

# Simple Poverty Scorecard<sup>®</sup> Poverty-Assessment Tool Ghana

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## Abstract

The Simple Poverty Scorecard<sup>®</sup>-brand poverty-assessment tool for Ghana uses ten low-cost indicators from the 2012/13 Living Standards Survey to estimate the likelihood that a household has consumption below a given poverty line. Field workers can collect responses in about ten minutes. The scorecard's bias and precision are reported for a range of poverty lines. The scorecard is a practical way for pro-poor programs in Ghana to measure poverty rates, to track changes in poverty rates over time, and to segment clients for targeted services.

## Version note

This paper uses 2012/13 data and Ghana's new definition of *poverty*. It replaces Schreiner and Woller (2010), which uses 2005/6 data and an older definition of *poverty*. The new 2012/13 scorecard here and its new definition of *poverty* should be used from now on. Existing users of Schreiner and Woller (2010) can still measure change over time using old-definition poverty lines with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard.

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# Simple Poverty Scorecard<sup>®</sup> Poverty-Assessment Tool

Interview ID: _____	<u>Name</u>	<u>Identifier</u>
Interview date: _____	Participant: _____	_____
Country: <u>GHA</u>	Field agent: _____	_____
Scorecard: <u>002</u>	Service point: _____	_____
Sampling wgt.: _____	Number of household members: _____	

Indicator	Response	Points	Score
1. How many members does the household have?	A. Eight or more	0	
	B. Seven	4	
	C. Six	9	
	D. Five	13	
	E. Four	14	
	F. Three	21	
	G. Two	24	
	H. One	29	
2. Are all household members ages 5 to 17 currently in school?	A. No	0	
	B. Yes	2	
	C. No one ages 5 to 17	3	
3. Can the male head/spouse read a phrase/sentence in English?	A. No	0	
	B. No male head/spouse	2	
	C. Yes	5	
4. What is the main construction material used for the outer wall?	A. Mud bricks/earth, wood, bamboo, metal sheet/slate/ asbestos, palm leaves/thatch (grass/raffia), or other	0	
	B. Cement/concrete blocks, landcrete, stone, or burnt bricks	5	
5. What type of toilet facility is usually used by the household?	A. No toilet facility (bush, beach), or other	0	
	B. Pit latrine, bucket/pan	4	
	C. Public toilet ( <i>e.g.</i> , W.C., KVIP, pit pan)	4	
	D. KVIP, or W.C.	6	
6. What is the main fuel used by the household for cooking?	A. None, no cooking	0	
	B. Wood, crop residue, sawdust, animal waste, or other	6	
	C. Charcoal, or kerosene	13	
	D. Gas, or electricity	22	
7. Does any household member own a working box iron or electric iron?	A. No	0	
	B. Yes	4	
8. Does any household member own a working television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish?	A. No	0	
	B. Only television	2	
	C. Video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish (regardless of T.V.)	8	
9. How many working mobile phones are owned by members of the household?	A. None	0	
	B. One	4	
	C. Two	8	
	D. Three or more	10	
10. Does any household member own a working bicycle, motor cycle, or car?	A. None	0	
	B. Only bicycle	3	
	C. Motor cycle or car (regardless of bicycle)	8	

## Back-page Worksheet: Household Membership and School Attendance

In the scorecard header, record the unique identifier of the interview, the date of the interview, and the sampling weight of the client. Then record the name and identification number of the client, of yourself as the field agent, and of the service point the client uses.

Then read to the respondent: *Please, I would like to make a complete list of all the people present or absent who usually live and eat together in this household, including visitors who spent the previous night. I would like to have the names and ages of the head of the household, his wife(s)/her husband, and their children, as well as the number of months out of the past 12 in which each person was away from the household.* [Record responses.] *Please give me the names, ages, and months away of any other persons related to the head of the household or to his/her spouse, together with their children, who usually live and eat together here.* [Record responses.] *Please give me the names, ages, and months away of any other persons not related to the head of the household or to his/her spouse who usually live and eat together here. For instance, servants, tenants, lodgers, visitors, or any other person who is not a relative.* [Record responses.] *Are there any other persons not now present but who normally live and eat here, that is, persons who are temporarily away for school, marriage, seasonal work, vacation, illness, birth, etc.? What are their names, ages, and months away?* [Record responses.] Count the number of *household members*, that is, all persons who have been away six months or less or who—regardless of time away—are the household head, under 6-months-old, was not a member of another household while away, or whose total intended stay with the household is at least six months.

Note the male head/spouse (if any). In the scorecard header, record the total number of household members next to “Number of household members:”, and circle the response to the first scorecard indicator.

For each household member who is 5 to 17-years-old, ask: *Is <name> currently in school?* Based on the responses, circle the response for the second indicator.

Keep in mind the definition of *household* in “Guidelines for the Interpretation of Scorecard Indicators”.

First name	Age	How many months of the past 12 has <name> been away?	Is <name> a household member? (apply rules)	If <name> is a household member 5- and 17-years-old, is he/she currently in school?		
1.			No      Yes	Not 5–17 or not member	No	Yes
2.			No      Yes	Not 5–17 or not member	No	Yes
3.			No      Yes	Not 5–17 or not member	No	Yes
4.			No      Yes	Not 5–17 or not member	No	Yes
5.			No      Yes	Not 5–17 or not member	No	Yes
6.			No      Yes	Not 5–17 or not member	No	Yes
7.			No      Yes	Not 5–17 or not member	No	Yes
8.			No      Yes	Not 5–17 or not member	No	Yes
9.			No      Yes	Not 5–17 or not member	No	Yes
10.			No      Yes	Not 5–17 or not member	No	Yes
11.			No      Yes	Not 5–17 or not member	No	Yes
12.			No      Yes	Not 5–17 or not member	No	Yes
13.			No      Yes	Not 5–17 or not member	No	Yes
14.			No      Yes	Not 5–17 or not member	No	Yes
Members:			# “Yes”:			

**Look-up table to convert scores to poverty likelihoods:  
New-definition per-adult-equivalent natl. poverty lines,  
and the per-capita line  
that marks the poorest half of people  
below 100% of the new-definition national line**

<b>Score</b>	<b>Poverty likelihood (%)</b>				
	<b>National poverty lines</b>				<b>Poorest half below 100% Natl.</b>
	<b>Food</b>	<b>100%</b>	<b>150%</b>	<b>200%</b>	
0-4	70.1	91.4	99.1	100.0	74.5
5-9	70.1	91.4	99.1	100.0	74.5
10-14	46.1	75.9	89.3	97.7	53.3
15-19	34.6	66.8	86.9	96.4	41.3
20-24	26.2	63.8	86.0	93.7	32.9
25-29	18.9	53.3	80.1	92.4	28.4
30-34	13.1	40.2	71.1	84.0	21.3
35-39	6.9	29.0	58.1	76.4	10.7
40-44	4.4	19.6	45.3	69.2	7.8
45-49	1.4	11.7	35.2	58.8	4.0
50-54	0.9	7.2	25.6	47.3	2.0
55-59	0.9	4.3	17.7	35.7	1.7
60-64	0.2	2.2	10.6	26.5	0.7
65-69	0.0	1.1	7.4	21.2	0.2
70-74	0.0	0.8	4.6	13.3	0.1
75-79	0.0	0.3	1.4	6.5	0.0
80-84	0.0	0.0	0.6	1.1	0.0
85-89	0.0	0.0	0.2	0.4	0.0
90-94	0.0	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0	0.0







## **Note on measuring changes in poverty rates over time using the old definition of *poverty* with the old 2005/6 and new 2012/13 scorecards**

This paper uses data from the 2012/13 GLSS and Ghana's new definition of *poverty*. It replaces Schreiner and Woller (2010), which uses data from the 2005/6 GLSS and an older definition of *poverty*. The new 2012/13 scorecard should be used from now on.

Some organizations in Ghana already use the old 2005/6 scorecard. Even after switching to the new 2012/13 scorecard, these legacy users can still estimate hybrid changes in poverty rates over time with existing baseline estimates from the old 2005/6 scorecard and follow-up estimates from the new 2012/13 scorecard.<sup>1</sup> This is possible because the new 2012/13 scorecard is calibrated to both the new and old definitions of *poverty* in the 2012/13 GLSS data. Given the assumption that the old-definition poverty lines are properly adjusted for changes in prices between the 2005/6 and 2012/13 GLSS, valid hybrid estimates of change can be found for the old definition of *poverty* with a baseline measure from the old 2005/6 scorecard and a follow-up measure from the new 2012/13 scorecard.

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<sup>1</sup> See the appendix for a step-by-step guide to the calculations.



Furthermore, a hybrid estimate of change based on the old definition of *poverty* can be spliced together with a non-hybrid estimate of change based on the new definition of *poverty* if poverty rates change at the same rate under both the old and new definitions. This is the “parallel lines” assumption.

For Ghana from 2005/6 and 2012/13, the “parallel-lines” assumption holds well. In particular, the decrease in the poverty rate by the old-definition national poverty line (7.2 percentage points) is similar to the decrease by the new-definition national line (7.7 percentage points, GSS 2014a, pp. 46 and 67).

In sum, both first-time and legacy users should use the new 2012/13 scorecard and the new definition of *poverty* from now on. Looking forward, this establishes a baseline with the best, most-relevant definition of *poverty*. Looking backward, legacy users of Ghana’s old 2005/6 scorecard (Schreiner and Woller, 2010) can salvage existing estimates to find hybrid measures of change in old-definition poverty rates over time.

# Simple Poverty Scorecard<sup>®</sup> Poverty-Assessment Tool Ghana

## 1. Introduction

This paper presents the Simple Poverty Scorecard<sup>®</sup> poverty-assessment tool. Pro-poor programs in Ghana can use it to estimate the likelihood that a household has consumption below a given poverty line, to measure groups' poverty rates at a point in time, to track changes in groups' poverty rates over time, and to segment clients for targeted services.

The new scorecard here uses data from the 2012/13 Ghana Living Standards Survey (GLSS); it replaces the old scorecard in Schreiner and Woller (2010) that uses data from the 2005/6 GLSS. For now on, only the new 2012/13 scorecard should be used. The new 2012/13 scorecard can be used to estimate a household's poverty likelihood based both the old and new definitions of *poverty*. This means that existing users of the old 2005/6 scorecard do not have to start over from scratch; they can estimate changes in old-definition poverty rates over time with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard.

The direct approach to poverty measurement via consumption surveys is difficult and costly. As a case in point, Ghana's 2012/13 GLSS has 174 pages and includes

many hundreds of items, most of which may be asked multiple times (for example, for each household member, each agricultural plot, or each crop). Over 28 days, a responding household kept a diary of consumption and expenditure and was visited by an enumerator 11 times. Enumerators completed about 14 households' surveys per month (Ghana Statistical Service, 2012).

In comparison, the indirect approach via the scorecard is simple, quick, and low-cost. It uses ten verifiable indicators (such as “What is the main construction material used for the outer wall?” and “What is the main fuel used by the household for cooking?”) to get a score that is highly correlated with poverty status as measured by the exhaustive GLSS survey.

The scorecard differs from “proxy-means tests” (Coady, Grosh, and Hoddinott, 2004) in that it is transparent, it is freely available,<sup>2</sup> and it is tailored to the capabilities and purposes not of national governments but rather of local, pro-poor organizations. The feasible poverty-measurement options for local organizations are typically blunt (such as rules based on land-ownership or housing quality) or subjective and relative (such as participatory wealth ranking facilitated by skilled field workers). Poverty measures from these approaches may be costly, their accuracy is unknown, and they are not comparable across places, organizations, nor time.

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<sup>2</sup> Ghana's Simple Poverty Scorecard tool is not, however, in the public domain. Copyright is held by the sponsor and by Microfinance Risk Management, L.L.C.

The scorecard can be used to measure the share of a program’s participants who are below a given poverty line, for example, the Millennium Development Goals’ line of \$1.25/day at 2005 purchase-power parity (PPP). USAID microenterprise partners in Ghana can use scoring with the new-definition \$1.25/day 2005 PPP line (deflated by the change in Ghana’s national poverty line) to report how many of their participants are “very poor”.<sup>3</sup> Scoring can also be used to measure net movement across a poverty line over time. In all these applications, the scorecard provides a consumption-based, objective tool with known accuracy. While consumption surveys are costly even for governments, some local pro-poor organizations may be able to implement a low-cost scorecard to help with monitoring poverty and (if desired) segmenting clients for targeted services.

The statistical approach here aims to be understood by non-specialists. After all, if managers are to adopt the scorecard on their own and apply it to inform their decisions, then they must first trust that it works. Transparency and simplicity build trust. Getting “buy-in” matters; proxy-means tests and regressions on the “determinants of poverty” have been around for three decades, but they are rarely used to inform

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<sup>3</sup> USAID defines a household as *very poor* if its daily per-capita consumption is less than the highest of the new-definition \$1.25/day line—GHS1.94 in January 2013 (if deflated by the change in the national poverty line) or GHS1.36 (if deflated by the Consumer Price Index)—or the line (GHS1.99) that marks the poorest half of people below 100% of the new-definition national line. The USAID “very poor” line is the new-definition \$1.25/day line (deflated by the change in the national line) because it gives a higher poverty rate than the other two lines (Figure 1). USAID (2012, p. 7) has approved all Simple Poverty Scorecard tools that are re-branded as Progress Out of Poverty Indexes<sup>®</sup> for use by their microenterprise partners.

decisions by local, pro-poor organizations. This is not because they 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”, simple, transparent scoring approaches can be about as accurate as complex, opaque ones (Schreiner, 2012a; Caire and Schreiner, 2012).

Beyond its simplicity and transparency, the scorecard’s technical approach is innovative in how it associates scores with poverty likelihoods, in the extent of its accuracy tests, and in how it derives formulas for standard errors. Although the accuracy tests are simple and commonplace in statistical practice and in the for-profit field of credit-risk scoring, they have rarely been applied to scorecards.

The scorecard is based on data from the 2012/13 GLSS from the Ghana Statistical Service (GSS). Indicators are selected to be:

- Inexpensive to collect, easy to answer quickly, and simple to verify
- Strongly correlated with poverty
- Liable to change over time as poverty status changes
- Applicable in all regions of Ghana

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

The scorecard can be used to estimate three basic quantities. First, it can estimate a particular household’s *poverty likelihood*, that is, the probability that the

household has per-adult-equivalent or per-capita consumption below a given poverty line.

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

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

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

This paper presents a single scorecard whose indicators and points are derived with the new definition of *poverty* applied to data from the 2012/13 GLSS. Scores from this one scorecard are calibrated with data from the 2012/13 GLSS to poverty likelihoods for 15 new-definition poverty lines and for seven old-definition lines.<sup>4</sup>

The new 2012/13 scorecard is constructed using half of the data from the 2012/13 GLSS. That same half of the 2012/13 data is also used to calibrate scores to poverty likelihoods for both new and old definitions of *poverty*. The other half of the

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<sup>4</sup> Section 2 below discusses the two definitions of *poverty* and the 22 poverty lines.

2012/13 GLSS data is used to validate the scorecard’s accuracy for estimating households’ poverty likelihoods, for estimating groups’ poverty rates at a point in time, and for segmenting clients.

The accuracy of estimated changes in poverty rates over time for Ghana is tested using data from pairs of GLSS rounds (1998/9, 2005/6, and 2012/13), with the later round taken as the baseline and the earlier round as the follow-up.

All three scoring-based estimators (the poverty likelihood of a household, the poverty rate of a group of households at a point in time, and the average annual rate of change in the poverty rate of households in a group between two points in time) are *unbiased*. That is, they match the true value on average in repeated samples when constructed from (and applied to) a single, unchanging population in which the relationship between scorecard indicators and poverty is constant. Like all predictive models, the scorecard here is constructed from a single sample and so misses the mark to some unknown extent when applied (in this paper) to a validation sample. Furthermore, it is biased when applied (in practice) to a different population or when applied before or after 2012/13 (because the relationships between indicators and poverty change over time).<sup>5</sup>

Thus, while the indirect scoring approach is less costly than the direct survey approach, it is also biased when applied in practice. (The survey approach is unbiased

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<sup>5</sup> Important examples include nationally representative samples at a later point in time or sub-groups that are not nationally representative (Diamond *et al.*, 2016; Tarozzi and Deaton, 2007).

by definition.) There is bias because the scorecard necessarily assumes that future relationships between indicators and poverty in all possible groups of households will be the same as in the construction data. Of course, this assumption—inevitable in predictive modeling—holds only partly.

On average across 1,000 bootstraps of  $n = 16,384$  from the 2012/13 validation sample, the difference between scorecard estimates of groups' poverty rates versus the true rates at a point in time for the new-definition national poverty line is +1.1 percentage points. Across all 15 new-definition poverty lines, the average absolute difference is about 0.6 percentage points, and the maximum absolute difference is 1.2 percentage points.<sup>6</sup> These differences reflect sampling variation, not bias; the average difference would be zero if the whole 2012/13 GLSS survey was to be repeatedly re-fielded and divided into sub-samples before repeating the entire process of constructing and validating scorecards.

The 90-percent confidence intervals are  $\pm 0.7$  percentage points or less across all poverty lines under all definitions. For  $n = 1,024$ , the 90-percent intervals are  $\pm 2.8$  percentage points or less.

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<sup>6</sup> For the seven old-definition lines in the 2012/13 validation sample, the average absolute difference is about 0.5 percentage points, and the maximum absolute difference is 1.1 percentage points.



To check the accuracy and precision of estimates of changes in poverty rates over time, the new 2012/13 scorecard is applied to data from three pairs of GLSS rounds:

- 2012/13 and 2005/6
- 2012/13 and 1998/9
- 2005/6 and 1998/9

With three pairs of surveys and 21 poverty lines, there are 63 estimates of change. Across 1,000 bootstraps with  $n = 16,384$ , the mean absolute error (that is, the difference between the estimate of change and the true change) is about 6 percentage points. For comparison, the mean absolute true change is about 16 percentage points.

The average across poverty lines and survey pairs of the ratio of the absolute error divided by the absolute true change is about 41 percent; the size of the bias of the estimated change averages less than half the size of the true change.<sup>7</sup>

Given a sample  $n = 1,024$ , the 90-percent confidence interval of the estimate covers the true change in 29 of 63 cases (46 percent).<sup>8</sup> In 59 of 63 cases (94 percent), the sign of the estimate matches the sign of the true change and the estimate's 90-percent confidence interval excludes zero. In other words, the estimated direction of change is correct and "statistically significant" in about 90 percent of cases. Of course, accuracy

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<sup>7</sup> For example, if the true change is -10 percentage points, then absolute bias of 40 percent of the size of the true change would give a scorecard estimate of -6 percentage points or -14 percentage points, as both have an absolute error of 4 percentage points.

<sup>8</sup> Estimates of change over time have errors because the population of Ghana changes, because the relationships between indicators and poverty change, and because response options for some scorecard indicators differ across GLSS rounds (see Section 7).

might be better (or worse) in other countries with other scorecards and other data or from now on in Ghana.

Section 2 below documents data and poverty lines. Sections 3 and 4 describe scorecard construction and offer guidelines for use in practice. Sections 5 and 6 tell how to estimate households' poverty likelihoods and groups' poverty rates at a point in time. Section 7 discusses estimating changes in poverty rates over time. Section 8 covers targeting. Section 9 places the scorecard here in the context of nine related exercises for Ghana. The last section is a summary.

The appendix gives step-by-step instructions for how to compute hybrid estimates of change with old-definition poverty lines that combine a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard.

The "Guidelines for the Interpretation of Scorecard Indicators" tells how to ask questions (and how to interpret responses) so as to mimic practice in the GLSS as closely as possible. These "Guidelines" (and the "Back-page Worksheet") are integral parts of the Simple Poverty Scorecard tool for Ghana.

## 2. Data and definitions of poverty status

This section discusses the data used to construct and validate the scorecard. It also documents the old and new definitions of *poverty* and the 22 poverty lines to which scores are calibrated.

### 2.1 Data

Indicators and points for the new 2012/13 scorecard are selected (*constructed*) based on a random half of the data from the 16,772 households in the 2012/13 GLSS. This is Ghana's most recent national consumption survey.

The half of the 2012/13 data that is used in scorecard construction is also used to associate (*calibrate*) scores to poverty likelihoods for all poverty lines under both the old and new definitions of *poverty*.

To test the accuracy and precision of scorecard estimators, data from three validation samples are used:

- The half of the 2012/13 GLSS not used in construction/calibration
- All 8,687 households in the 2005/6 GLSS
- All 5,998 households in the 1998/9 GLSS

Fieldwork for the 2012/13 GLSS ran from 18 October 2012 to 17 October 2013, and consumption is in third Cedis (GHS) in prices of Greater Accra in January 2013.

For the 2005/6 GLSS, fieldwork ran from 4 September 2005 to 3 September 2006, and consumption is in second Cedis (GHC) in prices of Greater Accra in January 2006.

Fieldwork for the 1998/9 GLSS ran from April 1998 to March 1999.

Consumption is in second Cedis (GHC) in prices of Greater Accra in January 1999.

## 2.2 Poverty rates at the household, person, or 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. Each household member has the same poverty status (or estimated poverty likelihood) as the other household members.

To illustrate, suppose a program serves two households. The first household is poor (its per-adult-equivalent or 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 equal-weighted average of poverty statuses (or estimated poverty likelihoods) across households with participants. In the example here,

this is  $\frac{1 \cdot 1 + 1 \cdot 0}{1 + 1} = \frac{1}{2} = 0.5 = 50$  percent. In the “1 · 1” term in the numerator, the first

“1” is the first household’s weight, and the second “1” is the first household’s poverty status (poor). In the “1 · 0” term in the numerator, the “1” is the second household’s

weight, and the “0” is the second household’s poverty status (non-poor). The “1 + 1” in

the denominator is the sum of the weights of the two households. Each household has a weight of one (1) because the unit of analysis is the household.

Alternatively, a person-level rate is relevant if a program defines all people in households that benefit from its services as *participants*. In the example here, the person-level rate is the household-size-weighted average of poverty statuses for

households with participants, or  $\frac{3 \cdot 1 + 4 \cdot 0}{3 + 4} = \frac{3}{7} = 0.43 = 43$  percent. In the “3 · 1” term

in the numerator, the “3” is the first household’s weight because it has three members, and the “1” is its poverty status (poor). In the “4 · 0” term in the numerator, the “4” is the second household’s weight because it has four members, and the zero is its poverty status (non-poor). The “3 + 4” in the denominator is the sum of the weights of the two households. A household’s weight is its number of members because the unit of analysis is the household member.

As a final example, a program might count as *participants* only those household members with whom it deals with directly. For the example here, this means that some—but not all—household members are counted. The person-level rate is now the participant-weighted average of the poverty statuses of households with participants, or

$\frac{1 \cdot 1 + 2 \cdot 0}{1 + 2} = \frac{1}{3} = 0.33 = 33$  percent. The first “1” in the “1 · 1” in the numerator is the

first household’s weight because it has one participant, and the second “1” is its poverty status (poor). In the “2 · 0” term in the numerator, the “2” is the second household’s weight because it has two participants, and the zero is its poverty status (non-poor).

The “1 + 2” in the denominator is the sum of the weights of the two households. Each household’s weight is its number of participants because the unit of analysis is the participant.

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

Figure 1 reports poverty lines and poverty rates for households and people in the 2012/13 GLSS for Ghana as a whole and for the construction/calibration and validation sub-samples.<sup>9</sup> 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. This is also why the scorecard is constructed, calibrated, and validated with household weights. Person-level poverty rates are also included in Figures 1 and 2 because these are the rates reported by the government of Ghana and because person-level rates are usually used in policy discussions.

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<sup>9</sup> Figure 1—like Figures 6, 9, and 10—has four versions. The first has new-definition national poverty lines as well as the line that marks the poorest half of people below 100% of the new-definition national line. The second has new-definition 2005 PPP lines with PPP factors deflated from January 2006 to January 2013 using the change in Ghana’s Consumer Price Index. The third covers new-definition 2005 PPP lines deflated with the change in Ghana’s new-definition national poverty line. The fourth version covers all old-definition lines.

Figure 2 reports poverty lines and poverty rates for:

- Households and people
- Ghana as a whole and for each of Ghana's 10 regions
- By urban, rural, and by urban-and-rural-together in a given region
- 1998/9, 2005/6, and 2012/13

For old-definition lines in 1998/9 and 2005/6 (Figure 2), all-Ghana person-level poverty rates for the food line (26.9 and 18.1 percent) and for 100% of the national line (39.5 and 28.6 percent) match those in GSS (2007). Likewise, person-level poverty rates for new-definition national lines in 2012/13 (8.4 percent for the food line and 24.2 percent for the national line) match those in GSS (2014a).

### **2.3 Definitions of *poverty***

*Poverty* is whether a household is poor or non-poor. In Ghana, poverty status is determined by whether per-adult-equivalent or per-capita aggregate household consumption is below than a given poverty line. Thus, a definition of *poverty* has two aspects: a measure of aggregate household consumption, and a poverty line.

The definition of *poverty* used by Ghana's GSS changed between the 2005/6 GLSS and the 2012/13 GLSS. This section presents and compares the two definitions.

### 2.3.1 Old and new aggregate household consumption

The old and new definitions of consumption (Coulombe and McKay, 2008; GSS, 2014a) differ in that the new definition:

- Includes the use-value of VCDs/DVDs/MP4 players/iPads, vacuum cleaners, rice cookers, toasters, electric kettles, water heaters, tablet PCs, and mobile phones.<sup>10</sup> This increases measured consumption
- Excludes the value of wages received in-kind and the value of a household's consumption from its own non-farm enterprises. This leads to a minor decrease in measured consumption (GSS, 2014a, p. 72)
- Imputes the unit values of consumption items more than five standard deviations (rather than three) from the average of the logarithmic transform

The GSS computes old-definition consumption only in the 2005/6 and 1998/9 data, and it computes new definition consumption only in the 2012/13 data. Because the two definitions have not been applied to the same data, the net effect on measured consumption of the move from old to new definitions in a given GLSS round is unknown. When measuring change over time for a given household, the GSS treats the two definitions as if they give the same value of consumption.

### 2.3.2 Old-definition poverty lines

*Food line.* The derivation of Ghana's old-definition poverty lines starts with a food line<sup>11</sup> based on a 2,900-Calorie basket of items and the "cost-of-basic-needs" method (Ravallion, 1998). The composition of the basket is that consumed by households in

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<sup>10</sup> Data on most of these consumer durables was not collected before the 2012/13 GLSS.

<sup>11</sup> The food line is sometimes called the "lower" or "extreme" line.



which old-definition per-adult-equivalent<sup>12</sup> consumption (of food and non-food, excluding housing) in the 1998/9 GLSS is somewhere between the 40<sup>th</sup> and 50<sup>th</sup> percentiles<sup>13</sup> (GSS, 2000). The food line is then the cost of this bundle in Greater Accra in January 1999, adjusted for price differences across regions. The old-definition food line in 1998/9 gives poverty rates of 20.1 percent of households and 26.9 percent of people (Figure 2).

For the 2005/6 GLSS, the old-definition food line for 1998/9 is inflated to January 2006 using a factor of 4.121.<sup>14</sup> In 2005/6, this line averages GHC6,600 per adult equivalent per day, giving a household-level poverty rate of 11.3 percent and a person-level poverty rate of 18.1 percent (Figure 2).<sup>15</sup>

*National (food-plus-non-food) line.* Given the old-definition food line, the old-definition national (food-plus-non-food) poverty line<sup>16</sup> for 1998/9 (and 2005/6) is defined as the old-definition food line plus the cost of essential non-food goods and services. According to GSS (2000), this non-food allowance is defined as the observed non-food old-definition consumption for households whose total (food and non-food) old-definition

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<sup>12</sup> The number of adult equivalents in a household is based on the age and sex of household members (GSS, 2014a, p. 75).

<sup>13</sup> The food line for 1998/9 is GHC700,000 per adult equivalent per year. This round number is somewhere between the values for the 40<sup>th</sup> and 50<sup>th</sup> percentiles.

<sup>14</sup> This factor is the ratio of the food line in 2005/6 to the food line in 1998/9. It is also the ratio of the national (food-plus-non-food) line in 2005/6 to the national line in 1998/9. It is the change in the all-Ghana CPI (GSS, 2007, pp. 4–5). After regional price adjustments, the ratio of the 2005/6 lines to the 1998/9 lines is close to 3.9.

<sup>15</sup> In 2007, one “third Cedi” (GHS) replaced 10,000 “second Cedis” (GHC). The all-Ghana person-level poverty rates for the food line and for 100% of the national line in Figure 2 match those in GSS (2014a, pp. 9 and 12) and in GSS (2007, pp. 7 and 9).

<sup>16</sup> The national line is sometimes called the “upper” or “general” line.

consumption is equal to the old-definition food line as derived via the “regression method” of Ravallion and Bidani (1994).

In the 1998/9 GLSS, the average national line for Ghana overall is GHC2,176 per adult equivalent per day, giving a household-level poverty rate of 30.2 percent and a person-level poverty rate of 39.5 percent (Figure 2).

In the 2005/6 GLSS, the national line is GHC8,485 per adult equivalent per day, giving poverty rates of 18.9 percent for households and 28.6 percent for people.

### **2.3.3 New-definition poverty lines**

*Food line.* The new-definition food line introduced with the 2012/13 GLSS is the same as the old-definition food line, except that the composition of the 2,900-Calorie basket is that observed to be consumed by people in the bottom half in the distribution of daily per-adult-equivalent new-definition consumption in the 2012/13 GLSS (rather than somewhere between the 40<sup>th</sup> and 50<sup>th</sup> percentiles of old-definition consumption as in the 2005/6 GLSS). On average, the new-definition food line in the 2012/13 GLSS is GHS2.16 in prices in Greater Accra as of January 2013, implying poverty rates of 5.4 percent for households and 8.4 percent for people (Figure 2).

*National (food-plus-non-food) line.* The new-definition national poverty line differs from the old-definition national line in that the non-food component is the average new-definition non-food consumption of the 20 percent of people in the 2012/13 GLSS whose total per-adult-equivalent new-definition consumption is centered on the new-definition food line (rather than the old-definition non-food consumption of

households whose total old-definition consumption is equal to the old-definition food line as derived via the “regression method”). In the 2012/13 GLSS, the average new-definition national line is GHS3.58 per adult equivalent per day, giving a household-level poverty rate of 16.4 percent and a person-level poverty rate of 24.2 percent (Figure 2).

#### **2.3.4 Summary and implications of changes in the definition of *poverty***

Ghana’s new definition of *poverty* differs from its old definition in that:

- Aggregate household consumption:
  - Includes the use-value of a few new consumer durables
  - Excludes non-food, in-kind wages
  - Uses less-strict standards to detect outlying unit values to be imputed
- Poverty-line derivations:
  - Update the food basket used to derive the food component
  - Use a different formula to derive the non-food component
  - Use new-definition consumption in 2012/13 (rather than old-definition consumption in 1998/9) to derive the food and non-food components

The central purpose of “Poverty Profile of Ghana: 2005–2013” (GSS, 2014a) is to estimate changes in poverty. The consumption module of the 2012/13 GLSS is designed to be almost identical to that in 2005/6 so as to produce comparable poverty estimates (GSS, 2014b, p. 204). Nevertheless, the definition of *poverty* changed, so the old-definition 2005/6 person-level poverty rate by the national line of 28.6 percent (Figure 2) is not strictly comparable to the new-definition 2012/13 rate of 24.2 percent.

In recognition of this, GSS (2014a) estimates definition-consistent changes in poverty from 2005/6 to 2012/13 by:

- Assuming that the distributions of old- and new-definition consumption in a given survey round is the same<sup>17</sup>
- Inflating old-definition consumption in the 2005/6 data to prices in January 2013 to be applied with new-definition poverty lines to get a 2005/6 poverty rate (31.9 percent of people for the national line, Figure 2)<sup>18</sup> that is comparable with the 2012/13 poverty rate found by applying new-definition consumption in the 2012/13 data with new-definition poverty lines (24.2 percent). This gives a decrease in the poverty rate between 2005/6 and 2012/13 of 7.7 percentage points
- Deflating new-definition consumption in the 2012/13 data to prices in January 2006 to be applied with old-definition poverty lines to get a 2012/13 poverty rate (21.4 percent of people for the national line, Figure 2)<sup>19</sup> that is comparable with the 2005/6 poverty rate found by applying old-definition consumption in the 2005/6 data with old-definition poverty lines (28.6 percent). This gives a decrease in the poverty rate of 7.2 percentage points

Both approaches—the first with new-definition lines, the second with old-definition lines—suggest that Ghana’s person-level poverty rate for the national line fell by about 7 percentage points.<sup>20</sup> Assuming that the deflators are appropriate,<sup>21</sup> both approaches are valid as long as the distribution of consumption is the same under the old and new definitions.

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<sup>17</sup> This assumption could be checked by computing old-definition consumption with 2012/13 data and new-definition consumption with 1998/9 and 2005/6 data.

<sup>18</sup> GSS (2014a, pp. 10 and 46)

<sup>19</sup> GSS (2014a, p. 67)

<sup>20</sup> The closeness of the estimated changes across the two definitions (7.7 and 7.2 percentage points) suggests that the “parallel lines” assumption held between 2005/6 and 2012/13. This assumption is needed to combine estimates of change based on old-definition poverty with estimates of change based on new-definition poverty.

<sup>21</sup> Food lines use a factor of 2.9, and national lines use 3.3 (GSS, 2014a, p. 10). The factors were “estimated over the seven-year period using the CPI”.

To enable existing users of the old 2005/6 scorecard to measure changes in poverty rates with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard, scores from the new 2012/13 scorecard are calibrated with households' old-definition poverty status as determined by inflating old-definition poverty lines from January 2006 to January 2013. Old-definition poverty status in 2012/13 is then found by comparing these lines with new-definition consumption in 2012/13.<sup>22</sup> This paper follows GSS (2014a) in assuming that the distributions of consumption under the new and old definitions can be considered equivalent.

New-definition poverty status is found in the same way for households in 1998/9 and 2005/6 (Figure 2). In particular, new-definition poverty lines are deflated to 2005/6 with factors of 2.9 (food line) and 3.3 (non-food lines).<sup>23</sup> All these 2005/6 new-definition lines are deflated to 1998/9 with a factor of 4.121. The new-definition lines are then compared with old-definition consumption to find new-definition poverty status in 1998/9 and 2005/6. This again follows GSS in assuming that the distribution of consumption is the same under both old and new definitions.

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<sup>22</sup> For finding poverty status, inflating old-definition lines from 2005/6 to January 2013 is equivalent to deflating new-definition consumption in 2012/13 to January 2006.

<sup>23</sup> Figure 2 does not show results in 1998/9 and 2005/6 for new-definition line that mark the poorest half of people below 100% of the national line. Poverty rates by this line are not comparable over time because the real value of the line is not constant.

## 2.4 Supported poverty lines

Because local pro-poor organizations in Ghana may want to use different or various poverty lines, this paper calibrates scores from its single new 2012/13 scorecard to poverty likelihoods for 22 lines:

- Old-definition:
  - Food
  - 100% of national
  - 150% of national
  - 200% of national
  - \$1.25/day 2005 PPP
  - \$2.50/day 2005 PPP
  - \$3.75/day 2005 PPP
- New-definition:
  - Food
  - 100% of national
  - 150% of national
  - 200% of national
  - Line marking the poorest half of people below 100% of the national line
  - 2005 PPP lines deflated with the change in Ghana's CPI:
    - \$1.25/day
    - \$2.00/day
    - \$2.50/day
    - \$3.75/day
    - \$5.00/day
  - 2005 PPP lines deflated with the change in Ghana's national poverty line:
    - \$1.25/day
    - \$2.00/day
    - \$2.50/day
    - \$3.75/day
    - \$5.00/day

Under both new- and old definitions, the lines for 150% and 200% of national are multiples of the national line.

The new-definition line that marks the poorest half of people below 100% of the national line is defined—for urban and rural areas separately in each of Ghana's 10

regions in a given GLSS round—as the median aggregate household per-adult-equivalent expenditure of people (not households nor adult equivalents) below 100% of the new-definition national line (U.S. Congress, 2002).

The derivation of the old-definition \$1.25/day 2005 PPP line in prices for Greater Accra in January 2006 (GHS5,878 per person per day) is in Schreiner and Woller (2010, p. 12). This line is applied to 1998/9 by dividing it by the same factor (4.121) used to take old-definition national lines from January 1999 to January 2006. This gives a 1998/9 old-definition \$1.25/day line of GHC1,426 per person per day (Figure 2). This line is applied in 2012/13 by multiplying the 2005/6 line by the same factor (3.3) used to take old-definition national lines from January 2006 to January 2013, giving a 2012/13 old-definition \$1.25/day line of GHS1.94.

The new 2012/13 scorecard here is calibrated to two sets of new-definition 2005 PPP lines. The two sets differ in the deflators used to bring the \$1.25/day 2005 PPP line in Schreiner and Woller (2010) from prices in January 2006 back to January 1999 and forward to January 2013.

Regardless of deflator, the new-definition \$1.25/day 2005 PPP line in 2005/6 is the same as the old-definition \$1.25/day line in 2005/6: GHC5,878. For conversion to 1998/9 and 2012/13, the CPI deflators are:<sup>24</sup>

- CPI in January 1999: 118.70
- Average CPI in 2005: 435.35
- CPI in January 2006: 457.40
- CPI in January 2013: 1,057.06

For 1998/9, the CPI-deflated \$1.25/day line, is GHC5,878 multiplied by 118.70 and divided by 457.40, giving GHC1,525 as of January 1999 (Figure 2).

For 2012/13, the CPI-deflated \$1.25/day line is GHC5,878 multiplied by 1,057.06, divided by 457.40, and divided by GHC10,000 per GHS, giving GHS1.36 in January 2013.

Each of the three new-definition \$1.25/day lines deflated by the CPI (GHC1,525 in 1998/9, GHC5,878 in 2005/6, and GHS1.36 in 2012/13) is then multiplied by the GSS' regional price deflator in a given area and divided by the person-weighted average of regional price deflators for all of Ghana.

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<sup>24</sup> The CPI here unifies three series (with average calendar-year bases of 100 in 1997, 2002, and 2012) in a single series with a base of 105.1 in December 1997. Sources are:

- Dec. 1997 to Dec. 2011: [statsghana.gov.gh/docfiles/CPI%20Release\\_pdf/cpi\\_national\\_time\\_series\\_jan1970-sept2012.pdf](http://statsghana.gov.gh/docfiles/CPI%20Release_pdf/cpi_national_time_series_jan1970-sept2012.pdf), retrieved 10 March 2015
- Jan. 2012 to December 2012: [statsghana.gov.gh/docfiles/CPI%20Release\\_pdf/dec12\\_cpi\\_release.pdf](http://statsghana.gov.gh/docfiles/CPI%20Release_pdf/dec12_cpi_release.pdf), retrieved 10 March 2015
- Jan. 2013 to Dec. 2013: [statsghana.gov.gh/docfiles/new\\_CPI\\_pdfs/CPI\\_Newsletter\\_December\\_2013.pdf](http://statsghana.gov.gh/docfiles/new_CPI_pdfs/CPI_Newsletter_December_2013.pdf), retrieved 10 March 2015



When the \$1.25/day deflator is taken as the change in 100% of the national line, the factors are 4.121 (for 1998/9 to 2005/6) and 3.3 (for 2005/6 to 2012/13). Thus, the 1998/9 change-in-national-line-deflated \$1.25/day line is GHC5,878 divided by 4.121, giving GHC1,426 (Figure 2). The 2012/13 change-in-national-line-deflated \$1.25/day line is GHC5,878 multiplied by 3.3 and divided by GHC10,000 per GHS, giving GHS1.94. These all-Ghana \$1.25/day lines are then adjusted for regional price differences as described in the previous paragraph.

Which deflator—the CPI or the change in the national line—is better? Sillers (2006)—USAID’s poverty-line expert—uses CPI deflators as a rule. Chen (2015)—the World Bank’s expert on 2005 PPP poverty lines—says that the issue for Ghana is not clear-cut<sup>25</sup> and that the change in the national poverty line may better reflect changes in prices of the items relevant for households in the poorer end of the distribution of consumption.<sup>26</sup>

The choice of deflator matters; for people in 2012/13 with the new-definition \$1.25/day line, 5.6 percent are poor with CPI deflation (a decrease of 19.7 percentage points since 2005/6) versus 13.2 percent with the the \$1.25/day line deflated by the change in the national line (a decrease of 12.1 percentage points).

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<sup>25</sup> Misalignment in Ghana’s inflation, exchange rates, and interest rates is consistent with measured inflation being too low (Osei-Assibey, 2013).

<sup>26</sup> This is related to the motivation behind “poverty purchasing power parity” (Deaton and Dupriez, 2011).

For 2005/6, the World Bank’s PovcalNet<sup>27</sup> reports a person-level rate for \$1.25/day 2005 PPP of 28.6 percent, versus 25.3 percent here (regardless of deflators or definition of *poverty*). The figure here is to be preferred (Schreiner, 2014, p. 57) because PovcalNet does not document whether it:

- Adjusts for regional differences in prices
- Expresses the poverty line in prices as of January 2006

## 2.5 The USAID “very poor” poverty line

USAID microenterprise partners in Ghana who use the scorecard to report poverty rates to USAID should use the \$1.25/day 2005 PPP line deflated by the change in the national line. This is because USAID defines the “very poor” as those people in households whose per-capita consumption is below the highest of the following poverty lines:

- The line that marks the poorest half of people below 100% of Ghana’s new-definition national line (GHS1.99 per person per day in 2012/13, with a person-level poverty rate of 12.1 percent, Figure 1)
- New-definition \$1.25/day 2005 PPP, deflated with Ghana’s CPI (GHS1.36, person-level poverty rate of 5.6 percent)
- New-definition \$1.25/day 2005 PPP, deflated with the change in the national line (GHS1.94, person-level poverty rate of 13.2 percent)

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<sup>27</sup> [iresearch.worldbank.org/PovcalNet/index.htm](http://iresearch.worldbank.org/PovcalNet/index.htm), retrieved 14 March 2015. PovcalNet does not report poverty rates for 2012/13.

## 2.6 “Parallel-lines” assumption

If the “parallel-lines” assumption holds, then it is valid to splice together two estimates of change over time in which the follow-up estimate of change is a non-hybrid (using new-definition poverty lines with both a baseline and a follow-up from the new 2012/13 scorecard) and in which the baseline estimate of change is a hybrid (using old-definition poverty lines with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard).

