-of-collection and verifiability:

- Education of the head
- Characteristics of the residence:
  - Type of floor
  - Source of drinking water
  - Type of toilet arrangement
- Ownership of consumer durables:
  - Radio
  - Television
  - Refrigerator
  - Motorized transport

Like Gwatkin *et al.*, Sahn and Stifel share many of the strengths of the approach here in that it can be used for targeting and in that it is flexible, low-cost, and adaptable to diverse contexts. Sahn and Stifel point out that because an asset index does not require price adjustments over time or between countries—and because it does not require consumption data at all—it has lower data requirements than consumption-based poverty-assessment tools.

Sahn and Stifel also share with Gwatkin *et al.* the disadvantages of using a less-common definition of *poverty*, being more difficult to compute and to interpret, and of not reporting standard errors.

Sahn and Stifle find that poverty in Mali showed a "substantial drop" from 1987 to 2005/6. Among the 15 countries in the pooled data-analysis,[43] Mali had the sixth-lowest poverty by the 25th-percentile line and the tenth-lowest poverty by the 40th-percentile line.

Booysen *et al.* (2008) closely follow Sahn and Stifel (2000), constructing asset indexes from the DHS for Mali of 1987, 1995/6, and 2001 using seven of the eight indicators in Sahn and Stifel (2000). They find that asset-based poverty fell in Mali from 1987 to 1995/6 and also from 1995/6 to 2001, as well as that Mali had the second-worst poverty among the seven countries studied.[44] Booysen *et al.* differ from Sahn and Stifel (2000) mostly in their use Multiple Correspondence Analysis instead of factor analysis. MCA is PCA, without the assumption that indicators have Normal distributions. In principle, this makes MCA better suited for categorical indicators, although Booysen *et al.* do not show that this makes any difference for the results.

9.3 Brown, Ravallion, and van de Walle

Brown *et al.* (2016) study the targeting accuracy of poverty-assessment tools for nine countries in Sub-Saharan Africa, including Mali. When the share of people who are targeted is the same as the share of people who are poor, average inclusion across the

[43] Besides Mali, these are Benin, Cameroon, Central African Republic, Comoros, Côte d'Ivoire, Ghana, Kenya, Mozambique, Senegal, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.
[44] Besides Mali, these are Ghana, Kenya, Senegal, Tanzania, Zambia, and Zimbabwe.

nine countries is highest for their "Extended proxy-means" tool[45] that regresses the logarithm of per-capita consumption on 47 low-cost, verifiable indicators that are commonly used in poverty-assessment tools:

- Household demographics:
  - Number of household members
  - Share of household members by age and sex:
    - Girls ages 5 or younger
    - Boys ages 5 or younger
    - Girls ages 6 to 14
    - Boys ages 6 to 14
    - Women ages 65 or older
    - Men ages 65 or older
    - Widows of any age
    - Disabled women ages 15 or older
    - Disabled men ages 15 or older
    - Orphaned girls ages 14 or younger
    - Orphaned boys ages 14 or younger

[45] If people are targeted because their estimated consumption is below a poverty line, then Brown *et al.*'s "Extended poverty quantile" tool is the best in terms of the difference between the share of the poor who are targeted and the share of the non-poor who are targeted. In this same targeting set-up, "Extended centered-quantile" and "Extended proxy-means" are the best in terms of reducing the head-count poverty rate with a uniform cash transfer set at the aggregate poverty gap divided by the number of pre-transfer poor people. In practice, however, targeting in this way lets the statistical tail wag the policy dog and can lead to nonsense (such as Brown *et al.*'s "Basic proxy-means" tool not targeting anyone in Mali because it estimates that no one has consumption below the first-quintile/20th-percentile poverty line). It makes more sense to target people when their estimated consumption (or their score) is below a given percentile of the distribution of estimated consumption (or of the distribution of scores). This allows policy—not the statistical tool—to determine how many people are targeted.

  - Characteristics of the head of the household:
    - Sex
    - Age
    - Marital status
    - Highest level of education completed
  - Highest level of education completed by any household member
  - Whether the head is a female who is single/never-married, widowed, or divorced/separated
- Characteristics of residence:
  - Presence of electricity
  - Type of floor
  - Type of wall
  - Type of roof
  - Type of cooking fuel
  - Source of drinking water
  - Type of toilet arrangement
  - Number of people per room
- Employment status of head
- Ownership of durable assets:
  - Dwelling
  - Electrical generator
  - Stove of any type
  - Refrigerator or freezer
  - Air conditioner or fan
  - Sewing machine
  - Iron
  - Radio
  - Television
  - Video player
  - Satellite dish
  - Bicycle
  - Motorcycle/scooter
  - Car or truck
  - Land-line telephone
  - Cellular telephone
  - Computer
- Location of residence:
  - Region
  - Urban/rural
- Month in which the household is surveyed

For Mali, Brown *et al.* construct and test tools at the level of people with data from 3,212 households from the 2014 *Enquête Agricole de Conjoncture Intégrée aux Conditions de Vie des Ménages* (ECI, Living Standards Measurement Study—Integrated Survey of Agriculture). For Mali and with the first-quintile (20^{th}-percentile) poverty line when targeting 20 percent of people, inclusion for the "Extended proxy-means" tool is 8.6 percent. For the second-quintile (40^{th}-percentile) poverty line when targeting 40 percent of people, inclusion is 26.4 percent. For Mali (but not for other countries), Brown *et al.*'s "Stepwise regression" tool is more accurate than "Extended proxy-means", with inclusion of 10.2 and 27.2 percent.

How does this compare with Mali's new scorecard? The figures in Tables 9 and 10 for the relevant poverty lines are not comparable with those in Brown *et al.* because they are:

- Based on the 2016/17 EMOP, not the 2014 ECI
- At the level of households, not people
- Out-of-sample, not in-sample

If the scorecard's points are re-derived at the person level (keeping the same 10 indicators) using the entire 2016/17 EMOP, and if the scorecard is tested in-sample at the person-level, then its inclusion is 11.6 and 29.4 percent, better than all of Brown *et al.*'s tools for Mali with the 2014 ECI and also better than the average across their nine countries for the "Extended proxy-means" tool (10.9 and 28.3 percent).

Of course, it may be easier to target with the 2016/17 EMOP than with the 2014 ECI, so this test is not conclusive for Mali, let alone in general. And the scorecard's

targeting accuracy for Mali still is similar to that typical in Brown *et al.* Thus, the results here for Mali do not change Brown *et al.*'s main conclusion that a basic-income scheme or an extremely simple demographic tool with one or two indicators can do almost as well as a more-complex tool in terms of reducing the person-level poverty rate. It does show, however, that a 10-indicator scorecard can do as well as a 57-indicator tool.

The results are also inconsistent with Brown *et al.*'s finding that accuracy is much lower for tools—such as the scorecard—that estimate poor/non-poor status (rather than the level of consumption).[46] Unusually low accuracy is also inconsistent with the "flat max" and with Emmerling's (2012) results for Mali.

9.4 Emmerling

Emmerling (2012) seeks "to develop an improved method of targeting the poor in social-protection programs in Mali . . . [because the efficiency of] existing social-protection programs . . . is limited due to mostly *ad hoc* (or a total lack of meaningful) targeting schemes" (p. 1). Like Brown *et al.*, he tests various statistical approaches, but only for Mali using data from 9,235 households from the 2010 ELIM.

[46] The reasons for the unusually high errors found by Brown *et al.* are unknown. If one or more categorical response options are highly lop-sided, then a poor/non-poor tool may be barely estimable and might target everyone or no one. Or the probability threshold for targeting may be too high or too low, or perhaps the share targeted is not held constant.

Emmerling's "Baseline model" is a regression of the logarithm of per-capita consumption on 80 indicators. Consistent with the flat maximum, he finds that R^2 (a measure of how well a tool fits the construction data) is 0.56 with 80 indicators and 0.55 with the 24 indicators in his "Baseline model":

- Household demographics:
  - Whether the ratio of the number all household members divided by the number of working household members exceeds two (2)
  - Overall number of household members
  - Number of household members older than 60
  - Number of household members ages 0 to 16
- Education:
  - Whether the head of the household completed secondary school
  - Whether the spouse of the head of the household completed secondary school
- Employment:
  - Whether any household member works in agriculture
  - Whether any household member is unemployed
- Characteristics of residence:
  - Presence of electricity
  - Type of floor
  - Type of wall
  - Source of drinking water
  - Type of toilet arrangement
  - Number of household members per sleeping room
- Ownership of durable assets:
  - Refrigerator
  - Air conditioner
  - Television
  - Canoe
  - Motorcycle
  - Automobile
  - Computer
  - Camel
- Location of residence:
  - Region
  - Urban/rural

Emmerling also tests five variants on this 24-indicator, all-Mali "Baseline" tool that estimates household consumption with ordinary-least squares:

- Baseline plus indicators for Mali's 49 *cercles*
- Baseline segmented into two tools, urban-only and rural-only
- Baseline segmented into nine region-specific tools
- Baseline that estimates consumption as a quantile regression
- Baseline that estimates poor/non-poor status as a Probit regression (much like the scorecard's Logit)

Emmerling focuses on in-sample accuracy when a household is targeted if its estimated consumption is below Mali's food poverty line (with an all-Mali person-level poverty rate in the 2010 ELIM of 22.1 percent) or below Mali's national line (with a poverty rate of 43.6 percent). But targeting a household because its estimated consumption is below a poverty line—rather than because its estimated consumption (or its score) is below a given percentile in the distribution of estimated consumption (or of the distribution of scores)—means that each tool targets a different number of people. Thus, some tools have better inclusion (but worse exclusion) than others, and Emmerling (like Brown *et al.*) does not provide a way to evaluate these trade-offs. Thus, their cross-tool comparisons of targeting accuracy are uninformative.[47]

[47] The cross-tool comparisons in McBride and Austin (2016) have the same issue.

Fortunately, Emmerling (like Brown *et al.*) also reports in-sample accuracy when targeting people scoring below the 22.1st percentile and the 43.6th percentile of estimated consumption. These results can be meaningfully compared across tools, and they turn out to be consistent with well-known properties of poverty-assessment tools:

- Targeting accuracy varies little across statistical approaches
- Targeting accuracy improves only slightly when segmenting tools by urban/rural
- Finer segmentation can improve in-sample accuracy (at the risk of over-fitting)

In the case where the poverty rate is 22.1 percent and the lowest-scoring 22.1 percent of people are targeted, inclusion for Emmerling's tools varies from 13.2 and 14.1 percent, with the highest accuracy for the "*cercle*" tool (that is, the tool with the greatest risk of being overfit). The other five variants have inclusion between 13.3 and 13.6 percent, so the statistical approach and segmentation do not matter much.

When the poverty rate is 43.6 percent and the lowest-scoring 43.6 percent of people are targeted, the "*cercle*" tool again has the highest inclusion (33.5 percent) while the other five vary from 32.5 to 33.0 percent. Accounting for the risk of overfitting, the statistical approach and segmentation again hardly matter.[48]

[48] Emmerling reports some out-of-sample tests, but they do not hold the share of people targeted constant and so do not say much about overfitting for the "*cercle*" tool.

How does this accuracy (in-sample, at the person-level, in the 2010 ELIM) compare with that of Mali's new scorecard in the 2016/17 EMOP? For a scorecard that is re-estimated at the person-level and applied with poverty lines with person-level rates of 22.1 and 43.6 percent (and that same share being targeted), inclusion is 13.1 and 33.1 percent. This is about 0.5 percentage points worse than Emmerling for the food line and about 1 percentage point worse for the national line.

Of course, targeting in the 2016/17 EMOP may not be equivalent to targeting in the 2010 ELIM, so the main result of the comparison—which applies to Brown *et al.* as well—is that most poverty-assessment tools have similar targeting accuracy regardless of the number of indicators, the statistical estimation technique, and the use of segmented tools.

10. Summary

The scorecard helps pro-poor programs in Mali to get to know their participants better and so prove and improve their social performance. It 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 Mali 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 Mali's 2016/17 EMOP. Those households' scores are then calibrated to poverty likelihoods for 18 poverty lines. The scorecard's accuracy (errors and standard errors) is tested out-of-sample on data that is not used in scorecard construction.

When the scorecard is applied to the 18 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 3.2 percentage points, and the average of the absolute values of the average error across the 18 lines is about 0.9 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 precision of point-in-time estimates of poverty rates is ± 0.6 percentage points or better. With $n = 1{,}024$, the 90-percent confidence intervals are ± 2.5 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 the targeting cut-off that best 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 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 Mali 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:

Institut National de la Statistique. (2016) « Enquête Modulaire et Permanente auprès des Ménages (EMOP 2016–17): Manuel de l'Agent Enquêteur » [the *Manual*].

Basic interview instructions

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 appropriate answer based on your knowledge of the region in which the interviewed household lives.

Do not directly ask the second scorecard indicator ("How many household members are 15-years-old or younger?"). Instead, fill in the appropriate answer based on the number of household members who are 15-years-old or younger that you have listed on the "Back-page Worksheet".

Ask all of the other 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 same person as 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 is doing the interview. Rather, the "field agent" is the employee of the pro-poor program with whom the participant has an on-going relationship. If the program does not have such a field agent, then the relevant spaces in the scorecard header may be left blank.

Read each question word-for-word, in the order presented in the scorecard. Do not read the response options aloud.

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:

4. What is the residence's floor made of?	A. Dirt/sand, or other	0	
	B. Dung	1	1
	C. Concrete with cement veneer, or tile	4	

To help to reduce transcription errors, you should circle the response option, the points printed on the scorecard, and 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 Mali's INSTAT in the 2016/17 EMOP. 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. 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, you do not—in general—need to verify responses. You should verify a response only if something suggests to you that the response may be inaccurate and thus that verification might improve data accuracy. For example, you might choose to verify if the respondent hesitates, seems nervous, or otherwise gives signals that he/she may be lying or be confused. Likewise, verification is probably appropriate if a child in the household or a neighbor says something that does not square with the 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 2016/17 EMOP by Mali's INSTAT. For example, interviews should take place in respondents' homesteads because the 2016/17 EMOP took place in respondents' homesteads.

Translation:

As of this writing, the scorecard itself, the "Back-page Worksheet", and this "Guide" are available only in French, Bambara, Fula, and English. There are not yet official, professional translations to other major local languages spoken in Mali such as Soninke and Kassonke. Users should check scorocs.com to see what translations have been completed since this writing.

If there is not yet a professional translation to a given local language, then users should contact the author of this document for help in creating such a translation. In particular, the translation of scorecard indicators should follow as closely as possible the meaning of the original French wording in the 2016/17 EMOP questionnaire. Likewise, the *Enumerator Manual* for the 2016/17 EMOP is written in French, so this "Guide" must be translated from the *Manual*'s original French, not from this English "Guide" here.

Who should be the respondent?

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

Who is the head of the household?

Note that the head of the household may or may not be the same person who participates with your organization (although the head of the household may be that person).

According to p. 7 of the *Manual*, "The *head of the household* is the member who is acknowledged as such by the rest of the members of the household."

Guidelines for each indicator in the scorecard

1. In what region does the household live?
    A. Sikasso
    B. Ségou, Koulikoro, Mopti, or Gao
    C. Bamako, Kayes, or Tombouctou

Do not directly ask this indicator of the respondent. Instead, mark the appropriate answer based on your knowledge of the region in which the interviewed household lives.

2. How many household members are 15-years-old or younger?
    A. Seven or more
    B. Six
    C. Five
    D. Four
    E. Three
    F. Two
    G. One
    H. None

Do not directly ask this indicator of the respondent. Instead, fill in the appropriate answer based on the number of household members who are 15-years-old or younger that you have listed on the "Back-page Worksheet".

According to p. 7 of the *Manual*, "Age is counted in terms of completed years, that is, age on the most-recent birthday."

You need to know a member's precise age only if it may be close to 15.

According to pp. 4 and 5 of the *Manual*, a *household* is "a group of people [or a single person] (regardless of blood or marital relationship) who live in the same residence or compound, who eat their meals together or in small sub-groups, who share all or part of their income for the good of the entire group, and who defer in decisions regarding spending to one member of the household known as the *head*.

"A household is commonly made up of a head, his wife or wives, the children of the head and of his wife or wives, and perhaps other people who may or may not have a blood or marital relationship with the head.

"A household may be made up of one person who lives alone. A household may also be made up of a head without a spouse who lives with his/her children (if any), perhaps along with other people who may or may not have a blood or marital relationship with the head.

"Noteworthy cases include:

- A lodger who does not eat with the interviewed household is not counted as a member of the interviewed household
- Domestic servants who work for the interviewed household are counted as members of the interviewed household
- Married children (and their dependents, if any) who live apart from the interviewed household are not counted as members of the interviewed household
- In the case of polygamous families (or any other situation in which a wife does not live in the same compound as her husband), the wife and her dependents are considered to be members of a different household than that of her husband, and the wife is considered to be the head of her household. A husband is counted as the head of the household in which he spent the night before the interview
- If a group of unrelated, unmarried people live together in the same residence, and if each single person is responsible for meeting his/her own basic needs, then each single person is considered to be the head of his/her own one-person household"

According to p. 6 of the *Manual*, if a person is to count as a member of the household, then he/she must "usually live with the household. That is, he/she must have lived with the household for at least six months. If a person has lived with the household for less than six months but expects the total duration of his/her stay to be at least six months, then that person is counted as a member of the household. (This is the case, for example, for a student who joins a household in August and plans to stay until the school year ends.)"