The “parallel lines” assumption is that *changes* in poverty rates over time are the same regardless of the definition of *poverty*, even though the *levels* of the estimates at a point in time may differ by the definition of *poverty*.

For Ghana, the “parallel lines” assumption can be checked; between 2005/6 and 2012/13, the person-level poverty rate decreased by (Figure 2):

- 7.2 percentage points for 100% of the old-definition national line
- 7.7 percentage points for 100% of the new-definition national line

Thus, the “parallel-lines” assumption holds well from 2005/6 to 2012/13.<sup>28</sup> Of course, it may hold worse (or better) in the future. If it held well in the past, then it is more likely to hold well in the future than if it did not hold well in the past.

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<sup>28</sup> It also holds well for 1998/9 to 2005/6, falling 10.9 percentage points by the old-definition national line and 12.0 percentage points by the new-definition national line.

### 3. Scorecard construction

For Ghana, about 100 candidate indicators are initially prepared in the areas of:

- Household composition (such as the number of members)
- Education (such as the literacy of the male head/spouse)
- Housing (such as the type of walls)
- Ownership of durable assets (such as irons or mobile telephones)
- Employment (such as the number of household members who work)
- Agriculture (such as the ownership of large livestock)

Figure 3 lists the candidate indicators, ordered by the entropy-based “uncertainty coefficient” (Goodman and Kruskal, 1979) that measures how well a given indicator predicts poverty status on its own.<sup>29</sup>

One possible application of the scorecard is to measure *changes* in poverty through time. Thus, when selecting indicators and holding other considerations constant, preference is given to more sensitive indicators. For example, the ownership of an iron 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 new-definition national poverty line and Logit regression on the 2012/13 construction sub-sample. Indicator selection uses both judgment and statistics. The first step is to use Logit to build one scorecard for each candidate indicator. Each scorecard’s power to rank households by poverty status is measured as “c” (SAS Institute Inc., 2004).

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<sup>29</sup> The uncertainty coefficient is not used as a criterion when selecting scorecard indicators; it is just a way to order the candidate indicators in Figure 3.

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 poverty, variety among 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 “c” with the non-statistical criteria. These steps are repeated until the scorecard has 10 indicators that work well together.<sup>30</sup>

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).

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<sup>30</sup> For Ghana, the selection of the final 10 indicators was also informed by feedback from future users via desk-based review and field testing.

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<sup>31</sup> and non-statistical criteria. The use of non-statistical criteria can improve robustness through time and helps ensure that indicators are simple, sensible, and acceptable to users.

The single scorecard here applies to all of Ghana. Tests for Indonesia (World Bank, 2012), Bangladesh (Sharif, 2009), India and Mexico (Schreiner, 2006 and 2005a), Sri Lanka (Narayan and Yoshida, 2005), and Jamaica (Grosh and Baker, 1995) suggest that segmenting scorecards by urban/rural does not improve targeting accuracy much. In general, segmentation may improve the accuracy of estimates of poverty rates (Diamond *et al.*, 2016; Tarozzi and Deaton, 2007), but it may also increase the risk of overfitting (Haslett, 2012).

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<sup>31</sup> 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.

## 4. Practical guidelines for scorecard use

The main challenge of scorecard design is not to maximize statistical accuracy but rather to improve the chances that the scorecard is actually used (Schreiner, 2005b). When scoring projects fail, the reason is not usually statistical inaccuracy but rather the failure of an organization to decide to do what is needed to integrate scoring in its processes and to train and convince its employees to use the scorecard properly (Schreiner, 2002). After all, most reasonable scorecards have similar targeting accuracy, thanks to the empirical phenomenon known as the “flat maximum” (Caire and Schreiner, 2012; Hand, 2006; Baesens *et al.*, 2003; Lovie and Lovie, 1986; Kolesar and Showers, 1985; Stillwell, Barron, and Edwards, 1983; Dawes, 1979; Wainer, 1976; Myers and Forgy, 1963). The bottleneck is less technical and more human, not statistics but organizational-change management. Accuracy is easier to achieve than adoption.

The scorecard here is designed to encourage understanding and trust so that users will want to adopt it on their own and use it properly. Of course, accuracy matters, but it must be balanced with simplicity, ease-of-use, and “face validity”. Programs are more likely to collect data, compute scores, and pay attention to the results if, in their view, scoring does not imply a lot of additional work and if the whole process generally seems to them to make sense.

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

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

A field worker using Ghana’s new 2012/13 scorecard would:

- Record the interview identifier, the date of the interview, the county code (“GHA”), the scorecard code (“002”) and the sampling weight assigned by the survey design to the household of the respondent
- Record the names and identifiers of the participant, field agent, and relevant organizational service point
- Complete the back-page worksheet with each household member’s:
  - First name
  - Age
  - Months away from the household in the past 12 months
  - Whether the person qualifies as a *household member*
  - If the person is a household member aged 5 to 17, whether he/she is currently in school
- Record household size in the scorecard header next to “Number of household members:”, and record the responses to the first two scorecard indicators based on the responses recorded on the back-page worksheet
- Read each of the remaining eight questions one-by-one from the scorecard, drawing a circle around the relevant responses and their points, and writing each point value in the far right-hand column
- Add up the points to get a total score
- Implement targeting policy (if any)
- Deliver the paper scorecard to a central office for data entry and filing

Of course, field workers must be trained. The quality of outputs depends on the quality of inputs. If organizations or field workers gather their own data and believe that they have an incentive to exaggerate poverty rates (for example, if funders reward them for higher poverty rates), then it is wise to do on-going quality control via data



review and random audits (Matul and Kline, 2003).<sup>32</sup> IRIS Center (2007a) and Toohig (2008) are useful nuts-and-bolts guides for budgeting, training field workers and supervisors, logistics, sampling, interviewing, piloting, recording data, and controlling quality.

In particular, while collecting scorecard indicators is relatively easier than alternative ways of measuring poverty, it is still absolutely difficult. Training and explicit definitions of terms and concepts in the scorecard are essential, and field workers should scrupulously study and follow the “Guidelines for the Interpretation of Scorecard Indicators” found at the end of this paper, as the “Guidelines”—along with the “Back-page Worksheet”—are an integral part of the scorecard.<sup>33</sup>

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

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<sup>32</sup> If a program does not want field workers and respondents to know the points associated with responses, then it can use a version of the scorecard that does not display the points and then apply the points and compute scores later at a central office. Schreiner (2012b) argues that hiding points in Colombia (Camacho and Conover, 2011) did little to deter cheating and that, in any case, cheating by the user’s central office was more damaging than cheating by field workers and respondents. Even if points are hidden, field workers and respondents can apply common sense to guess how response options are linked with poverty.

<sup>33</sup> 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 Ghana’s GSS does in the GLSS.

Mexico, Martinelli and Parker (2007, pp. 24–25) find that “underreporting [of asset ownership] is widespread but not overwhelming, except for a few goods . . . [and] overreporting is common for a few goods, which implies that self-reporting may lead to the exclusion of deserving households”. Still, as is done in Mexico in the second stage of its targeting process, most false self-reports can be corrected (or avoided in the first place) by field workers who make a home visit. This is the recommended procedure for local, pro-poor organizations who use scoring for targeting in Ghana.

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

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

In general, the sampling design should follow from the organization’s goals for the exercise, the questions to be answered, and the budget. The main goal should be to make sure that the sample is representative of a well-defined population and that the scorecard will inform an issue that matters to the organization.

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

- Employees of the organization
- Third parties

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

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

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

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

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

The frequency of application can be:

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

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

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

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

## 5. Estimates of household poverty likelihoods

The sum of scorecard points for a household is called the *score*. For Ghana, 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 must be converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. This is done via simple look-up tables. For the example of 100% of the new-definition national line, scores of 30–34 have a poverty likelihood of 40.2 percent, and scores of 35–39 have a poverty likelihood of 29.0 percent (Figure 4).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 30–34 are associated with a poverty likelihood of 40.2 percent for 100% of the new-definition national line but of 20.3 percent for the new-definition \$1.25/day 2005 PPP line deflated with the change in the national poverty line.<sup>34</sup>

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<sup>34</sup> Starting with Figure 4, many figures have 22 versions, covering four types of poverty lines:

- Five new-definition national lines
- Five new-definition \$1.25/day lines deflated with the CPI
- Five new-definition \$1.25/day lines deflated with the change in the national line
- Seven old-definition lines

To keep them straight, lines are grouped by type. Single figures pertaining to all lines of a given type are placed with the figures for 100% of the new-definition national line.

## 5.1 Calibrating scores with poverty likelihoods

A given score is associated (“calibrated”) with a poverty likelihood by defining the poverty likelihood as the share of households in the calibration sub-sample who have the score and who have per-adult-equivalent consumption or per-capita consumption below a given poverty line.

For the example of 100% of the new-definition national line (Figure 5), there are 6,447 (normalized) households in the 2012/13 calibration sub-sample with a score of 30–34. Of these, 2,592 (normalized) are below the poverty line. The estimated poverty likelihood associated with a score of 30–34 is then 40.2 percent, because  $2,592 \div 6,447 = 40.2$  percent.

To illustrate with 100% of the new-definition national line and a score of 35–39, there are 8,013 (normalized) households in the 2012/13 calibration sample, of whom 2,320 (normalized) are below the line (Figure 5). The poverty likelihood for this score range is then  $2,320 \div 8,013 = 29.0$  percent.

The same method is used to calibrate scores with estimated poverty likelihoods for all 22 poverty lines.<sup>35</sup>

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<sup>35</sup> To ensure that poverty likelihoods never increase as scores increase, likelihoods across series of adjacent scores are sometimes iteratively averaged before grouping scores into ranges. This preserves unbiasedness 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.

Figure 6 shows—for all scores and separately for the four types of poverty lines—the likelihood that a given household’s per-adult-equivalent consumption or per-capita consumption falls in a range demarcated by two adjacent poverty lines.

As an example with new-definition national lines, the probability that a household with a score of 30–34 falls between two adjacent poverty lines is:

- 13.1 percent below the food line
- 8.2 percent between the food line and the poorest half below the natl. line
- 18.9 percent between the poorest half below the natl. line and 100% of national
- 30.9 percent between 100% and 150% of the national line
- 12.9 percent between 150% and 200% of the national line
- 16.0 percent above 200% of the national line

Even though the scorecard is constructed partly based on judgment related to non-statistical criteria, the calibration process produces poverty likelihoods that are objective, that is, derived from quantitative poverty lines and from survey data on consumption. The calibrated poverty likelihoods would be objective even if the process of selecting indicators and points did not use any data at all. In fact, objective scorecards of proven accuracy are often constructed using only expert judgment to select indicators and points (Fuller, 2006; Caire, 2004; Schreiner *et al.*, 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 this objectivity depends on using data in score calibration, not on using data (and nothing else) in scorecard construction.

Although the points in the Ghana 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. Non-specialists find it more intuitive to define the poverty likelihood as the share of households with a given score in the calibration sample who are below a poverty line. Going from scores to poverty likelihoods in this way requires no arithmetic at all, just a look-up table. This approach to calibration can also improve accuracy, especially with large samples.

## 5.2 Accuracy of estimates of households' poverty likelihoods

As long as the relationships between indicators and poverty do not change over time, and as long as the scorecard is applied to households that are representative of the same population from which the scorecard was originally constructed, then this calibration process produces unbiased estimates of poverty likelihoods. *Unbiased* means that in repeated samples from the same population, the average estimate matches the true value. Given the assumptions above, the scorecard also produces unbiased estimates of poverty rates at a point in time and unbiased estimates of changes in poverty rates between two points in time.<sup>36</sup>

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<sup>36</sup> This follows because these estimates of groups' poverty rates are linear functions of the unbiased estimates of households' poverty likelihoods.



Of course, the relationships between indicators and poverty do change to some unknown extent over time and also across sub-national groups in Ghana's population. Thus, the scorecard will generally be biased when applied after October 2013 (the last month of fieldwork for the 2012/13 GLSS) or when applied with sub-groups that are not nationally representative.

How accurate are estimates of households' poverty likelihoods, given the assumption of unchanging relationships between indicators and poverty over time and the assumption of a sample that is representative of Ghana as a whole? To find out, the scorecard is applied to 1,000 bootstrap samples of size  $n = 16,384$  from the 2012/13 validation sample. Bootstrapping means to:

- Score each household in a given validation sample
- Draw a bootstrap sample *with replacement* from the validation sample
- For each score, compute the true poverty likelihood in the bootstrap sample, that is, the share of households with the score and with consumption below a poverty line
- For each score, record the difference between the estimated poverty likelihood (Figure 4) and the true poverty likelihood in the bootstrap sample
- Repeat the previous three steps 1,000 times
- For each score, report the average difference between estimated and true poverty likelihoods across the 1,000 bootstrap samples
- For each score, report the two-sided intervals containing the central 900, 950, and 990 differences between estimated and true poverty likelihoods

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

For the example of 100% of the new-definition national line, the average poverty likelihood across bootstrap samples for scores of 30–34 in the 2012/13 validation sample

is too high by 3.1 percentage points. For scores of 35–39, the estimate is too high by 6.2 percentage points.<sup>37</sup>

The 90-percent confidence interval for the differences for scores of 30–34 is  $\pm 3.4$  percentage points (100% of the new-definition national line, Figure 7). This means that in 900 of 1,000 bootstraps, the difference between the estimate and the true value is between  $-0.3$  and  $+6.5$  percentage points (because  $+3.1 - 3.4 = -0.3$ , and  $+3.1 + 3.4 = +6.5$ ). In 950 of 1,000 bootstraps (95 percent), the difference is  $+3.1 \pm 4.0$  percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is  $+3.1 \pm 5.4$  percentage points.

A few differences between estimated poverty likelihoods and true values in Figure 7 are large. There are differences because the validation sample is a single sample that—thanks to sampling variation—differs in distribution from the construction/calibration sub-samples and from Ghana’s population. For targeting, however, what matters is less the difference in all score ranges and more the differences in the score ranges just above and below the targeting cut-off. This mitigates the effects of bias and sampling variation on targeting (Friedman, 1997). Section 8 below looks at targeting accuracy in detail.

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<sup>37</sup> These differences are not zero, despite the estimator’s unbiasedness, because the scorecard comes from a single sample from the 2012/13 GLSS. The average difference by score range would be zero if the GLSS was repeatedly applied to samples of the population of Ghana and then split into sub-samples before repeating the entire process of scorecard construction/calibration and validation.

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

Another possible source of differences between estimates and true values is overfitting. The scorecard here is unbiased, but it may still be *overfit* when applied after the end of the GLSS fieldwork in October 2013. That is, the scorecard may fit the data from the 2012/13 GLSS so closely that it captures not only some real patterns but also some random patterns that, due to sampling variation, show up only in the 2012/13 GLSS but not in the overall population of Ghana. 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 samples 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 groups' poverty rates for nationally representative samples (see the next two sections). Furthermore, at least some of the differences in change-through-time estimates may come from non-scorecard sources such as changes in the relationships

between indicators and poverty, sampling variation, changes in poverty lines, inconsistencies in data quality across time, and imperfections in cost-of-living adjustments across time and across geographic regions. These factors can be addressed only by improving 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 group's poverty rate at a point in time

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

To illustrate, suppose an organization samples three households on 1 January 2015 and that they have scores of 20, 30, and 40, corresponding to poverty likelihoods of 63.8, 40.2, and 19.6 percent (100% of the new-definition national line, Figure 4). The group's estimated poverty rate is the households' average poverty likelihood of  $(63.8 + 40.2 + 19.6) \div 3 = 41.2$  percent.

Be careful; the group's poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is 30, which corresponds to a poverty likelihood of 40.2 percent. This differs from the 41.2 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 targeting. The safest rule to follow is: Always use poverty likelihoods, never scores.

Scores from the new 2012/13 scorecard are calibrated with data from the 2012/13 GLSS for all 22 poverty lines. The process of calibrating scores to poverty likelihoods and the approach to estimating poverty rates is exactly the same for all

lines, regardless of their definition. For users, the only difference is in the specific look-up table used to convert scores to poverty likelihoods.

Existing users of the old 2005/6 scorecard who switch to the new 2012/13 scorecard and who want to salvage existing poverty-rate estimates for measuring change over time can use the old-definition lines to estimate poverty rates for use in hybrid estimates of change with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard. From now on, all users of the new 2012/13 scorecard should also estimate poverty rates using new-definition lines. The appendix describes the process of splicing together hybrid estimates of change looking backwards and non-hybrid estimates of change going forward, as well as the assumptions required for such estimates to be valid.

## 6.1 Accuracy of estimated poverty rates at a point in time

For the new 2012/13 Ghana scorecard applied to 1,000 bootstraps of  $n = 16,384$  from the 2012/13 validation sample and 100% of the new-definition national poverty line, the average difference between the estimated poverty rate at a point in time versus the true rate is +1.1 percentage points (Figure 9, summarizing Figure 8 across all poverty lines of a given type). Across all 15 new-definition poverty lines in the 2012/13 validation sample, the maximum absolute difference is 1.2 percentage points, and the average absolute difference is about 0.6 percentage points. At least part of these differences is due to sampling variation in the division of the 2012/13 GLSS into two sub-samples.

When estimating poverty rates at a point in time, the bias reported in Figure 9 should be subtracted from the average poverty likelihood to make the estimate unbiased. For the example of Ghana's new 2012/13 scorecard and 100% of the new-definition national line in the 2012/13 validation sample, bias is +1.1 percentage points, so the unbiased estimate in the three-household example above is  $41.2 - (+1.1) = 40.1$  percent.

For old-definition lines, the maximum absolute difference in the 2012/13 validation sample is 1.1 percentage points, and the average absolute difference is about 0.5 percentage points (Figure 9).

In terms of precision, the 90-percent confidence interval for a group's estimated poverty rate at a point in time with  $n = 16,384$  is  $\pm 0.7$  percentage points or better for

all lines across all types of poverty lines (Figure 9). This means that in 900 of 1,000 bootstraps of this size, the estimate (after subtracting off bias) is within 0.7 percentage points of the true value.

For example, suppose that the average poverty likelihood in a sample of  $n = 16,384$  with the Ghana scorecard and 100% of the new-definition national line is 41.2 percent. Then estimates in 90 percent of such samples would be expected to fall in the range of  $41.2 - (+1.1) - 0.4 = 39.7$  percent to  $41.2 - (+1.1) + 0.4 = 40.5$  percent, with the most likely true value being the unbiased estimate in the middle of this range, that is,  $41.2 - (+1.1) = 40.1$  percent. This is because the original (biased) estimate is 41.2 percent, bias is +1.1 percentage points, and the 90-percent confidence interval for 100% of the new-definition national line in the 2012/13 validation sample with this sample size is  $\pm 0.4$  percentage points (Figure 9).

## 6.2 Formula for standard errors for estimates of poverty rates

How precise are the point-in-time estimates? Because these estimates are averages, they have (in “large” samples) a Normal distribution and can be characterized by their average difference vis-à-vis true values (*bias*), together with their standard error (*precision*).



Schreiner (2008a) proposes an approach to deriving a formula for the standard errors of estimated poverty rates at a point in time from indirect measurement via scorecards. 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 direct measurement of ratios, where:

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

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

$\sigma$  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,

$\phi$  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, Ghana's 2012/13 GLSS gives a direct-measurement estimate of the household-level poverty rate for 100% of the new-definition national line in the 2012/13 validation sample of  $\hat{p} = 16.3$  percent (Figure 1). If this estimate came from a sample of  $n = 16,384$  households from a population  $N$  of 6,601,484 (the number of households in Ghana in 2012/13 according to the GLSS sampling weights), then the finite

population correction  $\phi$  is  $\sqrt{\frac{6,601,484 - 16,384}{6,601,484 - 1}} = 0.9988$ , which very close to  $\phi = 1$ . If

the desired confidence level is 90-percent ( $z = 1.64$ ), then the confidence interval  $\pm c$  is

$$\pm z \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}} = \pm 1.64 \cdot \sqrt{\frac{0.163 \cdot (1 - 0.163)}{16,384}} \cdot \sqrt{\frac{6,601,484 - 16,384}{6,601,484 - 1}} = \pm 0.473$$

percentage points. (If  $\phi$  were taken as 1, then the interval is still  $\pm 0.473$  percentage points.)

Scorecards, however, do not measure poverty directly, so this formula is not applicable. To derive a formula for the Ghana scorecard, consider Figure 8, which reports empirical confidence intervals  $\pm c$  for the differences for the scorecard applied to 1,000 bootstraps of various sizes from the 2012/13 validation sample. For example, with  $n = 16,384$  and 100% of the new-definition national line in the 2012/13 validation sample, the 90-percent confidence interval is  $\pm 0.417$  percentage points.<sup>38</sup>

Thus, the 90-percent confidence interval with  $n = 16,384$  is  $\pm 0.417$  percentage points for the Ghana scorecard and  $\pm 0.473$  percentage points for direct measurement. The ratio of the two intervals is  $0.417 \div 0.473 = 0.88$ .

Now consider the same exercise, but with  $n = 8,192$ . The confidence interval under direct measurement and 100% of the new-definition national line in the 2012/13

$$\text{validation sample is } \pm 1.64 \cdot \sqrt{\frac{0.163 \cdot (1 - 0.163)}{8,192}} \cdot \sqrt{\frac{6,601,484 - 8,192}{6,601,484 - 1}} = \pm 0.669$$

percentage points. The empirical confidence interval with the Ghana scorecard (Figure

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<sup>38</sup> Due to rounding, Figure 8 displays 0.4, not 0.417.

8) is  $\pm 0.606$  percentage points. Thus for  $n = 8,192$ , the ratio of the two intervals is  $0.606 \div 0.669 = 0.91$ .

This ratio of 0.91 for  $n = 8,192$  is close to the ratio of 0.88 for  $n = 16,384$ . Across all sample sizes of 256 or more in Figure 8, these ratios are generally close to each other, and the average ratio in the 2012/13 validation sample turns out to be 0.89, implying that confidence intervals for indirect estimates of poverty rates via the Ghana scorecard and 100% of the new-definition national poverty line are—for a given sample size—about 11-percent narrower than confidence intervals for direct estimates via the 2012/13 GLSS. This 0.89 appears in Figure 9 as the “ $\alpha$  factor” because if  $\alpha = 0.89$ , then the formula for confidence intervals  $c$  for the Ghana scorecard is  $\pm c = \pm z \cdot \alpha \cdot \sigma$ . That is, the formula for the standard error  $\sigma$  for point-in-time estimates of poverty rates via

$$\text{scoring is } \alpha \cdot \sqrt{\frac{\hat{p} \cdot (1 - \hat{p})}{n}} \cdot \sqrt{\frac{N - n}{N - 1}}.$$

In general,  $\alpha$  can be more or less than 1.00. When  $\alpha$  is less than 1.00, it means that the scorecard is more precise than direct measurement. It turns out that  $\alpha$  is less than 1.00 for 15 of 22 poverty lines in Figure 9.

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

$n = N \cdot \left( \frac{z^2 \cdot \alpha^2 \cdot \tilde{p} \cdot (1 - \tilde{p})}{z^2 \cdot \alpha^2 \cdot \tilde{p} \cdot (1 - \tilde{p}) + c^2 \cdot (N - 1)} \right)$ . If the population  $N$  is “large” relative to the

sample size  $n$ , then the finite population correction factor  $\phi$  can be taken as one (1),

and the formula becomes  $n = \left( \frac{\alpha \cdot z}{c} \right)^2 \cdot \tilde{p} \cdot (1 - \tilde{p})$ .

To illustrate how to use this, suppose the population  $N$  is 6,601,484 (the number of households in Ghana in 2012/13), suppose  $c = 0.03356$ ,  $z = 1.64$  (90-percent confidence), and the relevant poverty line is 100% of the new-definition national line so that the most sensible expected poverty rate  $\tilde{p}$  is Ghana’s overall poverty rate for that line in 2012/13 (16.4 percent at the household level, Figure 1). The  $\alpha$  factor is 0.89 (Figure 9). Then the sample-size formula gives

$$n = 6,601,484 \cdot \left( \frac{1.64^2 \cdot 0.89^2 \cdot 0.164 \cdot (1 - 0.164)}{1.64^2 \cdot 0.89^2 \cdot 0.164 \cdot (1 - 0.164) + 0.03356^2 \cdot (6,601,484 - 1)} \right) = 260,$$

which is close to the sample size of 256 observed for these parameters in Figure 8 for 100% of the new-definition national line. Taking the finite population correction factor

$\phi$  as one (1) gives the same result, as  $n = \left( \frac{0.89 \cdot 1.64}{0.03356} \right)^2 \cdot 0.164 \cdot (1 - 0.164) = 260$ .<sup>39</sup>

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<sup>39</sup> 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 microenterprise partners in Ghana should report using the new-definition \$1.25/day line deflated by the change in the national line. Given the  $\alpha$  factor of 0.68 for this line in 2012/13 (Figure 9), an expected before-measurement household-level poverty rate of 8.4 percent (the all-Ghana rate in 2012/13, Figure 1), and a confidence level of 90 percent

Of course, the  $\alpha$  factors in Figure 9 are specific to Ghana, its poverty lines, its poverty rates, and its scorecard. The derivation of the formulas for standard errors using the  $\alpha$  factors, however, is valid for any scorecard following the approach in this paper.

In practice after the end of fieldwork for the GLSS in October 2013, a program would select a poverty line (say, 100% of the new-definition 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,  $\pm 2.0$  percentage points, or  $c = \pm 0.02$ ), make an assumption about  $\bar{p}$  (perhaps based on a previous measurement such as the household-level poverty rate for 100% of the new-definition national line for Ghana of 16.4 percent in the 2012/13 GLSS in Figure 1), look up  $\alpha$  (here, 0.89 in Figure 9), assume that the scorecard will still work in the future and for sub-groups that are not nationally representative,<sup>40</sup> and then compute the required sample size. In this illustration,

$$n = 10,000 \cdot \left( \frac{1.64^2 \cdot 0.89^2 \cdot 0.164 \cdot (1 - 0.164)}{1.64^2 \cdot 0.89^2 \cdot 0.164 \cdot (1 - 0.164) + 0.02^2 \cdot (10,000 - 1)} \right) = 681.$$

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( $z = 1.64$ ), then  $n = 300$  implies a confidence interval of

$$\pm 1.64 \cdot 0.68 \cdot \sqrt{\frac{0.084 \cdot (1 - 0.084)}{300}} = \pm 1.8 \text{ percentage points.}$$

<sup>40</sup> This paper reports accuracy for the scorecard applied to its validation samples, but it cannot test accuracy for later years or for sub-groups. Performance after October 2013 will resemble that in the 2012/13 GLSS with deterioration over time to the extent that the relationships between indicators and poverty status change.

## 7. Estimates of changes in poverty rates over time

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

This section discusses non-hybrid estimates of change in which both the baseline and follow-up use the new 2012/13 scorecard with same poverty line.

Because the new 2012/13 scorecard is calibrated both to old-definition lines and to new-definition lines, existing users of the old 2005/6 scorecard—after switching to the new 2012/13 scorecard—can still find hybrid estimates of change in poverty rates over time for old-definition lines with a baseline from the old 2005/6 scorecard and a follow-up from the new 2012/13 scorecard. The appendix (not this section) explains the step-by-step mechanics of that calculation.

To give an idea of how accurate the new 2012/13 Ghana scorecard might be when used to measure changes in poverty rates over time from now on, this section looks at how accurate the scorecard would have been, had it been applied between three pairs of existing GLSS rounds (the first round listed is the baseline):

- 2012/13 and 2005/6
- 2012/13 and 1998/9
- 2005/6 and 1998/9

The tests here are stringent because:

- They compare scorecard estimates with known, true values from the GLSS
- Poverty rates in Ghana fell steeply from 1998 to 2005/6 and then again from 2005/6 to 2012/13. The long time frame and the large change in poverty increase the risk of inaccuracy due to changing relationships between indicators and poverty
- The tests are *out-of-sample* in that they use only GLSS data that is not also used in construction or calibration of the new 2012/13 scorecard
- The tests are *out-of-time* in that the baseline and/or follow-up is from a year other than 2012/13, the year of the data used for construction/calibration
- Some indicators and responses are inconsistent across GLSS rounds, increasing the systematic error in the data

Of course, these backward-looking tests—the only ones possible for estimates of changes in poverty rates—can only give a rough idea of how accurate the scorecard might be when used from now on. After all, the factors that mattered in the past will differ in type, degree, and extent from the factors that will matter in the future. This is the unfortunate-but-inevitable nature of scorecards.

Because estimates from the scorecard are unbiased when applied to an unchanging population in which there are unchanging relationships between indicators and poverty, inaccuracies in estimates of change over time with pairs of years from these three GLSS rounds must be due to:

- Sampling variation
- Inconsistent data quality
- Inaccuracy in the adjustment for changes in prices over time
- Change in the relationships between indicators and poverty over time
- Changes in the composition of Ghana's population
- Differences in scorecard indicators and response options across GLSS rounds

Items in the scorecard (and their responses) are not always identical across the three GLSS rounds. The discrepancies are discussed below. They explain at least some of the differences observed between estimated changes and true changes.

*Indicator 3: “Can the male head/spouse read a phrase/sentence in English? (No; Yes)”*

In 1998/9 and 2005/6, the question matches the scorecard, but in 2012/13 it is “Can the male head/spouse read a phrase/sentence in English or French? (No; Yes, English; Yes, French; Yes, both)”. Because the response options can be cleanly aligned across rounds, this discrepancy probably has little effect.

*Indicator 4: “What is the main construction material used for the outer wall?”*

Some response options are not consistently present, worded, grouped, or ordered:

<b>1998/9</b>	<b>2005/6</b>	<b>2012/13</b>
Mud/mud bricks	Mud/mud bricks	Mud bricks/earth
Wood/bamboo	Wood/bamboo	Wood
		Bamboo
Metal sheets/corrugated iron/slate/asbestos	Metal sheets/corrugated iron/slate/asbestos	Metal sheet/slate/asbestos
Stone/burned bricks	Stone/burned bricks	Stone
		Burned bricks
Cement/sandcrete blocks	Cement/sandcrete blocks	Cement blocks/concrete
Landcrete, thatch, cardboard, or other	Landcrete	Landcrete
	Thatch	Palm leaves/thatch (grass/raffia)
	Cardboard	
	Other	Other



These differences probably matter little; almost all households fall into “Mud/mud bricks”/“Mud bricks/earth” or “Cement/sandcrete blocks”/“Cement blocks/concrete”.

*Indicator 5: “What type of toilet facility is usually used by the household?”*

<b>1998/9</b>	<b>2005/6</b>	<b>2012/13</b>
Flush toilet (W.C.)	Flush toilet (W.C.)	W.C.
Pit latrine	Pit latrine	Pit latrine
KVIP	KVIP	KVIP
Pan/bucket	Pan/bucket	Bucket/pan
Public toilet (flush/bucket/KVIP), toilet in another house, or no toilet facility (bush, beach)	Public toilet (flush/bucket/KVIP)	Public toilet (e.g., W.C., KVIP, pit, pan)
	Toilet in another house	
	No toilet facility (bush, beach)	No facility (e.g., bush/beach/field)
Other	Other	

Very few households had “Other” or “Toilet in another house”, so the main discrepancy of consequence is that “Public toilet” and “No toilet” were grouped in a single response option in 1998/9 but were separate options in 2005/6 and 2012/13. In the tests here, “Public toilet” is counted as “No toilet” in the 1998/9 data.

There are also large shifts in the distribution of responses across rounds toward more use of public toilets and less use of pit latrines and KVIP. This reflect some mix of real changes and changes in the order and wording of response options in the GLSS.

*Indicator 6: “What is the main fuel used by the household for cooking?”*

<b>1998/9</b>	<b>2005/6</b>	<b>2012/13</b>
	None, no cooking	None, no cooking
Wood	Wood	Wood
Charcoal	Charcoal	Charcoal
Kerosene	Kerosene	Kerosene
Gas	Gas	Gas
Electricity	Electricity	Electricity
Crop waste/residue, animal waste, or other	Crop waste/residue	Animal waste
		Crop waste
		Sawdust

The inconsistent response options matter for few households and so probably do not lead to much inaccuracy.

*Indicator 7: “Does the household own a working box iron or electric iron?”*

In 1998/9, the GLSS did not ask about box irons. This may cause large inaccuracies; about 13 percent of households in 2005/6 (and 8 percent in 2012/13) had box irons but no electric irons, suggesting that more than 13 percent of households in 1998/9 will be counted as not having box irons when they did in fact have them.

*Indicator 8: “Does any household member own a working television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish?”*

The 1998/9 GLSS asks only about video players, and the 2005/6 GLSS asks only about video players and satellite dishes. If satellite dishes and VCD/DVD/MP3/MP4 player/iPods were rarely owned until after 2005/6, then this should not cause much inaccuracy. Still, owning a video player in 1998/9 may have a different link with poverty than does, say, owning an MP3 player in 2012/13.

Overall, the changes in the content of the GLSS surveys across rounds is a systematic source of inaccuracy in estimates of change, although the level of inaccuracy cannot be known.

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

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

## **7.2 Estimating changes in poverty rates over time**

Consider the illustration begun in the previous section. On 1 January 2015, an organization samples three households who score 20, 30, and 40 and so have poverty likelihoods of 63.8, 40.2, and 19.6 percent (100% of the new-definition national line,

Figure 4). Adjusting for the known bias in the 2012/13 validation sample of +1.1 percentage points (Figure 9), the group's baseline estimated poverty rate is the households' average poverty likelihood of  $[(63.8 + 40.2 + 19.6) \div 3] - (+1.1) = 40.1$  percent.

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

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

By way of illustration, suppose that two years later on 1 January 2017, the organization samples three additional households who are in the same population as the three original households (or suppose that the same three original households are scored a second time) and finds that their scores are 25, 35, and 45 (poverty likelihoods of 53.3, 29.0, and 11.7 percent, 100% of the new-definition national line, Figure 4).

Adjusting for the known bias, the average poverty likelihood at follow-up is  $[(53.3 + 29.0 + 11.7) \div 3] - (+1.1) = 30.2$  percent, an improvement of  $40.1 - 30.2 = 9.9$  percentage points.<sup>41</sup>

Thus, about one in ten participants in this hypothetical example cross the poverty line in 2015/7.<sup>42</sup> Among those who start below the line, about one in four ( $9.9 \div 40.1 = 24.7$  percent) on net end up above the line.<sup>43</sup>

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<sup>41</sup> Of course, such a huge reduction in poverty in two years is highly unlikely, but this is just an example to show how the scorecard can be used to estimate change.

<sup>42</sup> This is a net figure; some start above the line and end below it, and vice versa.

<sup>43</sup> The scorecard does not reveal the reasons for this change.

### 7.3 Accuracy for estimated change in two independent samples

The accuracy of scoring’s estimates of changes in poverty rates over time is checked using GLSS data from 1998/9, 2005/6, and 2012/13. While one cannot “drive by looking in the rear-view mirror”, historical accuracy is the best-available—but inevitably imperfect—indicator of future accuracy.

Across the 63 combinations of the 21 lines applied across three pairs of GLSS rounds in Figure 10,<sup>44</sup> the average of the ratios of the absolute error to the absolute true change is 41 percent. Distinct but related, the mean absolute error is 5.9 percentage points, while the mean absolute true change is 15.8 percentage points.<sup>45</sup> This suggests, for example, that if the true change is 10 percentage points, then on average the estimate will be off by about 4 percentage points, whether too high (14 percentage points) or too low (6 percentage points).

In 29 of 63 cases (46 percent), the true value is in the estimate’s 90-percent confidence interval (given  $n = 1,024$ ). That is, the size of the estimated change is not statistically different from the size of the true change with 90-percent confidence about half the time. Of course, if all of scoring’s assumptions hold, then 90 percent of estimates’ 90-percent confidence intervals would contain the true value.

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<sup>44</sup> For the line that marks the poorest half of people below the national line, changes are not estimated because this line is not constant in real terms.

<sup>45</sup> The ratio of 5.9 to 15.8 is 37 percent. This differs from the 41-percent average of the ratios of the absolute error to the true change because  $5.9 \div 15.8$  is a ratio of averages, while the other is the average of ratios.

Scoring gets the direction of change (whether poverty increased or decreased) right in 59 of 63 cases (94 percent). In these 59 cases the estimated direction matches the true direction, and zero is not in the estimate’s 90-percent confidence interval.

In sum, the scorecard almost always gets the *sign* of change correct. The absolute error in the estimated *size* of change is, on average, within 40 percent of the absolute true change, and a little less than half of the true changes are in the 90-percent confidence intervals of the estimated changes.

Are the estimates of change from the Ghana scorecard “good enough”? The answer depends on the context and purpose of a given analysis task. Sometimes scoring is adequate, sometimes not. While greater accuracy is always preferred and sought, a strength of the scorecard is that its accuracy is known, allowing judgments about how much trust to put in scoring estimates to be transparent and intentional. The accuracy of estimates of change in Ghana is among the highest of the dozen countries for which such tests have been done.

## 7.4 Precision for estimates of change in two samples

Beyond errors in the sign and the size of estimated magnitudes, another formal aspect of accuracy is the standard statistical concept of *precision*. Figure 10 reports precision as 90-percent confidence intervals (given  $n = 16,384$ ) and more generally as the  $\alpha$  factor used in formulas for standard errors.

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  $\sigma$  of a scorecard's estimate of the change in poverty rates over time:

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

Here,  $z$ ,  $c$ ,  $\hat{p}$  and  $N$  are defined as above,  $n$  is the sample size at both baseline and follow-up,<sup>46</sup> and  $\alpha$  is the average (across a range of bootstrapped sample sizes) of the ratio of the observed confidence interval from a scorecard and the theoretical confidence interval under direct measurement.

Given  $n = 16,384$ , the 90-percent confidence intervals for estimates of change over time are  $\pm 1.0$  percentage points or less (Figure 10).

Seen another way, the  $\alpha$  factor indicates that scoring's standard errors are, on average across all lines and pairs of GLSS rounds, 3 percent larger than standard errors under direct measurement (Figure 10).

Is this precise enough? There can be no general, once-and-for-all answer as to whether the scorecard's bias and standard errors are small enough to be useful for measuring change over time. The tests for Ghana here offer both hope and disappointment. The scorecard's precision is close to that of direct measurement, and the estimated direction of change is almost always correct. At the same time, the

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<sup>46</sup> 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 measurements (not twice as many) as does estimating a poverty rate at a point in time.

average (across poverty lines and pairs of GLSS rounds) absolute error is about 6 percentage points (about 40 percent of the average absolute true change), and a little less than half of estimates do not include the true value in their 90-percent confidence interval.

Is the scorecard better than feasible alternatives for measuring change over time? This question is also difficult to answer. A central strength of scoring is that its accuracy is known, while the accuracy of most alternatives is unknown or unreported.

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

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

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

To illustrate the use of this formula to determine sample size for estimating changes in poverty rates across two independent samples, suppose the desired confidence level is 90 percent ( $z = 1.64$ ), the desired confidence interval is  $\pm 2$  percentage points ( $\pm c = \pm 0.02$ ), the poverty line is 100% of the new-definition national line,  $\alpha = 0.92$  (Figure 10 for 2012/13 to 2005/6),  $\hat{p} = 0.164$  (the household-level poverty rate in 2012/13 for 100% of the new-definition national line in Figure 1), and the population  $N$  is large enough relative to the expected sample size  $n$  that the finite



population correction  $\phi$  can be taken as one. Then the baseline sample size is

$$n = 2 \cdot \left( \frac{0.92 \cdot 1.64}{0.02} \right)^2 \cdot 0.164 \cdot (1 - 0.164) \cdot 1 = 1,561, \text{ and the follow-up sample size is}$$

also 1,561.

## 7.5 Precision for estimated change for one sample, scored twice

Analogous to previous derivations, the general formula relating the confidence interval  $\pm c$  to the standard error  $\sigma$  when using a scorecard to estimate change for a single group of households, all of whom are scored at two points in time, is:<sup>47</sup>

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

where  $z$ ,  $c$ ,  $\alpha$ ,  $N$ , 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.

Because the GLSS data for Ghana does not cover the same households in more than one round (except by pure chance, and even then, there is no way to identify such households), it is not possible to estimate values of  $\alpha$  here.

The formula for confidence intervals can be rearranged to give a formula for sample size before measurement. This requires an estimate (based on information available before measurement) of the expected shares of all households who cross the

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<sup>47</sup> See McNemar (1947) and Johnson (2007). John Pezzullo helped find this formula.

poverty line  $\tilde{p}_{12}$  and  $\tilde{p}_{21}$ . Before measurement, a conservative assumption is that the change in the poverty rate will be zero, which implies  $\tilde{p}_{12} = \tilde{p}_{21} = \tilde{p}_*$ , giving:

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

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

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

Given this, a sample-size formula for a group of households to whom the Ghana scorecard is applied twice (once after October 2013 and then again later) is

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

In Peru (the only source of a data-based estimate, Schreiner, 2009e), the average  $\alpha$  across years and poverty lines is about 1.30.

To illustrate the use of this formula, suppose the desired confidence level is 90 percent ( $z = 1.64$ ), the desired confidence interval is  $\pm 2.0$  percentage points ( $\pm c = \pm 0.02$ ), the poverty line is 100% of the new-definition national line, the sample will first be scored in 2015 and then again in 2018 ( $y = 3$ ), and the population  $N$  is so large relative to the expected sample size  $n$  that the finite population correction  $\phi$  can be taken as one. The pre-baseline poverty rate  $p_{2015}$  is taken as 16.4 percent (Figure 1),

and  $\alpha$  is assumed to be 1.30. Then the baseline sample size is

$$n = 2 \cdot \left( \frac{1.30 \cdot 1.64}{0.02} \right)^2 \cdot \{-0.02 + 0.016 \cdot 3 + 0.47 \cdot [0.164 \cdot (1 - 0.164)]\} \cdot 1 = 2,101. \text{ The}$$

same group of 2,101 households is scored at follow-up as well.

## 8. Targeting

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

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

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

Figure 11 depicts these four possible targeting outcomes. Targeting accuracy varies by the cut-off score; a higher cut-off has better inclusion (but worse leakage), while a lower cut-off has better exclusion (but worse undercoverage).

Programs should weigh these trade-offs when setting a cut-off. A formal way to do this is to assign net benefits—based on a program’s values and mission—to each of the four possible targeting outcomes and then to choose the cut-off that maximizes total net benefits (Adams and Hand, 2000; Hoadley and Oliver, 1998).