3. Can the male head/spouse read and write in French, Arabic, English, a national language, or some other language?
    A. No
    B. Yes
    C. No male head/spouse

According to p. 9 of the *Manual*, "The question concerns basic literacy, that is, the ability read and write simple sentences and popular writing, such as a newspaper. If the male head/spouse can read but cannot write, then he is considered to be illiterate and the relevant response is 'A. No'.

"The EMOP questionnaire does not establish a way to test literacy. You as the enumerator should use your judgement and the information provided by the respondent to evaluate the literacy of the male head/spouse (if he exists). Keep in mind that the question concerns literacy in any language, not only in Mali's main language and not only in an official language. All that is required to be considered as literate is the ability to read and write in a language that has a commonly-used written form."

Remember that you already know the name of the male head/spouse (and whether he exists) from compiling the "Back-page Worksheet". Thus, if there is a male head/spouse, do not mechanically ask, "Can the male head/spouse read and write in French, Arabic, English, a national language, or some other language?". Instead, use the actual first name or nickname of the male head/spouse, for example: "Can Mamadou read and write in French, Arabic, English, a national language, or some other language?" If there is no male head/spouse, then do not ask the question of the respondent but rather mark "C. No male head/spouse" and go to the next question.

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

- The household head, if the head is male
- The spouse/conjugal partner of the household head, if the head is female
- Non-existent, if the head is female and if she does not have a spouse/conjugal partner who is a member of her household

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

4. What is the residence's floor made of?
    A. Dirt/sand, or other
    B. Dung
    C. Concrete with cement veneer, or tile

According to p. 16 of the *Manual*, "This question concerns the main material of the floor of the residence's main building, which may differ from the main material of the floors of other buildings that may also be part of the residence."

5. What is the residence's roof made of?
    A. Straw, thatch, woven leaves, or other
    B. Packed earth, corrugated metal sheets, concrete slab, or tile

According to p. 16 of the *Manual*, "This question concerns the main material of the roof of the residence's main building, which may differ from the main material of the roofs of other buildings that may also be part of the residence."

6. What toilet arrangement does the household use?
    A. None/bush, or other
    B. Latrine, or flush toilet

According to p. 17 of the *Manual*, "The question concerns the toilet arrangement that the household mainly uses. Note the following definitions:

- *Latrine*: A man-made toilet that does not have a water tank and that does not provide for flushing. The waste falls directly into a sealed hole. Latrines are built outside of the residence in the yard/courtyard of the residence or compound
- *Flush toilet*: A man-made toilet with a water tank for flushing. Flush toilets may be built inside the residence or outside of the residence in the yard/courtyard of the residence or compound

7. Does the household have any TVs in good working order?
    A. No
    B. Yes

According to p. 18 of the *Manual*, "If the respondent reports that the household has a broken TV, then try to determine how long it has been broken and whether it will be repaired. If the respondent says that the TV is only temporarily out-of-order, then [count it as being in good working order]."

8. Does the household have any radios (with or without cassette) or hi-fi stereos in good working order?
    A. No
    B. Yes

According to p. 18 of the *Manual*, "If the respondent reports that the household has a broken radio or a broken hi-fi stereo, then try to determine how long it has been broken and whether it will be repaired. If the respondent says that the radio or hi-fi stereo is only temporarily out-of-order, then [count it as being in good working order]."

9. Does the household have any motorcycles or scooters in good working order?
    A. No
    B. Yes

According to p. 18 of the *Manual*, "If the respondent reports that the household has a broken motorcycle or a broken scooter, then try to determine how long it has been broken and whether it will be repaired. If the respondent says that the motorcycle or scooter is only temporarily out-of-order, then [count it as being in good working order]."

10. How many cell phones does the household have in good working order?
    A. None, or one
    B. Two or more

According to p. 18 of the *Manual*, "If the respondent reports that the household has a broken cell phone, then try to determine how long it has been broken and whether it will be repaired. If the respondent says that the cell phone is only temporarily out-of-order, then [count it as being in good working order]."

Table 1 (Mali): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		522	784	1,045
	Rate	Households	2,712	16.3	39.0	60.6
	Rate	People		22.4	48.1	69.3
Rural	Line	People		445	668	890
	Rate	Households	3,203	44.4	73.8	88.1
	Rate	People		55.2	82.7	93.5
All	Line	People		465	698	930
	Rate	Households	5,915	36.3	63.8	80.2
	Rate	People		46.8	73.8	87.3

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Mali): International 2005 and 2011 PPP poverty lines and poverty rates for households and people by urban/rural/all

Region	Line or Rate	Households or People	*n*	Poverty lines and poverty rates							
				Intl. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		513	821	1,026	2,053	501	844	1,450	5,720
	Rate	Households	2,712	15.1	42.5	59.3	91.2	14.3	44.3	79.3	99.5
	Rate	People		20.8	51.6	67.8	94.8	19.7	53.5	85.4	99.8
Rural	Line	People		437	700	875	1,749	427	719	1,235	4,874
	Rate	Households	3,203	42.8	77.1	87.3	98.4	41.1	78.6	95.3	100.0
	Rate	People		53.6	85.3	93.0	99.4	52.0	86.5	97.8	100.0
All	Line	People		457	731	914	1,827	446	751	1,291	5,092
	Rate	Households	5,915	34.8	67.1	79.2	96.3	33.4	68.7	90.7	99.9
	Rate	People		45.2	76.7	86.5	98.2	43.7	78.0	94.6	99.9

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP field work.

Table 1 (Mali): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		385	305	367	478	543	630	882
	Rate	Households	2,712	5.5	1.9	4.8	12.0	17.8	24.8	47.6
	Rate	People		8.4	3.5	7.5	17.1	24.2	32.9	56.7
Rural	Line	People		328	260	312	407	463	537	751
	Rate	Households	3,203	20.1	8.2	17.0	37.4	48.0	58.7	80.8
	Rate	People		28.5	12.4	24.3	47.9	58.9	69.4	88.1
All	Line	People		343	272	326	426	484	561	785
	Rate	Households	5,915	15.9	6.4	13.5	30.1	39.3	48.9	71.2
	Rate	People		23.4	10.1	20.0	40.0	50.0	60.0	80.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Kayes): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		512	767	1,023
	Rate	Households	300	13.0	48.7	73.2
	Rate	People		20.8	62.5	83.9
Rural	Line	People		443	665	886
	Rate	Households	572	29.4	68.3	86.7
	Rate	People		32.8	75.3	91.3
All	Line	People		452	677	903
	Rate	Households	872	26.9	65.3	84.6
	Rate	People		31.3	73.7	90.4

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Kayes): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		503	804	1,005	2,010	490	826	1,420	5,602
	Rate	Households	300	12.0	53.9	72.0	96.1	11.3	55.2	90.2	100.0
	Rate	People		19.2	66.9	82.8	98.6	18.2	68.2	95.7	100.0
Rural	Line	People		435	697	871	1,741	425	716	1,230	4,853
	Rate	Households	572	27.5	71.8	86.1	99.4	26.2	73.8	94.6	100.0
	Rate	People		31.3	78.2	90.7	99.9	30.0	79.7	97.2	100.0
All	Line	People		444	710	887	1,774	433	729	1,253	4,944
	Rate	Households	872	25.2	69.1	84.0	98.9	24.0	70.9	94.0	100.0
	Rate	People		29.9	76.8	89.8	99.7	28.6	78.3	97.0	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Kayes): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		377	299	359	468	532	617	863
	Rate	Households	300	2.7	0.4	2.3	6.8	14.4	24.6	58.1
	Rate	People		3.5	1.2	2.9	12.8	22.9	38.1	71.7
Rural	Line	People		326	259	311	406	461	535	748
	Rate	Households	572	6.4	1.3	4.6	22.0	32.9	45.7	75.5
	Rate	People		8.8	1.6	5.2	26.3	36.2	50.7	81.1
All	Line	People		333	264	317	413	470	545	762
	Rate	Households	872	5.9	1.2	4.2	19.7	30.0	42.5	72.8
	Rate	People		8.2	1.6	5.0	24.7	34.5	49.1	80.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Koulikoro): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		510	765	1,020
	Rate	Households	242	28.9	55.2	76.3
	Rate	People		39.6	64.3	82.7
Rural	Line	People		444	666	888
	Rate	Households	563	37.4	69.1	83.3
	Rate	People		52.4	79.3	90.2
All	Line	People		449	673	897
	Rate	Households	805	36.7	67.8	82.6
	Rate	People		51.5	78.2	89.7

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Koulikoro): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		501	801	1,002	2,004	489	823	1,415	5,584
	Rate	Households	242	26.7	58.1	75.8	98.4	25.7	60.1	91.4	100.0
	Rate	People		36.4	67.8	82.4	99.6	35.1	69.7	94.7	100.0
Rural	Line	People		436	697	872	1,744	425	717	1,232	4,859
	Rate	Households	563	35.7	73.4	82.4	97.5	34.1	74.4	93.3	100.0
	Rate	People		51.0	82.4	89.6	98.2	49.3	83.2	95.8	100.0
All	Line	People		441	705	881	1,762	430	724	1,245	4,912
	Rate	Households	805	34.9	72.0	81.8	97.5	33.3	73.1	93.2	100.0
	Rate	People		50.0	81.4	89.1	98.3	48.3	82.2	95.7	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Koulikoro): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		376	298	358	467	530	615	860
	Rate	Households	242	11.7	2.9	10.8	23.5	30.0	40.6	65.1
	Rate	People		17.9	5.2	16.6	32.0	40.4	50.0	73.0
Rural	Line	People		327	259	311	406	462	535	749
	Rate	Households	563	16.2	6.5	12.6	29.9	40.7	54.5	76.9
	Rate	People		28.2	11.3	22.4	43.9	55.3	68.2	85.3
All	Line	People		330	262	315	411	467	541	757
	Rate	Households	805	15.8	6.2	12.5	29.3	39.7	53.2	75.8
	Rate	People		27.5	10.9	22.0	43.0	54.3	66.9	84.4

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Sikasso): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		505	758	1,011
	Rate	Households	348	33.1	54.1	73.3
	Rate	People		46.9	67.1	81.5
Rural	Line	People		449	673	898
	Rate	Households	619	63.5	89.0	96.0
	Rate	People		70.7	92.8	98.5
All	Line	People		460	690	919
	Rate	Households	967	56.1	80.5	90.5
	Rate	People		66.2	87.9	95.3

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Sikasso): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		496	794	993	1,986	484	816	1,402	5,533
	Rate	Households	348	31.9	57.4	71.9	95.6	31.7	60.1	87.6	99.6
	Rate	People		45.4	69.0	80.5	97.8	44.9	71.1	93.6	99.7
Rural	Line	People		441	706	882	1,764	430	725	1,246	4,916
	Rate	Households	619	62.1	91.1	95.5	99.0	59.7	91.7	98.3	100.0
	Rate	People		69.4	94.9	98.0	99.8	67.2	95.3	99.6	100.0
All	Line	People		452	722	903	1,806	441	742	1,276	5,033
	Rate	Households	967	54.7	82.9	89.8	98.2	52.9	84.0	95.7	99.9
	Rate	People		64.8	89.9	94.6	99.4	62.9	90.7	98.5	99.9

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Sikasso): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		372	295	355	462	526	610	853
	Rate	Households	348	13.8	5.0	12.4	28.9	34.9	42.1	62.8
	Rate	People		23.5	11.1	21.7	42.4	48.6	55.1	73.8
Rural	Line	People		331	262	315	411	467	542	757
	Rate	Households	619	31.3	16.6	28.1	55.6	67.3	79.0	92.5
	Rate	People		38.4	23.1	34.3	62.9	74.3	84.7	95.8
All	Line	People		339	268	323	421	478	555	776
	Rate	Households	967	27.0	13.7	24.3	49.1	59.4	70.0	85.2
	Rate	People		35.6	20.8	31.9	59.0	69.4	79.1	91.6

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Ségou): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		509	763	1,017
	Rate	Households	277	12.2	30.7	51.2
	Rate	People		21.2	44.5	66.5
Rural	Line	People		446	669	892
	Rate	Households	547	44.4	65.5	80.1
	Rate	People		59.5	79.4	89.9
All	Line	People		453	679	905
	Rate	Households	824	39.7	60.4	75.9
	Rate	People		55.5	75.7	87.5

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Ségou): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		500	799	999	1,998	488	821	1,411	5,569
	Rate	Households	277	11.6	35.4	49.8	88.3	10.7	38.0	72.7	99.4
	Rate	People		18.7	50.1	64.9	94.7	17.2	53.5	84.4	99.9
Rural	Line	People		438	701	876	1,752	428	720	1,238	4,883
	Rate	Households	547	43.0	68.1	80.0	96.6	42.1	70.3	90.9	100.0
	Rate	People		57.6	81.5	89.9	99.3	56.7	83.6	96.6	100.0
All	Line	People		445	711	889	1,778	434	731	1,256	4,955
	Rate	Households	824	38.4	63.3	75.6	95.4	37.6	65.6	88.2	99.9
	Rate	People		53.5	78.2	87.2	98.8	52.5	80.5	95.3	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Ségou): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		375	297	357	465	529	614	858
	Rate	Households	277	3.7	1.8	3.5	9.5	13.4	18.3	40.6
	Rate	People		7.2	3.9	6.8	15.6	22.3	27.6	55.8
Rural	Line	People		328	260	313	408	464	538	752
	Rate	Households	547	23.7	9.4	20.2	39.5	47.7	54.1	73.1
	Rate	People		33.8	12.0	29.6	53.5	63.7	70.2	85.3
All	Line	People		333	264	318	414	471	546	764
	Rate	Households	824	20.8	8.3	17.8	35.1	42.7	48.9	68.4
	Rate	People		31.0	11.2	27.2	49.5	59.4	65.7	82.2

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Mopti): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		511	766	1,022
	Rate	Households	299	35.3	68.4	81.7
	Rate	People		44.0	77.7	88.9
Rural	Line	People		444	667	889
	Rate	Households	501	60.4	87.1	95.3
	Rate	People		68.3	93.2	97.9
All	Line	People		455	682	909
	Rate	Households	800	56.6	84.3	93.2
	Rate	People		64.6	90.8	96.6

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Mopti): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		502	803	1,003	2,007	490	825	1,417	5,593
	Rate	Households	299	34.5	70.7	81.5	98.8	32.6	72.8	94.1	100.0
	Rate	People		43.1	79.6	88.7	99.6	41.1	81.8	97.3	100.0
Rural	Line	People		437	698	873	1,746	426	718	1,233	4,866
	Rate	Households	501	58.3	89.3	94.7	99.5	56.3	90.5	98.2	100.0
	Rate	People		66.7	94.6	97.7	99.9	65.1	95.5	99.5	100.0
All	Line	People		447	714	893	1,786	436	734	1,262	4,978
	Rate	Households	800	54.7	86.5	92.7	99.4	52.8	87.8	97.6	100.0
	Rate	People		63.1	92.3	96.3	99.9	61.4	93.4	99.2	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Mopti): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		376	298	358	467	531	616	862
	Rate	Households	299	14.5	5.1	12.3	28.2	38.1	47.5	75.8
	Rate	People		18.1	7.1	15.5	36.8	47.0	57.7	84.3
Rural	Line	People		327	260	312	407	462	536	750
	Rate	Households	501	30.5	11.9	26.3	52.7	65.5	74.1	92.0
	Rate	People		39.8	16.5	35.3	62.3	73.6	81.7	96.5
All	Line	People		335	265	319	416	473	549	767
	Rate	Households	800	28.1	10.8	24.2	49.0	61.3	70.1	89.5
	Rate	People		36.4	15.0	32.2	58.4	69.6	78.1	94.6

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Tombouctou): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		511	767	1,022
	Rate	Households	246	8.4	44.9	75.5
	Rate	People		11.2	50.7	80.9
Rural	Line	People		442	663	885
	Rate	Households	324	13.9	51.9	86.8
	Rate	People		18.0	58.6	90.9
All	Line	People		453	680	906
	Rate	Households	570	13.1	50.8	85.0
	Rate	People		16.9	57.4	89.3

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Tombouctou): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		502	803	1,004	2,008	490	825	1,418	5,596
	Rate	Households	246	8.3	51.2	73.0	97.1	7.7	54.8	91.5	100.0
	Rate	People		11.0	57.1	78.3	98.5	10.3	60.5	94.0	100.0
Rural	Line	People		434	695	869	1,738	424	714	1,227	4,842
	Rate	Households	324	13.4	58.5	84.0	99.2	11.5	61.1	97.6	100.0
	Rate	People		17.5	65.4	88.5	99.7	15.2	67.4	98.6	100.0
All	Line	People		445	712	890	1,780	434	732	1,258	4,962
	Rate	Households	570	12.6	57.4	82.3	98.9	10.9	60.1	96.7	100.0
	Rate	People		16.4	64.0	86.9	99.6	14.5	66.3	97.9	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Tombouctou): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		376	298	359	468	532	617	862
	Rate	Households	246	1.6	0.0	0.7	6.1	10.9	20.9	58.5
	Rate	People		3.2	0.0	1.3	8.7	14.0	25.6	63.5
Rural	Line	People		326	258	310	405	460	534	746
	Rate	Households	324	1.9	0.0	1.6	9.3	15.7	26.7	66.9
	Rate	People		2.8	0.0	2.4	11.3	19.5	30.8	72.7
All	Line	People		334	265	318	415	471	547	765
	Rate	Households	570	1.8	0.0	1.4	8.8	14.9	25.8	65.6
	Rate	People		2.8	0.0	2.2	10.9	18.6	30.0	71.3