Figure 12 shows the distribution of households by targeting outcome for Ghana. For an example cut-off of 34 or less, outcomes for 100% of the new-definition national line in the 2012/13 validation sample are:

- Inclusion: 9.3 percent are below the line and correctly targeted
- Undercoverage: 6.9 percent are below the line and mistakenly not targeted
- Leakage: 8.3 percent are above the line and mistakenly targeted
- Exclusion: 75.4 percent are above the line and correctly not targeted

Increasing the cut-off to 39 or less improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 11.6 percent are below the line and correctly targeted
- Undercoverage: 4.6 percent are below the line and mistakenly not targeted
- Leakage: 14.1 percent are above the line and mistakenly targeted
- Exclusion: 69.7 percent are above the line and correctly not targeted

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

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

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

- Assign benefits and costs to possible outcomes, based on its values and mission
- Tally total net benefits for each cut-off using Figure 12 for a given poverty line
- Select the cut-off with the highest total net benefit

The most difficult step is assigning benefits and costs to targeting outcomes. A program that uses targeting—with or without scoring—should thoughtfully consider how it values successful inclusion and exclusion versus errors of undercoverage and leakage. It is healthy to go through a process of thinking explicitly and intentionally about how possible targeting outcomes are valued.

A common choice of benefits and costs is the “hit rate”, where total net benefit is the number of households correctly included or correctly excluded:

$$\begin{array}{rclcl}
 \text{Hit rate} = & 1 & \times & \text{Households correctly included} & - \\
 & 0 & \times & \text{Households mistakenly undercovered} & - \\
 & 0 & \times & \text{Households mistakenly leaked} & + \\
 & 1 & \times & \text{Households correctly excluded.} & 
 \end{array}$$

Figure 12 shows the hit rate for all cut-offs for the new 2012/13 scorecard for Ghana. For 100% of the new-definition national line in the 2012/13 validation sample, total net benefit is greatest (86.4) for a cut-off of 24 or less, with about seven in eight households in Ghana correctly classified.

The hit rate weighs successful inclusion of households below the 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  $(2 \times \text{Households correctly included}) + (1 \times \text{Households correctly excluded})$ .<sup>48</sup>

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 Figure 13 (“% targeted HHs who are poor”) shows, for the Ghana scorecard applied to a validation sample, the expected poverty rate among households who score at or below a given cut-off. For the example of 100% of the new-definition national line, targeting households in the 2012/13 validation sample who score 34 or less would target 17.7 percent of all households (second column) and would be associated with a poverty rate among those targeted of 52.8 percent (third column).

Figure 13 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 new-definition national line with the 2012/13 validation sample and a cut-off of 34 or less, 57.5 percent of all poor households are covered.

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<sup>48</sup> Figure 12 also reports BPAC, the Balanced Poverty Accuracy Criteria adopted by USAID for certifying poverty-assessment tools. BPAC is discussed in Section 9.

The final targeting measure in Figure 13 is the number of successfully targeted poor households for each non-poor household mistakenly targeted (right-most column). For 100% of the new-definition national line with the 2012/13 validation sample and a cut-off of 34 or less, covering 1.1 poor households means leaking to 1 non-poor household.



## 9. Context for poverty-assessment tools in Ghana

This section discusses nine existing scorecard-like poverty-measurement tools for Ghana in terms of their goals, methods, definitions of *poverty*, data, indicators, bias, precision, and cost. In general, the advantages of the scorecard here are its:

- Use of data from the most recent available nationally representative consumption survey
- Reporting bias and precision for estimates of poverty rates at a point in time from out-of-sample tests, including formulas for standard errors
- Reporting bias and precision for estimates of changes in poverty rates between two points in time from out-of-sample/out-of-time tests, including formulas for standard errors
- Fewer and lower-cost indicators
- Use of a consumption-based definition of *poverty* that is widely understood and that is used by government of Ghana
- Targeting accuracy that is similar to that of alternative approaches
- Feasibility for local, pro-poor programs, due to its simplicity and transparency

### 9.1 Gwatkin *et al.*

Gwatkin *et al.* (2007) construct a poverty-assessment tool for Ghana with an approach that they use in 56 countries with Demographic and Health Surveys (Rutstein and Johnson, 2004). They use Principal Components Analysis to make an asset index from simple, low-cost indicators available for the 6,251 households in Ghana's 2003 DHS.<sup>49</sup> The PCA index is like the scorecard here except that, because the DHS does not collect data on consumption, the index is based on a different conception of *poverty*, its

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<sup>49</sup> All DHS datasets for Ghana since 1993 include each household's score on the asset index ([dhsprogram.com/topics/wealth-index/](http://dhsprogram.com/topics/wealth-index/), retrieved 11 March 2015).

accuracy vis-à-vis consumption-based poverty is unknown, and it can only be assumed to be a proxy for long-term wealth/economic status.<sup>50</sup> Well-known examples of the PCA asset-index approach include Stifel and Christiaensen (2007), Zeller *et al.* (2006), Sahn and Stifel (2003 and 2000), and Filmer and Pritchett (2001).

The 17 indicators in Gwatkin *et al.* are similar to those in the scorecard in terms of their simplicity, low cost, and verifiability:

- Characteristics of the residence:
  - Presence of electricity
  - Type of floor
  - Means of garbage disposal
  - Type of cooking fuel
  - Source of drinking water
  - Type of toilet arrangement
- Ownership of consumer durables:
  - Radios
  - Televisions
  - VCRs or VCPs
  - Telephones
  - Refrigerators
  - Bicycles
  - Motorcycles or scooters
  - Cars or trucks
  - Tractors
  - Horses or carts
- Whether members of the household work their own or family's agricultural land

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<sup>50</sup> Nevertheless, the indicators are similar and the “flat maximum” is important, so carefully built PCA indexes and consumption-based poverty-assessment tools may pick up the same underlying construct (perhaps “permanent income”, see Bollen, Glanville, and Stecklov, 2007), and they may rank households much the same. Comparisons of rankings by PCA indexes and consumption-based scorecards include Filmer and Scott (2012), Lindelow (2006), Sahn and Stifel (2003 and 2000), 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 score to see how health varies with socio-economic status
- Monitoring (via exit surveys) how well local health-service posts reach the poor
- Measuring local coverage of health services via small-scale surveys

The first goal is akin to targeting, and the last two goals deal with performance monitoring, so the asset index would be used much like the scorecard here.

Still, the Gwatkin *et al.* index is more costly and difficult-to-use than the scorecard. While the scorecard requires adding up 10 integers (some of them likely to be zeroes), Gwatkin *et al.*'s index requires adding up 100 numbers, each with five decimal places and half with negative signs.

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

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

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

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

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

## 9.2 Sahn and Stifel (2003)

Sahn and Stifel (2003) seek a low-cost, practical way to measure poverty. Based on data from the 3,192 households in Ghana’s 1988/9 GLSS and from the 4,522 households in the 1991/2 GLSS, they use factor analysis—a sister of the PCA approach of Gwatkin *et al.*—to build two asset indexes. Their goal is “to see if there exist simpler and less demanding alternatives to collecting data on expenditure for purposes of measuring economic welfare and ranking households” (p. 484). Thus, the motivation of

Sahn and Stifel (2003) is similar to that of the scorecard here: they want tools that are affordable and feasible given constraints on budgets and non-specialists' technical resources. Furthermore, they want to make comparisons over time and across countries without the complications and assumptions required for direct measurement via consumption surveys. Like this paper, they also seek a tool that can be used for targeting.

Sahn and Stifel's (2003) nine indicators are simple, low-cost, and verifiable:

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

To check coherence between their two asset indexes and consumption in the 1988/9 and 1991/2 GLSS<sup>51</sup> and between their 1988/9 asset index and child nutrition, Sahn and Stifel (2003) rank households in Ghana based on the index, on consumption, and on height-for-age. They judge the coherence between two sets of rankings as the distance between a given household's decile ranks. They conclude that the asset index predicts long-term nutritional status no worse than does current consumption and that

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<sup>51</sup> Sahn and Stifel (2003) check the index against consumption because it is a common proxy for living standards, not because they believe it should be the benchmark.

the index is simpler and less costly. They also report that their asset index predicts consumption worse than does a scorecard-like approach (that is, a least-squares regression that predicts consumption based on household demographics, education, residence quality, and access to public services). Finally, they find that measurement error is worse for consumption than for their index.

### **9.3 Sahn and Stifel (2000)**

Like Sahn and Stifel (2003), Sahn and Stifel (2000) use factor analysis to construct an asset index that measures poverty in Ghana in terms of long-term wealth. Their purpose is assessment (to inform governments and donors on the broad progress of poverty-reduction efforts in Africa) rather than management (to provide a tool to help local, pro-poor organizations to improve their products and services).

Like the other asset indexes reviewed here, Sahn and Stifel (2000) share many of the strengths of the poverty-scoring approach in that it can be used for targeting and in that it is flexible, low-cost, and adaptable to diverse contexts. In particular, an asset index does not require price adjustments over time and nor consumption data.

Sahn and Stifel (2000) construct their index by pooling data from Ghana's 1988 and 1993 DHS. The nine indicators are the same as in Sahn and Stifel (2003), even though the data sources differ. After defining poverty status according to lines set at the 25<sup>th</sup> and 40<sup>th</sup> percentiles of scores from the index, they compare the distribution of the index and index-based poverty rates over time within Ghana.

Sahn and Stifel (2000) also construct a single index from pooled DHS data from 11 sub-Saharan countries—including Ghana—with two DHS rounds, along with five other sub-Saharan countries with only a single DHS round. This elegantly allows them to compare asset-based poverty across time (within a country) and across countries based on a single index with a definition of *poverty* that—unlike a consumption-based definition—is measured consistently across time and countries.

Sahn and Stifel (2000) find that asset-based poverty decreased more in Ghana than in other countries with two rounds of DHS data.<sup>52</sup> The decrease was driven by improvement in the quality of drinking water, in the educational attainment by the household head, and in the quality of floors. Ghana also had the best (lowest) asset-based poverty rate, even though it had the sixth-highest per-capita GDP.

Booyesen *et al.* (2008) is like Sahn and Stifel (2000), except that Booyesen *et al.* look at both poverty rates and inequality measures, they use more recent data, and they use three rounds of DHS data rather than two. In addition, Booyesen *et al.* use Multiple Correspondence Analysis instead of factor analysis. MCA is PCA, *sans* the assumption that indicators have Normal distributions. In principle, this makes MCA better suited for scorecard-like categorical indicators, although Burger *et al.* (2006) and Booyesen *et al.* (2008) fail to show that MCA ranks—for a given benchmark—better than PCA. Using DHS data, Booyesen *et al.* find that asset-based poverty decreased in Ghana from 1988 to 1998. Burger *et al.* (2006) report similar results for Ghana.

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<sup>52</sup> Their ranking ignores that the time between the two DHS surveys varies by country.

## 9.4 Filmer and Scott

Filmer and Scott (2012) test (on 11 countries, including Ghana) how well ranks from different types of asset indexes are correlated with ranks from:

- Other asset indexes
- Expenditure as directly measured by a survey
- Expenditure as estimated by a regression (that is, a scorecard)

They find that different approaches to constructing asset indexes generally lead to similar rankings vis-à-vis the benchmarks of directly measured expenditure and regression-estimated expenditure. This result is strongest for countries where regression works well for predicting expenditure and weakest for less-poor countries with larger shares of non-food expenditure.

For Ghana, Filmer and Scott use data on the 4,522 households in the 1991/2 GLSS to select 27 indicators that—as in the other asset indexes and as in this paper—are simple, low-cost, and verifiable:

- Whether the household shares a residence with another household
- Whether the household owns land or has a plot
- Characteristics of the residence:
  - Whether the residence is owned by the household
  - Type of walls
  - Type of roof
  - Type of floor
  - Type of toilet arrangement



- Ownership of consumer durables:
  - Radios
  - Radio-cassettes
  - Record players
  - 3-in-1 RCPs
  - Televisions (color or black-and-white)
  - Video players
  - Cameras
  - Stoves
  - Refrigerator/freezers
  - Electric irons
  - Sewing machines
  - Fans
  - Washing machines
  - Air conditioners
  - Furniture
  - Bicycles
  - Boats
  - Canoes
  - Outboard motors
  - Cars

Filmer and Scott's goal is to establish general properties of asset-index approaches (rather than to provide asset indexes that local, pro-poor organizations can use), so they do not report scorecard points or standard errors.

Among the 11 countries studied, Ghana (with Zambia) generally had the lowest correlation of ranks by the asset index with ranks by other measures. That is, the ranking of households by Filmer and Scott's asset index for Ghana was unusually non-congruent with the rankings by direct-measured consumption and with rankings by scorecard-predicted consumption.

## 9.5 Coulombe

Coulombe (2008) uses “poverty mapping” (Elbers, Lanjouw, and Lanjouw, 2003) with the 1998/9 GLSS to estimate poverty rates for Ghana’s 10 regions, 110 districts, and 1,048 council areas. The main goal is to inform poverty policy and to give Ghana’s decentralization process an objective basis for directing more resources and attention to poorer areas.

For each of the seven strata in the 1998/9 GLSS (Accra, Urban Coastal, Rural Coastal, Urban Forest, Rural Forest, Urban Savannah, and Rural Savannah), Coulombe uses backward stepwise least-squares regression of the logarithm of per-adult-equivalent consumption with indicators found both in the 1998/9 GLSS and in Ghana’s 2000 Census (including cluster-level census means and data on local infrastructure from a community-level facility survey done along with the Census). The seven stratum-specific scorecards are then applied to Census data with 100% of the old-definition national poverty line. This set-up gives poverty estimates for smaller areas (regions, districts, and council areas) than is possible with only the 1998/9 GLSS. Finally, Coulombe reports the estimated poverty rates and their standard errors for all regions and districts.

Poverty mapping in Coulombe has much in common with the scorecard here in

that they both:

- Build scorecards with data that is representative of a population (all-Ghana for the scorecard, and the GLSS survey strata for the poverty map) and then apply the scorecards to other data on groups that are not, in general, representative of the same populations
- Estimate poverty rates for groups
- Test accuracy empirically
- Report bias and standard errors
- Provide unbiased estimates when their assumptions hold
- Seek to be useful in practice and so aim to be understood by non-specialists

Strengths of poverty mapping include that it:

- Has formally established theoretical properties
- Can be applied straightforwardly to distributional measures of well-being (such as the poverty gap or the Gini coefficient) that go beyond head-count poverty rates
- Accounts for uncertainty in the estimation of scorecard points when estimating standard errors
- Requires data on fewer households for construction and calibration
- Includes cluster- and community-level indicators, including some not found in the GLSS, decreasing bias and increasing precision
- Uses only indicators that are in a census

Strengths of the scorecard include that it:

- Uses simple, verifiable indicators that are quick and inexpensive to collect
- Is simpler in terms of both construction and application
- Associates poverty likelihoods with scores non-parametrically
- Surfaces estimates of poverty likelihoods for individual households
- Reduces overfitting by selecting indicators with statistical and non-statistical criteria and by having only a single, all-Ghana scorecard<sup>53</sup>
- Tests accuracy *out-of-sample* (that is, with data not used in scorecard construction)
- Reports confidence intervals and simple formulas for standard errors
- Aims to be transparent to non-specialists

The basic difference between the two approaches is that poverty mapping seeks to help governments to target pro-poor policies, while the scorecard seeks to help local, pro-poor organizations to manage their social performance.<sup>54</sup> On a technical level, Coulombe estimates consumption directly, whereas the scorecard estimates poverty likelihoods.<sup>55</sup>

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<sup>53</sup> According to Mahadevan, Yoshida, and Praslova (2013, pp. 6–7) “the latest recommendation from poverty-map experts in the World Bank Research Department is not to use multiple [scorecards] to predict household consumption” because they can be “problematic since the number of observations for each area becomes small and, as a result, the regression coefficients become less stable.” To reduce overfitting, Haslett (2012) recommends that poverty maps be based on a single, all-country scorecard.

<sup>54</sup> Another apparent difference is that the developers of poverty mapping (Elbers, Lanjouw, and Lanjouw, 2003; Demombynes *et al.*, 2004) say that poverty mapping is too inaccurate to be used for targeting at the household level. In contrast, Schreiner (2008b) supports household-level targeting as a legitimate, potentially useful application of the scorecard. In Elbers *et al.* (2007), the developers of poverty mapping seem to take a step back from their previous position.

<sup>55</sup> Haslett and Jones (2006, p. 61) say that “the benefits of [poverty mapping] accrue when interest is in several non-linear functions of the same target variable [such as the consumption-based poverty gap] . . . or in distributional properties. If only a single measure were of interest, then it might be worthwhile to consider direct modelling of this. For example, small-area estimates of poverty [rates] could be derived by estimating

Coulombe's seven scorecards use an average of about 12 indicators from among the following 43:

- Demographics:
  - Number of household members
  - Number of household members ages 0 to 6
  - Number of male household members ages 7 to 14
  - Number of female household members ages 7 to 14
  - Number of female household members ages 15 to 59
  - Age of head
  - Sex of head
  - Religion of head
  - Ethnic group of head
- Education:
  - Whether the head went to school
  - Share of household members who went to school
  - Number of household members who went to school
  - Whether the head can read English and a Ghanaian language
  - Whether a household member has completed junior secondary school
- Employment:
  - Whether the head works
  - Whether the head is employed in the formal sector
  - Whether the head is self-employed in non-agriculture
  - Whether the head is self-employed in agriculture
  - Hours worked per capita per week in agriculture by self-employed household members
  - Hours worked per capita per week by household members
- Characteristics of the residence:
  - Presence of an electrical connection
  - Type of wall
  - Type of roof
  - Source of fuel for cooking
  - Type of toilet arrangement
- Place of residence:
  - Region
  - District or council area

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a logistic regression model for incidence in the survey data". This is what the scorecard here does.

- Cluster-level census means:
  - Hours per week per capita worked by households
  - Total hours per week worked by households
  - Average number of rooms
  - Presence of garbage collection
  - Presence of electricity
  - Presence of a telephone connection
  - Presence of a post office
  - Presence of a school
  - Share of households whose head can read English
  - Share of households whose residence has cement walls
  - Share of households who cook with charcoal
  - Share of households who use electricity
  - Share of households who drink water from wells
  - Share of households who drink piped water
  - Share of households with no toilet arrangement
  - Share of households with a flush toilet

Coulombe's poverty map is not meant for use by local, pro-poor organizations.

For example, there are seven scorecards, complicating administration if an organization works in more than a single survey stratum. Also, the precise definitions of indicators and points are not reported. Furthermore, an organization's back-office would have to match up a household and its cluster with average census values for that cluster.

While Coulombe reports standard errors for estimated poverty rates for strata, regions, and districts, comparisons with standard errors (or  $\alpha$  factors) for the scorecard here are not possible because Coulombe does not report person-level sample sizes.

Ghana's 2000 Census does not measure consumption, so Census data cannot be used to test the poverty map's accuracy out-of-sample. Instead, Coulombe compares the poverty map's estimates of the person-level poverty rates by 100% of the old-definition national poverty line with the directly-measured poverty rates for the seven survey

strata in the 1998/9 GLSS (p. 229). In these out-of-sample tests, the maximum absolute error is 3.2 percentage points (Urban Forest), and the average absolute error across the seven strata is 1.2 percentage points.

For comparison, the new 2012/13 scorecard is applied to the same seven strata in the 1998/9 GLSS. The scorecard faces a more difficult task than does the poverty map because the scorecard is applied out-of-sample (using different data than that used to build the scorecard) and 14 years out-of-time (using data from a different period than that of the data used to build the scorecard). In contrast, the poverty map is tested in-time. Furthermore, the poverty map uses seven stratum-specific scorecards (rather than one all-Ghana scorecard). Segmenting scorecards increases the risk of overfitting and consequently of having overstated accuracy. Finally, the poverty map uses some cluster-level indicators from the Census (rather than only household-level indicators from the GLSS), and cluster-level indicators help to reduce bias and increase precision (Elbers, Lanjouw, and Leite, 2008).

For the scorecard, the maximum absolute bias between an estimate and a true value across the 1998/9 GLSS' seven strata is 15.1 percentage points (Rural Savannah), and the mean absolute bias is 5.8 percentage points. Thus, the scorecard's average error is about five times that of the poverty map. This shows the value of keeping scorecards (or maps) updated as new data becomes available.

Is the poverty map accurate enough? As a benchmark, Coulombe (following Mistiaen *et al.*, 2002) notes that the poverty-map's point estimates of poverty rates for

the seven survey strata are comparable to the survey's estimates in that the null hypothesis of equality is not rejected with more than 95-percent confidence.<sup>56</sup> Coulombe also points out that the poverty-map estimates have systematically smaller standard errors than the survey estimates. If policy-makers find that the the survey's precision is adequate at the strata level (the lowest level of representativity in the 1998/9 GLSS), then they should also view the poverty map's precision as adequate down to the level of districts, regions, and council areas. Yet accuracy encompasses not only precision but also bias, and the bias not known for Ghana's poverty map (and for Ghana's scorecard) for regions, districts, and council areas.

As research, Coulombe's work is refreshingly clear, concise, and insightful. For example, he notes that the set of potential indicators is greatly constrained in that it is limited to items:

- In both the GLSS and Census
- With the same wording and response options in both data sources
- With the same distribution of responses in both data sources

Coulombe does not make the common mistake of trumpeting poverty mapping's ability to estimate standard errors without actually reporting them. Furthermore, he asks not only "How low can we go?" in terms of the size of the "small areas" to which poverty mapping is applied but also "How low should we go?" in terms of whether

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<sup>56</sup> This is not a very stringent standard. For example, it implies that estimates are comparable even if they have a 90-percent risk of being different. The opposite, equally valid null hypothesis (that the estimates differ) would not be rejected either and would imply the opposite conclusion.



greater depth adds value for policy-makers. Unlike most other poverty-map authors, Coulombe does not present an actual graphical map of poverty rates. Perhaps ironically, this is an improvement vis-à-vis common practice, as Coulombe's tables are more straightforward and more precise than the usual color-coded maps. Finally, Coulombe's motivation for poverty mapping (p. 222) is common sense that it often missed: "Telling Ghanaian policy-makers that the neediest people are in the Savannah region is not too impressive; that is well-known and too vague to be useful; telling them in which villages or towns (or even districts) are poorest is more convincing."

## 9.6 Coulombe and Wodon

Coulombe and Wodon (2012) make an updated poverty map for Ghana that closely follows the one in Coulombe (2008) except that it:

- Uses the 2005/6 GLSS instead of the 1998/9 GLSS
- Uses the 2003 Core Welfare Indicator Questionnaire, not the 2000 Census<sup>57</sup>
- Constructs four strata-level scorecards rather than seven
- Estimates poverty rates for 10 regions and 110 districts, but not for council areas
- Does not report the indicators used
- Presents a color-coded poverty map rather than tables

Coulombe and Wodon's updated poverty map suggests that poverty rates by 100% of the old-definition national line decreased from 1998/9 to 2005/6. The poverty map also accurately picks up the size of the decrease, as its estimates for the four survey strata are close to the direct-measure estimates in the 2005/6 GLSS. In

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<sup>57</sup> The CWIQ has a smaller sample than the Census but has a richer set of indicators.

particular, the maximum absolute bias across the four strata is 1.2 percentage points, and average absolute bias is 0.7 percentage points.

For comparison, the maximum absolute bias of the new 2012/13 scorecard applied to the four survey strata in the 2005/6 GLSS for 100% of the old-definition national line is 10.2 percentage points (Forest), and the average absolute bias is 5.9 percentage points. The new 2012/13 scorecard has about the same bias with the 2005/6 data as with the 1998/9 data.

## 9.7 Fofack

Fofack (2000) is an early poverty map. He uses data on the 4,500 households in the 1991/2 GLSS to make scorecards with indicators that are in both the GLSS and in Ghana's Priority Survey. This "light" monitoring survey is quicker, less costly, more frequent, and covers more households than the GLSS, but it lacks a complete measure of consumption.<sup>58</sup>

Fofack shows that the incomplete measure of consumption in the "light" survey gives highly biased estimates of poverty rates (especially in rural areas). He then shows that the estimates of regional poverty rates derived from the scorecard (applied to data

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<sup>58</sup> In the canonical poverty map, scorecards are derived with data from a national consumption survey (for Ghana, the GLSS) and applied to census data. Fofack builds scorecards with the GLSS and applies them with data from a "light" monitoring survey that is somewhere between a census and a national consumption survey.

from the “light” survey) are much closer to the GLSS estimates.<sup>59</sup> Fofack says that a poverty map based on such estimates “can help researchers reduce targeting errors significantly” (p. 195) and that scoring can be applied to data from “light” surveys to track poverty at shorter intervals than would be possible with more costly, less frequent expenditure surveys.<sup>60</sup>

Fofack constructs eight regional scorecards—each with 10 indicators—with  $R^2$ -based stepwise least-squares regression on the logarithm of per-capita expenditure (not per-adult-equivalent expenditure). The poverty line is equivalent to the USAID “extreme” line and gives a person-level poverty rate of 19.0 percent in 1991/2. The indicators for the all-Ghana scorecard are:

- Number of spouses
- Percentage of school-age children in school
- Number of household members per room
- Asset score
- Ownership of land
- Ownership of poultry
- Export crops
- Expenditures on soap
- Expenditures on meat
- Consumption of bread

Fofack calls these “a set of minimum core variables that can be easily collected with minimal measurement error” (p. 207), but some are complex, difficult to collect, or non-verifiable. For example, calculating ratios is required for the percentage of children

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<sup>59</sup> There is a scorecard for eight non-exclusive regions: national, rural, urban, Accra, Other Urban, Rural Forest, Rural Coastal, and Savannah.

<sup>60</sup> This is a common idea, and there are many appropriate “light” surveys, but it has been done only in a few cases (Christiaensen *et al.*, 2008; Mathiassen, 2008 and 2006).

enrolled in school and for the number of people per room. Likewise, some undocumented calculation by field agents or respondents is also required for the asset score. Finally, respondents must recall and compute expenditure on soap, meat, and bread, all of which are past events and hence non-verifiable. Local, pro-poor organizations could not use Fofack's scorecards because their documentation does not define the indicators nor report points.

Fofack reports that the error between estimated and true poverty rates for Ghana overall is -1.5 percentage points. The average absolute error across his eight scorecards' regions is 3.1 percentage points. For comparison, the average absolute error across the 22 poverty lines for the scorecard here is about 0.6 percentage points.<sup>61</sup> Fofack does not report standard errors.

Overall, Fofack overstates the usefulness of his poverty maps. For example, he says (p. 213) that "the method described sharpens the accuracy of poverty maps and allows policymakers to target beneficiaries at sub-regional levels." But Fofack does not report estimates of sub-regional poverty; instead, he estimates regional poverty, and better estimates at that level are already available from the GLSS. The value of poverty mapping is in estimating poverty for smaller areas than can the national consumption survey (for Ghana, the GLSS). And while the scorecard estimates may have smaller standard errors than those from the GLSS, they also have more bias.

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<sup>61</sup> Of course, this paper and Fofack use data from different GLSS surveys.

## 9.8 Pop

Pop (2015) constructs a proxy-means test—in essence, a scorecard that is labeled “for targeting”—in the spirit of the PMT used by Ghana’s Livelihood Empowerment Against Poverty program. LEAP uses a PMT (along with other mechanisms) to target cash transfers to the extreme poor, defined roughly as households with:

- Consumption below the old-definition food poverty line
- An elderly member
- A disabled member, or
- An orphan/vulnerable child

The indicators and points in the LEAP PMT are secret, chosen by experts without using data.<sup>62</sup> Wodon (2012) says that while LEAP has been well targeted to the poor, there is still has room for improvement. According to Pop, the PMT approach is the most amenable for use across all safety-net programs in Ghana, with households’ scores recorded in a single national registry.

Pop constructs a PMT with data from the 2005/6 GLSS to promote it as a possible common targeting method across programs in Ghana and to “to improve the current LEAP PMT test formula (and implicitly the instrument used to collect information about potential beneficiaries)”<sup>63</sup> (p. 69).

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<sup>62</sup> Pop rightly points out that expert scorecards can be effective, but using data—when available—will likely increase accuracy and decrease the number of indicators collected.

<sup>63</sup> According to Pop, the LEAP PMT questionnaire is “complex and lengthy to administer” (p. 69). Its first section has 40 questions on housing, assets, and the household roster, and its second section has 30 questions on the demographics, education, and employment of individual household members (Wodon, 2012).

As a first step, Pop checks the targeting accuracy of LEAP's expert-based PMT by applying it to data from the 2005/6 GLSS in which consumption-based poverty status is known.<sup>64</sup> This is like the out-of-sample accuracy tests for the new 2012/13 scorecard here.

Based solely on the PMT score and ignoring LEAP's "gateway" targeting of the elderly, disabled, and orphans/vulnerable children, Pop's results for the old-definition food poverty line imply that 19 percent of households are targeted, inclusion is 2.3 percent, undercoverage is 9.0, leakage is 16.7, and exclusion is 72.0. The hit rate is 74.3.

When the new 2012/13 scorecard here is used out-of-sample and out-of-time with the old-definition food line to target the lowest-scoring 19 percent of households in the 2005/6 GLSS, inclusion is 7.3 percent, undercoverage is 4.0, leakage is 11.7, and exclusion is 77.0, giving a hit rate of 84.3. Thus, the new 2012/13 scorecard correctly classifies about 10 more people per 100 than does the LEAP PMT (without its normal gateway targeting). It does this out-of-sample and out-of-time, with 10 indicators instead of 70.

When targeting 19 percent of households and using 100% of the old-definition national line, Pop finds that the LEAP PMT has inclusion of 3.9 percent and exclusion of 66.8, giving a hit rate of 70.7. The new 2012/13 scorecard does better by about 12 more households per 100 (inclusion is 10.5 percent, exclusion is 72.6, and the hit rate is 83.1).

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<sup>64</sup> Pop has access to the LEAP PMT's secret formula.

Pop also constructs an improved, data-based PMT. Like Coulombe and Wodon (2012), he uses ordinary least-squares regression to relate the natural logarithm of per-adult-equivalent consumption with indicators from the 2005/6 GLSS. As in this paper,<sup>65</sup> Pop wants to select a small number of indicators that are:

- Easy to collect
- Verifiable
- Difficult for households to misrepresent in order to “game” their score
- Stable over time in terms of their relationship with poverty
- Included in LEAP’s original expert-based PMT
- Strongly linked with poverty

In terms of statistical criteria, Pop differs from this paper in considering not only an indicator’s contribution to rankings of households by poverty but also the statistical significance of estimated points as well as the regression’s goodness-of-fit.

Pop reports the points as well as the 21 indicators in his preferred PMT:

- Household demographics:
  - Number of household members
  - Whether the household has members who are at least 65-years-old
  - Share of household members who are at least 19-years-old
- Employment:
  - Whether the head is employed in the formal sector
  - Whether the head is self-employed in agriculture

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<sup>65</sup> Pop may be familiar with the Simple Poverty Scorecard<sup>®</sup> tools. Besides technical/design parallels, on p. 79 he writes, “. . . we designed a PMT form (or poverty scorecard) . . .”

- Characteristics of the residence:
  - Number of persons per room
  - Presence of electricity
  - Type of floor
  - Type of wall
  - Type of roof
  - Source of drinking water
  - Type of toilet arrangement
- Ownership of consumer durables:
  - Stoves
  - Refrigerators or freezers
  - Televisions
  - Motorcycles
  - Cars
- Ownership of agricultural assets:
  - Acres of land
  - Number of cattle, sheep, or goats
- Location of residence:
  - Urban/rural
  - Administrative region

When targeting 20 percent of people (not households) and using the old-definition food poverty line (which corresponds with 18.1 percent person-level poverty rate in the 2005/6 GLSS, Figure 2), Pop's in-sample tests imply inclusion of 11.2 percent, undercoverage of 6.9, leakage of 8.8, and exclusion of 73.1. The hit rate is then 84.3.

When the new 2012/13 scorecard targets the lowest-scoring 20 percent of people (not households) out-of-sample and out-of-time in the 2005/6 GLSS, inclusion is 10.0 percent, undercoverage is 8.1, leakage is 10.0, exclusion is 71.9, and the hit rate is 81.9. Thus, Pop's PMT correctly classifies about 2.5 more people per 100 than does the scorecard.



This gap would shrink if the scorecard were not at a disadvantage due to being tested out-of-sample and out-of-time (rather than in-sample and in-time). Schreiner (2014) compares targeting accuracy for scorecards versus PMTs that—like Pop—estimate expenditure directly. In the 10 countries with caveat-free comparisons, expenditure-estimating PMTs correctly classify about 1 more household<sup>66</sup> (not person) per 100 than does the scorecard. This suggests that if all else were constant, Pop’s PMT would beat the scorecard by about one person per 100.

When targeting 20 percent of people and defining *poor* by the 100% of the old-definition national poverty line (corresponding with a poverty rate of 28.6 percent of people in the 2005/6 GLSS, Figure 2), Pop’s PMT has inclusion of 14.4 percent, exclusion of 65.9, and hit rate of 80.3. This is about 2 people per 100 better than the new 2012/13 scorecard, which has inclusion of 13.5 percent, exclusion of 65.0, and a hit rate of 78.5. With all else constant, it would be a reasonable guess that Pop’s PMT correctly classifies about one more person per 100.

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<sup>66</sup> More precisely, 0.7 households.

## 9.9 IRIS Center

IRIS Center (2010) was commissioned to build a tool (called a “Poverty Assessment Tool”, or PAT) for use by USAID’s microenterprise partners in Ghana for reporting the share of their participants who are “very poor”.

Using the 2005/6 GLSS, IRIS defines the “very poor” as those with per-capita consumption below the old-definition 1.25/day 2005 PPP line. In Figure 2, this is GHC5,878, with poverty rate of 16.3 percent for households. IRIS gets a different rate (18.9 percent) because it uses a different line (GHC6,151). PovcalNet uses a third \$1.25/day line with a person-level rate of 28.6 percent.<sup>67</sup> Schreiner (2014, p. 56) argues that the old-definition \$1.25/day line here and in Schreiner and Woller (2010) is correct and that the differences are due to using different versions of the 2005/6 GLSS data or—more likely—to the PAT’s and PovcalNet’s inflating 2005 PPP factors to average prices in some period other than January 2006 or their failing to adjust for regional price differences.

After comparing several statistical approaches,<sup>68</sup> IRIS settles on a one-step quantile regression that estimates the 41<sup>st</sup> percentile of per-capita household consumption, conditional on the PAT indicators. A household is counted as *very poor* if this estimate is less than the old-definition \$1.25/day line.

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<sup>67</sup> [iresearch.worldbank.org/PovcalNet/index.htm](http://iresearch.worldbank.org/PovcalNet/index.htm), retrieved 14 March 2015

<sup>68</sup> Thanks to the “flat maximum”, all methods have similar hit rates.

In general, the IRIS PAT is like the scorecard here, except that it:

- Uses older data (2005/6 rather than 2012/13)
- Has a more indicators (18 rather than 10)
- Uses poverty likelihoods of either 0 or 100 percent (rather than between 0 and 100)

The PAT's 18 indicators are simple and verifiable:

- Demographics:
  - Number of household members
  - Age of the head
- Education:
  - Share of household members who have no educational qualifications
  - Whether the head has no educational qualifications
- Characteristics of residence:
  - Number of rooms
  - Type of floor
  - Method of garbage disposal
  - Type of toilet arrangement
- Ownership of consumer durables:
  - Fans
  - Televisions
  - Video players
  - Gas stoves
  - Irons
  - Sewing machines
- Ownership of real estate:
  - House
  - Land
- Location:
  - Urban/rural
  - Region

In terms of accuracy, IRIS reports out-of-sample results in terms of:

- Bias of estimated poverty rates at a point in time<sup>69</sup>
- Targeting (inclusion, undercoverage, leakage, and exclusion)
- The Balanced Poverty Accuracy Criterion, USAID’s standard for certifying PATs

IRIS Center (2005) introduced BPAC. It considers accuracy in terms of inclusion and in terms of the absolute difference between undercoverage and leakage (which, under the PAT’s approach, is equal to the absolute value of the bias of the estimated poverty rate). The formula is  $BPAC = 100 \cdot \left( \frac{\text{Inclusion} - |\text{Undercoverage} - \text{Leakage}|}{\text{Inclusion} + \text{Undercoverage}} \right)$ .

Because bias (in the PAT approach) is the difference between undercoverage and leakage, and because the normalization term  $\frac{100}{\text{Inclusion} + \text{Undercoverage}}$  may be relevant only when comparing scorecards across populations with different poverty rates (an irrelevant consideration when selecting among alternative scorecards for a given country in a given year), the simpler formula  $BPAC = \text{Inclusion} - |\text{Bias}|$  ranks scorecards the same as the more complex formula.

Expressing BPAC as  $\text{Inclusion} - |\text{Bias}|$  helps to show why BPAC is not useful for comparing the PAT with the scorecard (Schreiner, 2014). Given the assumptions discussed earlier in this paper,<sup>70</sup> the scorecard produces unbiased estimates of poverty rates, regardless of whether undercoverage differs from leakage. While BPAC can be

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<sup>69</sup> IRIS (2005) calls bias the “Poverty Incidence Error” (PIE). IRIS picks a quantile so that undercoverage equals leakage. Under the approach in which estimated poverty likelihoods are either 0 or 100 based on a single cut-off, this makes bias zero.

<sup>70</sup> The unbiasedness of the PAT—or of any other scorecard—also requires these assumptions.

used to compare alternative scorecards that all use the PAT’s consumption-estimation approach, it does not make sense to apply BPAC to the scorecard’s likelihood-estimation approach. This is because the scorecard does not use a single cut-off to classify households as either 100-percent poor or 0-percent poor. Instead, households have an estimated poverty likelihood somewhere between 0 to 100 percent. If a poverty-scorecard user sets a targeting cut-off, then that cut-off matters only for targeting, and it does not affect the estimation of poverty rates at all.

Both the PAT and the scorecard give unbiased estimates of poverty rates (after subtracting off known bias), so any distinction between their accuracy must hinge on targeting or on the precision of estimated poverty rates. Schreiner (2014) documents an almost-clean comparison<sup>71</sup> between the old 2005/6 scorecard for Ghana and the PAT: the PAT targets better (about 2.4 more households correct per 100), but the scorecard is more precise ( $\alpha = 0.82$  versus 1.03).

Although IRIS reports the PAT’s targeting accuracy and although the BPAC formula considers targeting accuracy, IRIS says that the PAT should not be used for targeting.<sup>72</sup> IRIS also doubts that the PAT can be useful for measuring change, noting that “it is unclear that the tools will be able to identify real changes in poverty over time due to their inherent measurement errors. Unless the changes in the poverty rate

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<sup>71</sup> IRIS tests are partly—but not completely—in-sample because they use all the data to select indicators but choose points with data that is not used in validation.

<sup>72</sup> [povertytools.org/faq/faq.html#11](http://povertytools.org/faq/faq.html#11), retrieved 19 February 2009.

are exceptionally large and unless the tools are exceptionally accurate, then the changes identified are likely to be contained within the margin of error.”<sup>73</sup>

Targeting and estimating changes over time are possible uses that are supported for the scorecard. In particular, this paper reports targeting accuracy so users can decide for themselves whether scoring targets adequately for their purposes.

Furthermore, this paper tests the accuracy of scorecard’s estimates of change over time, finding that the estimated direction of change is correct and statistically significant in almost all cases and that the magnitude of the true change falls in the estimate’s 90-percent confidence level in a little less than half of cases.

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<sup>73</sup> [povertytools.org/faq/faq2.html](http://povertytools.org/faq/faq2.html), retrieved 7 December 2012.

## 10. Conclusion

The Simple Poverty Scorecard poverty-assessment tool for Ghana can be used to segment clients for targeted services as well as to estimate the:

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

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

The scorecard is constructed with half of the data from Ghana's 2012/13 GLSS. Its scores are then calibrated to poverty likelihoods for seven old-definition poverty lines and 15 new-definition lines with 2012/13 data. The support for old-definition lines allows existing users of Ghana's old 2005/6 scorecard (Schreiner and Woller, 2010) to switch to the new 2012/13 scorecard here and to find hybrid estimates of changes in poverty rates over time for old-definition lines with a baseline with the old 2005/6 scorecard and a follow-up with the new 2012/13 scorecard. In general, the new 2012/13 scorecard is more accurate and more relevant, so it—with new-definition poverty lines—should be used from now on.

The accuracy of the new 2012/13 scorecard is tested on data from the 1998/9, 2005/6, and 2012/13 GLSS that is not used in construction or calibration. Bias and precision are reported for estimates of households' poverty likelihoods, groups' poverty rates at a point in time, and changes in groups' poverty rates over time. Of course, the

scorecard's estimates of change are not the same as estimates of program impact.

Targeting accuracy is also reported.

On average when the scorecard is applied to 22 poverty lines with the 2012/13 validation sample, the maximum absolute bias for estimates versus true poverty rates for groups of households at a point in time is 1.2 percentage points. The average absolute bias is about 0.6 percentage points. Unbiased estimates may be had by subtracting the known bias for a given poverty line from the original estimates.

For  $n = 16,384$  and 90-percent confidence, the precision of point-in-time estimates of poverty rates is  $\pm 0.7$  percentage points or better.

This paper also tests the accuracy of scorecard estimates of changes in poverty rates over time, using data from three pairs of GLSS rounds. The estimated direction of change is almost always correct. The absolute error in the estimated magnitude of change is, on average, within 40 percent of the absolute value of the true change, and about half of the true changes are in the 90-percent confidence intervals of the estimated changes.

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

Although the statistical technique is innovative, and although technical accuracy is important, the design of the scorecard focuses on transparency and ease-of-use. After



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

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

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

## References

- Adams, Niall M.; and David J. Hand. (2000) “Improving the Practice of Classifier Performance Assessment”, *Neural Computation*, Vol. 12, pp. 305–311.
- Baesens, Bart; Van Gestel, Tony; Viaene, Stijn; Stepanova, Maria; Suykens, Johan A.K.; and Jan Vanthienen. (2003) “Benchmarking State-of-the-Art Classification Algorithms for Credit Scoring”, *Journal of the Operational Research Society*, Vol. 54, pp. 627–635.
- Bollen, Kenneth A.; Glanville, Jennifer L.; and Guy Stecklov. (2007) “Socio-Economic Status, Permanent Income, and Fertility: A Latent-Variable Approach”, *Population Studies*, Vol. 61, No. 1, pp. 15–34.
- Booyesen, Frikkie; van der Berg, Servaas; Burger, Ronelle; von Maltitz, Michael; and Gideon du Rand. (2008) “Using an Asset Index to Assess Trends in Poverty in Seven Sub-Saharan African Countries”, *World Development*, Vol. 36, No. 6, pp. 1113–1130.
- Burger, Ronelle; Booyesen, Frikkie; van der Berg, Servaas; and Michael von Maltitz. (2006) “Marketable Wealth in a Poor African Country: Using a Wealth Index of Consumer Durables to Investigate Wealth Accumulation by Households in Ghana”, World Institute for Development Economics Research Working Paper No. 2006/138, [mpra.ub.uni-muenchen.de/9063/](http://mpra.ub.uni-muenchen.de/9063/), retrieved 14 March 2015.
- Caire, Dean. (2004) “Building Credit Scorecards for Small-Business Lending in Developing Markets”, [microfinance.com/English/Papers/Scoring\\_SMEs\\_Hybrid.pdf](http://microfinance.com/English/Papers/Scoring_SMEs_Hybrid.pdf), retrieved 14 March 2015.
- ; and Mark Schreiner. (2012) “Cross-Tab Weighting for Credit Scorecards in Developing Markets”, [business-school.ed.ac.uk/crc/conferences/conference-archive?a=46055](http://business-school.ed.ac.uk/crc/conferences/conference-archive?a=46055), retrieved 14 March 2015.
- Camacho, Adriana; and Emily Conover. (2011) “Manipulation of Social-Program Eligibility”, *American Economic Journal: Economic Policy*, Vol. 3, No. 2, pp. 41–65.
- Carter, Michael R.; and Christopher B. Barrett. (2006) “The Economics of Poverty Traps and Persistent Poverty: An Asset-Based Approach”, *Journal of Development Studies*, Vol. 42, No. 2, pp. 178–199.

- Chen, Shaohua. (2015) “Re: \$1.25/day when (a) currency changes, or (b) natl. pov. changes line out of line with inflation?” electronic mail to Mark Schreiner, 5 January.
- Christiaensen, Luc; Lanjouw, Peter; Luoto, Jill; and David Stifel. (2012) “The Reliability of Small-Area Estimation Prediction Methods to Track Poverty”, *Journal of Economic Inequality*, Vol. 10, No. 2, pp. 267–297.
- Coady, David; Grosh, Margaret; and John Hoddinott. (2004) *Targeting of Transfers in Developing Countries*, [hdl.handle.net/10986/14902](http://hdl.handle.net/10986/14902), retrieved 3 November 2015.
- Cochran, William G. (1977) *Sampling Techniques, Third Edition*.
- Coulombe, Harold. (2008) “Ghana Census-Based Poverty Map: District and Sub-District Level Results”, pp. 222–250 in Ernest Aryeetey and Ravi Kanvur (eds) *The Economy of Ghana: Analytical Perspectives on Stability, Growth, and Poverty*.
- ; and Andrew McKay. (2008) “The Estimation of Components of Household Incomes and Expenditures: A Methodological Guide Based on the Last Three Rounds of the Ghana Living Standards Survey, 1991/2, 1998/9, and 2005/6”, [personal.psc.isr.umich.edu/~david1/GhanaCourse/GLSS/G5Aggregate%20Paper.pdf](http://personal.psc.isr.umich.edu/~david1/GhanaCourse/GLSS/G5Aggregate%20Paper.pdf), 14 March 2014.
- ; and Quentin Wodon. (2012) “A New Poverty Map for Ghana”, pp. 42–49 in Quentin Wodon (ed.) *Improving the Targeting of Social Programs in Ghana*.
- Dawes, Robyn M. (1979) “The Robust Beauty of Improper Linear Models in Decision-Making”, *American Psychologist*, Vol. 34, No. 7, pp. 571–582.
- Deaton, Angus; and Olivier Dupriez. (2011) “Purchase Power Parity Exchange Rates for the Global Poor”, *American Economic Journal: Applied Economics*, Vol. 3, pp. 137–166.
- Demombynes, Gabriel; Elbers, Chris; Lanjouw, Jenny; Lanjouw, Peter; Mistiaen, Johan; and Berk Özler. (2004) “Producing an Improved Geographic Profile of Poverty: Methodology and Evidence from Three Developing Countries”, pp. 154–176 in Anthony Shorrocks and Rolph van der Hoeven (eds.) *Growth, Inequality, and Poverty*.

- Diamond, Alexis; Gill, Michael; Rebolledo Dellepiane, Miguel Angel; Skoufias, Emmanuel; Vinha, Katja; and Yiqing Xu. (2016) “Estimating Poverty Rates in Target Populations: An Assessment of the Simple Poverty Scorecard<sup>®</sup> Poverty-Assessment Tool and Alternative Approaches”, World Bank Policy Research Working Paper No. 7793, [hdl.handle.net/10986/25038](http://hdl.handle.net/10986/25038), retrieved 11 January 2017.
- Elbers, Chris; Fujii, Tomoki; Lanjouw, Peter; Özler, Berk; and Wesley Yin. (2007) “Poverty Alleviation through Geographic Targeting: How Much Does Disaggregation Help?”, *Journal of Development Economics*, Vol. 83, pp. 198–213.
- ; Lanjouw, Jean O.; and Peter Lanjouw. (2003) “Micro-Level Estimation of Poverty and Inequality”, *Econometrica*, Vol. 71, No. 1, pp. 355–364.
- Elbers, Chris; Lanjouw, Peter; and Phillippe George Leite. (2008) “Brazil within Brazil: Testing the Poverty-Map Methodology in Minas Gerais”, World Bank Policy Research Working Paper No. 4513, [papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1092691](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1092691), retrieved 14 March 2015.
- Filmer, Deon; and Lant Pritchett. (2001) “Estimating Wealth Effects without Expenditure Data—or Tears: An Application to Educational Enrollments in States of India”, *Demography*, Vol. 38, No. 1, pp. 115–132.
- ; and Kinnon Scott. (2012) “Assessing Asset Indices”, *Demography*, Vol. 49, pp. 359–392.
- Fofack, Hippolyte. (2000) “Combining Light Monitoring Surveys with Integrated Surveys to Improve Targeting for Poverty Reduction: The Case of Ghana”, *World Bank Economic Review*, Vol. 14, No. 1, pp. 195–219.
- Friedman, Jerome H. (1997) “On Bias, Variance, 0–1 Loss, and the Curse-of-Dimensionality”, *Data Mining and Knowledge Discovery*, Vol. 1, pp. 55–77.
- Fuller, Rob. (2006) “Measuring the Poverty of Microfinance Clients in Haiti”, [microfinance.com/English/Papers/Scoring\\_Poverty\\_Haiti\\_Fuller.pdf](http://microfinance.com/English/Papers/Scoring_Poverty_Haiti_Fuller.pdf), retrieved 14 March 2015.
- Ghana Statistical Service. (2014a) “Poverty Profile in Ghana: 2005–2013”, [statsghana.gov.gh/docfiles/glss6/GLSS6\\_Poverty%20Profile%20in%20Ghana.pdf](http://statsghana.gov.gh/docfiles/glss6/GLSS6_Poverty%20Profile%20in%20Ghana.pdf), retrieved 14 March 2015.

----- (2014b) “Main Report: GLSS6”, [statsghana.gov.gh/docfiles/glss6/GLSS6\\_Main%20Report.pdf](http://statsghana.gov.gh/docfiles/glss6/GLSS6_Main%20Report.pdf), retrieved 14 March 2015.

- (2012) “Interviewer Manual: GLSS6”.
- (2007) “Patterns and Trends of Poverty in Ghana: 1991–2006”, [catalog.ihnsn.org/index.php/catalog/63/download/65112](http://catalog.ihnsn.org/index.php/catalog/63/download/65112), retrieved 14 March 2015.
- (2000) “Poverty Trends in Ghana in the 1990s”, [siteresources.worldbank.org/INTLSMS/Resources/3358986-1181743055198/3877319-1190217341170/PovProf.pdf](http://siteresources.worldbank.org/INTLSMS/Resources/3358986-1181743055198/3877319-1190217341170/PovProf.pdf), retrieved 14 March 2015.
- Goodman, Leo A.; and Kruskal, William H. (1979) *Measures of Association for Cross Classification*.
- Grosh, Margaret; and Judy L. Baker. (1995) “Proxy-Means Tests for Targeting Social Programs: Simulations and Speculation”, World Bank LSMS Working Paper No. 118, [go.worldbank.org/W90WN57PD0](http://go.worldbank.org/W90WN57PD0), retrieved 14 March 2015.
- Gwatkin, Davidson R.; Rutstein, Shea; Johnson, Kiersten; Suliman, Eldaw; Wagstaff, Adam; and Agbessi Amouzou. (2007) “Socio-Economic Differences in Health, Nutrition, and Population: Ghana”, World Bank Country Reports on HNP and Poverty, [go.worldbank.org/T6LCN5A340](http://go.worldbank.org/T6LCN5A340), retrieved 14 March 2015.
- Hand, David J. (2006) “Classifier Technology and the Illusion of Progress”, *Statistical Science*, Vol. 22, No. 1, pp. 1–15.
- Haslett, Stephen. (2012) “Practical Guidelines for the Design and Analysis of Sample Surveys for Small-Area Estimation”, *Journal of the Indian Society of Agricultural Statistics*, Vol. 66, No. 1, pp. 203–212.
- ; and Geoffrey Jones. (2006) “Small-Area Estimation of Poverty, Caloric Intake, and Malnutrition in Nepal”, [un.org.np/node/10501](http://un.org.np/node/10501), retrieved 14 March 2015.
- Hoadley, Bruce; and Robert M. Oliver. (1998) “Business Measures of Scorecard Benefit”, *IMA Journal of Mathematics Applied in Business and Industry*, Vol. 9, pp. 55–64.
- IRIS Center. (2010) “Poverty-Assessment Tool Accuracy Submission: USAID/IRIS Tool for Ghana (updated with new data)”, 4 June, [povertytools.org/countries/Ghana/USAID\\_PAT\\_Ghana.pdf](http://povertytools.org/countries/Ghana/USAID_PAT_Ghana.pdf), retrieved 14 March 2015.
- (2007a) “Manual for the Implementation of USAID Poverty Assessment Tools”, [povertytools.org/training\\_documents/Manuals/USAID\\_PAT\\_Manual\\_Eng.pdf](http://povertytools.org/training_documents/Manuals/USAID_PAT_Manual_Eng.pdf), retrieved 14 March 2015.

- (2007b) “Introduction to Sampling for the Implementation of PATs”, [povertytools.org/training\\_documents/Sampling/Introduction\\_Sampling.pdf](http://povertytools.org/training_documents/Sampling/Introduction_Sampling.pdf), retrieved 14 March 2015.
- (2005) “Notes on Assessment and Improvement of Tool Accuracy”, [povertytools.org/other\\_documents/AssessingImproving\\_Accuracy.pdf](http://povertytools.org/other_documents/AssessingImproving_Accuracy.pdf), retrieved 14 March 2015.
- Johnson, Glenn. (2007) “Lesson 3: Two-Way Tables—Dependent Samples”, [onlinecourses.science.psu.edu/stat504/node/96](http://onlinecourses.science.psu.edu/stat504/node/96), retrieved 14 March 2015.
- Kolesar, Peter; and Janet L. Showers. (1985) “A Robust Credit-Screening Model Using Categorical Data”, *Management Science*, Vol. 31, No. 2, pp. 124–133.
- Koenker, Roger; and Kevin F. Hallock. (2001) “Quantile Regression”, *Journal of Economic Perspectives*, Vol. 15, No. 4, pp. 143–156.
- Lindelow, Magnus. (2006) “Sometimes More Equal Than Others: How Health Inequalities Depend on the Choice of Welfare Indicator”, *Health Economics*, Vol. 15, pp. 263–279.
- Lovie, Alexander D.; and Patricia Lovie. (1986) “The Flat-Maximum Effect and Linear Scoring Models for Prediction”, *Journal of Forecasting*, Vol. 5, pp. 159–168.
- Mahadevan, Meera; Yoshida, Nobou; and Larisa Praslova. (2013) “Poverty Mapping in the Kyrgyz Republic: Methodology and Key Findings”, World Bank Report No. 76690, [documents.worldbank.org/curated/en/2013/04/17584758/kyrgyz-republic-poverty-mapping-methodology-key-findings](http://documents.worldbank.org/curated/en/2013/04/17584758/kyrgyz-republic-poverty-mapping-methodology-key-findings), retrieved 14 march 2015.
- Martinelli, César; and Susan W. Parker. (2007) “Deception and Misreporting in a Social Program”, *Journal of the European Economic Association*, Vol. 4, No. 6, pp. 886–908.
- Mathiassen, Astrid. (2008) “The Predictive Ability of Poverty Models: Empirical Evidence from Uganda”, Statistics Norway Discussion Paper No. 560, [ssb.no/publikasjoner/DP/pdf/dp560.pdf](http://ssb.no/publikasjoner/DP/pdf/dp560.pdf), retrieved 14 March 2015.

- (2006) “Predicting the Poverty Headcount Ratio Based on IHS2 and WMS Data”, pp. 106–108 in National Statistical Office, *Welfare Monitoring Survey 2005*, [catalog.ihsn.org/index.php/catalog/2147/download/36581](http://catalog.ihsn.org/index.php/catalog/2147/download/36581), retrieved 14 March 2015.
- Matul, Michal; and Sean Kline. (2003) “Scoring Change: Prizma’s Approach to Assessing Poverty”, Microfinance Centre for Central and Eastern Europe and the New Independent States Spotlight Note No. 4, Warsaw, [mfc.org.pl/sites/mfc.org.pl/files/spotlight4.PDF](http://mfc.org.pl/sites/mfc.org.pl/files/spotlight4.PDF), retrieved 14 March 2015.
- McNemar, Quinn. (1947) “Note on the Sampling Error of the Difference between Correlated Proportions or Percentages”, *Psychometrika*, Vol. 17, pp. 153–157.
- Mistiaen, Johan A.; Özler, Bert; Razafinamantena, Tiaray; and Jean Razafindravonona. (2002) “Putting Welfare on the Map in Madagascar”, World Bank African Region Working Paper Series No. 34, [worldbank.org/afr/wps/wp34.pdf](http://worldbank.org/afr/wps/wp34.pdf), retrieved 14 May 2015.
- Montgomery, Mark; Gagnolati, Michele; Burke, Kathleen A.; and Edmundo Paredes. (2000) “Measuring Living Standards with Proxy Variables”, *Demography*, Vol. 37, No. 2, pp. 155–174.
- Myers, James H.; and Edward W. Forgy. (1963) “The Development of Numerical Credit-Evaluation Systems”, *Journal of the American Statistical Association*, Vol. 58, No. 303, pp. 779–806.
- Narayan, Ambar; and Nobuo Yoshida. (2005) “Proxy-Means Tests for Targeting Welfare Benefits in Sri Lanka”, World Bank Report No. SASPR-7, [documents.worldbank.org/curated/en/2005/07/6209268/proxy-means-test-targeting-welfare-benefits-sri-lanka](http://documents.worldbank.org/curated/en/2005/07/6209268/proxy-means-test-targeting-welfare-benefits-sri-lanka), retrieved 14 March 2014.
- Onwujekwe, Obinna; Hanson, Kara; and Julia Fox-Rushby. (2006) “Some Indicators of Socio-Economic Status May Not Be Reliable and Use of Indexes with These Data Could Worsen Equity”, *Health Economics*, Vol. 15, pp. 639–644.
- Osei-Assibey, Eric. (2013) “Exchange Rates, Interest Rates, and Inflation in Ghana: Is There a Missing Link?”, Economy of Ghana Network Policy Paper, [egn.org.gh/presentations/POLICY\\_PAPER\\_ON\\_EXCHANGE\\_RATE-4.docx](http://egn.org.gh/presentations/POLICY_PAPER_ON_EXCHANGE_RATE-4.docx), retrieved 14 March 2015.



- Pop, Lucian Bucur. (2015) “Options for Improving the Targeting of Safety Nets in Ghana”, pp. 67–106 in Carlo del Ninno and Bradford Mills (eds) *Safety Nets in Africa: Effective Mechanisms to Reach the Poor and Most Vulnerable*, [openknowledge.worldbank.org/handle/10986/21369](http://openknowledge.worldbank.org/handle/10986/21369), retrieved 14 March 2015.
- Ravallion, Martin. (1998) “Poverty Lines in Theory and Practice”, World Bank LSMS Working Paper No. 133, [go.worldbank.org/8P3IBJPQS1](http://go.worldbank.org/8P3IBJPQS1), retrieved 14 March 2015
- ; and Benu Bidani (1994) “How Robust is a Poverty Profile?”, *World Bank Economic Review*, Vol. 8, No. 1, pp. 75–102.
- Rutstein, Shea Oscar; and Kiersten Johnson. (2004) “The DHS Wealth Index”, DHS Comparative Reports No. 6, [measuredhs.com/pubs/pdf/CR6/CR6.pdf](http://measuredhs.com/pubs/pdf/CR6/CR6.pdf), retrieved 14 March 2015.
- Sahn, David E.; and David Stifel. (2003) “Exploring Alternative Measures of Welfare in the Absence of Expenditure Data”, *Review of Income and Wealth*, Series 49, No. 4, pp. 463–489.
- (2000) “Poverty Comparisons over Time and across Countries in Africa”, *World Development*, Vol. 28, No. 12, pp. 2123–2155.
- SAS Institute Inc. (2004) “The LOGISTIC Procedure: Rank Correlation of Observed Responses and Predicted Probabilities”, in *SAS/STAT User’s Guide, Version 9*, Cary, NC., [support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug\\_logistic\\_sect035.htm](http://support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug_logistic_sect035.htm), retrieved 14 March 2015.
- Schreiner, Mark. (2014) “How Do the Simple Poverty Scorecard Poverty-Assessment Tool and the PAT Differ?”, [microfinance.com/English/Papers/Scorecard\\_versus\\_PAT.pdf](http://microfinance.com/English/Papers/Scorecard_versus_PAT.pdf), retrieved 14 March 2014.
- (2013) “Simple Poverty Scorecard Poverty-Assessment Tool: Bangladesh”, [SimplePovertyScorecard.com/BGD\\_2010\\_ENG.pdf](http://SimplePovertyScorecard.com/BGD_2010_ENG.pdf), retrieved 14 March 2015.
- (2012a) “An Expert-Based Simple Poverty Scorecard Poverty-Assessment Tool for Rural China”, [microfinance.com/English/Papers/Scoring\\_Poverty\\_China\\_EN.pdf](http://microfinance.com/English/Papers/Scoring_Poverty_China_EN.pdf), retrieved 14 March 2015.
- (2012b) “Simple Poverty Scorecard Poverty-Assessment Tool: Colombia”, [SimplePovertyScorecard.com/COL\\_2009\\_ENG.pdf](http://SimplePovertyScorecard.com/COL_2009_ENG.pdf), retrieved 14 March 2015.

- (2009) “Simple Poverty Scorecard Poverty-Assessment Tool: Peru”, [SimplePovertyScorecard.com/PER\\_2007\\_ENG.pdf](http://SimplePovertyScorecard.com/PER_2007_ENG.pdf), retrieved 14 March 2015.
- (2008a) “Simple Poverty Scorecard Poverty-Assessment Tool: Peru”, [SimplePovertyScorecard.com/PER\\_2003\\_ENG.pdf](http://SimplePovertyScorecard.com/PER_2003_ENG.pdf), retrieved 14 March 2015.
- (2008b) “Simple Poverty Scorecard Poverty-Assessment Tool: Ecuador”, [SimplePovertyScorecard.com/ECU\\_2005\\_ENG.pdf](http://SimplePovertyScorecard.com/ECU_2005_ENG.pdf), retrieved 14 March 2015.
- (2006) “Is One Simple Poverty Scorecard Poverty-Assessment Tool Enough for India?”, [microfinance.com/English/Papers/Scoring\\_Poverty\\_India\\_Segments.pdf](http://microfinance.com/English/Papers/Scoring_Poverty_India_Segments.pdf), retrieved 14 March 2015.
- (2005a) “Herramienta Índice de Calificación de la Pobreza™: México”, [SimplePovertyScorecard.com/MEX\\_2002\\_SPA.pdf](http://SimplePovertyScorecard.com/MEX_2002_SPA.pdf), retrieved 14 March 2015.
- (2005b) “IRIS Questions on the Simple Poverty Scorecard Poverty-Assessment Tool”, [microfinance.com/English/Papers/Scoring\\_Poverty\\_Response\\_to\\_IRIS.pdf](http://microfinance.com/English/Papers/Scoring_Poverty_Response_to_IRIS.pdf), retrieved 14 March 2015.
- (2002) *Scoring: The Next Breakthrough in Microfinance?* CGAP Occasional Paper No. 7, [pdf.usaid.gov/pdf\\_docs/PNACQ633.pdf](http://pdf.usaid.gov/pdf_docs/PNACQ633.pdf), retrieved 14 March 2015.
- ; Matul, Michal; Pawlak, Ewa; and Sean Kline. (2014) “Poverty Scoring: Lessons from a Microlender in Bosnia-Herzegovina”, *Poverty and Public Policy*, Vol. 6, No. 4, pp. 407–428.
- ; and Michael Sherraden. (2006) *Can the Poor Save? Saving and Asset Accumulation in Individual Development Accounts*.
- ; and Gary Woller. (2010) “Simple Poverty Scorecard Poverty-Assessment Tool: Ghana”, [SimplePovertyScorecard.com/GHA\\_2005\\_ENG.pdf](http://SimplePovertyScorecard.com/GHA_2005_ENG.pdf), retrieved 14 March 2015.
- Sharif, Iffath Anwar. (2009) “Building a Targeting System for Bangladesh Based on Proxy-Means Testing”, World Bank Social Protection Discussion Paper No. 0914, [siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Safety-Nets-DP/0914.pdf](http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Safety-Nets-DP/0914.pdf), retrieved 14 March 2015.
- Sherraden, Michael. (1991) *Assets and the Poor: A New American Welfare Policy*.

- Sillers, Don. (2006) “National and International Poverty Lines: An Overview”, [pdf.usaid.gov/pdf\\_docs/Pnadh069.pdf](http://pdf.usaid.gov/pdf_docs/Pnadh069.pdf), retrieved 14 March 2015.
- Stifel, David; and Luc Christiaensen. (2007) “Tracking Poverty over Time in the Absence of Comparable Consumption Data”, *World Bank Economic Review*, Vol. 21, No. 2, pp. 317–341.
- Stillwell, William G.; Barron, F. Hutton; and Ward Edwards. (1983) “Evaluating Credit Applications: A Validation of Multi-Attribute Utility-Weight Elicitation Techniques”, *Organizational Behavior and Human Performance*, Vol. 32, pp. 87–108.
- Tarozzi, Alessandro; and Angus Deaton. (2007) “Using Census and Survey Data to Estimate Poverty and Inequality for Small Areas”, *Review of Economics and Statistics*, Vol. 91, No. 4, pp. 773–792.
- Toohig, Jeff. (2008) “PPI Pilot Training Guide”, [microfinancegateway.org/sites/default/files/mfg-en-paper-progress-out-of-poverty-index-ppi-pilot-training-mar-2008.pdf](http://microfinancegateway.org/sites/default/files/mfg-en-paper-progress-out-of-poverty-index-ppi-pilot-training-mar-2008.pdf), retrieved 14 March 2015.
- USAID. (2012) *Microenterprise Results Reporting: Annual Report to Congress, Fiscal Year 2012*, [pdf.usaid.gov/pdf\\_docs/PDACX521.pdf](http://pdf.usaid.gov/pdf_docs/PDACX521.pdf), retrieved 14 March 2015.
- United States Congress. (2004) “Microenterprise Results and Accountability Act of 2004 (HR 3818 RDS)”, November 20, [smith4nj.com/laws/108-484.pdf](http://smith4nj.com/laws/108-484.pdf), retrieved 14 March 2015.
- Wagstaff, Adam; and Naoko Watanabe. (2003) “What Difference Does the Choice of SES Make in Health-Inequality Measurement?”, *Health Economics*, Vol. 12, No. 10, pp. 885–890.
- Wainer, Howard. (1976) “Estimating Coefficients in Linear Models: It Don’t Make No Nevermind”, *Psychological Bulletin*, Vol. 83, pp. 223–227.
- Wodon, Quentin. (2012) *Improving the Targeting of Social Programs in Ghana*, [documents.worldbank.org/curated/en/2012/09/17559632/ghana-improving-targeting-social-programs](http://documents.worldbank.org/curated/en/2012/09/17559632/ghana-improving-targeting-social-programs), retrieved 14 March 2015.
- World Bank. (2012) *Targeting Poor and Vulnerable Households in Indonesia*, [documents.worldbank.org/curated/en/2012/01/15879773/targeting-poor-vulnerable-households-indonesia](http://documents.worldbank.org/curated/en/2012/01/15879773/targeting-poor-vulnerable-households-indonesia), retrieved 14 March 2015.

Zeller, Manfred. (2004) “Review of Poverty Assessment Tools”,  
[pdf.usaid.gov/pdf\\_docs/PNADH120.pdf](http://pdf.usaid.gov/pdf_docs/PNADH120.pdf), retrieved 14 March 2015.

-----; Sharma, Manohar; Henry, Carla; and Cécile Lapenu. (2006) “An Operational Method for Assessing the Poverty Outreach Performance of Development Policies and Projects: Results of Case Studies in Africa, Asia, and Latin America”, *World Development*, Vol. 34, No. 3, pp. 446–464.

## Calculating Hybrid and Spliced Estimates of Change in Poverty Rates through Time

This appendix is a step-by-step process with which existing users of the old 2005/6 Simple Poverty Scorecard tool for Ghana can calculate hybrid and spliced estimates of changes in poverty rates through time. The process makes use of past applications of the old 2005/6 scorecard by existing users, and it also allows all users from now on to make estimates of change based on current and future applications of the new 2012/13 scorecard.

In general, the process involves applying a scorecard at three points in time:

- *Past*: Only old 2005/6 scorecard, only with old-definition poverty lines
- *Now*: Only new 2012/13 scorecard, with new (and perhaps old) poverty lines
- *Future*: Only new 2012/13 scorecard, only with new-definition poverty lines

The steps are:

### *Past*:

1. Select an old-definition poverty line from among those supported in this paper (food; 100%, 150%, or 200% of the national line; \$1.25, \$2.50, or \$3.75/day)
2. Estimate a baseline poverty rate for the given old-definition line:
  - a. Retrieve (from a paper file, spreadsheet, or database) the poverty likelihoods for the given old-definition line for each household in the representative sample of a given population to whom the old 2005/6 scorecard has already been applied in the past. This likelihood comes from the look-up table for the given old-definition line in Schreiner and Woller, 2010 (not the look-up tables in this paper)
  - b. Average the households' poverty likelihoods to estimate their baseline poverty rate for the given old-definition line, subtracting off known bias for the given old-definition line from Figure 11 in Schreiner and Woller (2010, p. 98). Use the table rows labeled "2005/6 scorecard applied to 2005/6 validation", not the rows labeled "2005/6 scorecard applied to 1998/8 GLSS"

***Present:***

3. Estimate a follow-up poverty rate for a given old-definition line:
  - a. Apply the new 2012/13 scorecard to a representative sample of the same population to which the old 2005/6 scorecard was originally applied in (2a)<sup>74</sup>
  - b. Add up the score for each household from the new 2012/13 scorecard
  - c. Convert each household's score to a poverty likelihood using the look-up tables for the given old-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010). In this paper, the old-definition lines are explicitly labeled as "old-definition"
  - d. Average the households' poverty likelihoods to estimate their follow-up poverty rate for the given old-definition line, subtracting off known bias as found in Figure 9 on pp. 178–181 of this paper.
  
4. Find hybrid estimates of change for the given old-definition line:
  - a. The estimated hybrid change is the estimated follow-up poverty rate (3d) minus the estimated baseline poverty rate (2b). If estimated poverty decreased (got better) through time, then the result will be a negative number. A positive number means that poverty increased (got worse)
  - b. The estimated hybrid change relative to the share of participants who were under the given old-definition line at baseline is the estimated hybrid change (4a) divided by the estimated baseline poverty rate (2b)
  - c. The estimated net number of participants who crossed from below the given old-definition poverty line to above it since baseline is the negative of the change (4a) expressed as a proportion,<sup>75</sup> multiplied by the number of participants in the population at baseline

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<sup>74</sup> What matters is that the sample be representative of the same population as that to which the old 2005/6 scorecard was originally applied in (2a). In particular, the new 2012/13 scorecard does not have to be applied to the same households as the old 2005/6 scorecard.

<sup>75</sup> For example, 0.123 is the proportion that is equivalent to 12.3 percentage points.

To be ready to estimate on-going changes in poverty rates over time using new-definition poverty lines, all users (legacy and new) from now on should:

5. Select a new-definition poverty line from among those supported in this paper (food; 100%, 150%, or 200% of the national line; \$1.25, \$2.00, \$2.50, \$3.75, or \$5.00/day 2005 PPP deflated by the CPI; or \$1.25, \$2.00, \$2.50, \$3.75, or \$5.00/day 2005 PPP deflated by the change in the national line)<sup>76</sup>
  
6. Estimate a baseline poverty rate for the given new-definition line:
  - a. In addition to the sample of households to which the new 2012/13 scorecard was applied in (3a), apply the new 2012/13 scorecard to samples of households that are representative of any additional populations of interest
  
  - b. Add up (or retrieve from 3b) the score for each household to which the new 2012/13 scorecard has been applied
  
  - c. Convert each household's score to a poverty likelihood using the look-up tables for the given new-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010, none of which pertain to new-definition lines)
  
  - d. For the sample of households to which the new 2012/13 scorecard was applied in 3a (and separately for any samples of households that are representative of any additional populations of interest in 6a), average the households' poverty likelihoods to estimate their baseline poverty rate for the given new-definition line, subtracting off known bias as found in this paper's Figure 9, pp. 178–181

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<sup>76</sup> The line marking the poorest half of people below 100% of the national line is omitted because its real value changes with time. Thus, it is not meaningful when estimating changes in poverty.

From this point on, all estimates of change are based solely on new-definition lines.

**Future:**

7. Select a new-definition poverty line for which a baseline poverty rate has been estimated in 6d
  
8. Estimate a follow-up poverty rate for the given new-definition line:
  - a. Apply the new 2012/13 scorecard to a representative sample of the same population to which the new 2012/13 scorecard was originally applied (3a, as well as any additional populations represented in 6a)
  - b. Add up the score for each household to which the new 2012/13 scorecard has just been applied (8a)
  - c. Convert each household's score to a poverty likelihood using the look-up tables for the given new-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010, none of which pertain to new-definition lines)
  - d. For the sample(s) representing a given population (8a), average the households' poverty likelihoods to get an estimate of their follow-up poverty rate for the given new-definition line, subtracting off known bias as found in this paper's Figure 9, pp. 178–181
  
9. Find the (non-hybrid) estimates of change for the given new-definition line:
  - a. The estimated change is the estimated follow-up poverty rate (8d) minus the estimated baseline poverty rate (6d). If estimated poverty decreased (got better) through time, then the result will be a negative number. A positive number means that estimated poverty increased (got worse)
  - b. The estimated change relative to the share of participants who were under the given new-definition line at baseline is the change (9a) divided by the estimated baseline poverty rate (6d)
  - c. The estimated net number of participants who crossed from below the new-definition poverty line to above it since baseline is the negative of the estimated change (9a) expressed as a proportion, multiplied by the number of participants at baseline



10. Assuming that the “parallel lines” assumption holds,<sup>77</sup> find the “grand” estimates of change that splice together hybrid and non-hybrid estimates:
- a. The “grand” spliced estimate of change is the hybrid estimate of change (4a) for the given old-definition line plus the non-hybrid estimate of change for the given new-definition line (9a)
  - b. The “grand” spliced estimate of change relative to the share of participants who were below the given old-definition line in the past baseline is the “grand” estimate of change (10a) divided by the share of participants who were below the given old-definition line in the past baseline (2b). (There is no “grand” spliced estimate of relative change for the given new-definition line because there is no estimate of the poverty rate by the given new-definition line in the past baseline)
  - c. The “grand” spliced estimate of the net number of participants who crossed from below the given old-definition line to above it (or from below the given new-definition line to above it) since the past baseline is the negative of the “grand” estimate of change 10a expressed as a proportion, multiplied by the number of participants in the past baseline (2b)

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<sup>77</sup> In Ghana, the “parallel lines” assumption held well between 1998/9 and 2005/6 and also between 2005/6 and 2012/13 for 100% of the national poverty line.

The following hypothetical example illustrates the steps with specific numbers:

***Past:***

1. *Select an old-definition poverty line from among those supported in this paper:*

Select 100% of the old-definition national line.

2. *Estimate a baseline poverty rate for the given old-definition line:*

- a. *Retrieve (from a paper file, spreadsheet, or database) the scores and the poverty likelihoods for the given old-definition line for each household in the representative sample of a given population to whom the old 2005/6 scorecard has already been applied. This likelihood comes from the look-up table for the given old-definition line in Schreiner and Woller, 2010 (not the look-up tables in this paper).*

In this hypothetical example, the scores and likelihoods for the three<sup>78</sup> households in the sample are:

<b>Score</b>	<b>Poverty likelihood (100% of the old-definition national line)</b>
15	78.5
20	68.7
25	52.9

The poverty likelihoods for 100% of the old-definition national line come from p. 93 of Schreiner and Woller (2010).<sup>79</sup>

- b. *Average the households' poverty likelihoods to get an estimate of their baseline poverty rate for the given old-definition line, subtracting off known bias.*

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<sup>78</sup> Three households is an unrealistically small sample, but it is used in this hypothetical illustration to keep the arithmetic manageable.

<sup>79</sup> This is "Figure 4 (National line): Estimated poverty likelihoods associated with scores", [microfinance.com/English/Papers/Scoring\\_Poverty\\_Ghana\\_EN\\_2005.pdf](http://microfinance.com/English/Papers/Scoring_Poverty_Ghana_EN_2005.pdf), retrieved 14 March 2015.

$$[(78.5 + 68.7 + 52.9) \div 3] - (+0.8) = 65.9 \text{ percent.}$$

The known bias of +0.8 percentage points for 100% of the old-definition national line comes from p. 98 of Schreiner and Woller (2010). Use the table row under “Estimate minus true value” that is labeled “2005/6 scorecard applied to 2005/6 validation”, not the row labeled “2005/6 scorecard applied to 1998/8 GLSS”.

***Present:***

3. *Estimate a follow-up poverty rate for a given old-definition line:*

a. *Apply the new 2012/13 scorecard to a representative sample of the same population to which the old 2005/6 scorecard was originally applied in (2a)*

Draw a new sample of three households.

b. *Add up the score for each household from the new 2012/13 scorecard*

In this hypothetical example, the scores are 21, 26, and 31.

c. *Convert each household’s score to a poverty likelihood using the look-up tables for the given old-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010)*

Look up poverty likelihoods for 100% of the old-definition national line on p. 280 in this paper.

<b>Score</b>	<b>Poverty likelihood (100% of the old-definition national line)</b>
21	58.7
26	48.0
31	33.9

d. *Average the households’ poverty likelihoods to get an estimate of their follow-up poverty rate for the given old-definition line, subtracting off known bias*

$$[(58.7 + 48.0 + 33.9) \div 3] - (+0.7) = 46.2 \text{ percent.}$$

Bias for 100% of the old-definition national line with the new 2012/13 scorecard is +0.7 percentage points (Figure 9 on p. 181 in this paper).

4. Find hybrid estimates of change for the given old-definition line:

- a. The estimated change is the estimated follow-up poverty rate (3d) minus the estimated baseline poverty rate (2b). If estimated poverty decreased (got better) through time, then the result will be a negative number. If estimated poverty increased (got worse), then the result is a positive number

$$46.2 \text{ percent} - 65.9 \text{ percent} = -19.7 \text{ percentage points.}$$

- b. The estimated change relative to the share of participants who were under the given old-definition line at baseline is the estimated change (4a) divided by the estimated baseline poverty rate (2b)

$$-19.7 \text{ percentage points} \div 65.9 \text{ percentage points} = -29.9 \text{ percent.}$$

- c. The estimated net number of participants who crossed from below the given old-definition poverty line to above it since baseline is the negative of the change (4a) expressed as a proportion, multiplied by the number of participants at baseline

Assuming for the sake of this hypothetical illustration that there were 10,000 participants in the baseline population,  
 $-(-0.197) \times 10,000 \text{ participants} = 1,970 \text{ participants.}$

To be ready to estimate on-going changes in poverty rates over time using the new-definition lines, all users (legacy and new) from now on should:

5. Select a new-definition poverty line from among those supported in this paper

Select 100% of the new-definition national line.

6. Estimate a baseline poverty rate for the given new-definition line:

a. In addition to samples of households that are representative of the same population as that to which the new 2012/13 scorecard was applied in (3a), apply the new 2012/13 scorecard to samples of households that are representative of any additional populations of interest

In this example, no samples are drawn from additional populations. Thus the three households in (3a) are the only three households here.

b. Add up (or retrieve from 3b) the score for each household to which the new 2012/13 scorecard has been applied

The scores for the three households in 3b are 21, 26, and 31.

c. Convert each household's score to a poverty likelihood using the look-up tables for the given new-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010, none of which pertain to new-definition lines)

Look up the poverty likelihoods for 100% of the new-definition national line in Figure 4 on p. 170 in this paper.

Score	Poverty likelihood (100% of new-definition national line)
21	63.8
26	53.3
31	40.2

d. Average the households' poverty likelihoods to get an estimate of their baseline poverty rate for the given new-definition line, subtracting off known bias

$$[(63.8 + 53.3 + 40.2) \div 3] - (+1.1) = 51.3 \text{ percent.}$$

The known bias is +1.1 percentage points (Figure 9 on p. 178).

**Future:**

*From this point on, all estimates of change are based solely on the new-definition lines:*

7. *Select a new-definition poverty line for which a baseline poverty rate has been estimated in 6d*

For compatibility with the above, select 100% of the new-definition national line.

8. *Estimate a follow-up poverty rate for the given new-definition line:*

- a. *Apply the new 2012/13 scorecard to a representative sample of the same population to which the new 2012/13 scorecard was originally applied (3a, as well as any additional populations represented in 6a)*

Draw a new sample of three households from the same population as (3a). In this illustration, no additional samples are drawn.

- b. *Add up the score for each household to which the new 2012/13 scorecard has just been applied*

In this hypothetical example, the scores are 22, 27, and 37.

- c. *Convert each household's score to a poverty likelihood using the look-up tables for the given new-definition line in this paper (not the look-up tables in Schreiner and Woller, 2010, none of which pertain to new-definition lines)*

Look up poverty likelihoods for 100% of the new-definition national line in Figure 4 on p. 170 in this paper.

<b>Score</b>	<b>Poverty likelihood (100% of new-definition national line)</b>
22	63.8
27	53.3
37	29.0

- d. *For the sample representing a given population, average the households' poverty likelihoods to get an estimate of their follow-up poverty rate for the given new-definition line, subtracting off known bias*

$$[(63.8 + 53.3 + 29.0) \div 3] - (+1.1) = 47.6 \text{ percent.}$$

The known bias is +1.1 percentage points (Figure 9 on p. 178).

9. Find non-hybrid estimates of change for the given new-definition line:

- a. The estimated change is the estimated follow-up poverty rate (8d) minus the estimated baseline poverty rate (6d). If estimated poverty decreased (got better) through time, then the result will be a negative number. If estimated poverty increased (got worse), then the result will be a positive number

$$47.6 \text{ percent} - 51.3 \text{ percent} = -3.7 \text{ percentage points.}$$

- b. The estimated change relative to the share of participants who were under the given new-definition line at baseline is the estimated change (9a) divided by the estimated baseline poverty rate (6d)

$$-3.7 \text{ percentage points} \div 51.3 \text{ percentage points} = -7.2 \text{ percent.}$$

- c. The estimated net number of participants who crossed from below the given new-definition poverty line to above it since baseline is the negative of the change (9a) expressed as a proportion, multiplied by the number of participants at baseline

Assuming for the sake of this hypothetical illustration that there were 10,000 participants in the baseline population,  
 $-(-0.037) \times 10,000 \text{ participants} = 370 \text{ participants.}$

10. Assuming that the “parallel lines” assumption holds, find the “grand” spliced estimates of change that combine the hybrid and non-hybrid estimates:

- a. The “grand” spliced estimate of change is the hybrid estimate of change for the given old-definition line (4a) plus the non-hybrid estimate of change for the given new-definition line (9a)

$$-19.7 \text{ percentage points} + (-3.7 \text{ percentage points}) = -23.4 \text{ percentage points.}$$

- b. The “grand” spliced estimate of change relative to the share of participants who were below the given old-definition line in the past baseline is the “grand” estimate of change 10a divided by the share of participants who were below the given old-definition line in the past baseline (2b). (There is no “grand” spliced estimate of relative change for the given new-definition line because there is no estimate of the poverty rate by the given new-definition line in the past baseline)

$$-23.4 \div 65.9 = -35.5 \text{ percent.}$$

- c. The “grand” spliced estimate of the net number of participants who crossed from below the given old-definition line to above it (or from below the given new-definition line to above it) since the past baseline is the negative of the “grand” spliced estimate of change 10a expressed as a proportion, multiplied by the number of participants in the past baseline

Assuming for the sake of this hypothetical illustration that there were 10,000 participants in the baseline population,  
 $-(-0.234) \times 10,000 = 2,340.$



The following summarizes the process in the hypothetical illustration above. It focuses on estimates of changes in poverty rates.