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Gao): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		509	764	1,019
	Rate	Households	176	38.6	63.1	82.4
	Rate	People		44.4	67.9	85.8
Rural	Line	People		443	665	887
	Rate	Households	77	51.8	78.5	93.4
	Rate	People		62.8	85.8	96.7
All	Line	People		480	720	960
	Rate	Households	253	44.7	70.2	87.4
	Rate	People		52.5	75.8	90.6

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Gao): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		500	800	1,001	2,001	488	822	1,413	5,577
	Rate	Households	176	35.6	67.3	81.9	97.3	31.2	68.3	90.3	100.0
	Rate	People		40.4	71.0	85.5	99.1	36.7	72.0	93.8	100.0
Rural	Line	People		436	697	871	1,742	425	716	1,231	4,856
	Rate	Households	77	48.0	82.7	90.6	100.0	48.0	83.6	98.8	100.0
	Rate	People		58.6	88.9	95.9	100.0	58.6	89.6	99.2	100.0
All	Line	People		472	755	943	1,887	460	775	1,333	5,257
	Rate	Households	253	41.3	74.4	85.9	98.5	38.9	75.3	94.2	100.0
	Rate	People		48.5	78.9	90.1	99.5	46.4	79.8	96.2	100.0

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Gao): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		375	297	357	466	530	615	859
	Rate	Households	176	13.2	6.3	12.8	25.5	41.4	52.3	70.5
	Rate	People		15.8	7.4	15.4	30.5	47.2	59.0	73.5
Rural	Line	People		327	259	311	406	461	535	748
	Rate	Households	77	18.7	3.7	15.9	37.8	55.0	64.4	85.9
	Rate	People		25.2	5.4	22.8	47.6	67.7	76.4	91.4
All	Line	People		354	280	337	439	499	579	810
	Rate	Households	253	15.7	5.1	14.2	31.1	47.6	57.9	77.6
	Rate	People		20.0	6.5	18.7	38.1	56.3	66.7	81.4

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Bamako): National 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 (%) National (2016 def.) 100%	150%	200%
Urban	Line	People		537	805	1,073
	Rate	Households	824	5.9	24.4	47.5
	Rate	People		7.4	31.0	55.9
Rural	Line	People		—	—	—
	Rate	Households	—	—	—	—
	Rate	People		—	—	—
All	Line	People		537	805	1,073
	Rate	Households	824	5.9	24.4	47.5
	Rate	People		7.4	31.0	55.9

Source: 2016/17 EMOP
Poverty rates are percentages.
Poverty lines are XOF per-person per-day.
Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Bamako): International 2005 and 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. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
				$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Urban	Line	People		527	843	1,054	2,108	514	866	1,489	5,876
	Rate	Households	824	4.8	27.3	45.8	86.3	4.5	28.7	70.4	99.2
	Rate	People		6.0	34.7	53.9	91.2	5.4	36.4	76.9	99.7
Rural	Line	People		—	—	—	—	—	—	—	—
	Rate	Households	—	—	—	—	—	—	—	—	—
	Rate	People		—	—	—	—	—	—	—	—
All	Line	People		527	843	1,054	2,108	514	866	1,489	5,876
	Rate	Households	824	4.8	27.3	45.8	86.3	4.5	28.7	70.4	99.2
	Rate	People		6.0	34.7	53.9	91.2	5.4	36.4	76.9	99.7

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 1 (Bamako): Relative and 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 (%)						
				Poorest 1/2	Percentile-based lines (2016 def.)					
				< 100% Natl.	10th	20th	40th	50th	60th	80th
Urban	Line	People		395	313	377	491	558	648	905
	Rate	Households	824	1.0	0.2	0.6	3.4	6.9	12.1	32.4
	Rate	People		1.4	0.4	0.9	3.9	8.8	16.5	40.3
Rural	Line	People		—	—	—	—	—	—	—
	Rate	Households	—	—	—	—	—	—	—	—
	Rate	People		—	—	—	—	—	—	—
All	Line	People		395	313	377	491	558	648	905
	Rate	Households	824	1.0	0.2	0.6	3.4	6.9	12.1	32.4
	Rate	People		1.4	0.4	0.9	3.9	8.8	16.5	40.3

Source: 2016/17 EMOP

Poverty rates are percentages.

Poverty lines are XOF per-person per-day.

Lines are XOF in prices on average in Mali during the 2016/17 EMOP fieldwork.

Table 2: Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
143	How many household members are 15-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
142	How many household members are 14-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
141	How many household members are 13-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
140	How many household members are 12-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
139	How many household members are 16-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
136	How many household members are 17-years-old or younger? (Seven or more; Six; Five; Four; Three; Two; One; None)
135	How many household members are 18-years-old or younger? (Nine or more; Eight; Seven; Six; Five; Four; Three; Two; One; None)
134	How many household members are 11-years-old or younger? (Six or more; Five; Four; Three; Two; One; None)
128	How many household members are there? (Twelve or more; Ten, or eleven; Eight, or nine; Seven; Six; Five; Four; Three or less)
113	What is the what is the household's main source of energy for lighting? (Flashlight; Solar panel; Kerosene, paraffin, LPG, firewood, generator, or other; Electricity)
100	How many household members who did any work for at least one hour in the past month had their main occupation in something other than agriculture, forestry, or fishing? (None; One; Two; Three or more)
98	How many household members are 6-years-old or younger? (Four or more; Three; Two; One; None)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
98	Does the household have any fans in good working order? (No; Yes)
88	If the male head/spouse did any work for at least one hour in the past month, then was he in his main occupation a skilled worker in agriculture, forestry, or fishing? (Yes; Did not work; No male head/spouse; Worked, but not in agriculture, forestry, or fishing)
86	What is the household's main source of drinking water during the dry season? (Borewell; Non-protected well; Protected well; Neighbor's faucet, surface water, or other; Public standpipe; Household's faucet)
83	In what region does the household live? (Sikasso; Ségou, Koulikoro, Mopti, or Gao; Bamako, Kayes, or Tombouctou)
81	Do all household members ages 7 to 13 currrently go to school? (No; Yes; No members are ages 7 to 13)
81	Do all household members ages 7 to 12 currrently go to school? (No; Yes; No members are ages 7 to 12)
77	Do all household members ages 7 to 11 currrently go to school? (No; Yes; No members are ages 7 to 11)
76	Do all household members ages 7 to 14 currrently go to school? (No; Yes; No members are ages 7 to 14)
74	Do all household members ages 7 to 15 currrently go to school? (No; Yes; No members are ages 7 to 15)
70	What is the highest year in school that the male head/spouse has passed? (None, pre-school, kindergarten, or first grade; Second to fourth grade; Fifth or sixth grade; Seventh or eighth grade; No male head/spouse; Ninth grade, high school, or post-secondary)
68	What the household's main source of energy for cooking? (Firewood, or other; Dung, charcoal, kerosene/fuel oil, LPG, or electricity)
66	Does the household have any TVs, VCRS or DVD players, or satellite dishes in good working order? (No TV (regardless of the others); Only TV; TV and VCR or DVD player, but not satellite dish; TV and satellite dish (regardess of VCR or DVD player))
66	What is the tenancy status of the household in its residence? (Rooming house (pièces sans dépendance); Apartment in a one-story building around a common courtyard (maison en bandes); Other; Detached house or villa; Apartment; House in a compound)
65	Do all household members ages 7 to 16 currrently go to school? (No; Yes; No members are ages 7 to 16)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
65	Does the household have any TVs in good working order? (No; Yes)
64	How many household members did any work for at least one hour in the past month? (None; One; Two; Three; Four; Five or more)
63	Do all household members ages 7 to 17 currrently go to school? (No; Yes; No members are ages 7 to 17)
62	If the male head/spouse or the (eldest) female head/spouse worked for at least one hour in the past month in his or her main occupation as a business owner or employer or in self-employment in a sector other than agriculture, forestry, or fishing? (No; Yes)
61	If the male head/spouse did any work for at least one hour in the past month, then what was his/her employment status in his/her main occupation? (Self-employed, cooperativist, unpaid apprentice, or unpaid worker in family business; Does not work; Semi-skilled wage/salary worker, or casual laborer; No male head/spouse; Skilled wage/salary worker, middle- or front-line manager, upper manager, professional, or business owner/employer)
61	What is the residence's walls made of? (Packed earth, backed bricks, or other; Solid walls (cement, stone, and so on))
61	Can the male head/spouse read and write in French? (No; No male head/spouse; Yes)
57	Does the household have any bicycles in good working order? (Yes; No)
57	Do all household members ages 7 to 18 currrently go to school? (No; Yes; No members are ages 7 to 18)
54	What is the residence's floor made of? (Dirt/sand, or other; Dung; Concrete with cement veneer, or tile)
54	If the (eldest) female head/spouse did any work for at least one hour in the past month, then what was her occupation in her main job? (Skilled agricultural, forestry, or fishery worker; Craft and related trades worker, plant and machine operator, or assembler, or elementary occupation; No female head/spouse; Service and sales worker; Does not work; Armed forces, manager, professional, technician and associate professional, or clerical support worker)
54	What is the tenancy status of the household in its residence? (Owned or co-owned without title; Owned or co-owned with title; Housed for free; Renter, housed by employer, or other)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
50	Does the household have any carts in good working order? (Yes; No)
47	Does the household have any bicycles, motorcycles or scooters, or automobiles in good working order? (Only bicycle; None; Motorcycles or scooters, but not automobiles (regardless of bicycles); Automobiles (regardless of bicycles, motorcycles, or scooters))
46	What is the highest year in school that the (eldest) female head/spouse has passed? (No female head/spouse; None, pre-school, kindergarten, or first grade; Second to fourth grade; Fifth or sixth grade; Seventh or eighth grade; Ninth grade, high school, or post-secondary)
45	Can the male head/spouse read and write in French, Arabic, English, a national language, or some other language? (No; Yes; No male head/spouse)
44	Does the household have any satellite dishes in good working order? (No; Yes)
40	How many household members who did any work for at least one hour in the past month were in their main occupation a cooperativist, apprentice, or unpaid worker in a family business? (Two or more; One; None)
39	Can the (eldest) female head/spouse read and write in French? (No female head/spouse; No; Yes)
39	Does the household have any VCRs or DVD players in good working order? (No; Yes)
38	Does the household have any refrigerators or freezers in good working order? (No; Yes)
38	Can the (eldest) female head/spouse read and write in French, Arabic, English, a national language, or some other language? (No female head/spouse; No; Yes)
36	How does the household dispose of its waste water? (Dumped in a public area, or other; Dumped on the household's land, or public sewer system; Cesspool or septic tank)
36	If the (eldest) female head/spouse did any work for at least one hour in the past month, then what was her employment status in her main occupation? (Unpaid worker in family business, apprentice, cooperativist, or self-employed; No female head/spouse; Does not work; Skilled or semi-skilled wage/salary worker, casual laborer, upper/middle/front-line manager, professional, or business owner/employer)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
32	How many rooms does the household's residence have? (One; Two; Three; Four; Five; Six or more)
31	What toilet arrangement does the household use? (None/bush, or other; Latrine, or flush toilet)
26	How many household members who did any work for at least one hour in the past month were in their main occupation wage or salary workers (upper, middle, or line managers, professionals, or skilled or semi-skilled employees or wage workers)? (None; One or more)
24	How many household members who did any work for at least one hour in the past month had their main occupation in something other than agriculture, forestry, or fishing? (None; One; Two; Three or more)
22	Does the household have any automobiles in good working order? (No; Yes)
21	What is the male head/spouse's marital status? (Polygamously married, or widower; Monogamously married, co-habiting, single, never-married, divorced/separated; No male head/spouse)
20	How many mosquito nets does the household have in good working order? (None; One; Two; Three; Four; Five; Six or more)
20	What is the (eldest) female head/spouse's marital status? (Polygamously married; No female head/spouse; Monogamously married, or co-habiting; Widow, single/never-married, or divorced/separated)
19	Does the household have any computers in good working order? (No; Yes)
18	Does the household have any improved wood stoves or gas or electric stoves in good working order? (None; Only improved wood stove; Gas or electric stove (regardless of improved wood stove))
17	Can the male head/spouse read and write in Arabic? (No; Yes; No male head/spouse)
17	If the (eldest) female head/spouse did any work for at least one hour in the past month, then was she in her main occupation a skilled worker in agriculture, forestry, or fishing? (Yes; No female head/spouse; Did not work; Worked, but not in agriculture, forestry, or fishing)
15	Does the household have any gas or electric stoves in good working order? (No; Yes)

Table 2 (cont.): Poverty indicators

Uncertainty coefficient	Indicator (Responses ordered starting with those linked with higher poverty likelihoods)
15	Does the household have any radios (with or without cassette) or hi-fi stereos in good working order? (No; Yes)
14	In the past month, did the male head/spouse do any work for at least one hour? (No; Yes; No male head/spouse)
14	Does the household have any clothes irons (electric or charcoal) in good working order? (No; Yes)
13	How many cell phones does the household have in good working order? (None, or one; Two or more)
10	Does the household have any motorcycles or scooters in good working order? (No; Yes)
4	Can the (eldest) female head/spouse read and write in Arabic? (No female head/spouse; No; Yes)
4	What is the residence's roof made of? (Straw, thatch, woven leaves, or other; Packed earth, corrugated metal sheets, concrete slab, or tile)
3	Does the household have any improved wood stoves in good working order? (No; Yes)

Source: 2016/17 EMOP with 100% of the national poverty line

Tables for
100% of the National Poverty Line

(and Tables Pertaining
to All Poverty Lines)

Table 3 (100% of the national 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:
0–23	95.7
24–28	83.8
29–32	81.9
33–35	75.9
36–37	60.4
38–39	52.5
40–41	51.6
42–43	50.6
44–45	36.1
46–47	32.6
48–49	26.2
50–52	26.2
53–55	20.0
56–57	12.2
58–60	8.2
61–63	7.5
64–67	4.2
68–72	1.8
73–78	0.8
79–100	0.1

Table 4 (100% of the national line): Derivation of estimated poverty likelihoods

Score	Households in range and < poverty line		All households in range		Poverty likelihood (%)
0–23	4,959	÷	5,180	=	95.7
24–28	4,215	÷	5,032	=	83.8
29–32	5,149	÷	6,285	=	81.9
33–35	3,496	÷	4,608	=	75.9
36–37	2,917	÷	4,830	=	60.4
38–39	2,016	÷	3,843	=	52.5
40–41	2,902	÷	5,626	=	51.6
42–43	2,034	÷	4,023	=	50.6
44–45	1,637	÷	4,538	=	36.1
46–47	1,520	÷	4,657	=	32.6
48–49	1,217	÷	4,651	=	26.2
50–52	1,433	÷	5,476	=	26.2
53–55	1,048	÷	5,250	=	20.0
56–57	529	÷	4,347	=	12.2
58–60	486	÷	5,938	=	8.2
61–63	403	÷	5,397	=	7.5
64–67	216	÷	5,214	=	4.2
68–72	103	÷	5,611	=	1.8
73–78	36	÷	4,652	=	0.8
79–100	3	÷	4,844	=	0.1

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

Table 5 (100% of the national 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
0–23	+3.7	2.2	2.6	3.6
24–28	+0.7	2.4	2.9	4.0
29–32	+1.4	1.9	2.3	3.4
33–35	–0.5	2.8	3.3	4.2
36–37	–10.0	6.5	6.8	7.4
38–39	–5.5	4.7	5.1	6.9
40–41	+3.0	3.7	4.4	5.6
42–43	+2.3	3.7	4.3	5.8
44–45	+9.6	2.7	3.3	4.3
46–47	+7.6	2.6	3.1	3.9
48–49	–23.1	13.5	13.8	14.6
50–52	–1.4	2.9	3.3	4.8
53–55	–0.9	2.3	2.8	3.9
56–57	+6.6	1.6	2.0	2.5
58–60	–2.0	2.2	2.6	3.3
61–63	+4.4	1.0	1.2	1.5
64–67	+0.7	1.2	1.4	1.9
68–72	+0.9	0.5	0.6	0.7
73–78	+0.7	0.1	0.1	0.1
79–100	+0.1	0.0	0.0	0.0

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

Table 6 (100% of the national 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	+1.5	61.9	79.4	92.8
4	+0.2	34.7	41.7	53.2
8	+0.2	25.2	31.1	39.2
16	+0.1	17.8	21.7	28.0
32	+0.3	12.6	14.5	19.7
64	+0.2	8.9	11.2	14.8
128	0.0	6.4	7.4	10.5
256	0.0	4.6	5.6	7.4
512	0.0	3.4	4.2	5.6
1,024	0.0	2.4	3.0	3.8
2,048	0.0	1.7	2.0	2.6
4,096	0.0	1.2	1.5	1.7
8,192	0.0	0.9	1.0	1.3
16,384	0.0	0.6	0.7	1.0

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

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

	Poverty lines		
	National (2016 def.)		
	100%	150%	200%
Error (estimate minus observed value)	0.0	+0.7	+2.4
Precision of estimate	0.6	0.6	0.6
Alpha factor for precision	0.98	0.95	1.11

Scorecard applied to 1,000 bootstraps 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 estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Table 7 (International 2005 and 2011 PPP lines): Errors in households' estimated poverty rates at a point in time, precision, and the α factor for precision

	Poverty lines							
	Intl. 2005 PPP (2016 def.)				Intl. 2011 PPP (2016 def.)			
	$1.25	$2.00	$2.50	$5.00	$1.90	$3.20	$5.50	$21.70
Error (estimate minus observed value)	–0.6	+0.4	+3.2	+0.6	–1.0	+0.6	–0.3	+0.1
Precision of estimate	0.6	0.6	0.5	0.2	0.6	0.6	0.4	0.1
Alpha factor for precision	0.98	0.95	1.09	1.01	1.00	0.96	1.01	0.86

Scorecard applied to 1,000 bootstraps 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 estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

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

	Poverty lines						
	Poorest 1/2	Percentile-based lines (2016 def.)					
	< 100% Natl.	10th	20th	40th	50th	60th	80th
Error (estimate minus observed value)	+0.7	+0.8	+0.5	–0.9	+0.1	–1.5	+1.6
Precision of estimate	0.4	0.3	0.4	0.6	0.6	0.6	0.6
Alpha factor for precision	0.89	0.91	0.89	0.98	0.96	0.99	0.98

Scorecard applied to 1,000 bootstraps 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 estimated from 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 (100% of the national 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
<=23	4.6	31.7	0.2	63.5	68.1	–73.9
<=28	9.1	27.2	1.1	62.6	71.8	–46.7
<=32	14.9	21.4	2.7	61.0	75.9	–10.2
<=35	18.4	17.9	3.8	59.9	78.3	+12.0
<=37	22.0	14.3	5.3	58.4	80.4	+35.7
<=39	23.8	12.5	6.5	57.2	80.9	+48.9
<=41	25.8	10.5	9.0	54.7	80.6	+67.1
<=43	27.4	8.9	10.8	52.9	80.3	+70.3
<=45	29.0	7.2	14.1	49.6	78.6	+61.1
<=47	30.7	5.6	17.3	46.4	77.1	+52.3
<=49	32.2	4.1	20.0	43.7	75.9	+44.9
<=52	33.4	2.9	24.0	39.7	73.1	+33.9
<=55	35.1	1.2	30.2	33.5	68.6	+16.9
<=57	35.3	1.0	34.0	29.7	65.0	+6.4
<=60	35.9	0.4	39.5	24.2	60.0	–8.9
<=63	36.0	0.3	43.6	20.1	56.1	–20.2
<=67	36.2	0.1	49.1	14.6	50.8	–35.2
<=72	36.3	0.0	54.1	9.6	45.9	–49.1
<=78	36.3	0.0	59.3	4.4	40.7	–63.4
<=100	36.3	0.0	63.7	0.0	36.3	–75.5

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

Table 10 (100% of the national 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
<=23	4.9	94.9	12.7	18.8:1
<=28	10.2	89.4	25.2	8.4:1
<=32	17.7	84.6	41.2	5.5:1
<=35	22.2	82.8	50.7	4.8:1
<=37	27.3	80.5	60.5	4.1:1
<=39	30.3	78.4	65.4	3.6:1
<=41	34.8	74.2	71.2	2.9:1
<=43	38.2	71.8	75.5	2.5:1
<=45	43.2	67.3	80.0	2.1:1
<=47	48.0	64.0	84.7	1.8:1
<=49	52.2	61.7	88.6	1.6:1
<=52	57.4	58.2	92.1	1.4:1
<=55	65.2	53.7	96.6	1.2:1
<=57	69.3	51.0	97.3	1.0:1
<=60	75.4	47.5	98.8	0.9:1
<=63	79.7	45.2	99.3	0.8:1
<=67	85.3	42.5	99.8	0.7:1
<=72	90.4	40.1	100.0	0.7:1
<=78	95.6	38.0	100.0	0.6:1
<=100	100.0	36.3	100.0	0.6:1

Scorecard applied to the validation sample.

Tables for
150% of the National Poverty Line

Table 3 (150% of the national 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:
0–23	98.2
24–28	95.7
29–32	95.7
33–35	95.7
36–37	90.0
38–39	89.8
40–41	88.2
42–43	86.2
44–45	85.0
46–47	76.1
48–49	72.2
50–52	69.5
53–55	57.6
56–57	49.4
58–60	41.1
61–63	36.1
64–67	31.9
68–72	15.4
73–78	9.0
79–100	3.2

Table 5 (150% of the national 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
0–23	–1.8	0.9	0.9	0.9
24–28	+2.4	2.0	2.5	3.2
29–32	0.0	0.9	1.0	1.3
33–35	0.0	1.4	1.6	2.1
36–37	–5.3	3.2	3.3	3.5
38–39	+1.0	2.6	3.3	4.6
40–41	+1.0	2.0	2.3	3.1
42–43	+1.5	2.4	2.8	3.5
44–45	–2.3	2.2	2.5	3.3
46–47	+16.5	3.7	4.5	5.9
48–49	–5.7	4.2	4.5	5.0
50–52	–7.9	5.2	5.4	5.9
53–55	+5.9	2.8	3.3	4.5
56–57	+2.5	3.9	4.6	6.3
58–60	–11.6	7.2	7.5	7.9
61–63	+0.8	3.8	4.7	5.8
64–67	+8.2	2.8	3.4	4.4
68–72	+5.0	1.8	2.1	2.7
73–78	+0.5	1.6	2.0	2.4
79–100	–2.7	2.2	2.4	2.7

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

Table 6 (150% of the national 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	+1.9	67.5	77.2	93.3
4	+1.0	33.9	40.2	55.4
8	+0.9	25.1	29.1	37.3
16	+0.7	18.3	21.5	26.0
32	+0.7	12.7	15.7	18.9
64	+0.7	8.9	11.0	14.5
128	+0.6	6.2	7.3	9.9
256	+0.7	4.7	5.3	7.2
512	+0.7	3.3	3.9	5.4
1,024	+0.7	2.4	3.0	3.9
2,048	+0.7	1.7	2.0	2.6
4,096	+0.7	1.1	1.4	1.8
8,192	+0.7	0.8	1.0	1.3
16,384	+0.7	0.6	0.7	1.0

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

Table 9 (150% of the national 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
<=23	4.9	58.8	0.0	36.3	41.2	–84.7
<=28	10.0	53.7	0.2	36.1	46.2	–68.2
<=32	17.0	46.7	0.6	35.7	52.7	–45.6
<=35	21.5	42.3	0.8	35.5	57.0	–31.4
<=37	26.2	37.5	1.1	35.2	61.5	–16.0
<=39	28.9	34.8	1.4	34.9	63.8	–7.1
<=41	32.8	30.9	2.1	34.2	67.0	+6.1
<=43	35.5	28.2	2.7	33.6	69.1	+15.7
<=45	39.7	24.0	3.5	32.8	72.5	+30.1
<=47	43.2	20.5	4.8	31.5	74.7	+43.3
<=49	46.3	17.4	5.8	30.5	76.8	+54.6
<=52	50.2	13.5	7.3	29.0	79.2	+68.9
<=55	54.6	9.1	10.6	25.7	80.3	+83.3
<=57	56.4	7.3	12.9	23.4	79.8	+79.8
<=60	59.5	4.2	15.9	20.4	79.9	+75.0
<=63	61.0	2.8	18.7	17.6	78.5	+70.6
<=67	62.2	1.5	23.1	13.2	75.4	+63.7
<=72	62.9	0.8	27.5	8.8	71.7	+56.8
<=78	63.5	0.2	32.2	4.1	67.6	+49.5
<=100	63.7	0.0	36.3	0.0	63.7	+43.0

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

Table 10 (150% of the national 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
<=23	4.9	100.0	7.6	Only poor targeted
<=28	10.2	98.3	15.8	56.5:1
<=32	17.7	96.5	26.7	27.2:1
<=35	22.2	96.5	33.7	27.2:1
<=37	27.3	96.1	41.2	24.9:1
<=39	30.3	95.5	45.4	21.2:1
<=41	34.8	94.1	51.4	15.9:1
<=43	38.2	92.9	55.7	13.2:1
<=45	43.2	92.0	62.3	11.4:1
<=47	48.0	90.0	67.9	9.0:1
<=49	52.2	88.8	72.7	7.9:1
<=52	57.4	87.3	78.8	6.9:1
<=55	65.2	83.7	85.7	5.1:1
<=57	69.3	81.4	88.6	4.4:1
<=60	75.4	78.9	93.4	3.7:1
<=63	79.7	76.5	95.7	3.3:1
<=67	85.3	72.9	97.6	2.7:1
<=72	90.4	69.6	98.7	2.3:1
<=78	95.6	66.4	99.6	2.0:1
<=100	100.0	63.7	100.0	1.8:1

Scorecard applied to the validation sample.

Tables for
200% of the National Poverty Line

Table 3 (200% of the national 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:
0–23	99.6
24–28	99.0
29–32	99.0
33–35	99.0
36–37	97.7
38–39	96.5
40–41	96.5
42–43	96.5
44–45	96.5
46–47	93.3
48–49	92.5
50–52	92.5
53–55	84.5
56–57	82.2
58–60	72.9
61–63	66.1
64–67	53.6
68–72	43.4
73–78	37.6
79–100	10.4

Table 5 (200% of the national 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
0–23	–0.4	0.2	0.2	0.2
24–28	+5.4	2.0	2.5	3.2
29–32	–0.8	0.5	0.5	0.5
33–35	–1.0	0.5	0.5	0.5
36–37	–2.0	1.1	1.1	1.1
38–39	+5.5	2.6	3.1	4.1
40–41	0.0	0.9	1.1	1.5
42–43	–3.3	1.7	1.7	1.7
44–45	–0.1	1.0	1.1	1.5
46–47	+17.1	3.9	4.7	6.2
48–49	–5.6	3.1	3.1	3.2
50–52	–3.7	2.3	2.4	2.6
53–55	+8.2	2.8	3.5	4.3
56–57	+9.6	3.4	3.9	5.3
58–60	–4.4	3.5	3.7	4.1
61–63	+13.7	3.9	4.6	5.8
64–67	–9.8	6.5	6.8	7.5
68–72	+7.5	3.3	3.9	5.4
73–78	+10.3	2.9	3.4	4.6
79–100	–5.8	4.2	4.4	4.9

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

Tableau 6 (200% of the national line): Les écarts (moyens entre des taux de pauvreté estimés et les réelles des groupes des ménages en un instant du temps) et la précision des écarts, selon la taille des échantillons

Sample Size	Difference between estimate and observed value			
		Confidence interval (±percentage points)		
n	Error	90-percent	95-percent	99-percent
1	+2.1	64.3	73.5	93.1
4	+1.9	31.2	39.0	50.9
8	+1.8	23.1	28.4	36.5
16	+2.2	17.1	20.0	25.5
32	+2.0	12.3	14.2	18.6
64	+2.2	8.5	10.2	13.3
128	+2.2	6.2	7.4	10.0
256	+2.4	4.6	5.5	7.4
512	+2.3	3.2	3.8	5.2
1,024	+2.3	2.3	2.7	3.4
2,048	+2.3	1.6	1.9	2.5
4,096	+2.4	1.1	1.3	1.8
8,192	+2.4	0.8	0.9	1.2
16,384	+2.4	0.6	0.7	0.8

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

Table 9 (200% of the national 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
<=23	4.9	75.4	0.0	19.8	24.6	–87.9
<=28	10.1	70.2	0.2	19.6	29.7	–74.7
<=32	17.5	62.8	0.2	19.6	37.0	–56.2
<=35	22.1	58.2	0.2	19.6	41.6	–44.8
<=37	27.1	53.2	0.2	19.5	46.6	–32.3
<=39	29.9	50.4	0.4	19.3	49.2	–25.0
<=41	34.2	46.1	0.6	19.1	53.3	–14.0
<=43	37.5	42.7	0.7	19.1	56.6	–5.6
<=45	42.3	38.0	0.9	18.9	61.1	+6.5
<=47	46.6	33.6	1.4	18.3	64.9	+18.0
<=49	50.6	29.7	1.6	18.2	68.7	+28.0
<=52	55.6	24.7	1.9	17.9	73.4	+40.8
<=55	61.9	18.3	3.3	16.5	78.4	+58.5
<=57	64.9	15.3	4.4	15.4	80.3	+67.3
<=60	69.6	10.7	5.8	13.9	83.5	+80.7
<=63	72.1	8.1	7.6	12.2	84.3	+89.2
<=67	75.6	4.6	9.7	10.1	85.7	+87.9
<=72	77.8	2.5	12.6	7.1	84.9	+84.2
<=78	79.5	0.7	16.1	3.7	83.2	+79.9
<=100	80.2	0.0	19.8	0.0	80.2	+75.4

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

Table 10 (200% of the national 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
<=23	4.9	100.0	6.1	Only poor targeted
<=28	10.2	98.5	12.6	66.6:1
<=32	17.7	98.9	21.8	93.7:1
<=35	22.2	99.2	27.5	118.3:1
<=37	27.3	99.2	33.7	124.5:1
<=39	30.3	98.6	37.2	72.4:1
<=41	34.8	98.2	42.6	53.2:1
<=43	38.2	98.3	46.8	57.0:1
<=45	43.2	97.9	52.7	47.0:1
<=47	48.0	97.0	58.1	32.7:1
<=49	52.2	96.9	63.0	31.5:1
<=52	57.4	96.7	69.2	29.4:1
<=55	65.2	95.0	77.2	18.9:1
<=57	69.3	93.7	80.9	14.8:1
<=60	75.4	92.3	86.7	11.9:1
<=63	79.7	90.5	89.9	9.5:1
<=67	85.3	88.7	94.2	7.8:1
<=72	90.4	86.0	96.9	6.1:1
<=78	95.6	83.2	99.1	4.9:1
<=100	100.0	80.2	100.0	4.1:1

Scorecard applied to the validation sample.

Tables for
$1.25/day 2005 PPP Poverty Line

Table 3 ($1.25/day 2005 PPP): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	95.4
24–28	83.4
29–32	81.2
33–35	74.0
36–37	59.0
38–39	50.7
40–41	48.9
42–43	48.9
44–45	32.2
46–47	30.5
48–49	23.3
50–52	22.4
53–55	16.6
56–57	9.5
58–60	5.9
61–63	5.9
64–67	3.5
68–72	1.6
73–78	0.8
79–100	0.1

Table 5 ($1.25/day 2005 PPP): 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
0–23	+5.4	2.3	2.7	3.7
24–28	+0.4	2.4	2.9	4.0
29–32	+1.5	2.0	2.4	3.4
33–35	–0.9	2.9	3.4	4.3
36–37	–10.0	6.5	6.9	7.4
38–39	–7.2	5.5	5.9	7.0
40–41	+2.8	3.7	4.4	5.6
42–43	+2.5	3.8	4.6	5.8
44–45	+6.2	2.7	3.3	4.4
46–47	+7.5	2.5	3.0	3.8
48–49	–24.6	14.3	14.7	15.3
50–52	–3.2	3.1	3.4	4.7
53–55	–4.0	3.2	3.4	4.0
56–57	+3.9	1.6	2.0	2.5
58–60	+2.9	0.8	1.0	1.2
61–63	+3.2	1.0	1.1	1.5
64–67	0.0	1.2	1.4	1.9
68–72	+0.7	0.5	0.6	0.7
73–78	+0.7	0.1	0.1	0.1
79–100	+0.1	0.0	0.0	0.0

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

Table 6 ($1.25/day 2005 PPP): 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	62.1	79.4	93.0
4	–0.5	34.9	42.6	54.0
8	–0.2	25.4	30.4	39.4
16	–0.6	17.7	21.2	29.5
32	–0.3	12.6	14.8	20.2
64	–0.4	8.8	11.0	14.4
128	–0.6	6.4	7.5	10.0
256	–0.6	4.6	5.6	7.3
512	–0.6	3.3	4.1	5.5
1,024	–0.6	2.4	2.9	3.7
2,048	–0.6	1.7	2.0	2.6
4,096	–0.6	1.2	1.4	1.8
8,192	–0.6	0.9	1.0	1.3
16,384	–0.6	0.6	0.7	0.9

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

Table 9 ($1.25/day 2005 PPP) : 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
<=23	4.5	30.5	0.4	64.6	69.1	–73.3
<=28	9.0	26.0	1.2	63.8	72.8	–45.1
<=32	14.7	20.3	2.9	62.1	76.8	–7.5
<=35	18.1	16.9	4.1	60.9	79.0	+15.2
<=37	21.6	13.4	5.7	59.3	80.9	+39.6
<=39	23.4	11.7	6.9	58.1	81.4	+53.2
<=41	25.3	9.7	9.5	55.4	80.7	+71.6
<=43	26.8	8.2	11.4	53.6	80.4	+67.4
<=45	28.4	6.6	14.8	50.2	78.5	+57.7
<=47	29.9	5.1	18.1	46.9	76.8	+48.3
<=49	31.3	3.7	20.9	44.1	75.4	+40.3
<=52	32.5	2.6	25.0	40.0	72.5	+28.6
<=55	34.0	1.0	31.2	33.8	67.8	+10.9
<=57	34.3	0.7	35.0	30.0	64.3	0.0
<=60	34.6	0.4	40.8	24.2	58.8	–16.5
<=63	34.8	0.2	44.9	20.1	54.8	–28.3
<=67	34.9	0.1	50.4	14.6	49.6	–43.9
<=72	35.0	0.0	55.4	9.6	44.6	–58.3
<=78	35.0	0.0	60.6	4.4	39.4	–73.1
<=100	35.0	0.0	65.0	0.0	35.0	–85.6

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

Table 10 ($1.25/day 2005 PPP) : 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
<=23	4.9	92.1	12.8	11.7:1
<=28	10.2	88.0	25.7	7.4:1
<=32	17.7	83.4	42.1	5.0:1
<=35	22.2	81.4	51.7	4.4:1
<=37	27.3	79.1	61.6	3.8:1
<=39	30.3	77.1	66.7	3.4:1
<=41	34.8	72.6	72.2	2.6:1
<=43	38.2	70.1	76.5	2.3:1
<=45	43.2	65.7	81.0	1.9:1
<=47	48.0	62.3	85.5	1.7:1
<=49	52.2	60.0	89.3	1.5:1
<=52	57.4	56.5	92.7	1.3:1
<=55	65.2	52.2	97.2	1.1:1
<=57	69.3	49.5	98.0	1.0:1
<=60	75.4	45.9	98.8	0.8:1
<=63	79.7	43.6	99.3	0.8:1
<=67	85.3	41.0	99.8	0.7:1
<=72	90.4	38.7	100.0	0.6:1
<=78	95.6	36.6	100.0	0.6:1
<=100	100.0	35.0	100.0	0.5:1

Scorecard applied to the validation sample.