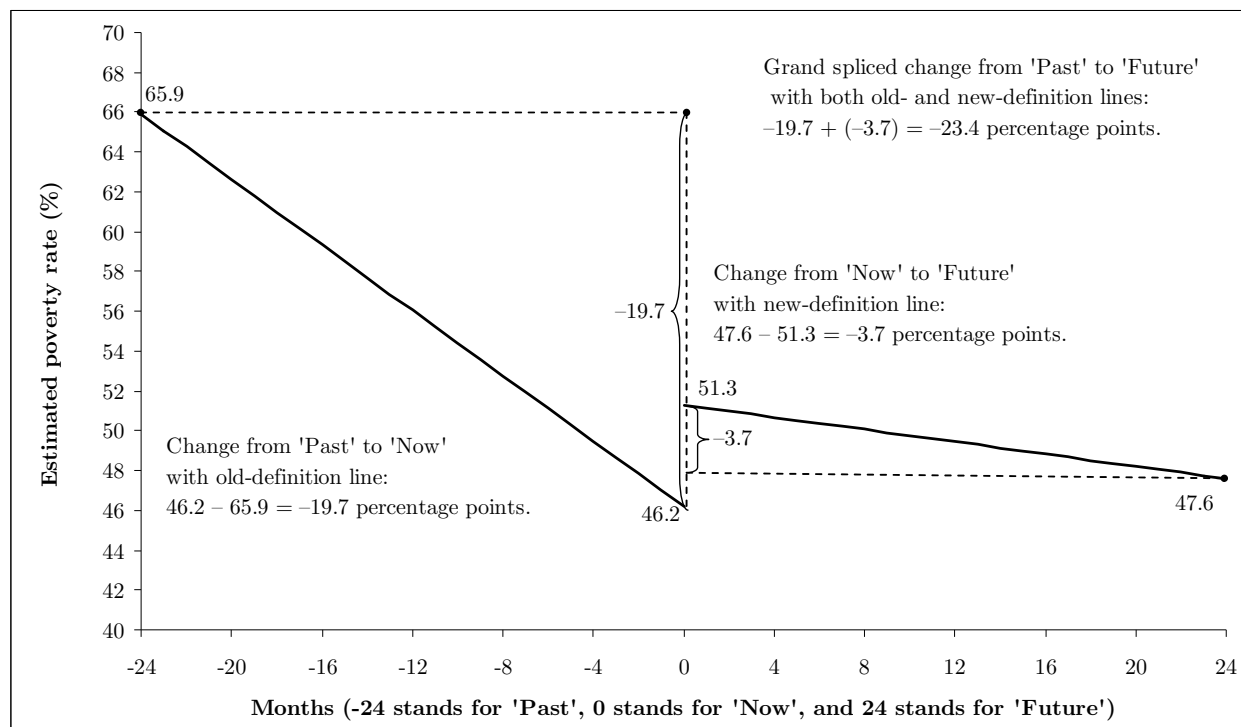
Selected poverty line: 100% of national line (old-definition and new-definition)

Scores and poverty likelihoods of sampled households for 100% of the national line

Past		"Now"			Future	
Score	Pov. like. (old-def., old card) (%)	Score	Pov. like. (old-def., new card) (%)	Pov. like. (new-def.) (%)	Score	Pov. like. (new-def.) (%)
15	78.5	21	58.7	63.8	22	63.8
20	68.7	26	48.0	53.3	27	53.3
25	52.9	31	33.9	40.2	37	29.0
Bias	+0.8	—	+0.7	+1.1	—	+1.1
Est. pov. rate (%)	65.9	—	46.2	51.3	—	47.6

Estimated change between:

Past and now (hybrid):  $46.2 - 65.9 = -19.7$  percentage points  
 Now and future (non-hybrid):  $47.6 - 51.3 = -3.7$  percentage points  
 Past and future ("grand" spliced):  $-19.7 + (-3.7) = -23.4$  percentage points



# Guidelines for the Interpretation of Scorecard Indicators

The following comes from:

Ghana Statistical Service (2012) “Interviewer’s Manual: Ghana Living Standards Survey 6”, [the *Manual*],

and

Ghana Statistical Service (2012) “Household Questionnaire, Parts A and B: Ghana Living Standards Survey 6”, [the *Questionnaire*].

When an issue arises that is not addressed here, its resolution should be left to the unaided judgment of the enumerator, as that apparently was the practice in Ghana’s 2012/13 GLSS. That is, an organization using the scorecard should not promulgate any definitions or rules (other than those in these “Guidelines”) to be used by all its field agents. Anything not explicitly addressed in these “Guidelines” is to be left to the unaided judgment of the individual enumerator.

## **General Guidelines**

Fill out the scorecard header and the “Back-page Worksheet” first, following the directions on the “Back-page Worksheet”. In particular, do not ask the first two scorecard indicators directly. Instead, use the information recorded on the “Back-page Worksheet” to determine the proper responses for the first two indicators.

Do not read the response options to the respondent. Unless instructed otherwise here, 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 these “Guidelines” 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 you see or sense something—that suggests that the response may not reflect reality, that the respondent is uncertain about his/her response, or that the respondent desires assistance in figuring out how to respond, then you should read the question again and provide whatever assistance you deem appropriate based on these “Guidelines”.

While most indicators in the scorecard are verifiable, you do not need to verify responses unless something suggests to you that the response may not reflect reality and thus that verification might improve data quality. For example, you might choose to verify if the respondent hesitates, seems nervous, or otherwise gives signals that he/she may be lying or be confused. Likewise, verification is probably appropriate if a child in the household or 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 an appliance that the respondent avers not to have, or a child eating in the room who has not been counted as a member of the household—that suggests that the response may not be accurate.

In general, the application of the scorecard should mimic as closely as possible the application of Ghana's 2012/13 GLSS. For example, the poverty-scoring interview should take place in the respondent's homestead because the 2012/13 GLSS took place in respondents' homesteads.

In Ghana's 2012/13 GLSS, it was left to each individual enumerator (or to local translators) to translate the survey instrument on the fly when needed to languages other than English. While the application of the scorecard should, in general, mimic the application of the 2012/13 GLSS, it makes sense to have a standard, well-done, cross-checked translation of the scorecard to languages and dialects that are common in Ghana. Without a standard translation, the variation in translations and interpretations across enumerators could greatly harm data quality. Any translation should reflect the meaning in the original English GLSS survey instrument as closely as possible. Ideally, all organizations using the scorecard in a given dialect or language would coordinate and use a single translation.

### **Who to interview:**

According to p. 5 of the *Questionnaire*, the respondent is “preferably the head of household. [If he/she is] not available, [then the respondent may be] any adult member of the household who is able to give information on behalf of the other household members.”

### **How to conduct an interview:**

According to p. 8 of the *Manual*, “Your role as an interviewer is crucial to the survey. The quality of the data to be collected will be determined by the quality of your work.

“You must follow strictly all instructions in [these “Guidelines”]. Read all questions exactly as they appear in the questionnaire.

“After finishing each interview, verify that all [questions have been answered]. . . . Make sure that you have recorded the required information. . . . Do this verification immediately after the interview.”

According to pp. 10–11 of the *Manual*, “When you enter a household, the first thing you should do is to greet everyone, introduce yourself, and say that you are working for [your organization]. Show your [identification card.] . . . Explain that you are doing a survey of [clients of your organization] to find out [how its clients live].

Tell the household that “the households that will be interviewed have been randomly selected, that other neighbouring households have been selected in the same way, and that all the information recorded will be regarded as confidential.

“Explanations play a great part in the willingness of people to reply to questions.”

According to pp. 13–14 of the *Manual*, “Be careful to follow all the instructions in [these “Guidelines”], the most important of which is to ask the questions exactly in the form in which they appear on the questionnaire. . . .

“Maintain the tempo of the interview. In particular, avoid long discussions of the questions with the respondents. If you are receiving irrelevant or complicated answers, do not break in too suddenly, but listen to what the respondent is saying and then lead him/her back to the original question. Remember, you are running the interview and therefore you must be in control of the situation at all times.

“Remain absolutely neutral about the subject of the interview. Most people are naturally polite, particularly with visitors, and they tend to give answers and adopt attitudes that they think will please the visitor. Do not express surprise, approval, nor disapproval about the answers given by the respondent, and do not tell him/her what you think about these topics yourself.

“Avoid any preconceived ideas about the respondent’s ability to answer certain questions or about the kind of answer he/she is likely to give. Your most important task is to read the questions exactly as they are written in the questionnaire.

“All the data collected are strictly confidential. . . . In principle, all the questions should be asked in complete privacy to ensure that the respondent’s answers remain confidential. The presence of other people during the interview may embarrass him/her and influence some of his/her answers. . . . [Especially before asking potentially sensitive questions], you should explain to the respondent that all responses are confidential and ask him/her for the best place in the house where he/she is least likely to be disturbed. If another adult does not understand and refuses to leave, you must use tact and imagination to try and get rid of him/her. For example:

- Ask the respondent to persuade the other person to leave
- Explain as politely as possible that the interview must be done in private
- Try to satisfy the person’s curiosity by reading the first few questions, and then say something like ‘You have heard some of the questions. Will you now excuse us for a little while?’”

According to pp. 16–17 of the *Manual*, “observe the following rules:

- Be courteous towards everyone (the respondent and his/her family and friends). . . . Your behaviour can have an enormous influence
- Avoid disturbing or upsetting anyone by your behaviour
- Dress properly so that the respondent will be inclined to trust you as a reliable and responsible person
- Arrive at the stated time, and never keep a respondent waiting
- Be patient and tactful when interviewing to avoid antagonising the respondent or leading him/her to give answers that do not conform with the facts

According to p. 18 of the *Manual*, “Questions must be read to the respondent just as they are written in the questionnaire. Read all questions in a clear and comprehensive manner, and wait patiently for the reply. A respondent may delay in giving the reply because he/she:

- Has not heard the question well
- Has not understood the question
- Does not know the answer

“In any case, repeat the question clearly. If there is still no answer, ask whether the question has been understood and, if necessary, reword the question without changing the sense.”

According to p. 88 of the *Manual*, “At the end of the interview, express your gratitude to the household before leaving. Thank them for their cooperation and assistance.”

### **Use of Interpreters:**

According to p. 12 of the *Manual*, “When you first enter a household, find out whether you will need an interpreter. If no one in the household speaks English well enough to interpret and if you do not speak the language of the household, then you must ask the household to choose someone (for instance, a friend, neighbour, or relative) to interpret. This person should be someone who speaks English well and is trusted by the household, because the responses to questions are confidential.

“Be aware that problems may arise from the use of interpreters. For example, it is difficult to know how good the translation is. It is possible that the respondent’s friend who speaks English does not speak it well enough to translate everything said during the interview, but that he/she will not want to admit it.

“If you find that the replies do not correspond to the questions, then try tactfully to help the interpreter or to replace him/her. For example, you could suggest that interpreting is a tiring job and that the interpreter should take a rest while someone else carries on. Or you might say that you have already taken up too much of the interpreter’s time and that the job should be shared among a number of people.

“Another difficulty often encountered is that the interpreter is so familiar with the household that he/she starts to answer for the respondent without directing the question to the respondent. In such a situation, you must politely remind the interpreter that it is the respondent that has been chosen for the interview, and that it is only his/her answers that you can record.

“Third, if the interpreter is a member of the community, then the respondent may be unwilling to answer honestly, particularly to sensitive questions, . . . as he/she may feel that the interpreter will share this information with others. If you feel that this is potentially the case, or if the respondent appears reluctant to answer certain questions, then you should reassure the respondent that all answers are confidential, and you should remind the interpreter of this and of his/her important role in maintaining this confidentiality.”

## Guidelines for specific scorecard indicators

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

According to pp. 21–22 of the *Manual*, a *household* “consists of a person or group of related or unrelated persons who live together in the same housing unit, who acknowledge one adult male or female as the head of the household, who share the same housekeeping and cooking arrangements, and who are considered as one unit.

“In some cases, a group of people may live together in the same house, but each person has separate eating arrangements. In this case, each person is counted as a separate one-person household.

“Remember that [it is possible that] not all related persons living in a residence form one household. Also, remember that more than one household may live in the same residence. One household cannot live in two different residences.

“It is not an easy task to put persons found in a residence or compound into the right household. The following examples are therefore given as guidelines:

- In general, a household consists of a man, his wife, his children, and some other relatives or a househelp who may be living with them
- In large family houses where there may be two or more generations of relations living, care should be taken not to [assume, for example, that] the grandfather, his married children, and all their families together form one large household. Note that sharing meals with each other is not the same as sharing the same housekeeping and cooking arrangements
- Treat as one household the case in which a man lives with more than one wife and their children in the same residence and eats successively with each wife in turns
- If a man does not live in the same residence as his wife or wives, then the man and his wife/wives must be considered as separate households. Any children and others must be included in the household in whose residence they sleep. Thus, if a man and his wife live in different residences and their two sons sleep in the father’s residence after eating in their mother’s residence, the children must be included in the father’s household while the mother is listed as a single-person household

- A lodger who sleeps and eats at least one meal a day with the household must be treated as a member of that household
- A househelp and his/her family who live in a residence or in an out-building in the same compound as the employer should not be included in the employer's household if they prepare their own food. However, if they eat and sleep with the employer's household, then they should be considered as part of the employer's household
- If two or more unrelated persons live together in one room or apartment, then they should be considered as separate single-person households if they do not share a common catering arrangement"

According to p. 24 of the *Manual*, "The roster must be filled with the greatest care. . . . Ask the respondent to give you the names and ages of all the people who normally sleep in the dwelling and who take their meals together. The order in which people are to be recorded is:

1. The head of household, even if he/she is not the respondent and even if he/she is absent
2. Members of the head's immediate family (wife/wives/husband and children) who sleep in the dwelling and who take their meals together
3. If the head is male and if he has more than one wife, then record the name of the first wife, followed by her children. After that, record the second wife, followed by her children
4. Other persons related to the head of household and his/her husband/wife who sleep in the dwelling and take their meals together
5. Unrelated persons who sleep in the dwelling and take their meals with the household
6. People who slept under the same roof during the night preceding the interview, even if they do not normally live with the household"

According to pp. 27–28 of the *Manual*, a person is a *household member* if he/she sleeps and eats with the household and has been away from the household for less than 6 of the past 12 months. A person is also considered as a household member—regardless of the number of months away from the household in the past 12 months—if he/she:

- Is the head of the household
- Is six-months-old or younger and is the child of a household member
- Was not a member of another household while away
- Intends to be with the household for at least six months, counting since their arrival



For example:

- A one-month-old child has lived and taken his/her meals with the household since he/she was born. Even though he/she has not lived and eaten with the household for more than 6 in the past 12 months, he/she is still a household member because he/she is six-months-old or younger and is the child of a household member
- The wife of the head of household gave birth to a child in her parents' village. The child is now two-months-old, and the mother and child are still staying with the child's grandparents. The wife is a household member because she has been absent for only two months during the past 12 months. The child, who was absent for all of the past 12 months, is nevertheless a household member because he/she is 6-months-old or younger and is a child of a household member
- Children who are away at school are not usually members of their parents' household. Instead, they are members of the household where they stay during school time

2. Are all household members ages 5 to 17 currently in school?
  - A. No
  - B. Yes
  - C. No one ages 5 to 17

According to p. 25 of the *Manual*, age is measured in completed years, that is, the age as of a given person's most recent birthday.

According to p. 29 of the *Manual*, "This question refers to full-time education in an educational institution such as nursery, kindergarten, primary, middle, JSS, vocational, commercial, technical, agricultural, SSS, teacher-training college, university, or similar types of schools where a person spends or has spent at least four hours a day receiving general education in which the emphasis is not on vocational skills nor trade training. It excludes night schools, trade schools such as catering schools, motor-driving schools, adult-literacy schools, etc. It also excludes on-the-job training establishments like commercial-bank training school and labour college."

3. Can the male head/spouse read a phrase/sentence in English?
- A. No
  - B. No male head/spouse
  - C. Yes

According to p. 33 of the *Manual*, “administer the flash card provided to the [male head/spouse]. The [male head/spouse] must be read the sentence in full for the response ‘Yes’ to be marked.”

According to Anthony Amuzu of the GSS, the sentence on the flash card is “The child is reading a book.”

According to Anthony Amuzu of the GSS, if the male head/spouse is not present at the time of the interview, then the response to this indicator may be marked based on the literacy status of the male head/spouse as reported by the respondent.

According to p. 23 of the *Manual*, the *head of household* is “the person acknowledged as such by members of the household and who is usually responsible for the up-keep and maintenance of the household.

“The head of household will be identified by the household members themselves. He/she is the person who is named in reply to the question ‘Who is the head of this household?’ Most often, but not always, it will be the person who is the main provider and who is familiar with all the activities and occupations of household members. The head of household can be male or female.”

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

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

4. What is the main construction material used for the outer wall?
  - A. Mud bricks/earth, wood, bamboo, metal sheet/slate/asbestos, palm leaves/thatch (grass/raffia), or other
  - B. Cement/concrete blocks, landcrete, stone, or burnt bricks

As for all scorecard questions, the enumerator should ask this question of the respondent. In particular, the enumerator should not merely observe what he/she can see of the outer wall and then mark a response based on that observation.

According to p. 63 of the *Manual*, “If the outer walls of the dwelling are composed of several materials (for instance, one part of the wall is bamboo, another part is earth, and yet another part is concrete), then the respondent should choose the predominant material.”

According to p. 62 of the *Manual*, a *dwelling* “includes all types of structures occupied by members of a household. These may consist of a room inside a house, a group of houses, a multi-storied house, or a hut or group of huts.”

5. What type of toilet facility is usually used by the household?
- A. No toilet facility (bush, beach), or other
  - B. Pit latrine, or bucket/pan
  - C. Public toilet (*e.g.*, W.C., KVIP, pit pan)
  - D. KVIP, or W.C.

According to p. 63 of the *Manual*, *no toilet facility (bush, beach)* “refers to when there is no toilet facility of any kind for the use of the household or when the respondents indicate that they use the bush, beach, or field (what is popularly called ‘free range’).”

According to Anthony Amuzu of the GSS, *KVIP* stands for *Kumasi Ventilated Improved Pit latrine*. A KVIP is a pit latrine with a ventilation system.

According to Anthony Amuzu of the GSS, responses A, B, and D pertain to private toilet arrangements (whether none (bush, beach), other, pit latrine, bucket/pan, KVIP, or W.C.), while response C (“Bucket/pan, or public toilet (*e.g.*, W.C., KVIP, pit pan)”) pertains to any type of public-toilet arrangement (not just those types of public-toilet arrangements explicitly mentioned as examples in the text of the response C).

According to Anthony Amuzu of the GSS, a *private toilet* is one that is used exclusively by the interviewed household and is not shared with members of any other households. In contrast, a *public toilet* is one that is shared by the household with members of other households.

For example, a toilet constructed and maintained by the household but which is used by the general public for a fee is considered a public toilet and thus would fall under response C. Likewise, the household’s use of a toilet constructed and maintained by a group of neighbors (or the toilet of a local school) would also fall under response C, because the household shares the use of the toilet with members of other households.

6. What is the main fuel used by the household for cooking?
  - A. None, no cooking
  - B. Wood, crop residue, sawdust, animal waste, or other
  - C. Charcoal or kerosene
  - D. Gas, or electricity

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

7. Does any household member own a working box iron or electric iron?
- A. No
  - B. Yes

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

According to Anthony Amuzu of the GSS, an electric iron that is not currently in use due to a lack of electricity may still be counted as *working* if the respondent answers the scorecard question in the affirmative.

If the respondent hesitates or asks whether an electric iron that is currently without a source of electricity should be counted, then the enumerator should indicate that it should be counted as long as it is currently in working condition and would work, if it were to be connected to an appropriate source of electricity.

According to Anthony Amuzu of the GSS, working box irons or electric irons that are jointly owned by members of more than one household are not to be counted as owned by the household being interviewed.

According to Anthony Amuzu of the GSS, working box irons or electric irons that are used partly or exclusively in a business run by the household are to be counted.

8. Does any household member own a working television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish?
  - A. No
  - B. Only television
  - C. Video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish (regardless of T.V.)

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

According to Anthony Amuzu of the GSS, a television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish that is not currently in use due to a lack of electricity may still be counted as *working* if the respondent answers the scorecard question in the affirmative.

If the respondent hesitates or asks whether a television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish that is currently without a source of electricity should be counted, then the enumerator should indicate that it should be counted as long as it is currently in working condition and would work, if it were to be connected to an appropriate source of electricity.

According to Anthony Amuzu of the GSS, working televisions, video players, VCD/DVD/MP3/MP4 player/iPods, or satellite dishes that are jointly owned by members of more than one household are not to be counted as owned by the household being interviewed.

According to Anthony Amuzu of the GSS, working televisions, video players, VCD/DVD/MP3/MP4 player/iPods, or satellite dishes that are used partly or exclusively in a business run by the household are to be counted.



9. How many working mobile phones are owned by members of the household?
- A. None
  - B. One
  - C. Two
  - D. Three or more

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

According to Anthony Amuzu of the GSS, a mobile phone that is not currently in use due to a lack of battery power, subscription, or minutes may still be counted as *working* if the respondent answers the scorecard question in the affirmative.

If the respondent hesitates or asks whether a mobile phone that is currently without power, subscription, or minutes should be counted, then the enumerator should indicate that it should be counted as long as it is currently in working condition and would work, if it were to be connected to an appropriate power source and if it had a subscription or minutes.

According to Anthony Amuzu of the GSS, working mobile phones that are jointly owned by members of more than one household are not to be counted as owned by the household being interviewed.

According to Anthony Amuzu of the GSS, working mobile phones that are used partly or exclusively in a business run by the household are to be counted.

10. Does any household member own a working bicycle, motor cycle, or car?
- A. None
  - B. Only bicycle
  - C. Motor cycle, or car (regardless of bicycle)

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

According to Anthony Amuzu of the GSS, a motor cycle or car that is not currently in use due to a lack of fuel may still be counted as *working* if the respondent answers the scorecard question in the affirmative.

If the respondent hesitates or asks whether a motor cycle or car that is currently without fuel should be counted, then the enumerator should indicate that it should be counted as long as it is currently in working condition and would work, if it had fuel.

According to Anthony Amuzu of the GSS, working bicycles, motor cycles, or cars that are jointly owned by members of more than one household are not to be counted as owned by the household being interviewed.

According to Anthony Amuzu of the GSS, working bicycles, motor cycles, or cars that are used partly or exclusively in a business run by the household are to be counted.

**Figure 1: New-definition national poverty lines (and the line marking the poorest half of people below 100% of the national line) and poverty rates for all of Ghana and for construction/validation samples, by households and people, for 2012/13**

Sample	Line or rate	Level	<i>n</i>	Poverty rates (% with consumption below a given poverty line) and poverty lines (GHS/day per adult-equivalent or per person)				
				Food	National poverty lines			Poorest half below 100% Natl.
					100%	150%	200%	
<b>All Ghana</b>								
	Line	People		2.16	3.58	5.36	7.15	1.99
	Rate	HHs	16,772	5.4	16.4	32.9	47.7	7.9
		People		8.4	24.2	44.5	60.2	12.1
<b>Construction and calibration</b> (Selecting indicators and points, and associating scores with likelihoods)								
	Rate	HHs	8,394	5.4	16.5	32.7	47.8	8.0
<b>Validation</b> (measuring accuracy)								
	Rate	HHs	8,378	5.5	16.3	33.1	47.5	7.8

Source: 2012/13 GLSS. Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

National poverty lines are per-adult-equivalent.

The line marking the poorest half of people below 100% of the national poverty line is per-person.

**Figure 1: New-definition international 2005 PPP poverty lines (deflated by Ghana's CPI) and poverty rates for all of Ghana and for construction/validation samples, by households and people, for 2012/13**

			Poverty rates (% with consumption below a given poverty line) and poverty lines (GHS/day per person)							
Sample	Line or rate	Level	n	International 2005 PPP lines					Intl. 2011 PPP	
				\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10
<b>All Ghana</b>										
	Line	People		1.36	2.17	2.72	4.08	5.43	1.76	2.88
	Rate	HHs	16,772	3.4	10.9	17.4	33.2	47.7	6.7	19.3
		People		5.6	16.7	25.7	45.2	60.9	10.5	28.3
<b>Construction and calibration</b> (Selecting indicators and points, and associating scores with likelihoods)										
	Rate	HHs	8,394	3.4	10.8	17.4	33.1	47.7	6.5	19.5
<b>Validation</b> (measuring accuracy)										
	Rate	HHs	8,378	3.4	11.0	17.4	33.2	47.7	6.9	19.1

Source: 2012/13 GLSS. Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

International 2005 PPP poverty lines are per-person.

The price deflator is the change in Ghana's Consumer Price Index.

**Figure 1: New-definition international 2005 PPP poverty lines (deflated by the change in Ghana's national poverty line) and poverty rates for all of Ghana and for construction/validation samples, by households and people, for 2012/13**

Sample	Line or rate	Level	<i>n</i>	Poverty rates (% with consumption below a given poverty line) and poverty lines (GHS/day per person)						
				International 2005 PPP lines					Intl. 2011 PPP	
				\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10
<b>All Ghana</b>										
	Line	People		1.94	3.10	3.88	5.82	7.76	2.52	4.11
	Rate	HHs	16,772	8.4	21.9	30.9	51.1	64.3	14.8	35.7
		People		13.2	31.6	42.6	64.3	76.5	22.1	45.7
<b>Construction and calibration</b> (Selecting indicators and points, and associating scores with likelihoods)										
	Rate	HHs	8,394	8.3	21.9	30.8	51.1	64.2	14.9	33.4
<b>Validation</b> (measuring accuracy)										
	Rate	HHs	8,378	8.6	22.0	30.9	51.0	64.4	14.6	33.7

Source: 2012/13 GLSS. Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

International 2005 PPP poverty lines are per-person.

The price deflator is the change in Ghana's national poverty line.

**Figure 1: Old-definition poverty lines and poverty rates for all of Ghana and for construction/validation samples, by households and people, for 2012/13**

Sample	Line or rate	Level	<i>n</i>	Poverty rates (% with consumption below a given poverty line) and poverty lines (GHS/day per adult-equivalent or per person)						
				National poverty lines				Intl. 2005 PPP		
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75
<b>All Ghana</b>										
	Line	People		2.28	3.33	5.00	6.66	1.94	3.88	5.82
	Rate	HHs	16,772	6.3	14.3	29.8	44.0	8.4	30.9	51.1
		People		9.7	21.4	40.8	56.5	13.2	42.6	64.3
<b>Calibration</b> ( <i>Associating scores with likelihoods</i> )										
	Rate	HHs	8,394	6.2	14.4	29.5	44.1	8.3	30.8	51.1
<b>Validation</b> ( <i>measuring accuracy</i> )										
	Rate	HHs	8,378	6.3	14.2	30.0	43.9	8.6	30.9	51.0

Source: 2012/13 GLSS. Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

National poverty lines are per-adult-equivalent. International 2005 PPP poverty lines are per-person.

**Figure 2 (all Ghana): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	Old-definition poverty										New-definition poverty																
			National lines				Intl. 2005 PPP			National lines			Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines										
			n	Food	100%		200%	\$1.25	\$2.50	\$3.75	Food	100%		200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP			Intl. 2011 PPP						
					150%	150%						150%	150%		\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	
1998/9	Urban	Line	1,776	2,283	3,425	4,566	1,497	2,993	4,490	1,681	2,451	3,677	4,902	1,447	1,601	2,561	3,201	4,802	6,402	2,078	3,390	1,497	2,395	2,993	4,490	5,987	1,943	3,170	
		Rate (HHs)	2,199	8.2	13.9	29.4	45.2	9.8	35.3	57.6	7.1	16.3	32.9	49.4	8.1	11.3	28.0	38.3	60.6	75.5	19.6	41.5	9.8	24.9	35.3	57.6	71.8	17.4	37.8
		Rate (people)		11.6	19.4	38.7	56.5	13.9	46.2	70.5	9.9	22.8	42.8	60.7	11.4	16.1	37.7	49.3	73.6	86.6	27.5	53.1	13.9	34.2	46.2	70.5	83.5	24.7	48.8
	Rural	Line	1,651	2,122	3,184	4,245	1,391	2,783	4,174	1,563	2,279	3,418	4,557	1,145	1,488	2,381	2,976	4,464	5,952	1,932	3,152	1,391	2,226	2,783	4,174	5,566	1,806	2,947	
		Rate (HHs)	3,799	27.0	39.6	62.4	76.1	31.8	67.7	83.9	24.5	44.0	66.1	78.8	20.7	35.1	60.7	70.3	85.8	93.1	49.6	72.8	31.8	57.0	67.7	83.9	91.9	46.0	69.9
		Rate (people)		34.4	49.5	73.2	85.0	40.4	78.3	91.5	31.7	54.5	76.6	87.2	27.2	44.8	72.3	80.8	92.8	97.1	60.7	83.2	40.4	68.6	78.3	91.5	96.4	56.8	80.4
	Overall	Line	1,692	2,176	3,264	4,352	1,426	2,853	4,279	1,602	2,336	3,504	4,672	1,245	1,525	2,441	3,051	4,576	6,102	1,980	3,231	1,426	2,282	2,853	4,279	5,706	1,852	3,021	
		Rate (HHs)	5,998	20.1	30.2	50.3	64.7	23.7	55.8	74.3	18.1	33.9	53.9	68.1	16.1	26.4	48.7	58.6	76.6	86.7	38.6	61.3	23.7	45.3	55.8	74.3	84.5	35.5	58.1
		Rate (people)		26.8	39.5	61.7	75.5	31.6	67.6	84.5	24.4	43.9	65.4	78.4	22.0	35.3	60.8	70.3	86.4	93.6	49.6	73.2	31.6	57.2	67.6	84.5	92.1	46.1	69.9
2005/6	Urban	Line	6,723	8,644	12,965	17,287	5,988	11,976	17,964	6,365	9,280	13,920	18,559	5,345	5,988	9,581	11,976	17,964	23,952	7,773	12,683	5,988	9,581	11,977	17,965	23,953	7,773	12,683	
		Rate (HHs)	3,618	3.4	7.3	18.3	32.3	5.5	26.0	48.5	3.1	8.5	21.3	36.5	3.8	5.5	17.1	26.0	48.5	65.2	10.4	29.4	5.5	17.1	26.0	48.6	65.2	10.4	29.4
		Rate (people)		5.7	10.7	25.9	43.3	8.8	35.8	62.3	5.1	12.4	29.7	48.1	6.2	8.8	24.3	35.8	62.3	78.0	15.2	40.3	8.8	24.3	35.8	62.3	78.0	15.2	40.3
	Rural	Line	6,525	8,389	12,584	16,779	5,812	11,624	17,435	6,178	9,007	13,510	18,013	4,637	5,812	9,299	11,624	17,435	23,247	7,545	12,310	5,812	9,299	11,624	17,436	23,249	7,545	12,310	
		Rate (HHs)	5,069	17.3	27.7	50.3	67.8	24.4	62.7	80.7	15.7	31.3	54.3	71.3	14.6	24.4	49.4	62.7	80.7	89.1	37.5	65.5	24.4	49.4	62.7	80.7	89.1	37.5	65.5
		Rate (people)		25.6	39.3	64.2	79.9	35.3	76.1	90.7	23.4	43.7	68.1	83.0	21.9	35.3	63.6	76.1	90.7	95.6	50.9	78.9	35.3	63.6	76.1	90.7	95.6	50.9	78.9
	Overall	Line	6,600	8,485	12,728	16,970	5,878	11,756	17,634	6,248	9,110	13,664	18,219	4,904	5,878	9,405	11,756	17,634	23,513	7,631	12,450	5,879	9,406	11,757	17,636	23,514	7,631	12,450	
		Rate (HHs)	8,687	11.3	18.9	36.5	52.5	16.2	46.9	66.8	10.3	21.4	40.1	56.3	9.9	16.2	35.4	46.9	66.8	78.8	25.8	49.9	16.2	35.4	46.9	66.8	78.8	25.8	49.9
		Rate (people)		18.1	28.5	49.8	66.1	25.3	60.9	80.0	16.5	31.9	53.7	69.8	16.0	25.3	48.8	60.9	80.0	88.9	37.5	64.4	25.3	48.8	60.9	80.0	88.9	37.5	64.4
2012/13	Urban	Line	2,30	3,36	5,04	6,72	1,96	3,91	5,87	2,17	3,61	5,41	7,22	2,14	1,37	2,19	2,74	4,11	5,48	1,78	2,90	1,96	3,13	3,91	5,87	7,83	2,54	4,15	
		Rate (HHs)	7,445	1.6	5.7	16.6	29.5	2.5	17.5	36.8	1.2	6.8	19.3	33.2	3.4	0.5	3.6	7.5	19.5	33.3	1.7	8.8	2.5	10.5	17.5	36.8	51.8	5.7	19.8
		Rate (people)		2.4	8.9	23.6	39.6	4.0	25.3	48.7	1.9	10.6	27.2	43.8	5.4	0.8	5.6	11.7	27.7	44.6	2.6	13.7	4.0	16.0	25.3	48.7	64.3	8.9	28.2
	Rural	Line	2,26	3,30	4,95	6,60	1,92	3,84	5,77	2,14	3,54	5,32	7,09	1,84	1,35	2,15	2,69	4,04	5,38	1,75	2,85	1,92	3,08	3,84	5,77	7,69	2,50	4,07	
		Rate (HHs)	9,327	12.1	24.9	46.1	62.0	15.8	47.5	68.8	10.6	28.3	49.8	65.6	13.5	7.0	20.0	29.7	50.2	65.6	12.9	32.4	15.8	36.1	47.5	68.8	79.7	26.0	50.7
		Rate (people)		16.9	34.0	58.0	73.6	22.3	60.1	80.0	15.0	37.9	61.8	76.8	18.9	10.4	27.8	39.8	62.8	77.2	18.4	43.0	22.3	47.3	60.1	80.0	88.7	35.4	63.4
	Overall	Line	2,28	3,33	5,00	6,66	1,94	3,88	5,82	2,16	3,58	5,36	7,15	1,99	1,36	2,17	2,72	4,08	5,43	1,76	2,88	1,94	3,10	3,88	5,82	7,76	2,52	4,11	
		Rate (HHs)	16,772	6.3	14.3	29.8	44.0	8.4	30.9	51.1	5.4	16.4	32.9	47.7	7.9	3.4	10.9	17.4	33.2	47.7	6.7	19.3	8.4	21.9	30.9	51.1	64.3	14.8	33.6
		Rate (people)		9.6	21.4	40.8	56.5	13.2	42.6	64.3	8.4	24.2	44.5	60.2	12.1	5.6	16.7	25.7	45.2	60.9	10.5	28.3	13.2	31.6	42.6	64.3	76.5	22.1	45.7

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages. Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Western): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half <Nat. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP			Intl. 2011 PPP						
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,732	2,227	3,341	4,454	1,460	2,920	4,380	1,640	2,391	3,586	4,782	1,560	1,561	2,498	3,123	4,684	6,245	2,027	3,307	1,460	2,336	2,920	4,380	5,840	1,895	3,092
		Rate (HHs)	180	3.8	8.0	28.0	42.9	4.3	33.9	58.0	3.2	12.2	30.9	44.6	6.2	6.2	27.4	37.3	61.2	82.3	17.2	38.9	4.3	24.8	33.9	58.0	79.4	13.5	37.3
		Rate (people)		3.8	9.6	35.6	53.6	4.6	42.1	67.8	2.7	14.3	38.8	54.6	7.2	7.2	33.8	45.6	71.2	90.6	19.7	50.3	4.6	30.3	42.1	67.8	89.2	15.6	45.6
	Rural	Line		1,685	2,166	3,249	4,332	1,420	2,840	4,260	1,595	2,325	3,488	4,651	1,343	1,519	2,430	3,037	4,556	6,074	1,971	3,216	1,420	2,272	2,840	4,260	5,680	1,843	3,008
		Rate (HHs)	459	13.0	26.1	54.2	72.0	18.5	61.9	80.9	10.6	31.0	59.1	75.7	15.2	22.2	53.0	65.0	84.2	91.2	37.4	68.0	18.5	47.5	61.9	80.9	90.1	31.7	64.3
		Rate (people)		16.2	31.9	63.8	79.2	22.7	71.4	88.8	13.3	37.6	69.0	82.6	18.8	27.9	63.0	73.9	91.9	96.5	45.8	77.8	22.7	56.5	71.4	88.8	96.1	39.5	73.4
	Overall	Line		1,695	2,179	3,268	4,358	1,428	2,857	4,285	1,604	2,339	3,509	4,678	1,388	1,528	2,444	3,055	4,583	6,110	1,983	3,235	1,428	2,285	2,857	4,285	5,714	1,854	3,025
		Rate (HHs)	639	10.9	21.8	48.0	65.2	15.2	55.4	75.5	8.9	26.6	52.5	68.4	13.1	18.4	47.0	58.5	78.8	89.1	32.7	61.2	15.2	42.2	55.4	75.5	87.6	27.5	57.9
		Rate (people)		13.6	27.3	57.9	73.9	18.9	65.3	84.4	11.1	32.7	62.7	76.7	16.4	23.5	56.8	68.0	87.6	95.2	40.3	72.1	18.9	51.0	65.3	84.4	94.7	34.5	67.6
2005/6	Urban	Line		6,100	7,843	11,764	15,685	5,433	10,866	16,299	5,775	8,420	12,630	16,840	4,350	5,433	8,693	10,866	16,299	21,732	7,053	11,508	5,433	8,693	10,867	16,300	21,733	7,053	11,508
		Rate (HHs)	294	4.6	8.0	18.0	36.7	6.4	30.1	53.2	4.2	9.7	24.4	41.0	3.5	6.4	16.5	30.1	53.2	69.6	9.9	33.6	6.4	16.5	30.1	53.2	69.6	9.9	33.6
		Rate (people)		6.9	11.0	26.2	49.0	10.1	41.9	70.3	6.2	12.6	34.7	54.4	6.3	10.1	24.2	41.9	70.3	84.8	13.9	46.6	10.1	24.2	41.9	70.3	84.8	13.9	46.6
	Rural	Line		6,790	8,730	13,095	17,460	6,048	12,096	18,144	6,429	9,373	14,059	18,745	5,374	6,048	9,677	12,096	18,144	24,191	7,851	12,810	6,048	9,677	12,096	18,145	24,193	7,851	12,810
		Rate (HHs)	540	4.7	13.2	35.0	52.6	10.5	47.6	67.6	4.0	17.0	38.5	56.7	7.6	10.5	33.8	47.6	67.6	80.3	23.9	50.1	10.5	33.8	47.6	67.6	80.3	23.9	50.1
		Rate (people)		8.5	21.8	49.7	68.7	17.9	63.4	83.4	7.0	27.3	53.9	72.7	13.7	17.9	48.8	63.4	83.4	90.9	36.5	66.2	17.9	48.8	63.4	83.4	90.9	36.5	66.2
	Overall	Line		6,584	8,466	12,699	16,931	5,865	11,729	17,594	6,234	9,089	13,633	18,177	5,068	5,865	9,383	11,729	17,594	23,459	7,613	12,422	5,865	9,384	11,730	17,595	23,460	7,613	12,422
		Rate (HHs)	834	4.7	11.5	29.7	47.6	9.2	42.1	63.1	4.0	14.7	34.1	51.8	6.3	9.2	28.4	42.1	63.1	77.0	19.5	44.9	9.2	28.4	42.1	63.1	77.0	19.5	44.9
		Rate (people)		8.1	18.6	42.7	62.9	15.6	57.0	79.5	6.8	22.9	48.1	67.3	11.5	15.6	41.5	57.0	79.5	89.1	29.8	60.4	15.6	41.5	57.0	79.5	89.1	29.8	60.4
2012/13	Urban	Line		2.39	3.50	5.25	6.99	2.04	4.07	6.11	2.26	3.75	5.63	7.51	2.40	1.43	2.28	2.85	4.28	5.70	1.85	3.02	2.04	3.26	4.07	6.11	8.15	2.64	4.31
		Rate (HHs)	726	0.8	3.9	12.9	25.8	1.4	14.8	33.2	0.7	5.5	14.8	29.6	3.0	0.3	2.2	5.9	16.6	30.1	1.0	6.9	1.4	8.6	14.8	33.2	50.9	4.6	17.0
		Rate (people)		0.9	6.8	19.0	35.3	1.6	21.2	44.2	0.8	8.6	21.3	39.6	4.3	0.2	2.7	9.3	23.7	40.5	1.2	10.9	1.6	13.2	21.2	44.2	62.8	7.9	24.6
	Rural	Line		2.36	3.46	5.18	6.91	2.01	4.02	6.04	2.24	3.71	5.56	7.42	1.99	1.41	2.25	2.82	4.23	5.64	1.83	2.98	2.01	3.22	4.02	6.04	8.05	2.61	4.26
		Rate (HHs)	992	7.6	19.5	40.3	55.0	11.6	40.1	62.8	6.9	22.5	43.2	58.7	10.6	4.3	15.0	22.8	42.4	58.3	8.4	26.1	11.6	30.0	40.1	62.8	77.5	19.6	42.9
		Rate (people)		10.3	26.1	50.2	66.5	16.1	51.4	74.8	8.9	29.8	53.2	69.8	14.9	6.3	20.9	30.8	53.3	70.0	11.7	35.0	16.1	40.3	51.4	74.8	87.2	27.3	53.9
	Overall	Line		2.37	3.47	5.21	6.95	2.02	4.04	6.07	2.25	3.73	5.59	7.46	2.16	1.42	2.27	2.83	4.25	5.67	1.84	3.00	2.02	3.24	4.04	6.07	8.09	2.63	4.28
		Rate (HHs)	1,718	4.6	12.6	28.1	42.0	7.0	28.9	49.6	4.1	14.9	30.6	45.8	7.2	2.5	9.3	15.3	30.9	45.7	5.1	17.5	7.0	20.5	28.9	49.6	65.7	13.0	31.4
		Rate (people)		6.3	18.0	37.0	53.3	10.0	38.7	61.9	5.5	20.9	39.8	57.1	10.4	3.7	13.2	21.7	40.8	57.6	7.3	24.9	10.0	28.9	38.7	61.9	76.9	19.1	41.5

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.