Tables for
$2.00/day 2005 PPP Poverty Line

Table 3 ($2.00/day 2005 PPP): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	98.2
24–28	96.7
29–32	96.7
33–35	96.7
36–37	91.6
38–39	91.6
40–41	90.9
42–43	90.0
44–45	89.7
46–47	79.0
48–49	78.3
50–52	75.3
53–55	60.3
56–57	54.5
58–60	49.0
61–63	42.1
64–67	35.5
68–72	21.4
73–78	11.5
79–100	3.4

Table 5 ($2.00/day 2005 PPP): 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
0–23	–1.8	0.9	0.9	0.9
24–28	+3.3	2.0	2.5	3.2
29–32	–0.4	0.6	0.8	0.9
33–35	+1.0	1.4	1.6	2.1
36–37	–3.7	2.4	2.5	2.7
38–39	+2.8	2.6	3.3	4.6
40–41	+1.3	1.7	2.1	2.8
42–43	–1.5	1.8	2.1	2.7
44–45	–4.6	2.8	2.9	3.1
46–47	+13.0	3.9	4.6	6.3
48–49	–1.5	2.7	3.4	4.4
50–52	–11.1	6.4	6.6	7.0
53–55	+5.6	2.8	3.3	4.6
56–57	–1.7	3.7	4.4	5.6
58–60	–7.9	5.4	5.7	6.2
61–63	+3.7	3.8	4.5	5.8
64–67	+6.4	3.1	3.6	4.9
68–72	+2.3	2.6	3.2	4.3
73–78	+1.3	1.8	2.2	2.9
79–100	–4.3	3.1	3.3	3.6

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

Table 6 ($2.00/day 2005 PPP): 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	+2.0	68.1	77.3	92.6
4	+0.6	33.3	40.4	55.4
8	+0.4	24.2	29.7	39.3
16	+0.5	17.7	20.9	26.6
32	+0.3	12.3	15.0	18.9
64	+0.3	8.6	10.5	14.3
128	+0.2	6.3	7.5	9.9
256	+0.4	4.5	5.3	7.0
512	+0.4	3.2	3.9	5.1
1,024	+0.4	2.3	2.8	3.6
2,048	+0.3	1.7	1.9	2.6
4,096	+0.4	1.1	1.3	1.8
8,192	+0.4	0.8	0.9	1.3
16,384	+0.4	0.6	0.7	0.9

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

Table 9 ($2.00/day 2005 PPP) : 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
<=23	4.9	62.2	0.0	33.0	37.8	–85.5
<=28	10.0	57.0	0.2	32.8	42.8	–69.8
<=32	17.1	49.9	0.5	32.4	49.6	–48.1
<=35	21.6	45.5	0.7	32.3	53.9	–34.7
<=37	26.3	40.7	0.9	32.0	58.4	–20.0
<=39	29.0	38.0	1.3	31.7	60.7	–11.5
<=41	33.0	34.1	1.8	31.1	64.1	+1.1
<=43	36.0	31.1	2.2	30.7	66.7	+10.6
<=45	40.4	26.6	2.7	30.2	70.7	+24.7
<=47	44.1	22.9	3.9	29.0	73.2	+37.5
<=49	47.3	19.7	4.8	28.1	75.5	+48.4
<=52	51.6	15.4	5.8	27.2	78.8	+62.7
<=55	56.4	10.7	8.8	24.1	80.5	+81.4
<=57	58.5	8.5	10.8	22.2	80.6	+83.9
<=60	61.8	5.2	13.6	19.4	81.2	+79.8
<=63	63.5	3.5	16.2	16.8	80.3	+75.9
<=67	65.1	2.0	20.2	12.7	77.8	+69.8
<=72	66.1	1.0	24.3	8.6	74.7	+63.7
<=78	66.7	0.3	28.9	4.0	70.7	+56.9
<=100	67.0	0.0	33.0	0.0	67.0	+50.8

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

Table 10 ($2.00/day 2005 PPP) : 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
<=23	4.9	100.0	7.3	Only poor targeted
<=28	10.2	98.3	15.0	56.5:1
<=32	17.7	97.1	25.6	33.5:1
<=35	22.2	97.0	32.2	32.0:1
<=37	27.3	96.6	39.3	28.0:1
<=39	30.3	95.9	43.3	23.2:1
<=41	34.8	94.7	49.2	17.9:1
<=43	38.2	94.2	53.7	16.1:1
<=45	43.2	93.7	60.3	14.8:1
<=47	48.0	91.8	65.8	11.2:1
<=49	52.2	90.8	70.6	9.8:1
<=52	57.4	89.9	77.0	8.9:1
<=55	65.2	86.4	84.1	6.4:1
<=57	69.3	84.4	87.3	5.4:1
<=60	75.4	82.0	92.2	4.6:1
<=63	79.7	79.7	94.8	3.9:1
<=67	85.3	76.3	97.1	3.2:1
<=72	90.4	73.1	98.5	2.7:1
<=78	95.6	69.8	99.5	2.3:1
<=100	100.0	67.0	100.0	2.0:1

Scorecard applied to the validation sample.

Tables for
$2.50/day 2005 PPP Poverty Line

Table 3 ($2.50/day 2005 PPP): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	99.5
24–28	98.9
29–32	98.9
33–35	98.9
36–37	97.1
38–39	96.4
40–41	96.4
42–43	96.4
44–45	96.4
46–47	92.7
48–49	92.0
50–52	92.0
53–55	83.3
56–57	79.6
58–60	71.2
61–63	64.6
64–67	53.6
68–72	42.5
73–78	36.4
79–100	9.8

Table 5 ($2.50/day 2005 PPP): 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
0–23	–0.5	0.2	0.2	0.2
24–28	+5.3	2.0	2.5	3.2
29–32	–0.9	0.5	0.5	0.6
33–35	–1.1	0.6	0.6	0.6
36–37	–0.9	0.8	1.0	1.2
38–39	+5.8	2.6	3.1	4.4
40–41	–0.2	0.9	1.1	1.5
42–43	–3.2	1.7	1.8	1.8
44–45	–0.2	1.0	1.1	1.5
46–47	+16.6	3.9	4.6	6.2
48–49	–2.1	1.8	2.0	2.6
50–52	–4.2	2.6	2.7	2.9
53–55	+8.7	2.8	3.5	4.6
56–57	+9.0	3.5	3.9	5.3
58–60	–5.6	4.0	4.3	4.7
61–63	+15.3	3.9	4.6	5.7
64–67	–6.3	4.8	5.2	5.7
68–72	+12.2	2.9	3.5	4.7
73–78	+13.3	2.6	3.0	4.2
79–100	–4.0	3.1	3.4	3.8

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

Table 6 ($2.50/day 2005 PPP): 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	+2.6	64.9	76.3	93.3
4	+2.9	32.4	39.5	52.1
8	+2.6	23.2	28.3	36.6
16	+3.0	17.1	20.5	25.6
32	+2.9	12.0	13.6	18.2
64	+3.0	8.8	10.3	13.7
128	+3.0	6.2	7.4	9.5
256	+3.2	4.5	5.6	7.0
512	+3.2	3.2	3.8	5.1
1,024	+3.1	2.4	2.8	3.4
2,048	+3.1	1.7	2.0	2.6
4,096	+3.2	1.1	1.4	1.7
8,192	+3.2	0.8	0.9	1.2
16,384	+3.2	0.5	0.7	0.9

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

Table 9 ($2.50/day 2005 PPP) : 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
<=23	4.9	74.0	0.0	21.2	26.0	–87.7
<=28	10.1	68.8	0.2	21.0	31.1	–74.3
<=32	17.5	61.4	0.2	21.0	38.4	–55.5
<=35	22.1	56.8	0.2	21.0	43.0	–43.8
<=37	27.0	51.9	0.3	20.9	47.8	–31.2
<=39	29.8	49.1	0.5	20.6	50.4	–23.8
<=41	34.1	44.8	0.7	20.4	54.5	–12.6
<=43	37.4	41.4	0.8	20.4	57.8	–4.1
<=45	42.1	36.7	1.0	20.1	62.3	+8.2
<=47	46.5	32.4	1.6	19.6	66.1	+19.9
<=49	50.3	28.5	1.9	19.3	69.6	+30.0
<=52	55.3	23.5	2.1	19.0	74.3	+43.0
<=55	61.6	17.3	3.7	17.5	79.1	+60.8
<=57	64.4	14.5	4.9	16.2	80.6	+69.6
<=60	69.0	9.9	6.4	14.7	83.7	+83.1
<=63	71.4	7.4	8.3	12.9	84.3	+89.5
<=67	74.7	4.1	10.6	10.6	85.4	+86.6
<=72	76.7	2.2	13.7	7.4	84.1	+82.6
<=78	78.2	0.6	17.4	3.8	82.0	+77.9
<=100	78.8	0.0	21.2	0.0	78.8	+73.2

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

Table 10 ($2.50/day 2005 PPP) : 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
<=23	4.9	100.0	6.2	Only poor targeted
<=28	10.2	98.5	12.8	66.6:1
<=32	17.7	98.9	22.2	93.7:1
<=35	22.2	99.2	28.0	118.3:1
<=37	27.3	98.9	34.2	91.4:1
<=39	30.3	98.3	37.8	57.3:1
<=41	34.8	97.8	43.2	45.5:1
<=43	38.2	97.9	47.5	47.6:1
<=45	43.2	97.6	53.5	41.0:1
<=47	48.0	96.7	59.0	29.7:1
<=49	52.2	96.4	63.8	27.2:1
<=52	57.4	96.3	70.2	25.8:1
<=55	65.2	94.4	78.1	16.8:1
<=57	69.3	92.9	81.7	13.1:1
<=60	75.4	91.5	87.5	10.7:1
<=63	79.7	89.6	90.6	8.6:1
<=67	85.3	87.6	94.8	7.1:1
<=72	90.4	84.8	97.3	5.6:1
<=78	95.6	81.8	99.2	4.5:1
<=100	100.0	78.8	100.0	3.7:1

Scorecard applied to the validation sample.

Tables for
$5.00/day 2005 PPP Poverty Line

Table 3 ($5.00/day 2005 PPP): Scores and their corresponding estimates of poverty likelihoods

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	100.0
24–28	100.0
29–32	100.0
33–35	100.0
36–37	99.8
38–39	99.6
40–41	99.6
42–43	99.6
44–45	99.6
46–47	99.6
48–49	99.5
50–52	99.4
53–55	99.2
56–57	98.2
58–60	97.4
61–63	96.1
64–67	94.0
68–72	91.8
73–78	89.1
79–100	67.0

Table 5 ($5.00/day 2005 PPP): 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
0–23	0.0	0.0	0.0	0.0
24–28	0.0	0.0	0.0	0.0
29–32	0.0	0.0	0.0	0.0
33–35	0.0	0.0	0.0	0.0
36–37	–0.2	0.1	0.1	0.1
38–39	+4.9	2.0	2.4	3.1
40–41	–0.4	0.2	0.2	0.2
42–43	–0.4	0.2	0.2	0.2
44–45	–0.4	0.2	0.2	0.2
46–47	+2.1	1.0	1.2	1.6
48–49	+0.5	0.5	0.6	0.8
50–52	–0.6	0.3	0.3	0.3
53–55	+4.5	1.6	1.9	2.5
56–57	–1.8	0.9	0.9	0.9
58–60	+1.0	1.1	1.3	1.6
61–63	–3.6	1.9	1.9	1.9
64–67	–2.1	1.6	1.7	1.8
68–72	–0.8	1.7	2.1	2.8
73–78	+5.4	2.3	2.7	3.5
79–100	+0.2	3.2	3.7	4.9

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

Table 6 ($5.00/day 2005 PPP): 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	+1.1	5.4	50.0	66.1
4	+1.1	14.4	20.7	33.8
8	+1.0	10.7	14.2	22.8
16	+0.7	7.4	9.7	13.8
32	+0.6	5.5	6.4	8.3
64	+0.6	3.9	4.6	6.0
128	+0.5	2.8	3.2	4.2
256	+0.6	2.0	2.4	3.0
512	+0.6	1.4	1.7	2.3
1,024	+0.6	1.0	1.2	1.6
2,048	+0.6	0.7	0.9	1.1
4,096	+0.6	0.5	0.6	0.8
8,192	+0.6	0.4	0.4	0.5
16,384	+0.6	0.2	0.3	0.4

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

Table 9 ($5.00/day 2005 PPP) : 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
<=23	4.9	91.3	0.0	3.9	8.7	–89.9
<=28	10.2	85.9	0.0	3.9	14.1	–78.7
<=32	17.7	78.5	0.0	3.9	21.5	–63.3
<=35	22.2	73.9	0.0	3.9	26.1	–53.7
<=37	27.3	68.9	0.0	3.9	31.1	–43.2
<=39	30.2	65.9	0.1	3.8	34.0	–37.1
<=41	34.7	61.4	0.1	3.8	38.5	–27.7
<=43	38.1	58.0	0.1	3.8	41.9	–20.6
<=45	43.1	53.1	0.1	3.8	46.8	–10.3
<=47	47.9	48.3	0.2	3.7	51.5	–0.2
<=49	51.9	44.2	0.3	3.6	55.5	+8.2
<=52	57.2	38.9	0.3	3.6	60.8	+19.3
<=55	64.8	31.3	0.4	3.4	68.2	+35.3
<=57	68.9	27.3	0.4	3.4	72.3	+43.7
<=60	74.7	21.4	0.7	3.2	78.0	+56.2
<=63	79.0	17.1	0.7	3.2	82.2	+65.1
<=67	84.4	11.7	0.9	3.0	87.4	+76.5
<=72	89.1	7.1	1.3	2.5	91.6	+86.7
<=78	93.2	2.9	2.4	1.5	94.7	+96.4
<=100	96.1	0.0	3.9	0.0	96.1	+96.0

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

Table 10 ($5.00/day 2005 PPP) : 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
<=23	4.9	100.0	5.1	Only poor targeted
<=28	10.2	100.0	10.6	Only poor targeted
<=32	17.7	100.0	18.4	Only poor targeted
<=35	22.2	100.0	23.1	Only poor targeted
<=37	27.3	100.0	28.4	Only poor targeted
<=39	30.3	99.7	31.4	300.8:1
<=41	34.8	99.7	36.1	345.9:1
<=43	38.2	99.7	39.6	379.6:1
<=45	43.2	99.8	44.8	429.2:1
<=47	48.0	99.6	49.8	246.6:1
<=49	52.2	99.5	54.0	200.9:1
<=52	57.4	99.6	59.5	221.4:1
<=55	65.2	99.3	67.4	148.4:1
<=57	69.3	99.4	71.6	157.7:1
<=60	75.4	99.1	77.8	114.3:1
<=63	79.7	99.1	82.2	116.2:1
<=67	85.3	98.9	87.8	92.8:1
<=72	90.4	98.5	92.6	66.3:1
<=78	95.6	97.5	97.0	38.7:1
<=100	100.0	96.1	100.0	24.8:1

Scorecard applied to the validation sample.