**Figure 2 (Central): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines				Intl. 2005 PPP			National lines			Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines									
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%		200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP						
																\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10
1998/9	Urban	Line		1,726	2,219	3,329	4,439	1,455	2,910	4,365	1,634	2,383	3,574	4,765	1,131	1,556	2,489	3,112	4,668	6,224	2,020	3,296	1,455	2,328	2,910	4,365	5,820	1,889	3,082
		Rate (HHs)	200	23.9	36.3	64.5	80.0	30.8	74.7	89.2	22.3	39.2	67.2	83.2	19.2	34.3	63.3	76.7	91.3	95.5	47.8	79.9	30.8	59.6	74.7	89.2	94.1	43.3	75.9
		Rate (people)		28.8	42.7	71.1	84.5	36.6	78.9	92.6	25.8	47.6	73.4	87.0	23.8	39.7	70.1	80.5	94.2	96.9	55.9	83.9	36.6	67.3	78.9	92.6	96.6	51.1	79.9
	Rural	Line		1,715	2,205	3,307	4,410	1,445	2,891	4,336	1,624	2,367	3,551	4,734	1,186	1,546	2,473	3,092	4,637	6,183	2,007	3,274	1,446	2,313	2,891	4,337	5,782	1,876	3,062
		Rate (HHs)	500	23.8	37.9	58.1	74.0	31.0	67.3	84.3	21.1	42.1	63.6	77.7	19.3	33.8	59.2	69.7	85.5	93.0	49.0	71.5	31.0	55.5	67.3	84.3	92.5	47.2	69.3
		Rate (people)		32.7	50.8	70.6	85.8	41.3	80.5	93.2	30.4	55.1	75.7	88.2	27.6	45.4	72.9	82.6	93.8	97.4	62.2	84.1	41.3	69.6	80.5	93.2	97.1	60.7	82.2
	Overall	Line		1,718	2,209	3,314	4,418	1,448	2,896	4,345	1,627	2,372	3,558	4,743	1,170	1,549	2,478	3,098	4,646	6,195	2,011	3,280	1,448	2,317	2,897	4,345	5,793	1,880	3,067
		Rate (HHs)	700	23.8	37.4	59.9	75.7	30.9	69.4	85.7	21.4	41.3	64.7	79.2	19.3	34.0	60.4	71.7	87.1	93.7	48.6	73.9	30.9	56.6	69.4	85.7	93.0	46.1	71.2
		Rate (people)		31.5	48.4	70.7	85.4	39.9	80.0	93.0	29.0	52.9	75.0	87.8	26.5	43.7	72.1	82.0	93.9	97.3	60.3	84.0	39.9	68.9	80.0	93.0	97.0	57.9	81.6
2005/6	Urban	Line		5,989	7,701	11,551	15,402	5,335	10,669	16,004	5,671	8,267	12,401	16,535	5,085	5,335	8,536	10,669	16,004	21,339	6,925	11,299	5,335	8,536	10,670	16,005	21,340	6,925	11,299
		Rate (HHs)	254	0.9	3.5	11.6	21.5	3.2	15.5	37.5	0.4	4.5	13.2	24.3	2.5	3.2	9.9	15.5	37.5	55.1	7.1	18.6	3.2	9.9	15.5	37.5	55.1	7.1	18.6
		Rate (people)		1.7	6.4	18.2	33.1	5.2	26.1	54.2	0.7	7.5	22.1	36.6	3.7	5.2	16.4	26.1	54.2	70.0	12.4	29.8	5.2	16.4	26.1	54.2	70.0	12.4	29.8
	Rural	Line		6,683	8,593	12,890	17,186	5,953	11,906	17,859	6,328	9,225	13,838	18,451	5,155	5,953	9,525	11,906	17,859	23,811	7,728	12,609	5,953	9,525	11,906	17,860	23,813	7,728	12,609
		Rate (HHs)	435	7.9	16.6	38.9	62.5	13.2	56.7	77.8	6.5	19.9	45.1	66.9	9.2	13.2	40.2	56.7	77.8	87.5	25.7	60.5	13.2	40.2	56.7	77.8	87.5	25.7	60.5
		Rate (people)		13.3	26.1	53.8	75.0	20.6	70.7	88.5	10.8	30.6	60.6	79.8	15.3	20.6	56.3	70.7	88.5	94.8	38.2	74.7	20.6	56.3	70.7	88.5	94.8	38.2	74.7
	Overall	Line		6,468	8,316	12,474	16,632	5,761	11,522	17,283	6,124	8,928	13,392	17,856	5,133	5,761	9,217	11,522	17,283	23,043	7,479	12,202	5,761	9,218	11,522	17,284	23,045	7,479	12,202
		Rate (HHs)	689	5.6	12.2	29.8	48.8	9.8	42.9	64.3	4.5	14.7	34.5	52.6	6.9	9.8	30.0	42.9	64.3	76.6	19.5	46.5	9.8	30.0	42.9	64.3	76.6	19.5	46.5
		Rate (people)		9.7	19.9	42.8	62.0	15.9	56.9	77.8	7.6	23.4	48.6	66.4	11.7	15.9	43.9	56.9	77.8	87.1	30.2	60.7	15.9	43.9	56.9	77.8	87.1	30.2	60.7
2012/13	Urban	Line		2.28	3.33	5.00	6.67	1.94	3.88	5.82	2.16	3.58	5.37	7.16	2.03	1.36	2.17	2.72	4.08	5.44	1.76	2.88	1.94	3.11	3.88	5.82	7.76	2.52	4.11
		Rate (HHs)	759	2.8	7.3	24.2	41.1	3.8	25.0	49.5	2.6	8.7	28.0	45.6	4.0	1.0	5.2	9.1	28.2	46.2	3.1	11.0	3.8	13.1	25.0	49.5	64.2	7.9	28.2
		Rate (people)		4.1	10.1	32.2	51.5	5.4	34.9	61.7	4.0	12.1	36.7	56.1	6.1	1.8	7.5	12.7	38.3	57.3	4.6	15.1	5.4	18.2	34.9	61.7	75.2	10.9	38.3
	Rural	Line		2.27	3.32	4.98	6.65	1.93	3.87	5.80	2.15	3.57	5.35	7.13	1.87	1.36	2.17	2.71	4.07	5.42	1.76	2.87	1.94	3.10	3.87	5.81	7.74	2.51	4.10
		Rate (HHs)	843	7.0	14.6	36.5	55.7	8.0	38.6	63.2	5.8	17.6	39.8	59.9	8.0	3.5	11.6	19.9	40.7	60.3	6.8	22.1	8.0	25.4	38.6	63.2	74.5	16.3	41.2
		Rate (people)		10.2	20.4	48.6	66.7	11.9	49.9	74.5	8.8	23.7	52.2	71.1	11.8	4.6	16.4	26.6	52.4	71.7	10.1	30.2	11.9	33.7	49.9	74.5	84.1	22.4	53.2
	Overall	Line		2.27	3.33	4.99	6.65	1.94	3.87	5.81	2.15	3.57	5.36	7.14	1.93	1.36	2.17	2.71	4.07	5.43	1.76	2.87	1.94	3.10	3.88	5.81	7.75	2.52	4.10
		Rate (HHs)	1,602	5.0	11.1	30.6	48.8	6.0	32.1	56.7	4.3	13.4	34.2	53.1	6.1	2.3	8.5	14.7	34.7	53.6	5.0	16.8	6.0	19.5	32.1	56.7	69.6	12.3	35.0
		Rate (people)		7.6	16.1	41.7	60.3	9.1	43.6	69.1	6.8	18.8	45.7	64.8	9.4	3.4	12.7	20.8	46.5	65.6	7.8	23.9	9.1	27.2	43.6	69.1	80.3	17.6	46.9

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages. Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Greater Accra): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP							
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,852	2,381	3,571	4,762	1,561	3,122	4,682	1,753	2,556	3,834	5,112	1,529	1,669	2,671	3,338	5,008	6,677	2,167	3,536	1,561	2,497	3,122	4,683	6,244	2,026	3,306
		Rate (HHs)	739	1.0	3.0	12.1	29.7	1.4	19.3	44.1	0.6	4.2	16.9	35.1	2.0	2.7	11.8	22.7	47.6	67.3	6.4	25.0	1.4	9.2	19.3	44.1	63.0	5.2	21.5
		Rate (people)		1.7	4.2	15.9	37.7	2.3	26.2	56.0	1.1	5.7	21.8	43.8	2.9	4.0	16.2	30.1	60.1	78.4	8.9	32.9	2.3	12.9	26.2	56.0	74.7	7.2	28.7
	Rural	Line		1,694	2,177	3,266	4,355	1,427	2,855	4,282	1,603	2,338	3,506	4,675	1,223	1,527	2,442	3,053	4,580	6,106	1,982	3,233	1,427	2,284	2,855	4,282	5,710	1,853	3,023
		Rate (HHs)	120	7.8	12.4	35.9	44.9	10.1	40.4	58.8	6.1	16.0	37.3	48.8	7.0	11.5	34.9	42.8	60.6	72.8	21.2	45.2	10.1	29.5	40.4	58.8	71.2	19.0	41.9
		Rate (people)		11.8	17.8	48.7	60.8	15.6	55.4	75.4	10.1	23.3	50.7	65.1	11.7	17.1	48.4	58.2	77.3	86.3	30.3	61.1	15.6	40.6	55.4	75.4	85.4	27.5	57.1
	Overall	Line		1,840	2,366	3,549	4,732	1,551	3,102	4,653	1,742	2,540	3,810	5,080	1,506	1,659	2,654	3,318	4,976	6,635	2,153	3,513	1,551	2,482	3,102	4,654	6,205	2,014	3,285
		Rate (HHs)	859	1.6	3.7	14.1	31.0	2.1	21.0	45.3	1.0	5.2	18.6	36.2	2.4	3.4	13.7	24.3	48.7	67.8	7.6	26.7	2.1	10.9	21.0	45.3	63.7	6.3	23.2
		Rate (people)		2.4	5.2	18.3	39.4	3.3	28.3	57.4	1.8	7.0	23.9	45.3	3.5	4.9	18.5	32.2	61.4	79.0	10.4	35.0	3.3	15.0	28.3	57.4	75.5	8.7	30.8
2005/6	Urban	Line		8,172	10,507	15,760	21,013	7,278	14,557	21,835	7,737	11,280	16,919	22,559	6,463	7,278	11,645	14,557	21,835	29,114	9,449	15,416	7,279	11,646	14,558	21,837	29,116	9,449	15,416
		Rate (HHs)	1,122	2.9	6.9	18.6	33.5	5.0	25.5	47.5	2.5	8.0	21.3	38.0	3.5	5.0	17.4	25.5	47.5	63.7	9.5	29.0	5.0	17.4	25.5	47.6	63.7	9.5	29.0
		Rate (people)		5.1	10.3	26.1	43.7	8.3	34.4	58.9	4.4	11.7	29.1	48.7	5.8	8.3	24.6	34.4	58.9	74.1	14.2	39.2	8.3	24.6	34.4	59.0	74.1	14.2	39.2
	Rural	Line		7,047	9,060	13,590	18,120	6,276	12,553	18,829	6,672	9,727	14,590	19,453	5,658	6,276	10,042	12,553	18,829	25,105	8,148	13,294	6,277	10,043	12,553	18,830	25,107	8,148	13,294
		Rate (HHs)	135	7.0	13.3	34.6	53.3	11.3	45.2	74.9	7.0	15.5	37.2	58.8	8.0	11.3	34.4	45.2	74.9	85.1	22.0	50.2	11.3	34.4	45.2	74.9	85.1	22.0	50.2
		Rate (people)		10.8	21.2	48.4	68.2	18.0	61.7	87.4	10.8	25.0	53.0	72.9	12.5	18.0	50.4	61.7	87.4	93.3	34.4	66.5	18.0	50.4	61.7	87.4	93.3	34.4	66.5
	Overall	Line		8,020	10,311	15,467	20,623	7,143	14,286	21,430	7,593	11,070	16,605	22,140	6,355	7,143	11,429	14,286	21,430	28,573	9,273	15,130	7,144	11,430	14,287	21,431	28,575	9,273	15,130
		Rate (HHs)	1,257	3.4	7.7	20.4	35.8	5.7	27.8	50.7	3.0	8.9	23.2	40.4	4.0	5.7	19.4	27.8	50.7	66.2	11.0	31.5	5.7	19.4	27.8	50.8	66.2	11.0	31.5
		Rate (people)		5.8	11.8	29.2	47.0	9.6	38.1	62.7	5.2	13.5	32.4	51.9	6.7	9.6	28.1	38.1	62.7	76.6	17.0	42.9	9.6	28.1	38.1	62.8	76.6	17.0	42.9
2012/13	Urban	Line		2.29	3.35	5.02	6.70	1.95	3.90	5.85	2.17	3.60	5.39	7.19	1.99	1.37	2.19	2.73	4.10	5.46	1.77	2.89	1.95	3.12	3.90	5.85	7.80	2.53	4.13
		Rate (HHs)	1,727	0.6	2.0	6.9	15.5	1.1	6.8	20.5	0.3	2.1	9.0	18.3	1.0	0.2	1.4	2.6	7.6	17.4	0.6	3.2	1.1	3.8	6.8	20.5	34.7	1.8	7.7
		Rate (people)		1.0	3.5	11.0	23.0	2.0	11.0	30.5	0.5	3.6	14.3	26.7	1.8	0.3	2.5	4.4	12.4	26.7	1.0	5.6	2.0	6.9	11.0	30.5	46.4	3.1	12.4
	Rural	Line		2.32	3.40	5.09	6.79	1.98	3.95	5.93	2.20	3.65	5.47	7.29	1.89	1.38	2.22	2.77	4.15	5.54	1.80	2.93	1.98	3.16	3.95	5.93	7.91	2.57	4.19
		Rate (HHs)	197	12.1	21.5	41.0	51.0	18.0	37.3	55.8	10.6	27.6	41.8	56.0	12.8	2.8	19.0	26.9	37.7	52.7	11.5	27.4	18.0	31.9	37.3	55.8	68.0	23.1	39.0
		Rate (people)		17.5	28.7	46.3	57.4	23.2	47.0	64.4	16.3	35.1	47.2	63.7	17.5	5.5	24.7	36.3	47.5	61.1	16.5	36.8	23.2	40.7	47.0	64.4	75.9	30.2	49.0
	Overall	Line		2.29	3.35	5.03	6.71	1.95	3.90	5.86	2.17	3.60	5.40	7.20	1.99	1.37	2.19	2.73	4.10	5.47	1.78	2.90	1.95	3.12	3.91	5.86	7.81	2.53	4.14
		Rate (HHs)	1,924	1.2	3.1	8.9	17.5	2.0	8.6	22.5	0.9	3.6	10.9	20.5	1.7	0.4	2.4	3.9	9.3	19.4	1.2	4.6	2.0	5.4	8.6	22.5	36.6	3.1	9.5
		Rate (people)		2.0	5.1	13.2	25.2	3.3	13.3	32.7	1.5	5.6	16.4	29.0	2.8	0.7	3.9	6.4	14.6	28.9	2.0	7.5	3.3	9.0	13.3	32.7	48.3	4.9	14.8

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS) . Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Volta): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half <Natl. line	Deflated by change in CPI						Deflated by change in national poverty lines				
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP				Intl. 2011 PPP			Intl. 2005 PPP			Intl. 2011 PPP				
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,752	2,252	3,378	4,504	1,476	2,953	4,429	1,658	2,418	3,627	4,835	1,490	1,579	2,526	3,158	4,736	6,315	2,050	3,344	1,476	2,362	2,953	4,429	5,905	1,916	3,127
		Rate (HHs)	140	14.6	28.9	58.6	72.6	14.2	62.9	82.6	12.0	32.4	62.9	76.5	15.3	18.3	54.0	64.8	87.2	91.6	37.6	70.7	14.2	48.2	62.9	82.6	88.7	30.5	64.8
		Rate (people)		18.9	35.3	69.4	84.0	17.8	75.7	89.5	14.6	38.7	74.7	86.5	19.3	23.8	66.9	78.2	93.0	96.3	47.9	83.0	17.8	60.5	75.7	89.5	93.9	40.2	78.2
	Rural	Line	500	1,660	2,134	3,201	4,268	1,399	2,798	4,197	1,572	2,291	3,437	4,582	1,063	1,496	2,394	2,992	4,488	5,985	1,942	3,169	1,399	2,239	2,798	4,197	5,596	1,816	2,963
		Rate (HHs)		28.1	39.1	62.0	77.9	32.7	68.8	85.8	25.4	43.2	65.6	81.2	20.7	35.7	60.0	71.2	86.8	93.1	48.0	75.2	32.7	57.3	68.8	85.8	91.1	44.6	71.2
		Rate (people)		33.6	46.0	70.2	84.3	38.9	75.4	91.0	30.3	51.3	73.3	87.0	25.7	42.6	68.2	77.9	91.9	96.6	56.2	82.8	38.9	65.6	75.4	91.0	95.4	53.0	77.9
	Overall	Line	640	1,679	2,159	3,239	4,319	1,416	2,831	4,247	1,590	2,318	3,477	4,636	1,154	1,514	2,422	3,028	4,542	6,055	1,965	3,206	1,416	2,265	2,831	4,247	5,663	1,838	2,998
		Rate (HHs)		25.1	36.8	61.3	76.7	28.6	67.5	85.1	22.4	40.8	65.0	80.1	19.5	31.9	58.7	69.8	86.9	92.8	45.7	74.2	28.6	55.3	67.5	85.1	90.6	41.5	69.8
		Rate (people)		30.4	43.7	70.0	84.2	34.4	75.4	90.7	27.0	48.6	73.6	86.9	24.3	38.5	67.9	78.0	92.2	96.6	54.5	82.8	34.4	64.5	75.4	90.7	95.1	50.3	78.0
2005/6	Urban	Line	195	5,987	7,698	11,547	15,396	5,333	10,665	15,998	5,669	8,264	12,396	16,528	5,553	5,333	8,532	10,665	15,998	21,331	6,923	11,295	5,333	8,533	10,666	15,999	21,332	6,923	11,295
		Rate (HHs)		1.0	5.6	19.8	35.7	3.6	30.7	55.7	1.0	7.1	23.1	41.7	3.5	3.6	19.1	30.7	55.7	71.0	12.5	34.5	3.6	19.1	30.7	55.7	71.0	12.5	34.5
		Rate (people)		0.8	5.8	25.2	43.5	3.7	39.6	67.7	0.8	7.8	28.4	49.8	4.1	3.7	24.0	39.6	67.7	81.9	14.4	43.7	3.7	24.0	39.6	67.7	81.9	14.4	43.7
	Rural	Line	525	6,545	8,416	12,623	16,831	5,830	11,660	17,490	6,197	9,035	13,552	18,070	5,036	5,830	9,328	11,660	17,490	23,320	7,568	12,348	5,830	9,329	11,661	17,491	23,321	7,568	12,348
		Rate (HHs)		14.7	28.3	54.6	72.0	23.7	67.3	84.0	12.9	34.1	59.6	75.9	16.5	23.7	54.0	67.3	84.0	91.7	39.6	69.3	23.7	54.0	67.3	84.0	91.7	39.6	69.3
		Rate (people)		20.3	40.6	69.2	83.8	34.7	80.4	93.2	17.6	47.4	73.6	86.1	23.7	34.7	68.6	80.4	93.2	97.2	53.7	82.4	34.7	68.6	80.4	93.2	97.2	53.7	82.4
	Overall	Line	720	6,403	8,232	12,348	16,464	5,703	11,406	17,108	6,062	8,838	13,257	17,676	5,169	5,703	9,124	11,406	17,108	22,811	7,403	12,079	5,703	9,125	11,406	17,110	22,813	7,403	12,079
		Rate (HHs)		11.0	22.1	45.1	62.2	18.2	57.3	76.3	9.7	26.8	49.7	66.6	13.0	18.2	44.5	57.3	76.3	86.1	32.2	59.8	18.2	44.5	57.3	76.3	86.1	32.2	59.8
		Rate (people)		15.3	31.7	57.9	73.5	26.8	70.0	86.6	13.3	37.3	62.0	76.8	18.7	26.8	57.2	70.0	86.6	93.3	43.7	72.5	26.8	57.2	70.0	86.6	93.3	43.7	72.5
2012/13	Urban	Line	513	2,33	3,41	5,11	6,82	1,98	3,97	5,95	2,21	3,66	5,49	7,32	2,03	1,39	2,22	2,78	4,17	5,56	1,80	2,94	1,99	3,18	3,97	5,96	7,94	2,58	4,20
		Rate (HHs)		3.6	13.5	29.5	44.3	6.0	31.2	51.4	2.6	15.1	32.8	47.6	6.5	0.7	8.0	16.5	33.4	49.7	3.9	18.9	6.0	21.4	31.2	51.4	64.2	13.8	34.2
		Rate (people)		6.1	19.9	38.2	56.1	10.1	40.6	65.0	4.0	22.1	42.2	59.7	11.0	1.1	13.1	23.0	42.8	63.2	5.7	25.9	10.1	29.3	40.6	65.0	77.8	20.3	43.8
	Rural	Line	1,061	2,30	3,36	5,04	6,72	1,96	3,91	5,87	2,17	3,61	5,41	7,21	1,90	1,37	2,19	2,74	4,11	5,48	1,78	2,90	1,96	3,13	3,91	5,87	7,82	2,54	4,14
		Rate (HHs)		10.7	24.8	47.0	62.5	15.0	48.5	69.0	8.2	29.2	50.6	64.7	14.0	4.9	19.9	29.8	50.9	66.6	12.1	32.8	15.0	37.0	48.5	69.0	79.9	26.2	51.3
		Rate (people)		14.8	33.6	58.1	72.9	20.9	60.9	78.9	11.2	38.9	61.5	74.7	19.4	7.1	27.6	39.9	62.8	77.3	16.8	43.1	20.9	47.7	60.9	78.9	88.9	35.2	63.1
	Overall	Line	1,574	2,31	3,37	5,06	6,75	1,96	3,93	5,89	2,18	3,62	5,43	7,24	1,94	1,38	2,20	2,75	4,13	5,50	1,79	2,91	1,96	3,14	3,93	5,89	7,86	2,55	4,16
		Rate (HHs)		8.2	20.9	41.0	56.2	11.9	42.6	62.9	6.3	24.3	44.5	58.8	11.4	3.5	15.8	25.2	44.9	60.8	9.3	28.0	11.9	31.6	42.6	62.9	74.5	21.9	45.4
		Rate (people)		12.1	29.4	52.0	67.8	17.6	54.7	74.7	9.0	33.8	55.7	70.1	16.9	5.3	23.2	34.8	56.7	73.0	13.4	37.9	17.6	42.1	54.7	74.7	85.5	30.7	57.3

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS) . Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Eastern): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty									New-definition poverty																
				National lines				Intl. 2005 PPP			National lines				Poorest half <Nat'l. line	Deflated by change in CPI					Deflated by change in national poverty lines								
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%		Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP						
				\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		
1998/9	Urban	Line		1,736	2,232	3,348	4,464	1,463	2,926	4,389	1,644	2,396	3,594	4,792	1,289	1,565	2,503	3,129	4,694	6,259	2,031	3,314	1,463	2,341	2,926	4,390	5,853	1,899	3,099
		Rate (HHs)	240	20.9	31.0	53.4	66.5	24.1	58.3	80.0	18.6	34.6	56.7	71.6	17.0	25.3	48.1	61.3	82.1	88.7	37.9	66.3	24.1	45.2	58.3	80.0	86.3	35.8	60.8
		Rate (people)		27.5	37.8	61.8	74.5	30.6	66.8	88.8	24.1	42.4	64.3	79.0	21.2	31.9	57.3	69.7	89.3	93.8	46.3	74.7	30.6	53.8	66.8	88.8	92.5	44.1	69.5
	Rural	Line		1,686	2,168	3,251	4,335	1,421	2,842	4,263	1,596	2,327	3,491	4,654	1,340	1,520	2,431	3,039	4,559	6,079	1,973	3,219	1,421	2,274	2,842	4,263	5,684	1,845	3,010
		Rate (HHs)	580	15.4	30.1	57.8	75.9	20.5	66.5	85.0	13.4	36.1	64.2	79.5	17.9	24.5	56.2	70.1	86.7	96.5	42.9	72.5	20.5	51.9	66.5	85.0	94.9	37.9	69.4
		Rate (people)		18.6	37.7	68.1	84.3	26.4	77.0	91.9	16.1	45.0	74.6	86.8	22.5	32.2	67.6	80.6	92.7	98.5	52.9	82.7	26.4	63.4	77.0	91.9	97.5	47.3	79.9
	Overall	Line		1,696	2,181	3,271	4,362	1,430	2,859	4,289	1,606	2,341	3,512	4,683	1,330	1,529	2,446	3,058	4,587	6,116	1,985	3,238	1,430	2,288	2,860	4,289	5,719	1,856	3,028
		Rate (HHs)	820	16.7	30.3	56.8	73.7	21.4	64.6	83.9	14.6	35.7	62.5	77.7	17.7	24.7	54.3	68.1	85.6	94.7	41.7	71.1	21.4	50.4	64.6	83.9	92.9	37.4	67.4
		Rate (people)		20.4	37.7	66.8	82.3	27.3	74.9	91.2	17.8	44.5	72.5	85.2	22.2	32.2	65.4	78.3	92.0	97.5	51.5	81.1	27.3	61.4	74.9	91.2	96.5	46.6	77.8
2005/6	Urban	Line		6,125	7,875	11,812	15,749	5,455	10,910	16,365	5,799	8,454	12,681	16,908	5,206	5,455	8,728	10,910	16,365	21,821	7,082	11,555	5,455	8,729	10,911	16,366	21,822	7,082	11,555
		Rate (HHs)	329	2.4	4.4	13.2	28.7	3.2	21.9	47.2	2.4	5.3	18.1	32.5	3.0	3.2	12.4	21.9	47.2	65.4	6.9	26.6	3.2	12.4	21.9	47.2	65.4	6.9	26.6
		Rate (people)		3.1	6.3	18.8	39.0	4.1	30.2	61.3	3.1	8.0	24.8	43.4	4.0	4.1	16.3	30.2	61.3	78.8	9.6	37.3	4.1	16.3	30.2	61.3	78.8	9.6	37.3
	Rural	Line		6,584	8,465	12,697	16,929	5,864	11,728	17,592	6,233	9,087	13,631	18,175	5,454	5,864	9,382	11,728	17,592	23,455	7,612	12,420	5,864	9,383	11,728	17,593	23,457	7,612	12,420
		Rate (HHs)	585	5.4	13.1	37.4	60.5	10.1	51.8	77.5	4.7	15.7	42.6	64.6	7.4	10.1	34.4	51.8	77.5	88.2	22.6	55.8	10.1	34.4	51.8	77.5	88.2	22.6	55.8
		Rate (people)		8.2	18.6	46.7	70.3	14.3	63.8	87.2	7.0	22.2	51.6	74.8	11.2	14.3	44.4	63.8	87.2	95.1	30.6	68.4	14.3	44.4	63.8	87.2	95.1	30.6	68.4
	Overall	Line		6,441	8,281	12,421	16,562	5,737	11,473	17,210	6,098	8,890	13,335	17,780	5,377	5,737	9,178	11,473	17,210	22,946	7,447	12,151	5,737	9,179	11,474	17,211	22,948	7,447	12,151
		Rate (HHs)	914	4.3	10.1	29.0	49.5	7.7	41.4	67.0	3.9	12.1	34.1	53.5	5.9	7.7	26.8	41.4	67.0	80.3	17.2	45.6	7.7	26.8	41.4	67.0	80.3	17.2	45.6
		Rate (people)		6.6	14.7	38.0	60.5	11.1	53.3	79.2	5.8	17.8	43.3	65.0	9.0	11.1	35.7	53.3	79.2	90.0	24.1	58.7	11.1	35.7	53.3	79.2	90.0	24.1	58.7
2012/13	Urban	Line		2.25	3.29	4.93	6.57	1.91	3.83	5.74	2.13	3.53	5.29	7.06	2.17	1.34	2.14	2.68	4.02	5.36	1.74	2.84	1.91	3.06	3.83	5.74	7.66	2.48	4.05
		Rate (HHs)	779	1.8	6.0	19.6	37.3	2.1	20.3	46.9	1.6	7.3	22.7	42.4	3.7	0.8	3.6	7.8	23.2	41.4	1.7	9.3	2.1	11.4	20.3	46.9	64.3	5.6	23.9
		Rate (people)		3.0	9.2	28.3	47.8	3.4	29.0	58.9	2.7	12.1	31.3	53.1	6.0	1.4	6.2	13.2	32.3	53.0	2.8	15.6	3.4	18.2	29.0	58.9	74.8	8.9	33.0
	Rural	Line		2.24	3.28	4.91	6.55	1.91	3.82	5.72	2.12	3.52	5.28	7.03	1.97	1.34	2.14	2.67	4.01	5.34	1.73	2.83	1.91	3.05	3.82	5.72	7.63	2.48	4.04
		Rate (HHs)	1,025	8.0	19.3	41.8	60.8	10.2	43.6	67.5	6.5	22.6	46.3	64.5	11.3	3.5	14.3	24.3	46.6	63.8	7.9	27.2	10.2	31.3	43.6	67.5	81.4	20.6	47.0
		Rate (people)		10.6	25.4	51.8	69.6	13.6	53.5	77.2	8.7	29.8	56.3	73.5	14.9	5.0	18.7	32.2	57.1	73.3	10.5	35.8	13.6	40.5	53.5	77.2	88.4	27.2	57.4
	Overall	Line		2.24	3.28	4.92	6.56	1.91	3.82	5.73	2.12	3.52	5.28	7.04	2.06	1.34	2.14	2.68	4.01	5.35	1.74	2.83	1.91	3.06	3.82	5.73	7.64	2.48	4.05
		Rate (HHs)	1,804	5.0	12.8	31.0	49.4	6.3	32.3	57.5	4.1	15.2	34.8	53.8	7.6	2.2	9.1	16.3	35.3	53.0	4.9	18.5	6.3	21.6	32.3	57.5	73.1	13.3	35.8
		Rate (people)		7.1	18.0	41.0	59.6	8.9	42.2	68.7	6.0	21.6	44.8	64.1	10.8	3.3	12.9	23.5	45.7	64.0	6.9	26.5	8.9	30.2	42.2	68.7	82.1	18.8	46.2

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Ashanti): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP							
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,730	2,225	3,337	4,450	1,458	2,917	4,375	1,638	2,388	3,583	4,777	1,426	1,560	2,496	3,119	4,679	6,239	2,025	3,304	1,459	2,334	2,917	4,376	5,834	1,893	3,089
		Rate (HHs)	400	4.5	9.0	18.0	30.5	6.6	20.8	39.8	3.6	11.1	19.4	34.2	5.9	7.9	16.5	23.2	43.2	61.5	11.8	26.4	6.6	14.6	20.8	39.8	54.4	10.9	23.0
		Rate (people)		7.8	14.7	29.7	44.4	11.6	34.1	58.3	6.1	19.4	32.0	49.1	9.7	14.1	28.3	36.1	63.3	80.5	21.4	40.2	11.6	25.5	34.1	58.3	73.1	19.6	36.0
	Rural	Line		1,659	2,134	3,200	4,267	1,399	2,797	4,196	1,571	2,291	3,436	4,581	1,263	1,496	2,393	2,992	4,487	5,983	1,942	3,168	1,399	2,238	2,798	4,196	5,595	1,816	2,963
		Rate (HHs)	660	15.4	25.9	48.4	63.1	16.9	51.1	72.7	13.8	28.4	51.0	65.8	13.1	20.2	44.5	54.6	76.5	86.7	31.8	56.9	16.9	40.8	51.1	72.7	84.5	29.0	53.8
		Rate (people)		21.8	35.9	60.9	76.0	24.7	65.0	83.9	19.6	39.3	64.0	78.4	19.6	29.0	58.1	69.3	86.7	93.5	44.0	71.3	24.7	54.4	65.0	83.9	92.3	40.5	68.3
	Overall	Line		1,687	2,169	3,253	4,338	1,422	2,843	4,265	1,597	2,328	3,493	4,657	1,326	1,520	2,433	3,041	4,561	6,082	1,974	3,221	1,422	2,275	2,844	4,266	5,687	1,846	3,011
		Rate (HHs)	1,060	10.8	18.8	35.6	49.4	12.6	38.4	58.9	9.5	21.1	37.7	52.6	10.1	15.0	32.8	41.4	62.5	76.1	23.4	44.1	12.6	29.8	38.4	58.9	71.9	21.4	40.9
		Rate (people)		16.4	27.7	48.9	63.8	19.7	53.1	74.0	14.4	31.6	51.6	67.0	15.8	23.3	46.6	56.5	77.7	88.5	35.3	59.3	19.7	43.3	53.1	74.0	84.9	32.4	55.9
2005/6	Urban	Line		6,062	7,794	11,691	15,589	5,400	10,799	16,199	5,740	8,368	12,552	16,736	4,898	5,400	8,639	10,799	16,199	21,598	7,010	11,437	5,400	8,640	10,800	16,200	21,599	7,010	11,437
		Rate (HHs)	794	1.3	3.4	12.1	22.3	2.5	18.7	40.0	1.3	4.3	14.0	26.2	2.0	2.5	11.0	18.7	40.0	56.9	6.2	20.5	2.5	11.0	18.7	40.0	56.9	6.2	20.5
		Rate (people)		2.0	4.6	17.3	32.0	3.7	26.4	55.8	2.0	6.0	20.0	37.7	3.0	3.7	16.0	26.4	55.8	73.1	8.7	29.1	3.7	16.0	26.4	55.8	73.1	8.7	29.1
	Rural	Line		6,686	8,596	12,894	17,193	5,955	11,910	17,865	6,330	9,229	13,843	18,458	4,869	5,955	9,528	11,910	17,865	23,820	7,731	12,613	5,955	9,529	11,911	17,866	23,822	7,731	12,613
		Rate (HHs)	780	12.0	23.3	48.3	67.0	20.0	61.9	80.4	9.9	27.5	52.0	71.4	12.2	20.0	47.4	61.9	80.4	88.5	34.1	65.0	20.0	47.4	61.9	80.4	88.5	34.1	65.0
		Rate (people)		18.1	32.4	60.5	79.1	28.1	74.1	89.7	15.6	37.4	64.7	82.6	18.7	28.1	58.8	74.1	89.7	94.8	44.5	77.3	28.1	58.8	74.1	89.7	94.8	44.5	77.3
	Overall	Line		6,419	8,253	12,380	16,507	5,718	11,435	17,153	6,078	8,861	13,291	17,721	4,881	5,718	9,148	11,435	17,153	22,870	7,422	12,110	5,718	9,149	11,436	17,154	22,872	7,422	12,110
		Rate (HHs)	1,574	6.8	13.6	30.7	45.2	11.5	40.9	60.7	5.7	16.2	33.5	49.4	7.2	11.5	29.7	40.9	60.7	73.1	20.5	43.4	11.5	29.7	40.9	60.7	73.1	20.5	43.4
		Rate (people)		11.2	20.5	42.0	58.9	17.7	53.7	75.2	9.8	24.0	45.6	63.4	12.0	17.7	40.5	53.7	75.2	85.5	29.2	56.7	17.7	40.5	53.7	75.2	85.5	29.2	56.7
2012/13	Urban	Line		2,33	3.41	5.12	6.82	1.99	3.97	5.96	2.21	3.66	5.49	7.32	2.31	1.39	2.23	2.78	4.17	5.56	1.81	2.95	1.99	3.18	3.97	5.96	7.95	2.58	4.21
		Rate (HHs)	1,184	0.8	4.0	14.0	26.8	1.7	16.1	35.4	0.8	4.9	16.7	29.9	2.2	0.1	2.2	5.8	17.7	31.7	1.1	6.8	1.7	8.8	16.1	35.4	50.0	3.9	18.1
		Rate (people)		1.4	5.9	18.8	36.2	3.0	22.3	46.4	1.3	7.4	22.9	39.5	3.7	0.1	3.6	8.7	24.6	42.4	1.8	10.0	3.0	12.5	22.3	46.4	62.8	6.0	25.1
	Rural	Line		2.24	3.28	4.92	6.56	1.91	3.82	5.73	2.12	3.52	5.28	7.04	2.08	1.34	2.14	2.68	4.01	5.35	1.74	2.83	1.91	3.06	3.82	5.73	7.64	2.48	4.05
		Rate (HHs)	797	4.7	14.0	34.0	51.5	6.7	36.3	59.9	4.2	16.4	38.3	56.2	8.5	2.0	9.3	18.0	40.3	56.4	5.5	20.5	6.7	24.5	36.3	59.9	72.2	14.5	41.0
		Rate (people)		5.4	20.8	46.5	66.7	8.8	49.7	74.2	4.8	23.3	51.4	70.9	11.7	2.2	13.4	25.2	54.2	70.8	6.8	28.2	8.8	34.0	49.7	74.2	84.5	20.5	55.2
	Overall	Line		2.29	3.35	5.03	6.70	1.95	3.90	5.85	2.17	3.60	5.40	7.19	2.20	1.37	2.19	2.73	4.10	5.47	1.77	2.89	1.95	3.12	3.90	5.85	7.81	2.53	4.13
		Rate (HHs)	1,981	2.5	8.3	22.6	37.5	3.9	24.9	46.0	2.3	9.9	26.1	41.3	5.0	0.9	5.3	11.1	27.5	42.4	3.0	12.7	3.9	15.6	24.9	46.0	59.6	8.5	28.0
		Rate (people)		3.3	12.8	31.6	50.3	5.7	34.9	59.3	2.9	14.7	36.1	54.0	7.4	1.1	8.2	16.3	38.3	55.5	4.1	18.4	5.7	22.4	34.9	59.3	72.9	12.7	39.0

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Brong Ahafo): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP					Intl. 2011 PPP									
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,747	2,246	3,369	4,492	1,472	2,945	4,417	1,654	2,411	3,617	4,822	1,711	1,575	2,519	3,149	4,724	6,298	2,044	3,335	1,472	2,356	2,945	4,417	5,890	1,911	3,118
		Rate (HHs)	160	2.5	4.3	17.5	37.9	2.7	25.7	61.1	2.5	5.3	20.5	43.2	3.7	2.7	17.6	29.0	62.4	79.7	11.4	34.8	2.7	15.0	25.7	61.1	78.3	7.7	29.0
		Rate (people)		4.3	7.6	25.9	51.1	4.4	36.4	76.1	4.3	9.2	29.6	55.7	5.0	4.4	25.8	40.6	76.8	91.4	17.6	47.8	4.4	23.0	36.4	76.1	90.5	13.0	40.6
	Rural	Line		1,638	2,106	3,159	4,211	1,380	2,761	4,141	1,551	2,261	3,391	4,521	1,354	1,476	2,362	2,952	4,429	5,905	1,916	3,127	1,380	2,209	2,761	4,141	5,522	1,792	2,924
		Rate (HHs)	380	17.7	35.1	65.0	77.9	24.0	65.4	84.9	14.5	42.3	67.1	80.0	21.1	28.7	60.8	69.4	86.4	94.3	48.6	73.6	24.0	56.4	65.4	84.9	93.5	42.3	68.6
		Rate (people)		24.3	46.5	78.3	89.1	32.7	80.3	94.3	19.8	55.9	80.5	90.4	28.0	40.0	76.8	83.0	95.1	98.1	63.7	86.5	32.7	72.5	80.3	94.3	97.8	56.1	82.5
	Overall	Line		1,668	2,144	3,216	4,288	1,406	2,811	4,217	1,579	2,302	3,453	4,604	1,452	1,503	2,405	3,006	4,510	6,013	1,951	3,184	1,406	2,249	2,811	4,217	5,623	1,825	2,977
		Rate (HHs)	540	13.1	25.7	50.6	65.8	17.5	53.4	77.7	10.9	31.1	52.9	68.9	15.8	20.8	47.7	57.1	79.1	89.9	37.3	61.8	17.5	43.9	53.4	77.7	88.9	31.8	56.6
		Rate (people)		18.8	35.8	63.9	78.7	25.0	68.3	89.3	15.5	43.1	66.6	80.9	21.7	30.2	62.8	71.3	90.1	96.3	51.1	75.9	25.0	59.0	68.3	89.3	95.8	44.3	71.0
2005/6	Urban	Line		6,018	7,737	11,606	15,475	5,360	10,720	16,080	5,698	8,307	12,460	16,613	4,740	5,360	8,576	10,720	16,080	21,440	6,958	11,353	5,360	8,577	10,721	16,081	21,442	6,958	11,353
		Rate (HHs)	300	5.3	13.0	24.0	38.4	9.0	34.2	55.7	4.9	13.8	26.1	42.5	5.5	9.0	21.8	34.2	55.7	74.7	14.7	37.6	9.0	21.8	34.2	55.7	74.7	14.7	37.6
		Rate (people)		8.5	17.4	32.3	48.6	14.8	43.9	65.9	7.6	18.8	34.6	53.0	9.4	14.8	29.7	43.9	65.9	84.6	20.2	47.9	14.8	29.7	43.9	65.9	84.6	20.2	47.9
	Rural	Line		6,371	8,192	12,287	16,383	5,675	11,350	17,024	6,032	8,794	13,192	17,589	4,771	5,675	9,080	11,350	17,024	22,699	7,367	12,020	5,675	9,080	11,350	17,025	22,700	7,367	12,020
		Rate (HHs)	495	12.5	26.0	54.1	70.7	23.0	67.1	83.1	11.3	30.3	57.5	73.9	14.3	23.0	53.8	67.1	83.1	91.1	37.5	69.3	23.0	53.8	67.1	83.1	91.1	37.5	69.3
		Rate (people)		18.9	37.2	68.3	82.2	32.9	80.4	92.9	17.4	43.3	72.0	84.6	21.7	32.9	68.5	80.4	92.9	96.9	51.4	82.5	32.9	68.5	80.4	92.9	96.9	51.4	82.5
	Overall	Line		6,237	8,020	12,029	16,039	5,556	11,111	16,667	5,906	8,610	12,914	17,219	4,760	5,556	8,889	11,111	16,667	22,222	7,212	11,767	5,556	8,889	11,112	16,668	22,224	7,212	11,767
		Rate (HHs)	795	9.6	20.7	41.8	57.5	17.3	53.6	71.9	8.7	23.6	44.6	61.0	10.7	17.3	40.7	53.6	71.9	84.4	28.2	56.3	17.3	40.7	53.6	71.9	84.4	28.2	56.3
		Rate (people)		15.0	29.7	54.6	69.5	26.0	66.5	82.7	13.7	34.0	57.8	72.6	17.0	26.0	53.8	66.5	82.7	92.2	39.6	69.4	26.0	53.8	66.5	82.7	92.2	39.6	69.4
2012/13	Urban	Line		2.27	3.32	4.98	6.64	1.93	3.87	5.80	2.15	3.56	5.35	7.13	2.30	1.35	2.17	2.71	4.06	5.42	1.76	2.87	1.93	3.09	3.87	5.80	7.73	2.51	4.09
		Rate (HHs)	721	1.9	10.4	26.5	42.0	3.6	26.9	49.7	1.3	12.7	29.6	46.7	7.1	0.5	5.9	12.7	31.1	45.8	2.4	15.0	3.6	17.3	26.9	49.7	66.7	9.3	31.7
		Rate (people)		2.2	15.3	35.0	51.7	4.9	35.8	60.8	1.5	18.4	38.8	57.2	10.0	0.5	8.0	18.3	40.2	56.8	2.9	21.8	4.9	24.3	35.8	60.8	77.8	13.9	41.0
	Rural	Line		2.24	3.28	4.91	6.55	1.91	3.82	5.72	2.12	3.52	5.28	7.03	1.89	1.34	2.14	2.67	4.01	5.34	1.73	2.83	1.91	3.05	3.82	5.72	7.63	2.48	4.04
		Rate (HHs)	900	9.6	24.2	48.1	65.4	13.9	49.2	71.9	8.3	28.0	51.6	69.6	13.1	5.4	18.4	31.2	52.2	68.3	10.3	34.0	13.9	37.4	49.2	71.9	81.8	26.8	52.4
		Rate (people)		12.8	32.4	58.9	75.9	19.2	61.3	82.3	11.2	36.3	63.0	79.3	18.2	7.4	24.5	39.5	64.8	79.0	14.3	42.9	19.2	47.1	61.3	82.3	90.1	34.9	64.9
	Overall	Line		2.25	3.30	4.94	6.59	1.92	3.84	5.76	2.13	3.54	5.31	7.08	2.08	1.34	2.15	2.69	4.03	5.38	1.75	2.85	1.92	3.07	3.84	5.76	7.68	2.49	4.07
		Rate (HHs)	1,621	5.6	17.0	36.9	53.2	8.5	37.6	60.3	4.7	20.0	40.2	57.7	10.0	2.9	11.9	21.6	41.2	56.6	6.2	24.1	8.5	27.0	37.6	60.3	74.0	17.7	41.6
		Rate (people)		7.8	24.3	47.6	64.5	12.4	49.2	72.1	6.6	27.9	51.5	68.9	14.3	4.2	16.7	29.5	53.2	68.5	8.9	32.9	12.4	36.3	49.2	72.1	84.3	25.0	53.6