Tables for
$1.90/day 2011 PPP Poverty Line

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	95.4
24–28	81.7
29–32	78.9
33–35	72.0
36–37	54.7
38–39	48.5
40–41	46.6
42–43	46.6
44–45	30.7
46–47	29.0
48–49	22.1
50–52	20.1
53–55	14.9
56–57	8.7
58–60	5.7
61–63	4.1
64–67	2.9
68–72	1.6
73–78	0.8
79–100	0.1

Table 5 ($1.90/day 2011 PPP): 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
0–23	+5.4	2.3	2.7	3.7
24–28	+2.0	2.6	3.1	4.2
29–32	+0.5	2.1	2.5	3.5
33–35	+5.4	3.1	3.7	4.6
36–37	–13.3	8.2	8.5	9.0
38–39	–9.3	6.6	7.0	8.1
40–41	+1.3	3.7	4.4	5.7
42–43	+3.4	3.8	4.6	5.8
44–45	+4.7	2.7	3.3	4.4
46–47	+7.6	2.4	2.9	3.8
48–49	–25.6	14.9	15.2	15.9
50–52	–4.1	3.6	3.9	4.6
53–55	–4.2	3.3	3.5	4.2
56–57	+3.7	1.6	1.9	2.5
58–60	+3.0	0.8	0.9	1.2
61–63	+1.3	1.0	1.1	1.5
64–67	–0.6	1.2	1.4	1.9
68–72	+0.7	0.5	0.6	0.7
73–78	+0.7	0.1	0.1	0.1
79–100	+0.1	0.0	0.0	0.0

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

Table 6 ($1.90/day 2011 PPP): 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	+0.1	62.9	79.4	92.8
4	–0.8	35.1	43.2	54.7
8	–0.6	25.3	29.4	39.1
16	–1.0	17.7	21.1	29.6
32	–0.7	12.9	15.4	20.6
64	–0.8	9.4	11.1	14.2
128	–0.9	6.6	7.8	9.8
256	–1.0	4.6	5.6	7.5
512	–1.0	3.4	4.1	5.6
1,024	–1.0	2.5	2.9	3.8
2,048	–1.0	1.7	2.0	2.6
4,096	–1.0	1.2	1.4	1.9
8,192	–1.0	0.9	1.0	1.3
16,384	–1.0	0.6	0.7	0.9

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

Table 9 ($1.90/day 2011 PPP) : 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
<=23	4.5	29.1	0.4	66.0	70.5	–72.2
<=28	8.8	24.8	1.4	64.9	73.7	–43.5
<=32	14.4	19.2	3.2	63.2	77.6	–4.6
<=35	17.5	16.1	4.7	61.7	79.2	+18.2
<=37	20.9	12.7	6.4	60.0	80.9	+43.3
<=39	22.7	11.0	7.6	58.8	81.4	+57.5
<=41	24.5	9.1	10.3	56.1	80.6	+69.4
<=43	25.9	7.7	12.3	54.1	80.0	+63.5
<=45	27.5	6.1	15.7	50.7	78.2	+53.3
<=47	28.9	4.7	19.1	47.3	76.2	+43.2
<=49	30.3	3.4	21.9	44.5	74.7	+34.9
<=52	31.3	2.3	26.1	40.3	71.6	+22.3
<=55	32.7	0.9	32.5	33.9	66.6	+3.3
<=57	33.0	0.7	36.3	30.0	63.0	–8.1
<=60	33.2	0.4	42.2	24.2	57.4	–25.5
<=63	33.4	0.2	46.3	20.1	53.4	–37.8
<=67	33.5	0.1	51.8	14.6	48.2	–53.9
<=72	33.6	0.0	56.8	9.6	43.2	–68.9
<=78	33.6	0.0	62.0	4.4	38.0	–84.4
<=100	33.6	0.0	66.4	0.0	33.6	–97.4

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

Table 10 ($1.90/day 2011 PPP) : 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
<=23	4.9	92.1	13.3	11.7:1
<=28	10.2	86.0	26.1	6.1:1
<=32	17.7	81.8	42.9	4.5:1
<=35	22.2	78.8	52.1	3.7:1
<=37	27.3	76.6	62.1	3.3:1
<=39	30.3	74.8	67.4	3.0:1
<=41	34.8	70.5	73.0	2.4:1
<=43	38.2	67.9	77.1	2.1:1
<=45	43.2	63.7	81.8	1.8:1
<=47	48.0	60.2	86.1	1.5:1
<=49	52.2	58.0	90.0	1.4:1
<=52	57.4	54.5	93.2	1.2:1
<=55	65.2	50.2	97.3	1.0:1
<=57	69.3	47.6	98.0	0.9:1
<=60	75.4	44.0	98.8	0.8:1
<=63	79.7	41.9	99.3	0.7:1
<=67	85.3	39.3	99.8	0.6:1
<=72	90.4	37.2	99.9	0.6:1
<=78	95.6	35.2	100.0	0.5:1
<=100	100.0	33.6	100.0	0.5:1

Scorecard applied to the validation sample.

Tables for
$3.20/day 2011 PPP Poverty Line

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	98.5
24–28	97.5
29–32	97.5
33–35	97.5
36–37	92.4
38–39	92.4
40–41	91.3
42–43	90.1
44–45	90.1
46–47	80.5
48–49	80.5
50–52	78.1
53–55	63.7
56–57	58.1
58–60	52.8
61–63	44.2
64–67	36.3
68–72	22.7
73–78	12.9
79–100	3.9

Table 5 ($3.20/day 2011 PPP): 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
0–23	–1.5	0.8	0.8	0.8
24–28	+4.1	2.0	2.5	3.2
29–32	–0.5	0.5	0.7	0.8
33–35	–1.1	0.9	0.9	1.0
36–37	–3.6	2.4	2.5	2.7
38–39	+3.5	2.6	3.3	4.6
40–41	–1.2	1.4	1.7	2.3
42–43	–1.4	1.8	2.1	2.7
44–45	–4.9	3.0	3.1	3.2
46–47	+11.5	3.8	4.8	6.1
48–49	–2.0	2.7	3.1	4.4
50–52	–9.7	5.7	5.8	6.3
53–55	+8.2	2.8	3.3	4.5
56–57	+0.7	3.7	4.5	5.6
58–60	–8.1	5.4	5.7	6.3
61–63	+4.5	3.7	4.6	5.8
64–67	+5.1	3.1	3.5	4.6
68–72	+2.3	2.7	3.2	4.3
73–78	+2.0	1.8	2.2	2.8
79–100	–3.9	2.9	3.0	3.5

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

Table 6 ($3.20/day 2011 PPP): 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	+1.7	66.9	76.9	89.7
4	+0.6	33.3	39.2	54.5
8	+0.2	24.7	28.8	39.4
16	+0.6	17.8	20.9	26.4
32	+0.4	12.2	14.4	19.1
64	+0.5	8.5	10.4	14.1
128	+0.4	6.5	7.4	10.0
256	+0.6	4.5	5.4	7.1
512	+0.6	3.2	3.9	4.9
1,024	+0.6	2.3	2.7	3.6
2,048	+0.5	1.6	1.9	2.6
4,096	+0.6	1.1	1.3	1.8
8,192	+0.6	0.8	0.9	1.3
16,384	+0.6	0.6	0.7	0.9

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

Table 9 ($3.20/day 2011 PPP) : 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
<=23	4.9	63.9	0.0	31.2	36.1	–85.9
<=28	10.0	58.7	0.2	31.0	41.1	–70.5
<=32	17.2	51.6	0.4	30.8	48.0	–49.3
<=35	21.7	47.1	0.5	30.7	52.4	–36.1
<=37	26.6	42.2	0.7	30.5	57.1	–21.7
<=39	29.3	39.5	1.0	30.2	59.5	–13.4
<=41	33.3	35.4	1.5	29.7	63.1	–0.9
<=43	36.3	32.5	1.9	29.3	65.7	+8.3
<=45	40.9	27.9	2.3	28.9	69.8	+22.2
<=47	44.7	24.1	3.3	27.9	72.6	+34.8
<=49	48.1	20.7	4.1	27.1	75.2	+45.7
<=52	52.5	16.3	5.0	26.3	78.8	+59.8
<=55	57.4	11.4	7.8	23.4	80.8	+78.2
<=57	59.6	9.2	9.7	21.5	81.1	+85.9
<=60	63.1	5.6	12.3	19.0	82.1	+82.2
<=63	64.9	3.9	14.8	16.4	81.4	+78.5
<=67	66.6	2.2	18.7	12.5	79.1	+72.8
<=72	67.7	1.1	22.7	8.5	76.2	+67.0
<=78	68.4	0.4	27.2	4.0	72.5	+60.5
<=100	68.8	0.0	31.2	0.0	68.8	+54.6

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

Table 10 ($3.20/day 2011 PPP) : 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
<=23	4.9	100.0	7.1	Only poor targeted
<=28	10.2	98.3	14.6	56.5:1
<=32	17.7	97.6	25.1	41.0:1
<=35	22.2	97.8	31.6	43.6:1
<=37	27.3	97.5	38.6	38.3:1
<=39	30.3	96.7	42.6	29.1:1
<=41	34.8	95.8	48.5	22.7:1
<=43	38.2	95.1	52.8	19.5:1
<=45	43.2	94.7	59.4	17.9:1
<=47	48.0	93.0	65.0	13.4:1
<=49	52.2	92.2	69.9	11.8:1
<=52	57.4	91.4	76.3	10.6:1
<=55	65.2	88.0	83.4	7.3:1
<=57	69.3	86.0	86.6	6.1:1
<=60	75.4	83.7	91.8	5.2:1
<=63	79.7	81.5	94.4	4.4:1
<=67	85.3	78.1	96.8	3.6:1
<=72	90.4	74.9	98.4	3.0:1
<=78	95.6	71.6	99.5	2.5:1
<=100	100.0	68.8	100.0	2.2:1

Scorecard applied to the validation sample.

Tables for
$5.50/day 2011 PPP Poverty Line

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	100.0
24–28	100.0
29–32	100.0
33–35	100.0
36–37	99.8
38–39	99.2
40–41	99.0
42–43	99.0
44–45	99.0
46–47	97.8
48–49	97.8
50–52	97.8
53–55	93.3
56–57	92.9
58–60	92.9
61–63	86.2
64–67	78.4
68–72	77.2
73–78	68.4
79–100	35.8

Table 5 ($5.50/day 2011 PPP): 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
0–23	0.0	0.0	0.0	0.0
24–28	+6.4	2.0	2.5	3.2
29–32	0.0	0.0	0.0	0.0
33–35	0.0	0.0	0.0	0.0
36–37	–0.2	0.1	0.1	0.1
38–39	+4.5	2.0	2.4	3.1
40–41	–1.0	0.5	0.5	0.5
42–43	–1.0	0.5	0.5	0.5
44–45	–1.0	0.5	0.5	0.5
46–47	+0.2	1.0	1.2	1.6
48–49	–1.3	0.9	0.9	1.0
50–52	–1.5	0.9	1.0	1.0
53–55	+0.4	1.6	2.0	2.5
56–57	+7.8	2.7	3.1	4.1
58–60	–1.0	1.4	1.6	2.0
61–63	+0.3	2.5	2.8	3.5
64–67	–11.0	6.3	6.5	6.7
68–72	+4.2	3.0	3.5	4.5
73–78	–5.2	4.0	4.3	4.6
79–100	–9.6	6.5	6.8	7.5

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

Table 6 ($5.50/day 2011 PPP): 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	+0.7	54.4	55.0	78.7
4	–0.1	22.6	29.6	43.7
8	–0.2	16.9	21.4	29.8
16	–0.1	11.7	14.1	20.9
32	–0.3	8.1	10.0	13.0
64	–0.3	5.5	6.8	9.7
128	–0.4	4.1	4.8	6.0
256	–0.2	2.8	3.5	4.7
512	–0.3	2.1	2.6	3.4
1,024	–0.3	1.5	1.8	2.4
2,048	–0.3	1.0	1.2	1.6
4,096	–0.3	0.8	0.9	1.0
8,192	–0.3	0.6	0.6	0.8
16,384	–0.3	0.4	0.4	0.6

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

Table 9 ($5.50/day 2011 PPP) : 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
<=23	4.9	86.0	0.0	9.2	14.0	–89.3
<=28	10.1	80.7	0.2	9.0	19.1	–77.7
<=32	17.5	73.3	0.2	9.0	26.5	–61.3
<=35	22.1	68.7	0.2	9.0	31.1	–51.2
<=37	27.1	63.7	0.2	9.0	36.2	–40.1
<=39	30.0	60.8	0.3	8.9	39.0	–33.6
<=41	34.6	56.2	0.3	8.9	43.5	–23.6
<=43	37.9	52.9	0.3	8.9	46.9	–16.1
<=45	42.9	47.9	0.3	8.9	51.8	–5.2
<=47	47.7	43.1	0.4	8.8	56.5	+5.4
<=49	51.7	39.1	0.4	8.8	60.5	+14.4
<=52	57.0	33.8	0.5	8.7	65.7	+26.0
<=55	64.3	26.5	0.9	8.3	72.6	+42.6
<=57	67.8	23.0	1.5	7.7	75.4	+50.9
<=60	73.4	17.4	1.9	7.2	80.7	+63.9
<=63	77.1	13.7	2.6	6.6	83.7	+72.6
<=67	81.9	8.9	3.4	5.8	87.8	+84.2
<=72	85.6	5.2	4.8	4.4	89.9	+93.8
<=78	88.9	1.9	6.7	2.5	91.3	+92.6
<=100	90.8	0.0	9.2	0.0	90.8	+89.9

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

Table 10 ($5.50/day 2011 PPP) : 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
<=23	4.9	100.0	5.4	Only poor targeted
<=28	10.2	98.5	11.1	66.6:1
<=32	17.7	99.1	19.3	115.7:1
<=35	22.2	99.3	24.3	146.0:1
<=37	27.3	99.4	29.9	179.3:1
<=39	30.3	99.2	33.1	119.3:1
<=41	34.8	99.3	38.1	137.4:1
<=43	38.2	99.3	41.8	150.8:1
<=45	43.2	99.4	47.3	163.0:1
<=47	48.0	99.3	52.5	133.6:1
<=49	52.2	99.2	57.0	122.8:1
<=52	57.4	99.2	62.7	121.0:1
<=55	65.2	98.6	70.8	70.0:1
<=57	69.3	97.8	74.6	44.6:1
<=60	75.4	97.4	80.9	37.7:1
<=63	79.7	96.7	84.9	29.5:1
<=67	85.3	96.1	90.2	24.4:1
<=72	90.4	94.7	94.2	17.7:1
<=78	95.6	93.0	97.9	13.2:1
<=100	100.0	90.8	100.0	9.9:1

Scorecard applied to the validation sample.

Tables for
$21.70/day 2011 PPP Poverty Line

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–23	100.0
24–28	100.0
29–32	100.0
33–35	100.0
36–37	100.0
38–39	100.0
40–41	100.0
42–43	100.0
44–45	100.0
46–47	100.0
48–49	100.0
50–52	100.0
53–55	100.0
56–57	100.0
58–60	100.0
61–63	100.0
64–67	99.8
68–72	99.5
73–78	99.5
79–100	99.2

Table 5 ($21.70/day 2011 PPP): 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
0–23	0.0	0.0	0.0	0.0
24–28	0.0	0.0	0.0	0.0
29–32	0.0	0.0	0.0	0.0
33–35	0.0	0.0	0.0	0.0
36–37	0.0	0.0	0.0	0.0
38–39	0.0	0.0	0.0	0.0
40–41	0.0	0.0	0.0	0.0
42–43	0.0	0.0	0.0	0.0
44–45	0.0	0.0	0.0	0.0
46–47	0.0	0.0	0.0	0.0
48–49	0.0	0.0	0.0	0.0
50–52	0.0	0.0	0.0	0.0
53–55	0.0	0.0	0.0	0.0
56–57	0.0	0.0	0.0	0.0
58–60	0.0	0.0	0.0	0.0
61–63	0.0	0.0	0.0	0.0
64–67	–0.2	0.1	0.1	0.1
68–72	–0.5	0.2	0.2	0.2
73–78	+0.3	0.3	0.4	0.5
79–100	+3.6	1.6	1.9	2.5

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

Table 6 ($21.70/day 2011 PPP): 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	0.2	0.4	0.4
4	+0.1	0.1	0.2	8.6
8	+0.1	0.1	0.1	5.8
16	+0.1	0.1	1.8	4.1
32	+0.1	0.9	1.2	2.1
64	+0.1	0.7	1.0	1.2
128	+0.1	0.5	0.5	0.9
256	+0.1	0.4	0.4	0.6
512	+0.1	0.3	0.3	0.4
1,024	+0.1	0.2	0.2	0.3
2,048	+0.1	0.1	0.2	0.2
4,096	+0.1	0.1	0.1	0.2
8,192	+0.1	0.1	0.1	0.1
16,384	+0.1	0.1	0.1	0.1

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

Table 9 ($21.70/day 2011 PPP) : 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
<=23	4.9	94.9	0.0	0.2	5.1	–90.3
<=28	10.2	89.6	0.0	0.2	10.4	–79.5
<=32	17.7	82.2	0.0	0.2	17.8	–64.6
<=35	22.2	77.6	0.0	0.2	22.4	–55.4
<=37	27.3	72.5	0.0	0.2	27.5	–45.3
<=39	30.3	69.5	0.0	0.2	30.5	–39.3
<=41	34.8	65.0	0.0	0.2	35.0	–30.2
<=43	38.2	61.6	0.0	0.2	38.4	–23.5
<=45	43.2	56.6	0.0	0.2	43.4	–13.5
<=47	48.0	51.8	0.0	0.2	48.2	–3.7
<=49	52.2	47.7	0.0	0.2	52.3	+4.5
<=52	57.4	42.4	0.0	0.2	57.6	+15.1
<=55	65.2	34.6	0.0	0.2	65.4	+30.7
<=57	69.3	30.5	0.0	0.2	69.5	+38.9
<=60	75.4	24.4	0.0	0.2	75.6	+51.1
<=63	79.7	20.1	0.0	0.2	79.9	+59.7
<=67	85.3	14.5	0.0	0.2	85.5	+70.9
<=72	90.4	9.4	0.0	0.2	90.6	+81.1
<=78	95.6	4.3	0.1	0.1	95.7	+91.5
<=100	99.8	0.0	0.2	0.0	99.8	+99.8

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

Table 10 ($21.70/day 2011 PPP) : 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
<=23	4.9	100.0	4.9	Only poor targeted
<=28	10.2	100.0	10.2	Only poor targeted
<=32	17.7	100.0	17.7	Only poor targeted
<=35	22.2	100.0	22.3	Only poor targeted
<=37	27.3	100.0	27.3	Only poor targeted
<=39	30.3	100.0	30.3	Only poor targeted
<=41	34.8	100.0	34.9	Only poor targeted
<=43	38.2	100.0	38.3	Only poor targeted
<=45	43.2	100.0	43.3	Only poor targeted
<=47	48.0	100.0	48.1	Only poor targeted
<=49	52.2	100.0	52.3	Only poor targeted
<=52	57.4	100.0	57.6	Only poor targeted
<=55	65.2	100.0	65.4	Only poor targeted
<=57	69.3	100.0	69.4	Only poor targeted
<=60	75.4	100.0	75.5	Only poor targeted
<=63	79.7	100.0	79.8	Only poor targeted
<=67	85.3	100.0	85.5	Only poor targeted
<=72	90.4	100.0	90.6	Only poor targeted
<=78	95.6	99.9	95.7	1,363.2:1
<=100	100.0	99.8	100.0	519.7:1

Scorecard applied to the validation sample.

Tables for
the Line Marking the Poorest Half of People
Below 100% of the National Poverty Line

Table 3 (Line marking the poorest half of people below 100% of the national 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:
0–23	75.6
24–28	57.8
29–32	43.0
33–35	31.8
36–37	26.0
38–39	18.1
40–41	14.6
42–43	14.6
44–45	11.2
46–47	9.6
48–49	3.9
50–52	2.8
53–55	2.1
56–57	1.6
58–60	1.2
61–63	1.2
64–67	0.1
68–72	0.1
73–78	0.0
79–100	0.0

Table 5 (Line marking the poorest half of people below 100% of the national 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
0–23	–2.1	3.0	3.5	4.4
24–28	+5.7	3.3	3.9	5.0
29–32	–2.9	2.8	3.2	4.1
33–35	–0.9	3.0	3.6	4.8
36–37	+0.3	2.8	3.4	4.3
38–39	–4.1	3.8	4.2	5.2
40–41	+0.1	2.4	2.9	3.6
42–43	–0.9	2.6	3.1	3.9
44–45	+5.0	1.4	1.7	2.1
46–47	+4.4	1.2	1.4	1.9
48–49	+3.1	0.4	0.5	0.6
50–52	+0.6	0.9	1.0	1.4
53–55	–0.3	0.7	0.8	1.1
56–57	+1.6	0.0	0.0	0.0
58–60	+1.2	0.0	0.0	0.0
61–63	+1.1	0.1	0.1	0.1
64–67	+0.1	0.0	0.0	0.0
68–72	+0.1	0.0	0.0	0.0
73–78	0.0	0.0	0.0	0.0
79–100	0.0	0.0	0.0	0.0

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

Table 6 (Line marking the poorest half of people below 100% of the national 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	55.6	69.9	83.0
4	+0.3	27.5	35.5	47.2
8	+0.8	19.0	22.9	30.9
16	+0.7	13.2	15.6	20.5
32	+0.9	9.7	11.4	15.5
64	+0.9	6.8	8.2	10.6
128	+0.8	4.7	5.8	7.5
256	+0.8	3.4	3.9	5.2
512	+0.7	2.3	3.0	3.8
1,024	+0.7	1.6	2.0	2.7
2,048	+0.7	1.2	1.5	2.0
4,096	+0.7	0.8	1.0	1.4
8,192	+0.7	0.6	0.7	0.9
16,384	+0.7	0.4	0.5	0.7

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

Table 9 (Line marking the poorest half of people below 100% of the national 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
<=23	3.8	12.0	1.0	83.2	87.0	–45.0
<=28	6.4	9.4	3.9	80.3	86.7	+5.0
<=32	9.5	6.2	8.1	76.1	85.6	+48.6
<=35	11.3	4.5	11.0	73.3	84.5	+30.6
<=37	12.6	3.1	14.6	69.6	82.2	+7.3
<=39	13.2	2.5	17.0	67.2	80.4	–8.0
<=41	14.0	1.8	20.9	63.4	77.3	–32.2
<=43	14.6	1.2	23.6	60.6	75.2	–49.7
<=45	15.0	0.8	28.2	56.0	70.9	–78.8
<=47	15.3	0.5	32.7	51.5	66.8	–107.4
<=49	15.4	0.4	36.7	47.5	62.9	–132.8
<=52	15.5	0.3	41.9	42.3	57.8	–165.6
<=55	15.8	0.0	49.5	34.8	50.5	–213.3
<=57	15.8	0.0	53.5	30.7	46.5	–239.1
<=60	15.8	0.0	59.6	24.6	40.4	–277.8
<=63	15.8	0.0	63.9	20.3	36.1	–304.9
<=67	15.8	0.0	69.5	14.7	30.5	–340.4
<=72	15.8	0.0	74.6	9.6	25.4	–372.7
<=78	15.8	0.0	79.8	4.4	20.2	–405.8
<=100	15.8	0.0	84.2	0.0	15.8	–433.6

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

Table 10 (Line marking the poorest half of people below 100% of the national 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
<=23	4.9	78.7	24.2	3.7:1
<=28	10.2	62.1	40.3	1.6:1
<=32	17.7	54.0	60.5	1.2:1
<=35	22.2	50.7	71.5	1.0:1
<=37	27.3	46.4	80.1	0.9:1
<=39	30.3	43.7	83.9	0.8:1
<=41	34.8	40.1	88.4	0.7:1
<=43	38.2	38.1	92.3	0.6:1
<=45	43.2	34.6	94.7	0.5:1
<=47	48.0	31.9	97.0	0.5:1
<=49	52.2	29.6	97.7	0.4:1
<=52	57.4	27.0	98.4	0.4:1
<=55	65.2	24.2	99.9	0.3:1
<=57	69.3	22.8	99.9	0.3:1
<=60	75.4	20.9	99.9	0.3:1
<=63	79.7	19.8	100.0	0.2:1
<=67	85.3	18.5	100.0	0.2:1
<=72	90.4	17.5	100.0	0.2:1
<=78	95.6	16.5	100.0	0.2:1
<=100	100.0	15.8	100.0	0.2:1

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:
0–23	45.9
24–28	25.2
29–32	18.1
33–35	11.8
36–37	8.3
38–39	3.5
40–41	2.6
42–43	2.6
44–45	2.6
46–47	2.2
48–49	0.4
50–52	0.4
53–55	0.4
56–57	0.4
58–60	0.4
61–63	0.4
64–67	0.0
68–72	0.0
73–78	0.0
79–100	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
0–23	–2.4	3.3	3.9	4.8
24–28	+0.4	2.8	3.2	4.4
29–32	+7.9	1.5	1.8	2.4
33–35	+0.7	1.9	2.2	2.9
36–37	+3.7	1.1	1.3	1.7
38–39	+2.7	0.5	0.6	0.8
40–41	+1.5	0.4	0.5	0.7
42–43	–5.0	3.5	3.7	4.1
44–45	+1.4	0.5	0.6	0.7
46–47	–0.7	0.9	1.1	1.5
48–49	+0.4	0.0	0.0	0.0
50–52	–1.8	1.3	1.5	1.6
53–55	+0.4	0.0	0.0	0.0
56–57	+0.4	0.0	0.0	0.0
58–60	+0.4	0.0	0.0	0.0
61–63	+0.4	0.0	0.0	0.0
64–67	0.0	0.0	0.0	0.0
68–72	0.0	0.0	0.0	0.0
73–78	0.0	0.0	0.0	0.0
79–100	0.0	0.0	0.0	0.0

Scorecard applied to 1,000 bootstraps 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	–0.3	39.7	63.9	71.6
4	+0.7	19.6	25.7	38.4
8	+0.7	13.1	16.7	22.1
16	+0.6	9.2	11.4	15.4
32	+0.7	6.4	8.1	11.2
64	+0.8	4.7	5.5	7.7
128	+0.9	3.3	3.9	4.9
256	+0.9	2.3	2.6	3.7
512	+0.8	1.6	1.9	2.4
1,024	+0.8	1.2	1.4	1.8
2,048	+0.8	0.8	0.9	1.2
4,096	+0.8	0.6	0.7	0.9
8,192	+0.8	0.4	0.5	0.7
16,384	+0.8	0.3	0.3	0.4

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
<=23	2.4	4.0	2.5	91.2	93.6	+14.3
<=28	3.6	2.7	6.6	87.1	90.7	–4.1
<=32	4.5	1.8	13.1	80.6	85.1	–107.0
<=35	5.2	1.2	17.1	76.6	81.8	–169.6
<=37	5.5	0.8	21.8	71.9	77.4	–243.6
<=39	5.6	0.8	24.7	68.9	74.5	–290.4
<=41	5.7	0.7	29.1	64.5	70.2	–360.1
<=43	5.9	0.4	32.3	61.4	67.3	–409.3
<=45	6.1	0.3	37.1	56.5	62.6	–486.1
<=47	6.2	0.1	41.8	51.8	58.1	–560.3
<=49	6.2	0.1	45.9	47.7	54.0	–625.1
<=52	6.3	0.0	51.1	42.6	48.9	–706.9
<=55	6.3	0.0	58.9	34.8	41.1	–829.7
<=57	6.3	0.0	63.0	30.7	37.0	–894.0
<=60	6.3	0.0	69.1	24.6	30.9	–990.3
<=63	6.3	0.0	73.4	20.3	26.6	–1,058.0
<=67	6.3	0.0	79.0	14.7	21.0	–1,146.6
<=72	6.3	0.0	84.1	9.6	15.9	–1,227.1
<=78	6.3	0.0	89.3	4.4	10.7	–1,309.5
<=100	6.3	0.0	93.7	0.0	6.3	–1,378.7

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
<=23	4.9	48.9	37.5	1.0:1
<=28	10.2	35.5	57.3	0.6:1
<=32	17.7	25.7	71.7	0.3:1
<=35	22.2	23.2	81.5	0.3:1
<=37	27.3	20.2	87.0	0.3:1
<=39	30.3	18.3	87.7	0.2:1
<=41	34.8	16.3	89.5	0.2:1
<=43	38.2	15.5	93.7	0.2:1
<=45	43.2	14.0	95.5	0.2:1
<=47	48.0	12.9	98.2	0.1:1
<=49	52.2	11.9	98.2	0.1:1
<=52	57.4	11.0	100.0	0.1:1
<=55	65.2	9.7	100.0	0.1:1
<=57	69.3	9.1	100.0	0.1:1
<=60	75.4	8.4	100.0	0.1:1
<=63	79.7	7.9	100.0	0.1:1
<=67	85.3	7.4	100.0	0.1:1
<=72	90.4	7.0	100.0	0.1:1
<=78	95.6	6.6	100.0	0.1:1
<=100	100.0	6.3	100.0	0.1:1

Scorecard applied to the validation sample.

Tables for
the First-Quintile (20^{th}-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:
0–23	69.6
24–28	54.0
29–32	37.5
33–35	24.9
36–37	19.8
38–39	11.8
40–41	11.2
42–43	10.6
44–45	8.9
46–47	7.1
48–49	2.2
50–52	1.6
53–55	1.6
56–57	1.2
58–60	0.7
61–63	0.7
64–67	0.1
68–72	0.1
73–78	0.0
79–100	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
0–23	–6.5	4.7	5.0	5.5
24–28	+10.4	3.3	3.8	5.1
29–32	–4.7	3.7	3.9	4.5
33–35	–1.3	2.6	3.2	4.3
36–37	+1.8	2.4	2.9	3.5
38–39	–2.0	2.8	3.3	4.2
40–41	–2.1	2.4	2.9	3.6
42–43	–4.8	3.7	4.0	4.4
44–45	+7.5	0.5	0.6	0.7
46–47	+3.1	1.0	1.3	1.6
48–49	+2.0	0.1	0.1	0.2
50–52	–0.6	0.9	1.0	1.4
53–55	+0.2	0.5	0.6	0.8
56–57	+1.2	0.0	0.0	0.0
58–60	+0.7	0.0	0.0	0.0
61–63	+0.7	0.1	0.1	0.1
64–67	+0.1	0.0	0.0	0.0
68–72	+0.1	0.0	0.0	0.0
73–78	0.0	0.0	0.0	0.0
79–100	0.0	0.0	0.0	0.0

Scorecard applied to 1,000 bootstraps 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	–0.1	50.0	67.1	80.8
4	+0.3	26.2	33.6	44.7
8	+0.6	17.4	22.4	31.2
16	+0.4	12.1	15.0	19.3
32	+0.7	8.7	10.7	15.0
64	+0.7	6.2	7.5	9.8
128	+0.6	4.3	5.1	7.0
256	+0.6	3.1	3.7	4.8
512	+0.5	2.2	2.7	3.8
1,024	+0.5	1.6	1.9	2.6
2,048	+0.5	1.1	1.3	1.8
4,096	+0.5	0.8	0.9	1.3
8,192	+0.5	0.6	0.7	0.9
16,384	+0.5	0.4	0.5	0.6

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
<=23	3.7	9.8	1.1	85.3	89.0	–36.6
<=28	5.8	7.7	4.4	82.0	87.9	+18.4
<=32	8.7	4.9	9.0	77.5	86.2	+33.8
<=35	10.2	3.4	12.1	74.4	84.5	+10.9
<=37	11.2	2.4	16.1	70.3	81.5	–18.8
<=39	11.6	1.9	18.6	67.8	79.4	–37.4
<=41	12.2	1.3	22.5	63.9	76.2	–66.2
<=43	12.8	0.7	25.3	61.1	74.0	–86.8
<=45	13.0	0.6	30.1	56.3	69.3	–122.4
<=47	13.3	0.3	34.7	51.7	65.0	–156.3
<=49	13.3	0.3	38.8	47.6	60.9	–186.4
<=52	13.4	0.1	44.0	42.4	55.9	–224.7
<=55	13.5	0.0	51.7	34.8	48.3	–281.2
<=57	13.5	0.0	55.7	30.7	44.2	–311.2
<=60	13.5	0.0	61.8	24.6	38.1	–356.3
<=63	13.6	0.0	66.1	20.3	33.9	–387.8
<=67	13.6	0.0	71.7	14.7	28.3	–429.3
<=72	13.6	0.0	76.8	9.6	23.2	–466.9
<=78	13.6	0.0	82.1	4.4	17.9	–505.5
<=100	13.6	0.0	86.4	0.0	13.6	–537.8

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
<=23	4.9	76.7	27.5	3.3:1
<=28	10.2	56.9	43.0	1.3:1
<=32	17.7	49.2	64.2	1.0:1
<=35	22.3	45.7	75.1	0.8:1
<=37	27.3	41.0	82.6	0.7:1
<=39	30.2	38.4	85.6	0.6:1
<=41	34.8	35.2	90.3	0.5:1
<=43	38.2	33.7	94.8	0.5:1
<=45	43.1	30.1	95.8	0.4:1
<=47	48.0	27.6	97.9	0.4:1
<=49	52.1	25.5	98.1	0.3:1
<=52	57.4	23.4	99.0	0.3:1
<=55	65.2	20.8	99.9	0.3:1
<=57	69.3	19.5	99.9	0.2:1
<=60	75.4	18.0	99.9	0.2:1
<=63	79.7	17.0	100.0	0.2:1
<=67	85.3	15.9	100.0	0.2:1
<=72	90.4	15.0	100.0	0.2:1
<=78	95.6	14.2	100.0	0.2:1
<=100	100.0	13.6	100.0	0.2:1

Scorecard applied to the validation sample.