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Northern): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half <Nat'l. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP				Intl. 2011 PPP		Intl. 2005 PPP			Intl. 2011 PPP					
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,751	2,251	3,377	4,502	1,476	2,951	4,427	1,658	2,417	3,625	4,834	1,121	1,578	2,525	3,156	4,735	6,313	2,049	3,343	1,476	2,361	2,952	4,427	5,903	1,916	3,126
		Rate (HHs)	100	30.8	40.0	62.0	84.4	33.1	70.3	86.2	27.6	45.5	67.3	87.7	21.7	34.0	58.2	74.0	87.4	93.3	47.4	75.2	33.1	56.8	70.3	86.2	93.3	45.4	74.0
		Rate (people)		33.6	46.5	69.1	89.2	39.7	78.7	91.8	31.3	51.6	73.6	92.1	25.8	41.0	67.8	81.5	92.1	98.2	55.3	83.0	39.7	67.2	78.7	91.8	98.2	54.3	81.5
	Rural	Line		1,579	2,030	3,046	4,061	1,331	2,662	3,993	1,495	2,180	3,270	4,360	807	1,424	2,278	2,847	4,271	5,694	1,848	3,015	1,331	2,130	2,662	3,993	5,325	1,728	2,819
		Rate (HHs)	260	54.7	65.9	82.8	88.7	59.7	86.1	92.5	51.2	70.7	84.9	89.8	32.4	61.9	82.2	86.8	93.9	97.9	78.2	87.7	59.7	79.6	86.1	92.5	97.3	75.5	86.8
		Rate (people)		62.2	73.8	89.2	92.6	68.0	91.0	95.8	59.1	77.5	90.3	93.3	38.8	70.4	88.9	91.8	96.6	98.9	84.4	92.5	68.0	85.8	91.0	95.8	98.5	82.1	91.8
	Overall	Line		1,608	2,068	3,101	4,135	1,355	2,711	4,066	1,523	2,220	3,330	4,440	860	1,450	2,319	2,899	4,349	5,798	1,882	3,070	1,356	2,169	2,711	4,067	5,422	1,760	2,871
		Rate (HHs)	360	50.4	61.2	79.0	87.9	54.8	83.2	91.4	46.9	66.1	81.7	89.4	30.4	56.8	77.9	84.5	92.7	97.1	72.6	85.4	54.8	75.4	83.2	91.4	96.6	70.0	84.5
		Rate (people)		57.4	69.2	85.8	92.0	63.2	89.0	95.1	54.4	73.2	87.5	93.1	36.6	65.5	85.3	90.0	95.8	98.7	79.5	90.9	63.2	82.7	89.0	95.1	98.4	77.5	90.0
2005/6	Urban	Line		5,919	7,610	11,414	15,219	5,272	10,543	15,815	5,604	8,169	12,254	16,339	3,997	5,272	8,434	10,543	15,815	21,086	6,843	11,166	5,272	8,435	10,544	15,816	21,087	6,843	11,166
		Rate (HHs)	210	13.0	19.6	42.8	60.6	15.6	51.6	76.0	12.4	22.7	46.2	63.9	10.9	15.6	42.7	51.6	76.0	88.6	28.1	57.2	15.6	42.7	51.6	76.0	88.6	28.1	57.2
		Rate (people)		19.3	27.3	52.6	69.7	23.5	61.0	83.7	17.8	32.2	56.3	72.6	16.1	23.5	51.5	61.0	83.7	94.4	37.0	66.8	23.5	51.5	61.0	83.7	94.4	37.0	66.8
	Rural	Line		6,216	7,993	11,989	15,985	5,537	11,074	16,611	5,886	8,581	12,871	17,162	3,643	5,537	8,859	11,074	16,611	22,148	7,188	11,728	5,537	8,860	11,075	16,612	22,149	7,188	11,728
		Rate (HHs)	585	36.0	49.1	67.4	78.5	45.8	75.3	87.1	32.9	51.9	70.0	80.1	24.8	45.8	66.5	75.3	87.1	92.0	57.7	77.6	45.8	66.5	75.3	87.1	92.0	57.7	77.6
		Rate (people)		43.9	58.5	77.4	87.0	55.9	84.8	93.6	40.8	61.7	80.1	88.8	30.8	55.9	77.2	84.8	93.6	96.6	68.2	87.0	55.9	77.2	84.8	93.6	96.6	68.2	87.0
	Overall	Line		6,156	7,915	11,872	15,830	5,483	10,966	16,449	5,828	8,497	12,746	16,995	3,715	5,483	8,773	10,966	16,449	21,932	7,118	11,614	5,483	8,773	10,967	16,450	21,934	7,118	11,614
		Rate (HHs)	795	30.5	42.0	61.4	74.2	38.5	69.6	84.5	27.9	44.9	64.3	76.2	21.5	38.5	60.7	69.6	84.5	91.2	50.6	72.6	38.5	60.7	69.6	84.5	91.2	50.6	72.6
		Rate (people)		38.9	52.2	72.4	83.5	49.4	80.0	91.6	36.1	55.7	75.3	85.5	27.9	49.4	71.9	80.0	91.6	96.1	61.9	82.9	49.4	71.9	80.0	91.6	96.1	61.9	82.9
2012/13	Urban	Line		2,27	3,31	4,97	6,63	1,93	3,86	5,79	2,15	3,56	5,34	7,12	2,04	1,35	2,16	2,70	4,06	5,41	1,76	2,86	1,93	3,09	3,86	5,79	7,72	2,51	4,09
		Rate (HHs)	508	5.5	16.8	39.3	56.6	8.4	41.6	65.4	4.1	19.9	43.6	62.8	9.9	2.3	11.8	22.7	44.8	62.4	5.0	25.3	8.4	28.6	41.6	65.4	79.5	17.7	44.9
		Rate (people)		7.1	22.6	50.9	69.0	11.2	55.4	77.3	5.3	27.0	56.1	74.3	13.5	2.7	15.2	32.2	58.6	73.8	6.8	35.4	11.2	39.1	55.4	77.3	89.5	24.0	58.6
	Rural	Line		2,23	3,26	4,89	6,52	1,90	3,80	5,69	2,11	3,50	5,25	7,00	1,54	1,33	2,13	2,66	3,99	5,32	1,73	2,82	1,90	3,04	3,80	5,69	7,59	2,46	4,02
		Rate (HHs)	1,194	26.5	47.0	69.2	81.5	34.6	70.5	86.1	24.1	51.2	73.4	83.9	23.3	17.5	42.4	52.9	72.7	84.0	30.0	55.7	34.6	58.1	70.5	86.1	91.9	48.7	73.5
		Rate (people)		33.3	56.9	77.5	87.4	43.9	79.4	91.3	31.0	61.1	81.4	89.3	30.6	24.1	52.1	63.9	81.4	90.0	38.3	66.6	43.9	68.8	79.4	91.3	95.0	59.2	81.9
	Overall	Line		2,24	3,28	4,92	6,55	1,91	3,82	5,72	2,12	3,52	5,28	7,04	1,70	1,34	2,14	2,67	4,01	5,35	1,73	2,83	1,91	3,05	3,82	5,73	7,63	2,48	4,04
		Rate (HHs)	1,702	18.4	35.4	57.7	71.9	24.5	59.4	78.2	16.4	39.1	61.9	75.8	18.1	11.7	30.6	41.3	62.0	75.7	20.3	44.0	24.5	46.7	59.4	78.2	87.2	36.7	62.5
		Rate (people)		24.9	45.9	69.0	81.5	33.5	71.7	86.8	22.8	50.2	73.3	84.5	25.1	17.2	40.3	53.8	74.1	84.8	28.3	56.6	33.5	59.3	71.7	86.8	93.2	47.9	74.4

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS) . Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 2 (Upper East): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines						Intl. 2005 PPP				National lines				Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines					
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%	200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP							
																\$1.25	\$2.00		\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90
1998/9	Urban	Line		1,743	2,241	3,362	4,482	1,469	2,938	4,407	1,650	2,406	3,609	4,812	1,583	1,571	2,514	3,142	4,714	6,285	2,040	3,328	1,469	2,351	2,939	4,408	5,877	1,907	3,112
		Rate (HHs)	20	20.0	45.0	85.0	90.0	25.0	85.0	95.0	15.0	55.0	90.0	90.0	27.5	25.0	85.0	90.0	95.0	95.0	60.0	90.0	25.0	70.0	85.0	95.0	95.0	60.0	90.0
		Rate (people)		26.2	60.2	91.3	96.1	32.0	91.3	99.0	20.4	68.9	96.1	96.1	34.5	32.0	91.3	96.1	99.0	99.0	73.8	96.1	32.0	81.6	91.3	99.0	99.0	73.8	96.1
	Rural	Line		1,574	2,024	3,036	4,049	1,327	2,654	3,981	1,491	2,173	3,260	4,347	652	1,419	2,271	2,838	4,258	5,677	1,842	3,006	1,327	2,123	2,654	3,981	5,308	1,723	2,811
		Rate (HHs)	100	76.6	87.9	96.9	97.2	80.5	96.6	99.4	75.6	89.7	97.2	99.0	38.4	85.6	95.9	97.2	99.4	100.0	93.5	97.2	80.5	93.5	96.6	99.4	100.0	92.9	97.2
		Rate (people)		87.1	94.5	99.5	99.6	90.1	99.5	99.9	86.5	95.9	99.6	99.8	47.9	93.8	99.3	99.6	99.9	100.0	98.4	99.6	90.1	98.4	99.5	99.9	100.0	98.2	99.6
	Overall	Line		1,627	2,091	3,137	4,182	1,371	2,742	4,113	1,540	2,245	3,368	4,490	940	1,466	2,346	2,932	4,398	5,864	1,903	3,105	1,371	2,194	2,742	4,113	5,484	1,780	2,904
		Rate (HHs)	120	56.3	72.4	92.6	94.6	60.5	92.4	97.8	53.8	77.2	94.6	95.8	34.5	63.8	92.0	94.6	97.8	98.2	81.4	94.6	60.5	85.0	92.4	97.8	98.2	81.0	94.6
		Rate (people)		68.3	83.9	96.9	98.5	72.2	96.9	99.6	66.1	87.6	98.5	98.7	43.8	74.8	96.8	98.5	99.6	99.7	90.8	98.5	72.2	93.2	96.9	99.6	99.7	90.7	98.5
2005/6	Urban	Line		6,092	7,833	11,749	15,665	5,426	10,852	16,278	5,768	8,409	12,614	16,818	4,709	5,426	8,682	10,852	16,278	21,705	7,044	11,493	5,426	8,682	10,853	16,279	21,706	7,044	11,493
		Rate (HHs)	75	19.7	36.2	54.4	68.2	31.3	61.7	82.2	15.5	41.4	57.8	73.3	17.2	31.3	54.7	61.7	82.2	94.9	43.2	64.3	31.3	54.7	61.7	82.2	94.9	43.2	64.3
		Rate (people)		26.8	42.2	59.8	75.1	36.4	67.1	87.0	20.8	46.8	63.5	79.6	23.4	36.4	61.2	67.1	87.0	97.6	48.9	69.5	36.4	61.2	67.1	87.0	97.6	48.9	69.5
	Rural	Line		6,242	8,025	12,038	16,050	5,559	11,119	16,678	5,910	8,616	12,924	17,231	3,138	5,559	8,895	11,119	16,678	22,238	7,217	11,776	5,560	8,896	11,120	16,680	22,239	7,217	11,776
		Rate (HHs)	525	55.8	67.9	84.6	92.2	63.5	90.5	94.9	53.5	70.6	86.5	93.4	32.6	63.5	82.7	90.5	94.9	97.6	76.2	91.5	63.5	82.7	90.5	94.9	97.6	76.2	91.5
		Rate (people)		63.5	73.7	88.1	93.7	70.6	92.8	96.6	61.1	75.9	89.8	95.6	37.9	70.6	87.2	92.8	96.6	98.3	80.5	93.5	70.6	87.2	92.8	96.6	98.3	80.5	93.5
	Overall	Line		6,226	8,005	12,008	16,011	5,546	11,092	16,637	5,895	8,594	12,892	17,189	3,300	5,546	8,873	11,092	16,637	22,183	7,199	11,746	5,546	8,874	11,092	16,638	22,184	7,199	11,746
		Rate (HHs)	600	51.8	64.4	81.3	89.5	59.9	87.3	93.5	49.3	67.4	83.3	91.2	30.9	59.9	79.6	87.3	93.5	97.3	72.6	88.4	59.9	79.6	87.3	93.5	97.3	72.6	88.4
		Rate (people)		59.8	70.5	85.2	91.8	67.1	90.1	95.6	56.9	72.9	87.1	93.9	36.4	67.1	84.6	90.1	95.6	98.3	77.2	91.0	67.1	84.6	90.1	95.6	98.3	77.2	91.0
2012/13	Urban	Line		2.17	3.18	4.76	6.35	1.85	3.70	5.55	2.06	3.41	5.11	6.82	1.96	1.30	2.07	2.59	3.89	5.18	1.68	2.74	1.85	2.96	3.70	5.55	7.40	2.40	3.92
		Rate (HHs)	302	6.2	16.3	36.2	54.2	6.7	35.7	63.7	5.2	18.9	38.4	60.3	8.6	2.8	10.8	20.2	37.5	58.7	6.1	23.7	6.7	26.2	35.7	63.7	78.3	15.7	37.5
		Rate (people)		6.9	20.3	43.7	63.7	9.0	45.2	73.4	5.5	23.2	47.3	69.7	11.6	3.0	13.2	24.2	47.6	68.7	7.8	28.4	9.0	31.1	45.2	73.4	85.0	18.7	47.6
	Rural	Line		2.15	3.15	4.72	6.30	1.83	3.67	5.50	2.04	3.38	5.07	6.76	1.48	1.28	2.06	2.57	3.85	5.14	1.67	2.72	1.83	2.94	3.67	5.50	7.34	2.38	3.89
		Rate (HHs)	1,145	23.0	38.9	59.2	71.6	27.6	60.2	78.7	20.7	42.6	63.1	74.9	20.3	15.8	32.2	43.2	62.5	75.8	22.7	46.9	27.6	50.7	60.2	78.7	86.5	39.9	63.5
		Rate (people)		27.9	45.9	67.3	80.6	33.2	68.9	86.8	25.5	49.9	71.5	83.2	25.0	20.0	37.8	50.6	71.4	84.4	27.4	54.3	33.2	58.8	68.9	86.8	93.7	46.9	72.5
	Overall	Line		2.16	3.16	4.73	6.31	1.84	3.68	5.51	2.04	3.39	5.08	6.78	1.58	1.29	2.06	2.57	3.86	5.15	1.67	2.73	1.84	2.94	3.68	5.51	7.35	2.39	3.89
		Rate (HHs)	1,447	19.3	33.9	54.1	67.7	23.0	54.8	75.4	17.3	37.4	57.6	71.7	17.7	12.9	27.5	38.1	57.0	72.0	19.1	41.8	23.0	45.3	54.8	75.4	84.7	34.6	57.8
		Rate (people)		23.5	40.4	62.3	77.0	28.1	63.9	83.9	21.3	44.3	66.4	80.4	22.1	16.4	32.6	45.0	66.4	81.1	23.3	48.8	28.1	52.9	63.9	83.9	91.9	40.9	67.3

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages.

Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.



**Figure 2 (Upper West): All poverty lines and rates (old and new definitions) by urban, rural, and all, for 1998/9, 2005/6, and 2012/13**

Year	Urban or rural	Line or rate for households or people	n	Old-definition poverty										New-definition poverty															
				National lines				Intl. 2005 PPP			National lines			Poorest half < Natl. line	Deflated by change in CPI					Deflated by change in national poverty lines									
				Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	Food	100%	150%		200%	Intl. 2005 PPP		Intl. 2011 PPP			Intl. 2005 PPP		Intl. 2011 PPP						
				\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50		\$3.75	\$5.00	\$1.90	\$3.10	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10				
1998/9	Urban	Line		1,773	2,279	3,419	4,559	1,494	2,988	4,483	1,678	2,447	3,671	4,894	1,213	1,598	2,557	3,196	4,794	6,392	2,074	3,385	1,494	2,391	2,989	4,483	5,977	1,940	3,165
		Rate (HHs)	20	25.0	30.0	65.0	85.0	25.0	65.0	90.0	25.0	30.0	70.0	90.0	16.0	30.0	65.0	70.0	90.0	95.0	45.0	75.0	25.0	55.0	65.0	90.0	95.0	40.0	70.0
		Rate (people)		37.6	44.4	80.3	93.2	37.6	80.3	96.6	37.6	44.4	81.2	96.6	22.2	44.4	80.3	83.8	96.6	99.1	63.2	88.9	37.6	72.6	80.3	96.6	99.1	56.4	83.8
	Rural	Line		1,548	1,990	2,985	3,980	1,305	2,609	3,914	1,465	2,137	3,205	4,273	672	1,395	2,232	2,790	4,186	5,581	1,811	2,955	1,305	2,087	2,609	3,914	5,219	1,694	2,763
		Rate (HHs)	240	79.3	89.6	95.7	97.7	84.8	97.0	98.9	77.0	90.4	96.5	98.2	41.2	87.4	95.7	97.0	98.9	99.6	92.1	97.0	84.8	95.1	97.0	98.9	99.6	91.2	97.0
		Rate (people)		85.3	94.1	97.9	99.0	89.9	98.5	99.7	83.1	94.5	98.3	99.6	47.3	91.8	97.9	98.5	99.7	99.9	95.4	98.5	89.9	97.7	98.5	99.7	99.9	94.9	98.5
	Overall	Line		1,575	2,025	3,037	4,050	1,327	2,655	3,982	1,491	2,174	3,261	4,348	737	1,420	2,271	2,839	4,259	5,678	1,843	3,007	1,327	2,124	2,655	3,982	5,310	1,723	2,812
		Rate (HHs)	260	73.7	83.4	92.5	96.3	78.6	93.7	98.0	71.6	84.2	93.8	97.4	38.6	81.4	92.5	94.2	98.0	99.1	87.2	94.7	78.6	90.9	93.7	98.0	99.1	85.9	94.2
		Rate (people)		79.6	88.2	95.8	98.3	83.6	96.3	99.3	77.6	88.5	96.3	99.2	44.3	86.1	95.8	96.7	99.3	99.8	91.6	97.3	83.6	94.6	96.3	99.3	99.8	90.3	96.7
2005/6	Urban	Line		5,867	7,543	11,314	15,086	5,225	10,451	15,676	5,554	8,098	12,147	16,196	2,479	5,225	8,360	10,451	15,676	20,901	6,783	11,068	5,226	8,361	10,451	15,677	20,902	6,783	11,068
		Rate (HHs)	45	42.1	50.2	56.9	58.3	45.0	56.9	62.9	39.8	50.2	56.9	58.3	23.3	45.0	55.4	56.9	62.9	76.4	50.2	58.3	45.0	55.4	56.9	62.9	76.4	50.2	58.3
		Rate (people)		40.1	49.7	59.5	61.3	44.2	59.5	67.2	39.6	49.7	59.5	61.3	24.9	44.2	58.1	59.5	67.2	78.5	54.4	61.3	44.2	58.1	59.5	67.2	78.5	54.4	61.3
	Rural	Line		6,235	8,017	12,025	16,033	5,553	11,107	16,660	5,903	8,606	12,910	17,213	2,509	5,553	8,886	11,107	16,660	22,214	7,209	11,763	5,554	8,886	11,108	16,661	22,215	7,209	11,763
		Rate (HHs)	464	78.1	87.2	96.0	98.7	84.3	98.2	99.4	76.2	88.7	96.5	98.7	42.2	84.3	95.0	98.2	99.4	99.6	91.0	98.5	84.3	95.0	98.2	99.4	99.6	91.0	98.5
		Rate (people)		81.8	90.5	98.1	99.6	88.3	99.4	99.9	78.5	91.8	98.5	99.6	45.9	88.3	97.7	99.4	99.9	99.9	94.9	99.5	88.3	97.7	99.4	99.9	99.9	94.9	99.5
	Overall	Line		6,211	7,986	11,979	15,972	5,532	11,065	16,597	5,881	8,574	12,860	17,147	2,507	5,532	8,852	11,065	16,597	22,129	7,182	11,718	5,533	8,852	11,065	16,598	22,130	7,182	11,718
		Rate (HHs)	509	75.1	84.1	92.7	95.3	81.0	94.8	96.3	73.2	85.4	93.2	95.3	40.6	81.0	91.7	94.8	96.3	97.7	87.6	95.1	81.0	91.7	94.8	96.3	97.7	87.6	95.1
		Rate (people)		79.1	87.9	95.6	97.1	85.4	96.8	97.8	76.0	89.1	95.9	97.1	44.6	85.4	95.1	96.8	97.8	98.6	92.3	97.0	85.4	95.1	96.8	97.8	98.6	92.3	97.0
2012/13	Urban	Line		2.21	3.23	4.85	6.46	1.88	3.76	5.65	2.09	3.47	5.20	6.94	1.99	1.32	2.11	2.64	3.95	5.27	1.71	2.79	1.88	3.01	3.76	5.65	7.53	2.44	3.99
		Rate (HHs)	226	5.2	11.2	30.6	45.5	5.7	32.0	51.4	3.7	13.8	32.6	48.3	6.5	2.1	6.6	13.9	34.4	47.0	5.4	17.0	5.7	20.7	32.0	51.4	63.1	12.1	35.3
		Rate (people)		7.6	16.5	43.3	57.5	9.3	44.0	65.1	6.0	21.5	46.2	60.8	10.7	2.8	11.1	21.1	47.0	60.4	8.6	25.3	9.3	30.2	44.0	65.1	77.5	18.6	47.6
	Rural	Line		2.21	3.24	4.86	6.48	1.89	3.77	5.66	2.10	3.48	5.22	6.96	1.31	1.32	2.11	2.64	3.96	5.28	1.72	2.80	1.89	3.02	3.77	5.66	7.55	2.45	4.00
		Rate (HHs)	1,173	49.2	70.0	84.3	90.8	55.3	84.2	91.6	45.9	73.2	85.5	91.9	35.1	35.4	61.3	72.2	85.5	90.9	50.0	74.4	55.3	78.6	84.2	91.6	94.1	69.5	85.5
		Rate (people)		56.9	77.8	89.5	94.1	64.5	89.7	94.9	52.8	80.3	90.3	95.1	40.2	40.7	70.4	79.8	90.5	94.5	57.7	81.7	64.5	85.1	89.7	94.9	96.4	77.6	90.5
	Overall	Line		2.21	3.24	4.86	6.48	1.89	3.77	5.66	2.10	3.48	5.21	6.95	1.43	1.32	2.11	2.64	3.96	5.28	1.71	2.80	1.89	3.02	3.77	5.66	7.54	2.45	3.99
		Rate (HHs)	1,399	39.8	57.5	72.9	81.2	44.8	73.2	83.1	36.9	60.6	74.3	82.7	29.0	28.3	49.7	59.9	74.7	81.6	40.6	62.2	44.8	66.3	73.2	83.1	87.5	57.3	74.9
		Rate (people)		48.8	67.8	81.9	88.1	55.5	82.3	90.0	45.1	70.7	83.1	89.5	35.3	34.5	60.7	70.2	83.4	88.9	49.7	72.5	55.5	76.1	82.3	90.0	93.3	67.9	83.5

National lines (and the line marking the poorest half of people below the national line) are per-day and per-adult-equivalent. International 2005 PPP lines are per-day and per-person. Poverty rates are in percentages. Poverty lines are in second Cedis (GHC) in prices of Greater Accra in January 1999 (1998/9 GLSS) and January 2006 (2005/6 GLSS). Poverty lines for 2012/13 are in third Cedis (GHS) in prices of Greater Accra in January 2013.

**Figure 3: Poverty indicators by uncertainty coefficient**

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
15,435	What is the main fuel used by the household for cooking? (None, or no cooking; Wood, crop residue, sawdust, animal waste, or other; Charcoal, or kerosene; Gas, or electricity)
12,458	What is the main source of drinking water supply for this household? (Rainwater, river/stream, dugout/pond/lake/dam, or other; Borehole/pump/tubewell; Well (protected or unprotected), or spring (protected or unprotected); Public tap/standpipe; Pipe-borne outside dwelling but from house of neighbor; Pipe-borne outside dwelling but on compound; Pipe-borne inside dwelling; Sachet water, bottled water, or tanker supply/vendor provided)
11,488	How many members does the household have? (Eight or more; Seven; Six; Five; Four; Three; Two; One)
11,475	Does the household own a working fan? (No; Yes)
11,075	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, how many household members were skilled workers in agriculture and fishing or worked in elementary occupations? (Four or more; Three; Two; One; None)
10,888	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, how many household members were skilled workers in agriculture and fishing? (Three or more; Two; One; None)
10,793	How many household members are 18-years-old or younger? (Five or more; Four; Three; Two; One; None)
10,759	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, how many household members were in agriculture (whether self-employed or as contributing family workers)? (Four or more; Three; Two; One; None)
10,432	How many household members are 17-years-old or younger? (Five or more; Four; Three; Two; One; None)
10,364	Does the household own a working electric iron? (No; Yes)
10,279	Does any household member own a working television, video player, VCD/DVD/MP3/MP4 player/iPod, or satellite dish? (No; Only television; Video player, VCD/DVD/MP3/MP4 player/ iPod, or satellite dish (regardless of T.V.))

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
10,217	How many household members are 16-years-old or younger? (Five or more; Four; Three; Two; One; None)
9,853	What is the highest grade that the male head/spouse has completed? (None; Pre-school, or P1 to P6; No male head/spouse; JSS1/JHS1 to JSS3/JHS3; M1 to M4; SSS1/SHS1 to SSS4/SHS4, S1 to S5, L6, U6, voc./technical/computer/comm./agric., teacher training, nursing, polytechnic, university, other tertiary, or other)
9,721	What is the main construction material used for the outer wall? (Mud bricks/earth, wood, bamboo, metal sheet/slate/asbestos, palm leaves/thatch (grass/raffia), or other; Cement/concrete blocks, landcrete, stone, or burnt bricks)
9,625	Does the household own a working stove (kerosene, electric, or gas)? (No; Yes)
9,443	How many household members are 15-years-old or younger? (Four or more; Three; Two; One; None)
9,424	Does the household own a working refrigerator or freezer? (No; Yes)
9,419	Does the household own a working television? (No; Yes)
9,147	How many household members are 14-years-old or younger? (Four or more; Three; Two; One; None)
9,051	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any draught animals (e.g., donkey, horse, or bullock) or cattle (including calves)? (Someone farms etc., and someone owns draught animals or cattle; Someone farms etc., but no one owns any draught animals or cattle; No one farms etc. (regardless of draught animals or cattle))
9,029	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any pigs? (Someone farms etc., and someone owns pigs; Someone farms etc., but no one owns any pigs; No one farms etc. (regardless of pigs))

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
9,008	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any draught animals (e.g., donkey, horse, or bullock), cattle (including calves), sheep, goats, or pigs? (Someone farms etc., and someone owns draught animals, cattle, sheep, goats, or pigs; Someone farms etc., but no one owns any draught animals, cattle, sheep, goats, or pigs; No one farms etc. (regardless of draught animals, cattle, sheep, goats, or pigs))
9,001	What type of toilet facility is usually used by the household? (No toilet facility (bush, beach), or other; Pit latrine, or bucket/pan; Public toilet (e.g., W.C., KVIP, pit pan); KVIP, or W.C.)
8,972	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any cattle (including calves)? (Someone farms etc., and someone owns cattle; Someone farms etc., but no one owns any cattle; No one farms etc. (regardless of cattle))
8,972	What is the main source of lighting for your dwelling? (Flashlight/torch, kerosene lamp, gas lamp, solar energy, candle, firewood, crop residue, or other; Electricity (mains or private generator))
8,938	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any goats? (Someone farms etc., and someone owns goats; Someone farms etc., but no one owns any goats; No one farms etc. (regardless of goats))
8,914	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any sheep, goats, or pigs? (Someone farms etc., and someone owns sheep, goats, or pigs; Someone farms etc., but no one owns any sheep, goats, or pigs; No one farms etc. (regardless of sheep, goats, or pigs))
8,817	What is the highest grade that the female head/spouse has completed? (No female head/spouse; None, or never attended; Pre-school/kindergarten, or P1 to P6; JSS1/JHS1 to JSS3/JHS3; M1 to M4; SSS1/SHS1 to SHS4, S1 to S5, L6, U6. voc./technical/computer/comm./Agric., teacher training, nursing, polytechnic, university, other tertiary, or other)
8,689	How many household members are 13-years-old or younger? (Four or more; Three; Two; One; None)

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
8,635	How many household members are 12-years-old or younger? (Four or more; Three; Two; One; None)
8,587	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any draught animals (e.g., donkey, horse, or bullock)? (Someone farms etc., and someone owns draught animals; Someone farms etc., but no one owns any draught animals; No one farms etc. (regardless of draught animals))
8,451	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? If yes, then does the household own any sheep? (Someone farms etc., and someone owns sheep; Someone farms etc., but no one owns any sheep; No one farms etc. (regardless of sheep))
8,279	During the past 12 months, did any member of the household own and/or operate a farm, keep livestock, or engage in fishing? (Yes; No)
8,187	How many household members are 11-years-old or younger? (Four or more; Three; Two; One; None)
8,148	Are all household members ages 5 to 14 currently in school? (No; Yes; No one ages 5 to 14)
8,119	Are all household members ages 5 to 12 currently in school? (No; Yes; No one ages 5 to 12)
7,993	Are all household members ages 5 to 13 currently in school? (No; Yes; No one ages 5 to 13)
7,971	Can the male head/spouse read a phrase/sentence in English? (No; No male head/spouse; Yes)
7,921	During the last 7 days, what were the main tasks and duties in the job in which the male head/spouse spent most of his time on? That is, describe the main job/task the male head/spouse was performing, e.g., carrying bricks, mixing baking flour, harvesting maize, etc. (Skilled workers in agriculture and fishing; Does not work; No male head/spouse; Plant and machine operators and assemblers; Elementary occupations; Craft and related trades workers; Service workers and shop and market salesworkers; Armed forces, legislators, senior officials and managers, professionals, technicians and associated professionals, or clerks)
7,878	Are all household members ages 5 to 11 currently in school? (No; Yes; No one ages 5 to 11)
7,860	Are all household members ages 5 to 17 currently in school? (No; Yes; No one ages 5 to 17)

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
7,778	Are all household members ages 5 to 15 currently in school? (No; Yes; No one ages 5 to 15)
7,716	Does any household member own a working box iron or electric iron? (No; Yes))
7,691	In the last 7 days, what was the status of the male head/spouse in his main job in which he worked for pay, profit, family gain, or produced something for barter or home use? (Agricultural self-employed (with or without employees), or agricultural contributing family worker; Does not work; No male head/spouse; Non-agricultural self-employed (with or without employees), non-agricultural contributing family worker, apprentice, casual worker, or other; Paid employee, or domestic employee (househelp))
7,606	Are all household members ages 5 to 16 currently in school? (No; Yes; No one ages 5 to 16)
7,527	During the last 7 days, what were the main tasks and duties in the job in which the female head/spouse spent most of her time on? That is, describe the main job/task the female head/spouse was performing, e.g., carrying bricks, mixing baking flour, harvesting maize, etc. (Skilled workers in agriculture and fishing; Does not work; Plant and machine operators and assemblers; Elementary occupations; Craft and related trades workers; Service workers and shop and market salesworkers; No female head/spouse; Armed forces, legislators, senior officials and managers, professionals, technicians and associated professionals, or clerks)
7,434	In the last 7 days, what was the status of the female head/spouse in her main job in which she worked for pay, profit, family gain, or produced something for barter or home use? (No female head/spouse; Agricultural self-employed (with or without employees); Does not work; Casual worker, or other; Agricultural contributing family worker; Non-agricultural self-employed, without employees, non-agricultural contributing family worker, or apprentice; Paid employee, domestic employee (househelp), or non-agricultural self-employed, with employees)
7,396	Are all household members ages 5 to 18 currently in school? (No; Yes; No one ages 5 to 18)
7,199	Can the female head/spouse read a phrase/sentence in English? (No; Yes; No female head/spouse)

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
7,115	Does the household own a working video player or VCD/DVD/MP3/Mp4 player/iPod? (No; Yes)
6,972	How does your household store drinking water? (Pot/earthenware vessel; Metal container; Plastic container/bucket; Other)
6,751	How many household members did any work for pay, profit, or family gain, or produced something for barter or home use during the last 7 days, even if it was for only one hour? (Four or more; Three; Two; One; None)
6,220	How does your household dispose of refuse? (Dumped indiscriminately; Burned by household; Public dump; Collected)
5,215	Does any household member own a working radio, radio cassette, record player, and/or 3-in-1 radio system/home theatre? (None; Only radio; Radio cassette but no CD player nor 3-in-one radio system/home theatre (regardless of radio); CD player but no 3-in-one radio system/home theatre (regardless of radio or radio cassette); 3-in-one radio system/home theatre (regardless of radio, radio cassette, or CD player))
5,021	In what type of dwelling does the household live? (Huts/buildings (same or different compound), tents, other; Semi-detached house; Compound house; Separate house (bungalow); Flat/apartment, living quarters attached to office/shop, improvised home (kiosk, container), or uncompleted building)
4,912	What is the present holding/tenancy arrangement of the dwelling? (Owning, perching, or squatting; Rent-free; Renting)
4,858	How many household members are 15-years-old or younger? (Two or more; One; None)
4,364	Does the household own a working rice cooker? (No; Yes)
4,264	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, how many household members were paid employees or worked in non-agriculture (whether as self-employed workers, as contributing family workers, as domestic workers, or as apprentices)? (None; One; Two or more)

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
4,195	How many working mobile phones are owned by members of the household? (None; One; Two; Three or more)
4,191	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, how many household members were something other than skilled workers in agriculture and fishing and did not work in elementary occupations? (None; One; Two)
4,171	Does the household own any working furniture? (No; Yes)
4,133	Does the household own a working food processor/blender? (No; Yes)
3,578	Does the household own a working 3-in-1 radio system/home theatre? (No; Yes)
3,436	What is the main material used for the roof? (Palm leaves/raffia/thatch, mud bricks/earth, bamboo, or other; Wood, or metal sheet; Concrete blocks/concrete, or slate/asbestos, or roofing tiles)
3,429	Does any member of the household own a fixed-line and/or mobile telephone? (No; Yes)
2,905	Does any member of the household own a personal computer (e.g., laptops, desktops/notebooks, etc.)? (No; Yes)
2,901	Does the household own a working desktop or laptop computer? (No; Yes)
2,848	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, were any household members paid employees? (No; Yes)
2,823	How many rooms that the household occupies are used for sleeping? (One; Two; Three or more)
2,794	What is the present marital status of the female head/spouse? (Married; Consensual union; Widowed; Separated, or divorced; No female head/spouse; Never married)
2,682	Does the household own a working electric kettle? (No; Yes)
2,543	Does the household own a working bicycle, motorcycle, or car? (None; Only bicycle; Motorcycle or car (regardless of bicycle))
2,435	Is the female head/spouse currently registered or covered with a health-insurance scheme? (No; Registered; Covered; No female head/spouse)



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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
2,203	What is the structure of household headship? (Both male and female heads/spouses; Female head/spouse only; Male head/spouse only)
2,053	What is the main construction material used for the floor? (Earth/mud; Wood, stone, burnt bricks, cement/concrete, vinyl tiles, ceramic/porcelain/granite/marble tiles, terrazzo/terrazzo tiles, or other)
1,859	What is the present marital status of the male head/spouse? (Married, or widowed; Consensual union; No male head/spouse; Separated, or divorced; Never married)
1,719	Does the household own any jewelry? (No; Yes)
1,704	Does the household own any working microwave? (No; Yes)
1,678	Does the household own a working satellite dish? (No; Yes)
1,661	How many rooms does the household occupy? (One; Two; Three; Four or more)
1,651	Does the household own a working bicycle? (Yes; No)
1,523	Is any household member currently in a private school (whether religious or non-religious)? (No; Yes)
1,491	Does any household member own a working bicycle or motor cycle? (None; Only bicycle; Motor cycle (regardless of bicycle))
1,425	Did the female head/spouse do any work for pay, profit, or family gain, or did she produce anything for barter or home use during the last 7 days, even if it was for only one hour? (Yes; No; No female head/spouse)
1,377	In the last 7 days in their main job in which they worked for pay, profit, family gain, or produced something for barter or home use, were the male or female head/spouse self-employed in non-agriculture? (No; Yes)
1,142	Does the household own a working CD player? (No; Yes)
1,117	Does the household own a working car? (No; Yes)
1,035	What is the area of the dwelling in square meters? (15 or less; >16 to 20; >21 to 25; >25 to 30; >30 to 35; >35 to 40; >40 to 50; More than 50)

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

<u>Uncertainty coefficient</u>	<u>Indicator (Responses ordered starting with those linked with higher poverty likelihoods)</u>
1,016	How many household members are currently registered or covered with a health-insurance scheme? (None; One; Two; Three; Four; Five)
749	Is the male head/spouse currently registered or covered with a health-insurance scheme? (No; Registered; Covered; No male head/spouse)
680	Does the household own a sprayer machine? (No; Yes)
631	Does the household own a working radio cassette? (No; Yes)
447	Does the household own any tractors, ploughs, trailers/carts, or other animal-drawn or tractor-drawn equipment now? (No; Yes)
341	Did the male head/spouse do any work for pay, profit, or family gain, or did he produce anything for barter or home use during the last 7 days, even if it was for only one hour? (No; Yes; No male head/spouse)
295	Does the household own a working sewing machine? (No; Yes)
171	Does the household own a working radio? (No; Yes)
132	Does the household own a working generator? (No; Yes)
1	Does the household own a working box iron? (No; Yes)
0	Does the household own a working motor cycle? (No; Yes)

Source: 2012/13 GLSS questionnaire and 100% of the new-definition national poverty line

**Figures for  
100% of the New-Definition National Poverty Line  
  
(and Figures Pertaining  
to Multiple Poverty Lines  
across All Definitions of *Poverty*)**

**Figure 4 (100% of the new-definition national line):  
 Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	91.4
5-9	91.4
10-14	75.9
15-19	66.8
20-24	63.8
25-29	53.3
30-34	40.2
35-39	29.0
40-44	19.6
45-49	11.7
50-54	7.2
55-59	4.3
60-64	2.2
65-69	1.1
70-74	0.8
75-79	0.3
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 5 (100% of the new-definition national line):  
Derivation of estimated poverty likelihoods  
associated with scores**

Score	Households in range and < poverty line		All households in range		Poverty likelihood (%)
0-4	0	÷	0	=	91.4
5-9	311	÷	341	=	91.4
10-14	719	÷	947	=	75.9
15-19	1,265	÷	1,895	=	66.8
20-24	2,212	÷	3,467	=	63.8
25-29	2,446	÷	4,587	=	53.3
30-34	2,592	÷	6,447	=	40.2
35-39	2,320	÷	8,013	=	29.0
40-44	1,870	÷	9,538	=	19.6
45-49	1,077	÷	9,168	=	11.7
50-54	688	÷	9,538	=	7.2
55-59	395	÷	9,223	=	4.3
60-64	181	÷	8,135	=	2.2
65-69	88	÷	8,193	=	1.1
70-74	63	÷	7,692	=	0.8
75-79	17	÷	5,819	=	0.3
80-84	0	÷	4,519	=	0.0
85-89	0	÷	1,621	=	0.0
90-94	0	÷	742	=	0.0
95-100	0	÷	113	=	0.0

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

**Figure 6 (New-definition national poverty lines, with the line that marks the poorest half of people below 100% of the national poverty line): Probability that a given household's daily per-adult-equivalent or per-person consumption falls in a range demarcated by two adjacent new-definition poverty lines in the 2012/13 GLSS**

Likelihood (%) that daily per-adult-equivalent or per-capita consumption is in a range demarcated by adjacent new-definition national poverty lines						
	<Food	≥Food and <Poorest half	≥Poorest half and <100% Natl.	≥100% Natl. and <150% Natl.	≥150% Natl. and <200% Natl.	≥200% Natl.
	<GHS2.16	≥GHS2.16 and <GHS1.99	≥GHS1.99 and <GHS3.58	≥GHS3.58 and <GHS5.36	≥GHS5.36 and <GHS7.15	≥GHS7.15
Score						
0-4	70.1	4.4	16.8	7.7	0.9	0.0
5-9	70.1	4.4	16.8	7.7	0.9	0.0
10-14	46.1	7.2	22.6	13.4	8.4	2.3
15-19	34.6	6.7	25.5	20.1	9.5	3.6
20-24	26.2	6.7	30.9	22.2	7.7	6.3
25-29	18.9	9.5	24.9	26.8	12.2	7.6
30-34	13.1	8.2	18.9	30.9	12.9	16.0
35-39	6.9	3.8	18.3	29.2	18.3	23.6
40-44	4.4	3.4	11.8	25.7	23.8	30.8
45-49	1.4	2.6	7.8	23.5	23.6	41.2
50-54	0.9	1.1	5.2	18.3	21.7	52.7
55-59	0.9	0.8	2.5	13.4	18.1	64.3
60-64	0.2	0.5	1.5	8.3	15.9	73.5
65-69	0.0	0.2	0.9	6.3	13.8	78.8
70-74	0.0	0.1	0.7	3.8	8.7	86.7
75-79	0.0	0.0	0.3	1.1	5.2	93.5
80-84	0.0	0.0	0.0	0.6	0.5	98.9
85-89	0.0	0.0	0.0	0.2	0.2	99.6
90-94	0.0	0.0	0.0	0.0	0.0	100.0
95-100	0.0	0.0	0.0	0.0	0.0	100.0

Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

National poverty lines are per-adult-equivalent.