Tables for
the Second-Quintile (40^{th}-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:
0–23	94.9
24–28	76.2
29–32	73.0
33–35	65.9
36–37	48.9
38–39	41.8
40–41	39.2
42–43	39.2
44–45	25.9
46–47	24.0
48–49	20.7
50–52	17.2
53–55	11.8
56–57	6.5
58–60	4.1
61–63	3.2
64–67	2.0
68–72	1.4
73–78	0.7
79–100	0.1

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
0–23	+4.8	2.3	2.7	3.7
24–28	–2.5	2.6	3.1	4.0
29–32	+2.5	2.5	2.9	3.8
33–35	0.0	3.2	3.7	4.7
36–37	–11.1	7.2	7.6	8.2
38–39	–13.0	8.4	8.8	9.9
40–41	–5.6	4.8	5.0	6.0
42–43	+1.3	3.7	4.4	5.8
44–45	+3.2	2.7	3.1	4.1
46–47	+5.3	2.4	2.8	3.5
48–49	–14.9	9.6	9.9	10.6
50–52	+2.2	2.3	2.8	3.6
53–55	–0.7	2.0	2.3	3.1
56–57	+1.8	1.6	1.9	2.5
58–60	+1.4	0.8	0.9	1.2
61–63	+1.1	0.8	1.0	1.3
64–67	–1.1	1.1	1.3	1.9
68–72	+1.4	0.0	0.0	0.0
73–78	+0.7	0.0	0.0	0.0
79–100	+0.1	0.0	0.0	0.0

Scorecard applied to 1,000 bootstraps 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	+0.6	54.9	74.5	90.1
4	–0.3	34.1	41.4	53.6
8	–0.3	24.2	28.6	37.8
16	–0.5	16.8	19.9	28.1
32	–0.3	12.5	15.4	20.0
64	–0.5	8.9	10.6	14.2
128	–0.8	6.5	7.9	10.0
256	–0.8	4.6	5.7	7.3
512	–0.9	3.3	4.0	5.2
1,024	–0.9	2.3	2.8	3.6
2,048	–0.9	1.6	1.9	2.5
4,096	–0.9	1.1	1.4	1.7
8,192	–0.9	0.8	1.0	1.3
16,384	–0.9	0.6	0.7	1.0

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
<=23	4.5	25.9	0.4	69.3	73.8	–69.2
<=28	8.7	21.7	1.6	68.1	76.8	–37.7
<=32	13.9	16.5	3.8	65.9	79.7	+3.9
<=35	16.9	13.4	5.3	64.3	81.2	+29.0
<=37	19.9	10.4	7.4	62.3	82.2	+55.5
<=39	21.6	8.8	8.7	60.9	82.5	+70.8
<=41	23.4	7.0	11.5	58.2	81.6	+62.2
<=43	24.6	5.8	13.6	56.0	80.6	+55.1
<=45	25.9	4.5	17.3	52.4	78.2	+43.0
<=47	27.1	3.2	20.9	48.7	75.8	+31.0
<=49	28.0	2.3	24.1	45.5	73.6	+20.5
<=52	28.8	1.6	28.7	41.0	69.7	+5.5
<=55	29.7	0.7	35.5	34.1	63.8	–17.1
<=57	29.9	0.5	39.4	30.2	60.1	–30.0
<=60	30.1	0.2	45.3	24.4	54.4	–49.3
<=63	30.2	0.1	49.5	20.2	50.4	–63.1
<=67	30.3	0.0	55.0	14.7	45.0	–81.1
<=72	30.3	0.0	60.1	9.6	39.9	–97.9
<=78	30.3	0.0	65.3	4.4	34.7	–115.1
<=100	30.3	0.0	69.7	0.0	30.3	–129.6

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
<=23	4.9	92.1	14.8	11.7:1
<=28	10.2	84.8	28.6	5.6:1
<=32	17.7	78.6	45.7	3.7:1
<=35	22.2	76.0	55.7	3.2:1
<=37	27.3	73.0	65.6	2.7:1
<=39	30.3	71.2	71.0	2.5:1
<=41	34.8	67.1	77.0	2.0:1
<=43	38.2	64.3	81.0	1.8:1
<=45	43.2	59.9	85.3	1.5:1
<=47	48.0	56.4	89.4	1.3:1
<=49	52.2	53.8	92.4	1.2:1
<=52	57.4	50.1	94.8	1.0:1
<=55	65.2	45.5	97.8	0.8:1
<=57	69.3	43.1	98.4	0.8:1
<=60	75.4	39.9	99.2	0.7:1
<=63	79.7	37.9	99.5	0.6:1
<=67	85.3	35.6	100.0	0.6:1
<=72	90.4	33.6	100.0	0.5:1
<=78	95.6	31.7	100.0	0.5:1
<=100	100.0	30.3	100.0	0.4:1

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:
0–23	95.7
24–28	85.7
29–32	83.9
33–35	81.5
36–37	65.0
38–39	59.5
40–41	59.5
42–43	55.8
44–45	38.9
46–47	36.9
48–49	30.5
50–52	30.5
53–55	25.0
56–57	17.0
58–60	11.4
61–63	7.8
64–67	6.1
68–72	2.5
73–78	0.9
79–100	0.1

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
0–23	+3.7	2.2	2.6	3.6
24–28	+2.3	2.4	2.8	4.1
29–32	0.0	1.8	2.2	3.1
33–35	+2.7	2.7	3.2	4.3
36–37	–14.8	8.6	8.9	9.3
38–39	+1.2	4.1	4.9	6.9
40–41	–0.7	3.3	3.8	5.0
42–43	+4.1	3.7	4.4	6.1
44–45	+4.8	3.1	3.7	5.1
46–47	+2.7	3.0	3.6	5.0
48–49	–19.5	11.7	12.1	12.9
50–52	–2.5	3.1	3.6	5.0
53–55	+2.7	2.4	2.8	3.9
56–57	+9.4	1.8	2.1	2.8
58–60	–1.2	2.2	2.7	3.5
61–63	+4.2	1.0	1.2	1.7
64–67	+2.6	1.2	1.4	1.9
68–72	+1.6	0.5	0.6	0.7
73–78	+0.8	0.1	0.1	0.1
79–100	+0.1	0.0	0.0	0.0

Scorecard applied to 1,000 bootstraps 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	+1.7	64.5	74.1	92.3
4	+0.8	35.3	41.0	52.0
8	+0.7	25.9	30.7	39.3
16	+0.4	18.3	21.9	29.9
32	+0.4	12.7	15.0	19.4
64	+0.3	8.9	10.4	14.2
128	+0.1	6.4	7.6	9.5
256	+0.1	4.7	5.9	7.4
512	+0.1	3.4	4.1	5.4
1,024	+0.1	2.4	2.9	3.9
2,048	+0.1	1.7	2.1	2.8
4,096	+0.1	1.2	1.4	1.9
8,192	+0.1	0.9	1.0	1.4
16,384	+0.1	0.6	0.7	1.0

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
<=23	4.6	34.4	0.2	60.8	65.4	–75.7
<=28	9.2	29.8	1.0	60.0	69.2	–50.2
<=32	15.2	23.7	2.4	58.6	73.9	–15.6
<=35	18.9	20.1	3.4	57.7	76.5	+5.5
<=37	22.6	16.3	4.7	56.4	79.0	+28.1
<=39	24.4	14.5	5.8	55.2	79.6	+40.5
<=41	26.8	12.2	8.1	53.0	79.7	+58.0
<=43	28.4	10.5	9.8	51.3	79.7	+71.0
<=45	30.5	8.5	12.7	48.3	78.8	+67.4
<=47	32.5	6.4	15.5	45.5	78.1	+60.2
<=49	34.1	4.9	18.1	43.0	77.1	+53.6
<=52	35.6	3.4	21.8	39.2	74.8	+44.0
<=55	37.4	1.6	27.9	33.2	70.6	+28.5
<=57	37.8	1.2	31.5	29.5	67.2	+19.0
<=60	38.5	0.5	36.9	24.1	62.6	+5.2
<=63	38.7	0.3	41.0	20.1	58.8	–5.2
<=67	38.9	0.1	46.4	14.6	53.5	–19.1
<=72	38.9	0.0	51.4	9.6	48.5	–32.0
<=78	39.0	0.0	56.7	4.4	43.3	–45.4
<=100	39.0	0.0	61.0	0.0	39.0	–56.6

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
<=23	4.9	94.9	11.8	18.8:1
<=28	10.2	89.7	23.5	8.7:1
<=32	17.7	86.3	39.1	6.3:1
<=35	22.2	84.8	48.4	5.6:1
<=37	27.3	82.9	58.1	4.9:1
<=39	30.3	80.7	62.7	4.2:1
<=41	34.8	76.9	68.7	3.3:1
<=43	38.2	74.4	73.0	2.9:1
<=45	43.2	70.6	78.2	2.4:1
<=47	48.0	67.7	83.5	2.1:1
<=49	52.2	65.4	87.5	1.9:1
<=52	57.4	62.0	91.4	1.6:1
<=55	65.2	57.3	95.9	1.3:1
<=57	69.3	54.5	96.9	1.2:1
<=60	75.4	51.0	98.7	1.0:1
<=63	79.7	48.6	99.4	0.9:1
<=67	85.3	45.6	99.8	0.8:1
<=72	90.4	43.1	100.0	0.8:1
<=78	95.6	40.8	100.0	0.7:1
<=100	100.0	39.0	100.0	0.6:1

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:
0–23	97.6
24–28	91.8
29–32	90.7
33–35	87.1
36–37	77.7
38–39	72.9
40–41	72.7
42–43	69.5
44–45	60.7
46–47	52.4
48–49	46.4
50–52	43.8
53–55	36.1
56–57	27.1
58–60	18.6
61–63	14.8
64–67	12.5
68–72	5.1
73–78	2.5
79–100	0.7

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
0–23	+5.0	2.2	2.6	3.5
24–28	+0.5	2.1	2.5	3.3
29–32	+0.2	1.4	1.7	2.3
33–35	+0.3	2.3	2.7	3.5
36–37	–9.8	5.8	6.0	6.3
38–39	–9.8	6.3	6.7	7.4
40–41	+1.3	2.9	3.4	4.6
42–43	+4.5	3.6	4.3	5.8
44–45	–2.4	3.5	4.3	5.4
46–47	+2.5	3.8	4.3	5.8
48–49	–9.8	6.7	7.0	7.8
50–52	–5.4	4.4	4.8	5.3
53–55	–5.3	4.0	4.2	4.5
56–57	+8.1	2.7	3.3	4.0
58–60	–5.0	3.8	4.0	4.6
61–63	–9.7	6.6	7.0	7.9
64–67	+1.7	2.1	2.5	3.4
68–72	+4.2	0.5	0.6	0.7
73–78	+0.7	0.7	0.8	1.1
79–100	+0.4	0.3	0.3	0.4

Scorecard applied to 1,000 bootstraps 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	+0.7	67.5	79.5	91.1
4	–0.7	34.8	41.4	52.5
8	–0.7	26.1	31.0	40.1
16	–1.1	19.1	22.3	30.3
32	–1.2	13.3	15.8	19.9
64	–1.4	9.3	11.1	15.1
128	–1.5	6.6	7.7	10.1
256	–1.5	5.0	6.0	7.9
512	–1.4	3.6	4.2	5.6
1,024	–1.5	2.5	2.9	3.8
2,048	–1.5	1.8	2.1	3.0
4,096	–1.5	1.2	1.5	2.0
8,192	–1.5	0.9	1.0	1.3
16,384	–1.5	0.6	0.8	1.0

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
<=23	4.7	44.6	0.2	50.5	55.2	–80.6
<=28	9.7	39.5	0.5	50.2	59.9	–59.5
<=32	16.4	32.9	1.3	49.4	65.8	–30.9
<=35	20.4	28.9	1.9	48.9	69.3	–13.3
<=37	24.7	24.6	2.7	48.1	72.8	+5.5
<=39	27.1	22.1	3.2	47.5	74.7	+16.7
<=41	30.1	19.2	4.8	45.9	76.0	+31.8
<=43	32.2	17.1	6.1	44.7	76.9	+43.0
<=45	35.3	14.0	8.0	42.7	78.0	+59.4
<=47	38.1	11.1	10.0	40.7	78.9	+75.1
<=49	40.1	9.2	12.2	38.5	78.6	+75.2
<=52	42.6	6.7	15.0	35.7	78.3	+69.5
<=55	45.7	3.6	19.7	31.0	76.7	+60.0
<=57	46.3	3.0	22.9	27.8	74.1	+53.5
<=60	47.7	1.6	27.6	23.1	70.8	+43.9
<=63	48.6	0.7	31.1	19.6	68.2	+36.9
<=67	49.1	0.2	36.2	14.5	63.6	+26.5
<=72	49.1	0.2	41.3	9.5	58.6	+16.3
<=78	49.2	0.0	46.4	4.4	53.6	+5.9
<=100	49.3	0.0	50.7	0.0	49.3	–3.0

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
<=23	4.9	96.1	9.5	24.6:1
<=28	10.2	95.0	19.7	18.9:1
<=32	17.7	92.6	33.2	12.4:1
<=35	22.3	91.6	41.4	10.9:1
<=37	27.3	90.3	50.1	9.3:1
<=39	30.3	89.4	55.1	8.4:1
<=41	34.9	86.2	61.0	6.2:1
<=43	38.3	84.1	65.4	5.3:1
<=45	43.3	81.5	71.6	4.4:1
<=47	48.1	79.2	77.4	3.8:1
<=49	52.3	76.7	81.3	3.3:1
<=52	57.6	73.9	86.4	2.8:1
<=55	65.4	69.9	92.7	2.3:1
<=57	69.2	66.9	94.0	2.0:1
<=60	75.3	63.3	96.8	1.7:1
<=63	79.6	61.0	98.6	1.6:1
<=67	85.3	57.5	99.6	1.4:1
<=72	90.4	54.3	99.7	1.2:1
<=78	95.6	51.5	100.0	1.1:1
<=100	100.0	49.3	100.0	1.0:1

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:
0–23	98.6
24–28	97.8
29–32	97.8
33–35	97.8
36–37	94.8
38–39	94.8
40–41	93.7
42–43	92.5
44–45	92.5
46–47	84.0
48–49	83.3
50–52	82.2
53–55	69.6
56–57	65.4
58–60	57.7
61–63	48.0
64–67	40.1
68–72	25.8
73–78	16.8
79–100	3.9

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
0–23	–1.4	0.7	0.7	0.7
24–28	+4.2	2.0	2.5	3.2
29–32	–1.2	0.8	0.8	0.9
33–35	–0.8	0.7	0.9	1.0
36–37	–1.2	1.2	1.4	1.8
38–39	+4.6	2.6	3.1	4.4
40–41	+0.9	1.4	1.7	2.2
42–43	–1.1	1.5	1.7	2.2
44–45	–3.4	2.2	2.3	2.4
46–47	+15.0	3.8	4.7	6.1
48–49	–3.3	2.7	3.0	3.5
50–52	–10.0	5.6	5.8	6.0
53–55	+10.8	2.9	3.4	4.5
56–57	+7.9	3.6	4.5	5.5
58–60	–7.7	5.2	5.5	6.2
61–63	+6.0	3.8	4.5	5.5
64–67	–1.4	3.2	3.7	4.7
68–72	+4.0	2.7	3.2	4.4
73–78	+5.7	1.8	2.2	2.8
79–100	–4.1	3.0	3.1	3.6

Scorecard applied to 1,000 bootstraps 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	+2.5	69.1	74.1	89.0
4	+1.5	33.5	39.7	54.9
8	+1.1	24.2	28.2	37.8
16	+1.6	17.4	20.1	27.4
32	+1.4	12.3	14.6	19.2
64	+1.5	8.8	10.3	13.7
128	+1.5	6.3	7.5	9.4
256	+1.7	4.4	5.4	7.3
512	+1.6	3.3	3.9	5.2
1,024	+1.6	2.3	2.8	3.7
2,048	+1.6	1.7	2.0	2.6
4,096	+1.6	1.1	1.4	1.8
8,192	+1.6	0.8	1.0	1.3
16,384	+1.6	0.6	0.7	0.9

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
<=23	4.9	66.1	0.0	29.0	33.9	–86.3
<=28	10.1	60.9	0.2	28.9	38.9	–71.4
<=32	17.4	53.6	0.3	28.7	46.1	–50.7
<=35	21.9	49.1	0.4	28.7	50.5	–37.8
<=37	26.7	44.3	0.6	28.5	55.2	–23.9
<=39	29.5	41.5	0.8	28.2	57.7	–15.8
<=41	33.6	37.4	1.3	27.8	61.3	–3.7
<=43	36.6	34.4	1.6	27.4	64.0	+5.4
<=45	41.2	29.7	1.9	27.1	68.3	+18.9
<=47	45.1	25.9	3.0	26.0	71.1	+31.2
<=49	48.5	22.4	3.6	25.4	74.0	+41.9
<=52	53.2	17.8	4.3	24.8	78.0	+55.9
<=55	58.4	12.6	6.8	22.2	80.6	+74.2
<=57	60.6	10.4	8.7	20.3	80.9	+83.0
<=60	64.5	6.5	10.9	18.1	82.6	+84.6
<=63	66.4	4.6	13.3	15.7	82.1	+81.3
<=67	68.6	2.4	16.7	12.3	80.9	+76.5
<=72	69.8	1.1	20.6	8.5	78.3	+71.0
<=78	70.6	0.4	25.0	4.0	74.6	+64.7
<=100	71.0	0.0	29.0	0.0	71.0	+59.1

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
<=23	4.9	100.0	6.8	Only poor targeted
<=28	10.2	98.5	14.2	66.6:1
<=32	17.7	98.4	24.5	60.1:1
<=35	22.2	98.3	30.8	59.5:1
<=37	27.3	97.9	37.6	47.5:1
<=39	30.3	97.3	41.5	35.8:1
<=41	34.8	96.4	47.3	26.7:1
<=43	38.2	95.8	51.6	23.0:1
<=45	43.2	95.5	58.1	21.3:1
<=47	48.0	93.8	63.5	15.1:1
<=49	52.2	93.1	68.4	13.4:1
<=52	57.4	92.6	74.9	12.5:1
<=55	65.2	89.5	82.3	8.5:1
<=57	69.3	87.4	85.4	7.0:1
<=60	75.4	85.5	90.8	5.9:1
<=63	79.7	83.3	93.5	5.0:1
<=67	85.3	80.4	96.6	4.1:1
<=72	90.4	77.3	98.4	3.4:1
<=78	95.6	73.8	99.5	2.8:1
<=100	100.0	71.0	100.0	2.4:1

Scorecard applied to the validation sample.