The line marking the poorest half of people below 100% of the national poverty line is per-person.

Some poverty lines are out-of-order because, for a given value,

per-person lines lead to higher poverty likelihoods than per-adult-equivalent lines.

**Figure 6 (New-definition international 2005 PPP poverty lines, deflated by Ghana's CPI): Probability that a given household's daily per-person consumption falls in a range demarcated by two adjacent new-definition poverty lines in the 2012/13 GLSS**

Score	Likelihood (%) that daily per-person consumption is in a range demarcated by adjacent new-definition international 2005 PPP poverty lines					
	<\$1.25/day	≥\$1.25/day and <\$2.00/day	≥\$2.00/day and <\$2.50/day	≥\$2.50/day and <\$3.75/day	≥\$3.75/day and <\$5.00/day	≥\$5.00/day
	<GHS1.36	≥GHS1.36 and <GHS2.17	≥GHS2.17 and <GHS2.72	≥GHS2.72 and <GHS4.08	≥GHS4.08 and <GHS5.43	≥GHS5.43
0-4	54.1	31.8	5.6	6.4	2.1	0.0
5-9	54.1	31.8	5.6	6.4	2.1	0.0
10-14	38.2	27.7	12.2	16.9	2.7	2.3
15-19	24.5	30.6	16.4	19.7	4.7	4.1
20-24	19.5	29.5	17.9	20.0	6.8	6.2
25-29	12.1	26.4	18.6	24.7	11.0	7.3
30-34	7.2	19.9	14.1	30.1	12.9	15.7
35-39	3.7	12.5	15.2	27.5	18.5	22.6
40-44	2.5	9.1	9.0	25.2	25.7	28.5
45-49	0.6	4.6	7.5	23.6	23.2	40.4
50-54	0.4	2.1	4.4	18.3	19.9	54.9
55-59	0.3	1.9	3.0	12.5	19.1	63.3
60-64	0.0	1.0	1.2	8.8	15.0	74.1
65-69	0.0	0.2	0.5	5.7	11.4	82.1
70-74	0.0	0.1	0.5	3.7	7.4	88.3
75-79	0.0	0.0	0.0	1.6	4.7	93.8
80-84	0.0	0.0	0.0	0.7	0.6	98.7
85-89	0.0	0.0	0.0	0.2	0.2	99.6
90-94	0.0	0.0	0.0	0.0	0.0	100.0
95-100	0.0	0.0	0.0	0.0	0.0	100.0

Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

International 2005 PPP poverty lines are per-person.

The price deflator is the change in Ghana's Consumer Price Index.

**Figure 6 (New-definition international 2005 PPP poverty lines, deflated by the change in Ghana's national poverty line): Probability that a given household's daily per-person consumption falls in a range demarcated by two adjacent new-definition poverty lines in the 2012/13 GLSS**

Score	Likelihood (%) that daily per-person consumption is in a range demarcated by adjacent new-definition international 2005 PPP poverty lines					
		≥\$1.25/day	≥\$2.00/day	≥\$2.50/day	≥\$3.75/day	≥\$5.00/day
	<\$1.25/day	and	and	and	and	
		<\$2.00/day	<\$2.50/day	<\$3.75/day	<\$5.00/day	
	≥GHS1.94	≥GHS3.10	≥GHS3.88	≥GHS5.82	≥GHS7.76	
	and	and	and	and		
	<GHS1.94	<GHS3.10	<GHS3.88	<GHS5.82	<GHS7.76	
0-4	83.9	12.8	1.2	2.1	0.0	0.0
5-9	83.9	12.8	1.2	2.1	0.0	0.0
10-14	59.6	24.9	9.0	4.4	1.4	0.6
15-19	47.3	31.4	9.5	8.2	2.5	1.1
20-24	39.4	35.6	11.1	10.1	2.5	1.3
25-29	31.1	34.9	13.4	15.0	2.9	2.7
30-34	20.3	30.7	18.3	18.1	7.8	4.6
35-39	10.6	29.3	15.1	24.7	10.5	9.8
40-44	7.8	19.7	14.5	32.5	11.1	14.3
45-49	3.5	15.3	12.4	33.0	15.4	20.3
50-54	1.5	11.1	9.9	26.9	18.7	31.8
55-59	1.5	5.5	8.4	26.2	18.6	39.7
60-64	0.7	3.3	4.9	22.4	20.8	47.9
65-69	0.1	1.8	3.6	16.8	20.1	57.4
70-74	0.1	1.7	2.0	11.8	16.5	68.1
75-79	0.0	0.3	0.5	6.9	10.6	81.7
80-84	0.0	0.1	0.4	1.7	4.7	93.1
85-89	0.0	0.0	0.2	0.5	3.7	95.6
90-94	0.0	0.0	0.0	0.2	1.0	98.8
95-100	0.0	0.0	0.0	0.0	0.0	100.0

Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

International 2005 PPP poverty lines are per-person.

The price deflator is the change in Ghana's national poverty line.



**Figure 6 (Old-definition poverty lines): Probability that a given household's daily per-adult-equivalent or per-person consumption falls in a range demarcated by adjacent old-definition poverty lines in the 2012/13 GLSS**

Likelihood (%) that daily per-adult-equivalent or per-person consumption is in a range demarcated by adjacent old-definition poverty lines								
	<Food	≥Food and <\$1.25/day	≥\$1.25/day and <100% Natl.	≥100% Natl. and <150% Natl.	≥150% Natl. and <\$2.50/day	≥\$2.50/day and <200% Natl.	≥200% Natl. and <\$3.75/day	≥\$3.75/day
	<GHS2.28	≥GHS2.28 and <GHS1.94	≥GHS1.94 and <GHS3.33	≥GHS3.33 and <GHS5.00	≥GHS5.00 and <GHS3.88	≥GHS3.88 and <GHS6.66	≥GHS6.66 and <GHS5.82	≥GHS5.82
Score								
0-4	70.4	13.5	5.1	9.0	0.0	1.1	0.9	0.0
5-9	70.4	13.5	5.1	9.0	0.0	1.1	0.9	0.0
10-14	50.7	8.9	14.9	13.7	5.4	2.8	1.6	2.1
15-19	38.4	9.0	15.0	23.2	2.7	6.0	2.3	3.6
20-24	31.0	8.4	19.3	26.2	1.2	5.7	4.4	3.7
25-29	21.5	9.6	16.9	27.9	3.6	9.7	5.2	5.6
30-34	15.1	5.3	13.6	31.6	3.9	12.5	5.6	12.5
35-39	8.1	2.5	13.6	29.5	1.2	19.0	5.7	20.4
40-44	5.4	2.4	8.7	22.7	2.8	23.2	9.3	25.5
45-49	2.2	1.4	6.6	20.8	0.4	22.1	10.9	35.7
50-54	1.3	0.2	3.4	16.1	1.5	18.3	8.6	50.6
55-59	1.2	0.3	2.1	10.9	1.0	15.0	11.2	58.3
60-64	0.4	0.3	1.0	6.8	0.5	13.7	8.7	68.7
65-69	0.1	0.0	0.6	4.2	0.7	9.8	7.0	77.6
70-74	0.1	0.0	0.7	2.9	0.0	6.0	5.7	84.5
75-79	0.0	0.0	0.2	0.7	-0.1	3.8	3.1	92.3
80-84	0.0	0.0	0.0	0.2	0.3	0.7	1.0	97.8
85-89	0.0	0.0	0.0	0.0	0.2	0.2	0.2	99.3
90-94	0.0	0.0	0.0	0.0	0.0	0.0	0.2	99.8
95-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

Poverty lines in third Cedis (GHS) for prices in Greater Accra in January 2013.

National poverty lines are per-adult-equivalent.

International 2005 PPP poverty lines are per-person.

Poverty lines are out-of-order because, for a given value, per-person lines lead to higher poverty likelihoods than per-adult-equivalent lines.

**Figure 7 (100% of the new-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+5.7	7.9	9.3	12.9
10-14	-4.2	6.1	7.2	9.6
15-19	-5.2	5.9	7.0	8.9
20-24	+5.6	3.9	4.6	5.7
25-29	+16.6	3.4	4.0	5.2
30-34	+3.1	3.4	4.0	5.4
35-39	+6.2	2.0	2.4	3.1
40-44	-1.3	2.5	2.9	3.9
45-49	+1.8	1.4	1.6	2.1
50-54	+2.1	0.9	1.1	1.3
55-59	+1.2	1.0	1.2	1.6
60-64	-0.2	0.8	0.9	1.2
65-69	-3.2	2.4	2.6	2.9
70-74	+0.5	0.2	0.2	0.3
75-79	+0.2	0.1	0.1	0.1
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (100% of the new-definition national line):**  
**Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.4	60.3	70.8	80.5
4	+1.1	24.6	33.3	49.8
8	+1.7	16.1	21.9	33.6
16	+1.4	12.5	15.1	22.3
32	+1.5	9.0	11.0	15.3
64	+1.3	6.8	8.2	10.3
128	+1.2	4.9	5.9	7.9
256	+1.3	3.4	4.0	5.5
512	+1.2	2.4	3.0	3.7
1,024	+1.2	1.7	2.0	2.8
2,048	+1.2	1.2	1.5	1.9
4,096	+1.2	0.8	1.0	1.4
8,192	+1.2	0.6	0.7	1.0
16,384	+1.1	0.4	0.5	0.7

**Figure 9 (New-definition national poverty lines and the line that marks the poorest half of people below 100% of the national poverty line): Average differences between estimates and true values for poverty rates of a group of households at a point in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to the 2012/13 validation sample**

	Poverty line				
	<u>National poverty lines</u>				Poorest half below 100% Natl.
	Food	100%	150%	200%	
Estimate minus true value	+0.1	+1.1	+0.8	+1.2	+0.3
Precision of difference	0.3	0.4	0.6	0.7	0.3
$\alpha$ factor for precision	0.91	0.89	1.04	1.10	0.91

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

Precision is measured as 90-percent confidence intervals in units of  $\pm$  percentage points.

Differences and precision estimated from 1,000 bootstraps with  $n = 16,384$ .

$\alpha$  is estimated from 1,000 bootstrap samples of  $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .

**Figure 9 (New-definition international 2005 PPP poverty lines, deflated by Ghana’s CPI): Average differences between estimates and true values for poverty rates of a group of households at a point in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to the 2012/13 validation sample**

	Poverty lines deflated with CPI						
	Intl. 2005 PPP					Intl. 2011 PPP	
	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10
Estimate minus true value	+0.6	+0.6	+0.1	+0.6	+0.5	+0.1	+0.4
Precision of difference	0.1	0.3	0.5	0.6	0.7	0.3	0.5
$\alpha$ factor for precision	0.52	0.83	0.98	0.98	1.12	0.87	0.99

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

Precision is measured as 90-percent confidence intervals in units of  $\pm$  percentage points.

Differences and precision estimated from 1,000 bootstraps with  $n = 16,384$ .

$\alpha$  is estimated from 1,000 bootstrap samples of  $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .

**Figure 9 (New-definition international 2005 PPP poverty lines, deflated by the change in Ghana’s national poverty line): Average differences between estimates and true values for poverty rates of a group of households at a point in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to the 2012/13 validation sample**

	Poverty lines deflated with change in national line						
	Intl. 2005 PPP				Intl. 2011 PPP		
	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	\$1.90	\$3.10
Estimate minus true value	+0.2	-0.1	+0.4	+0.8	+1.2	+1.1	+0.3
Precision of difference	0.3	0.5	0.6	0.7	0.7	0.4	0.6
$\alpha$ factor for precision	0.84	1.00	0.99	1.10	1.10	0.87	0.99

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

Precision is measured as 90-percent confidence intervals in units of  $\pm$  percentage points.

Differences and precision estimated from 1,000 bootstraps with  $n = 16,384$ .

$\alpha$  is estimated from 1,000 bootstrap samples of  $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .

**Figure 9 (Old-definition poverty lines): Average differences between estimates and true values for poverty rates of a group of households at a point in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to the 2012/13 validation sample**

	Poverty line						
	Food	National			International 2005 PPP		
		100%	150%	200%	\$1.25	\$2.50	\$3.75
Estimate minus true value	+0.3	+0.7	+0.1	+1.1	+0.2	+0.4	+0.8
Precision of difference	0.3	0.4	0.6	0.7	0.3	0.6	0.7
$\alpha$ factor for precision	0.68	0.82	0.98	1.07	0.64	0.91	1.17

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

Precision is measured as 90-percent confidence intervals in units of  $\pm$  percentage points.

Differences 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  $16,384$ .

**Figure 10 (New-definition national poverty lines and the line that marks the poorest half of people below 100% of the new-definition national poverty line): Average differences between estimates and true values for changes in poverty rates of a group of households between two points in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to pairs of the 2012/13 validation sample, all the 2005/6 data, and all the 1998/9 data**

	Poverty line					
	National poverty lines				Poorest half	
	Food	100%	150%	200%	below 100% Natl.	
<b>Estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	+1.5	+6.5	+8.9	+7.4	+4.7	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	-4.8	-2.0	+2.1	+4.2	+1.5	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	-6.2	-8.5	-6.8	-3.2	-3.3	
<b>Precision of estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	0.4	0.6	0.8	0.9	0.5	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	0.5	0.7	0.9	1.0	0.6	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	0.6	0.7	0.8	0.9	0.6	
<b><math>\alpha</math> factor for precision of estimated change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	1.00	0.92	0.95	1.03	0.95	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	1.29	1.05	1.02	1.06	1.17	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	1.02	0.96	0.91	0.96	1.08	
Differences between estimates of changes and true changes are displayed in units of percentage points.						
Precision is measured as 90-percent confidence intervals in units of $\pm$ percentage points.						
Differences 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.						



**Figure 10 (New-definition international 2005 PPP poverty lines, deflated by Ghana's CPI): Average differences between estimates and true values for changes in poverty rates of a group of households between two points in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to pairs of the 2012/13 validation sample, all the 2005/6 data, and all the 1998/9 data**

	Poverty line					
	International 2005 PPP lines					
	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	
<b>Estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	-7.8	-14.8	-16.9	-18.9	-15.3	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	-17.3	-24.1	-21.9	-19.6	-15.0	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	-9.6	-9.2	-5.0	-0.7	+0.3	
<b>Precision of estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	0.4	0.7	0.7	0.8	0.9	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	0.6	0.7	0.8	0.8	0.8	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	0.7	0.8	0.8	0.8	0.7	
<b><math>\alpha</math> factor for precision of estimated change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	1.31	1.12	1.08	0.94	0.95	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	1.86	1.27	1.15	0.95	0.94	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	1.05	0.97	0.91	0.90	0.93	
Differences between estimates of changes and true changes are displayed in units of percentage points.						
Precision is measured as 90-percent confidence intervals in units of $\pm$ percentage points.						
Differences and precision estimated from 1,000 bootstraps with $n = 16,384$ .						
$\alpha$ is estimated from 1,000 bootstrap samples of $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .						

**Figure 10 (New-definition international 2005 PPP poverty lines, deflated by the change in Ghana’s national poverty line): Average differences between estimates and true values for changes in poverty rates of a group of households between two points in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to pairs of the 2012/13 validation sample, all the 2005/6 data, and all the 1998/9 data**

	Poverty line					
	International 2005 PPP lines					
	\$1.25	\$2.00	\$2.50	\$3.75	\$5.00	
<b>Estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	+0.5	+1.2	-0.1	-0.2	-1.4	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	-5.1	-2.9	-1.2	+1.6	+1.2	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	-5.6	-4.2	-1.1	+1.8	+2.6	
<b>Precision of estimated change minus true change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	0.5	0.8	0.8	0.9	0.8	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	0.6	0.8	0.9	1.0	0.9	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	0.6	0.8	0.8	0.8	0.8	
<b><math>\alpha</math> factor for precision of estimated change</b>						
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	0.80	0.88	0.89	1.00	1.06	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	0.98	0.96	0.97	1.09	1.09	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	0.98	0.96	0.92	0.94	1.00	
Differences between estimates of changes and true changes are displayed in units of percentage points.						
Precision is measured as 90-percent confidence intervals in units of $\pm$ percentage points.						
Differences and precision estimated from 1,000 bootstraps with $n = 16,384$ .						
$\alpha$ is estimated from 1,000 bootstrap samples of $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .						

**Figure 10 (Old-definition poverty lines): Average differences between estimates and true values for changes in poverty rates of a group of households between two points in time, precision, and the  $\alpha$  factor for precision, 2012/13 scorecard applied to pairs of the 2012/13 validation sample, all the 2005/6 data, and all the 1998/9 data**

	Poverty line							
	National poverty lines				International 2005 PPP			
	Food	100%	150%	200%	\$1.25	\$2.50	\$3.75	
<b>Estimated change minus true change</b>								
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	+1.8	+6.1	+9.4	+7.8	+0.5	-0.1	-0.2	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	-5.2	-1.3	+2.2	+3.7	-5.1	-1.2	+1.6	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	-7.0	-7.4	-7.2	-4.1	-5.6	-1.1	+1.7	
<b>Precision of estimated change minus true change</b>								
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	0.5	0.6	0.8	0.9	0.5	0.8	0.9	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	0.6	0.7	0.8	0.9	0.6	0.9	1.0	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	0.6	0.7	0.9	0.8	0.6	0.8	0.8	
<b><math>\alpha</math> factor for precision of estimated change</b>								
2012/13 scorecard applied to 2012/13 validation sample and all of 2005/6	1.01	0.95	0.97	1.01	0.99	0.96	0.97	
2012/13 scorecard applied to 2012/13 validation sample and all of 1998/9	1.26	1.08	1.03	1.05	1.22	1.04	1.06	
2012/13 scorecard applied to all of 2005/6 and all of 1998/9	1.05	0.99	0.96	0.92	0.98	0.92	0.94	
Differences between estimates of changes and true changes are displayed in units of percentage points.								
Precision is measured as 90-percent confidence intervals in units of $\pm$ percentage points.								
Differences and precision estimated from 1,000 bootstraps with $n = 16,384$ .								
$\alpha$ is estimated from 1,000 bootstrap samples of $n = 256, 512, 1,024, 2,048, 4,096, 8,192, \text{ and } 16,384$ .								

**Figure 11 (All poverty lines): Possible targeting outcomes**

		<u>Targeting segment</u>	
		<u>Targeted</u>	<u>Non-targeted</u>
<u>True poverty status</u>	<u>Below poverty line</u>	<b><u>Inclusion</u></b> Below poverty line correctly targeted	<b><u>Undercoverage</u></b> Below poverty line mistakenly non-targeted
	<u>Above poverty line</u>	<b><u>Leakage</u></b> Above poverty line mistakenly targeted	<b><u>Exclusion</u></b> Above poverty line correctly non-targeted

**Figure 12 (100% of the new-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	16.3	0.0	83.7	83.7	-100.0
≤9	0.3	16.0	0.1	83.7	84.0	-96.2
≤14	1.1	15.2	0.2	83.5	84.6	-85.5
≤19	2.5	13.7	0.7	83.1	85.6	-64.9
≤24	4.6	11.6	2.0	81.7	86.4	-30.5
≤29	6.7	9.6	4.6	79.2	85.9	+10.2
≤34	9.3	6.9	8.3	75.4	84.7	+48.7
≤39	11.6	4.6	14.1	69.7	81.3	+13.4
≤44	13.6	2.6	21.6	62.1	75.7	-33.0
≤49	14.7	1.5	29.7	54.1	68.8	-82.5
≤54	15.5	0.8	38.5	45.3	60.7	-136.7
≤59	15.8	0.5	47.4	36.4	52.1	-191.5
≤64	16.0	0.3	55.3	28.5	44.5	-240.2
≤69	16.2	0.1	63.3	20.4	36.6	-289.5
≤74	16.2	0.0	70.9	12.8	29.0	-336.5
≤79	16.3	0.0	76.8	7.0	23.2	-372.2
≤84	16.3	0.0	81.3	2.5	18.7	-400.0
≤89	16.3	0.0	82.9	0.9	17.1	-410.0
≤94	16.3	0.0	83.6	0.1	16.4	-414.5
≤100	16.3	0.0	83.7	0.0	16.3	-415.2

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

**Figure 13 (100% of the new-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	91.4	0.0	10.6:1
≤9	0.3	83.0	1.7	4.9:1
≤14	1.3	82.5	6.5	4.7:1
≤19	3.2	79.1	15.5	3.8:1
≤24	6.7	69.8	28.6	2.3:1
≤29	11.2	59.5	41.1	1.5:1
≤34	17.7	52.8	57.5	1.1:1
≤39	25.7	45.3	71.5	0.8:1
≤44	35.2	38.7	83.8	0.6:1
≤49	44.4	33.2	90.7	0.5:1
≤54	53.9	28.7	95.1	0.4:1
≤59	63.2	25.0	97.1	0.3:1
≤64	71.3	22.4	98.5	0.3:1
≤69	79.5	20.4	99.6	0.3:1
≤74	87.2	18.6	99.9	0.2:1
≤79	93.0	17.5	100.0	0.2:1
≤84	97.5	16.7	100.0	0.2:1
≤89	99.1	16.4	100.0	0.2:1
≤94	99.9	16.3	100.0	0.2:1
≤100	100.0	16.3	100.0	0.2:1

**Tables for  
the New-Definition Food Poverty Line**

**Figure 4 (New-definition food line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	70.1
5-9	70.1
10-14	46.1
15-19	34.6
20-24	26.2
25-29	18.9
30-34	13.1
35-39	6.9
40-44	4.4
45-49	1.4
50-54	0.9
55-59	0.9
60-64	0.2
65-69	0.0
70-74	0.0
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0



**Figure 7 (New-definition food line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+19.8	11.9	13.9	18.6
10-14	+6.4	7.8	9.4	11.8
15-19	+8.2	4.6	5.4	7.5
20-24	+4.3	3.2	3.9	4.9
25-29	+8.5	1.8	2.1	2.8
30-34	+4.6	1.3	1.6	2.0
35-39	+0.1	1.2	1.4	1.8
40-44	-3.7	2.9	3.1	3.8
45-49	-2.7	1.9	2.1	2.4
50-54	+0.5	0.2	0.3	0.3
55-59	-0.9	0.9	1.1	1.4
60-64	-0.2	0.3	0.4	0.5
65-69	0.0	0.0	0.0	0.1
70-74	0.0	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition food line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.7	42.2	53.6	65.8
4	+0.1	14.2	18.0	36.7
8	+0.2	9.1	12.2	23.0
16	+0.2	6.7	10.3	16.0
32	+0.2	5.4	7.3	10.9
64	+0.2	4.0	5.0	7.2
128	+0.2	2.9	3.5	4.7
256	+0.2	2.1	2.4	3.2
512	+0.2	1.5	1.7	2.3
1,024	+0.1	1.1	1.2	1.8
2,048	+0.1	0.7	0.8	1.1
4,096	+0.1	0.5	0.6	0.8
8,192	+0.1	0.4	0.5	0.6
16,384	+0.1	0.3	0.3	0.4

**Figure 12 (New-definition food line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	5.5	0.0	94.5	94.5	-100.0
≤9	0.2	5.3	0.2	94.3	94.5	-90.6
≤14	0.6	4.9	0.6	93.8	94.5	-65.0
≤19	1.3	4.2	1.9	92.6	93.8	-19.2
≤24	2.2	3.3	4.5	90.0	92.2	+18.9
≤29	2.9	2.6	8.3	86.2	89.1	-50.7
≤34	3.8	1.7	13.9	80.6	84.4	-152.2
≤39	4.5	1.0	21.2	73.3	77.8	-285.0
≤44	5.0	0.5	30.3	64.2	69.2	-449.3
≤49	5.3	0.2	39.1	55.4	60.7	-609.6
≤54	5.4	0.1	48.6	45.9	51.3	-781.2
≤59	5.5	0.0	57.7	36.8	42.3	-947.0
≤64	5.5	0.0	65.8	28.7	34.2	-1,094.0
≤69	5.5	0.0	74.0	20.5	26.0	-1,242.5
≤74	5.5	0.0	81.7	12.8	18.3	-1,382.0
≤79	5.5	0.0	87.5	7.0	12.5	-1,487.6
≤84	5.5	0.0	92.0	2.5	8.0	-1,569.6
≤89	5.5	0.0	93.6	0.9	6.4	-1,599.0
≤94	5.5	0.0	94.4	0.1	5.6	-1,612.5
≤100	5.5	0.0	94.5	0.0	5.5	-1,614.6

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

**Figure 13 (New-definition food line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	70.1	0.0	2.3:1
≤9	0.3	52.5	3.2	1.1:1
≤14	1.3	49.8	11.6	1.0:1
≤19	3.2	39.9	23.1	0.7:1
≤24	6.7	32.8	39.6	0.5:1
≤29	11.2	26.1	53.2	0.4:1
≤34	17.7	21.4	68.7	0.3:1
≤39	25.7	17.4	81.3	0.2:1
≤44	35.2	14.1	90.1	0.2:1
≤49	44.4	11.9	96.1	0.1:1
≤54	53.9	10.0	97.6	0.1:1
≤59	63.2	8.7	99.2	0.1:1
≤64	71.3	7.7	99.8	0.1:1
≤69	79.5	6.9	99.9	0.1:1
≤74	87.2	6.3	100.0	0.1:1
≤79	93.0	5.9	100.0	0.1:1
≤84	97.5	5.7	100.0	0.1:1
≤89	99.1	5.6	100.0	0.1:1
≤94	99.9	5.5	100.0	0.1:1
≤100	100.0	5.5	100.0	0.1:1

**Tables for  
150% of the New-Definition National Poverty Line**

**Figure 4 (150% of the new-definition national line):  
 Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	99.1
5-9	99.1
10-14	89.3
15-19	86.9
20-24	86.0
25-29	80.1
30-34	71.1
35-39	58.1
40-44	45.3
45-49	35.2
50-54	25.6
55-59	17.7
60-64	10.6
65-69	7.4
70-74	4.6
75-79	1.4
80-84	0.6
85-89	0.2
90-94	0.0
95-100	0.0

**Figure 7 (150% of the new-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+0.7	2.1	2.6	3.5
10-14	-3.9	3.6	4.0	5.4
15-19	-6.3	4.2	4.4	4.8
20-24	+5.6	3.2	3.8	4.9
25-29	+8.9	3.6	4.4	5.7
30-34	+12.9	3.6	4.4	5.6
35-39	+0.8	2.8	3.4	4.4
40-44	-0.5	2.8	3.3	4.1
45-49	-0.2	2.7	3.2	4.1
50-54	+5.6	1.9	2.4	3.0
55-59	-4.2	3.2	3.5	3.9
60-64	+2.2	1.2	1.5	1.9
65-69	-1.8	1.9	2.2	2.9
70-74	-2.2	1.9	2.1	2.3
75-79	-0.8	0.9	1.0	1.3
80-84	+0.1	0.4	0.5	0.7
85-89	+0.2	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (150% of the new-definition national line):**  
**Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.6	66.3	76.7	89.3
4	+0.4	34.4	42.4	59.2
8	+0.9	26.4	31.3	40.1
16	+1.1	19.8	24.8	31.9
32	+1.2	14.0	16.7	21.1
64	+1.1	10.0	12.1	15.6
128	+0.9	7.0	8.3	10.6
256	+0.9	5.1	5.9	7.5
512	+0.9	3.4	4.1	5.6
1,024	+0.9	2.4	2.7	3.6
2,048	+0.9	1.7	2.0	2.8
4,096	+0.9	1.2	1.4	1.9
8,192	+0.8	0.9	1.0	1.4
16,384	+0.8	0.6	0.7	0.9



**Figure 12 (150% of the new-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	33.1	0.0	66.9	66.9	-100.0
≤9	0.3	32.8	0.0	66.9	67.2	-98.0
≤14	1.2	31.9	0.1	66.8	68.0	-92.4
≤19	2.9	30.2	0.2	66.6	69.6	-81.6
≤24	5.8	27.3	0.9	66.0	71.8	-62.3
≤29	9.3	23.8	2.0	64.9	74.3	-37.7
≤34	13.7	19.5	4.1	62.8	76.5	-5.2
≤39	18.5	14.6	7.5	59.4	77.9	+34.7
≤44	23.0	10.1	12.5	54.4	77.4	+62.2
≤49	26.4	6.7	18.3	48.6	75.0	+44.8
≤54	29.0	4.1	25.6	41.3	70.2	+22.6
≤59	30.8	2.3	33.0	33.8	64.7	+0.2
≤64	31.7	1.4	40.1	26.7	58.5	-21.3
≤69	32.5	0.6	47.2	19.7	52.2	-42.6
≤74	32.9	0.2	54.6	12.3	45.2	-65.0
≤79	33.1	0.0	61.2	5.6	38.7	-85.0
≤84	33.1	0.0	64.7	2.2	35.3	-95.4
≤89	33.1	0.0	66.5	0.4	33.5	-100.9
≤94	33.1	0.0	66.8	0.1	33.2	-101.8
≤100	33.1	0.0	66.9	0.0	33.1	-102.0

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

**Figure 13 (150% of the new-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	99.1	0.0	108.4:1
≤9	0.3	97.8	1.0	43.9:1
≤14	1.3	94.1	3.7	16.0:1
≤19	3.2	92.2	8.9	11.9:1
≤24	6.7	87.4	17.6	6.9:1
≤29	11.2	83.1	28.2	4.9:1
≤34	17.7	77.1	41.2	3.4:1
≤39	25.7	71.7	55.6	2.5:1
≤44	35.2	65.0	69.1	1.9:1
≤49	44.4	59.3	79.6	1.5:1
≤54	53.9	53.4	87.0	1.1:1
≤59	63.2	48.7	92.9	0.9:1
≤64	71.3	44.5	95.9	0.8:1
≤69	79.5	40.8	98.1	0.7:1
≤74	87.2	37.8	99.5	0.6:1
≤79	93.0	35.6	99.9	0.6:1
≤84	97.5	34.0	100.0	0.5:1
≤89	99.1	33.4	100.0	0.5:1
≤94	99.9	33.1	100.0	0.5:1
≤100	100.0	33.1	100.0	0.5:1

**Tables for  
200% of the New-Definition National Poverty Line**

**Figure 4 (200% of the new-definition national line):  
 Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	100.0
5-9	100.0
10-14	97.7
15-19	96.4
20-24	93.7
25-29	92.4
30-34	84.0
35-39	76.4
40-44	69.2
45-49	58.8
50-54	47.3
55-59	35.7
60-64	26.5
65-69	21.2
70-74	13.3
75-79	6.5
80-84	1.1
85-89	0.4
90-94	0.0
95-100	0.0

**Figure 7 (200% of the new-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+0.1	0.2	0.3	0.4
10-14	-2.3	1.1	1.1	1.1
15-19	-0.8	1.4	1.7	2.2
20-24	+4.1	2.5	3.1	3.9
25-29	+0.7	1.9	2.2	3.0
30-34	-3.7	2.8	3.0	3.4
35-39	+2.2	2.6	3.1	4.2
40-44	+6.9	2.9	3.5	4.6
45-49	+5.3	2.9	3.5	4.4
50-54	-2.0	2.8	3.4	4.7
55-59	-6.7	4.7	5.0	5.5
60-64	+5.2	2.2	2.5	3.2
65-69	+3.9	2.2	2.8	3.7
70-74	-0.8	2.0	2.4	3.0
75-79	+2.8	1.0	1.1	1.5
80-84	-0.2	0.6	0.7	0.9
85-89	+0.4	0.1	0.1	0.1
90-94	-0.1	0.2	0.2	0.3
95-100	0.0	0.0	0.0	0.0

**Figure 8 (200% of the new-definition national line):**

**Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.9	66.7	75.0	90.2
4	+1.2	36.8	44.4	53.8
8	+1.2	28.2	33.6	44.7
16	+1.6	21.2	26.0	32.5
32	+1.3	15.6	18.1	22.8
64	+1.3	10.6	12.6	16.6
128	+1.2	7.9	8.9	13.0
256	+1.2	5.5	6.5	8.8
512	+1.2	3.9	4.7	6.2
1,024	+1.1	2.8	3.2	4.3
2,048	+1.2	2.0	2.4	3.1
4,096	+1.2	1.3	1.6	2.2
8,192	+1.2	1.0	1.1	1.5
16,384	+1.2	0.7	0.8	1.1

**Figure 12 (200% of the new-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	47.5	0.0	52.5	52.5	-100.0
≤9	0.3	47.2	0.0	52.5	52.8	-98.6
≤14	1.3	46.2	0.0	52.5	53.8	-94.6
≤19	3.1	44.4	0.1	52.4	55.5	-86.7
≤24	6.3	41.2	0.4	52.1	58.4	-72.8
≤29	10.5	37.0	0.7	51.7	62.2	-54.3
≤34	16.0	31.5	1.7	50.8	66.8	-29.1
≤39	22.1	25.4	3.6	48.9	71.0	+0.6
≤44	28.5	19.1	6.8	45.7	74.2	+34.0
≤49	33.9	13.7	10.5	41.9	75.8	+64.7
≤54	38.5	9.0	15.4	37.0	75.5	+67.5
≤59	42.2	5.4	21.0	31.5	73.6	+55.8
≤64	44.4	3.1	26.9	25.6	70.0	+43.4
≤69	45.9	1.6	33.6	18.9	64.8	+29.4
≤74	47.1	0.4	40.1	12.4	59.5	+15.7
≤79	47.4	0.1	45.6	6.9	54.3	+4.1
≤84	47.5	0.0	50.0	2.5	50.0	-5.2
≤89	47.5	0.0	51.6	0.9	48.4	-8.6
≤94	47.5	0.0	52.4	0.1	47.6	-10.1
≤100	47.5	0.0	52.5	0.0	47.5	-10.4

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

**Figure 13 (200% of the new-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.3	99.6	0.7	228.0:1
≤14	1.3	99.9	2.7	864.7:1
≤19	3.2	97.9	6.6	46.9:1
≤24	6.7	94.6	13.2	17.6:1
≤29	11.2	93.4	22.1	14.0:1
≤34	17.7	90.6	33.7	9.6:1
≤39	25.7	86.1	46.6	6.2:1
≤44	35.2	80.8	59.9	4.2:1
≤49	44.4	76.3	71.3	3.2:1
≤54	53.9	71.4	81.0	2.5:1
≤59	63.2	66.7	88.7	2.0:1
≤64	71.3	62.3	93.4	1.7:1
≤69	79.5	57.8	96.6	1.4:1
≤74	87.2	54.0	99.1	1.2:1
≤79	93.0	51.0	99.8	1.0:1
≤84	97.5	48.7	100.0	1.0:1
≤89	99.1	47.9	100.0	0.9:1
≤94	99.9	47.6	100.0	0.9:1
≤100	100.0	47.5	100.0	0.9:1



**Tables for  
the Line that Marks the Poorest Half of People below  
100% of the New-Definition National Poverty Line**

**Figure 4 (Line that marks the poorest half of people  
below 100% of the new-definition national line):  
Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	74.5
5-9	74.5
10-14	53.3
15-19	41.3
20-24	32.9
25-29	28.4
30-34	21.3
35-39	10.7
40-44	7.8
45-49	4.0
50-54	2.0
55-59	1.7
60-64	0.7
65-69	0.2
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (Line that marks the poorest half of people below 100% of the new-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+14.2	12.0	14.4	18.7
10-14	-3.8	8.0	9.4	11.6
15-19	+1.8	5.4	6.2	8.0
20-24	-0.1	3.8	4.4	5.9
25-29	+11.5	2.4	2.9	3.6
30-34	+7.4	1.8	2.2	3.1
35-39	-1.7	1.7	2.1	2.7
40-44	-3.5	2.9	3.0	4.0
45-49	-1.3	1.3	1.4	2.0
50-54	+0.7	0.4	0.5	0.6
55-59	-0.2	0.9	1.1	1.4
60-64	+0.3	0.3	0.4	0.5
65-69	+0.2	0.0	0.0	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (Line that marks the poorest half of people below 100% of the new-definition national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.5	47.8	55.8	70.7
4	+0.2	18.2	25.3	38.1
8	+0.5	12.7	16.2	24.2
16	+0.3	9.4	12.2	17.0
32	+0.4	6.8	8.7	12.6
64	+0.4	4.8	5.9	8.3
128	+0.4	3.4	4.2	5.4
256	+0.4	2.5	2.8	3.6
512	+0.4	1.7	2.0	2.7
1,024	+0.4	1.2	1.4	1.9
2,048	+0.3	0.9	1.0	1.3
4,096	+0.3	0.6	0.7	0.9
8,192	+0.3	0.4	0.5	0.7
16,384	+0.3	0.3	0.4	0.5

**Figure 12 (Line that marks the poorest half of people below 100% of the new-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	7.7	0.0	92.3	92.3	-100.0
≤9	0.2	7.5	0.1	92.2	92.4	-93.0
≤14	0.8	6.9	0.5	91.8	92.5	-73.5
≤19	1.6	6.1	1.6	90.7	92.3	-38.1
≤24	2.8	4.9	3.9	88.4	91.2	+22.3
≤29	3.8	3.9	7.5	84.8	88.6	+2.8
≤34	5.0	2.7	12.7	79.6	84.6	-64.7
≤39	6.1	1.6	19.6	72.7	78.7	-155.2
≤44	6.9	0.8	28.4	63.9	70.8	-268.6
≤49	7.3	0.4	37.1	55.2	62.6	-381.4
≤54	7.5	0.2	46.4	45.9	53.4	-502.7
≤59	7.7	0.0	55.5	36.8	44.4	-620.9
≤64	7.7	0.0	63.6	28.7	36.4	-726.1
≤69	7.7	0.0	71.8	20.5	28.2	-832.4
≤74	7.7	0.0	79.5	12.8	20.5	-932.3
≤79	7.7	0.0	85.3	7.0	14.7	-1,007.9
≤84	7.7	0.0	89.8	2.5	10.2	-1,066.6
≤89	7.7	0.0	91.4	0.9	8.6	-1,087.6
≤94	7.7	0.0	92.2	0.1	7.8	-1,097.3
≤100	7.7	0.0	92.3	0.0	7.7	-1,098.7

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

**Figure 13 (Line that marks the poorest half of people below 100% of the new-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	74.5	0.0	2.9:1
≤9	0.3	58.6	2.6	1.4:1
≤14	1.3	58.2	9.7	1.4:1
≤19	3.2	49.8	20.6	1.0:1
≤24	6.7	41.6	35.9	0.7:1
≤29	11.2	33.4	48.8	0.5:1
≤34	17.7	28.3	65.0	0.4:1
≤39	25.7	23.5	78.6	0.3:1
≤44	35.2	19.5	89.1	0.2:1
≤49	44.4	16.5	95.3	0.2:1
≤54	53.9	14.0	97.8	0.2:1
≤59	63.2	12.1	99.4	0.1:1
≤64	71.3	10.8	99.9	0.1:1
≤69	79.5	9.7	100.0	0.1:1
≤74	87.2	8.8	100.0	0.1:1
≤79	93.0	8.3	100.0	0.1:1
≤84	97.5	7.9	100.0	0.1:1
≤89	99.1	7.8	100.0	0.1:1
≤94	99.9	7.7	100.0	0.1:1
≤100	100.0	7.7	100.0	0.1:1

**Tables for  
the New-Definition \$1.25/Day 2005 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$1.25/day line deflated by CPI): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	54.1
5-9	54.1
10-14	38.2
15-19	24.5
20-24	19.5
25-29	12.1
30-34	7.2
35-39	3.7
40-44	2.5
45-49	0.6
50-54	0.4
55-59	0.3
60-64	0.0
65-69	0.0
70-74	0.0
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0



**Figure 7 (New-definition \$1.25/day line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+4.9	12.1	13.9	18.5
10-14	+3.7	7.6	8.9	11.5
15-19	+7.1	3.7	4.3	5.6
20-24	+2.8	3.1	3.6	4.6
25-29	+4.6	1.5	1.8	2.1
30-34	+3.5	0.8	1.0	1.3
35-39	+0.5	0.8	0.9	1.3
40-44	+1.1	0.5	0.5	0.7
45-49	+0.2	0.2	0.2	0.3
50-54	+0.1	0.1	0.2	0.2
55-59	+0.3	0.0	0.0	0.0
60-64	0.0	0.0	0.0	0.0
65-69	0.0	0.0	0.0	0.1
70-74	0.0	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$1.25/day line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.2	6.0	44.1	64.1
4	+0.6	9.0	12.9	22.9
8	+0.6	6.1	8.1	11.5
16	+0.7	4.1	5.2	7.6
32	+0.7	2.6	3.2	4.7
64	+0.7	2.0	2.4	3.3
128	+0.7	1.4	1.7	2.2
256	+0.7	1.0	1.2	1.6
512	+0.7	0.7	0.8	1.0
1,024	+0.7	0.5	0.6	0.7
2,048	+0.6	0.3	0.4	0.5
4,096	+0.7	0.2	0.3	0.4
8,192	+0.7	0.2	0.2	0.3
16,384	+0.6	0.1	0.1	0.2

**Figure 12 (New-definition \$1.25/day line deflated by CPI): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	3.4	0.0	96.6	96.6	-100.0
≤9	0.2	3.2	0.2	96.4	96.6	-84.9
≤14	0.6	2.8	0.7	95.9	96.4	-45.6
≤19	1.0	2.4	2.2	94.4	95.5	+23.7
≤24	1.7	1.7	4.9	91.7	93.4	-44.8
≤29	2.2	1.2	9.0	87.6	89.9	-164.2
≤34	2.7	0.7	15.0	81.6	84.3	-340.3
≤39	3.1	0.3	22.6	74.0	77.0	-564.9
≤44	3.3	0.1	32.0	64.6	67.9	-839.5
≤49	3.3	0.1	41.1	55.5	58.9	-1,106.4
≤54	3.4	0.0	50.6	46.0	49.4	-1,385.3
≤59	3.4	0.0	59.8	36.8	40.2	-1,656.1
≤64	3.4	0.0	67.9	28.7	32.1	-1,895.1
≤69	3.4	0.0	76.1	20.5	23.9	-2,135.7
≤74	3.4	0.0	83.8	12.8	16.2	-2,361.7
≤79	3.4	0.0	89.6	7.0	10.4	-2,532.6
≤84	3.4	0.0	94.1	2.5	5.9	-2,665.4
≤89	3.4	0.0	95.7	0.9	4.3	-2,713.1
≤94	3.4	0.0	96.5	0.1	3.5	-2,734.9
≤100	3.4	0.0	96.6	0.0	3.4	-2,738.2

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

**Figure 13 (New-definition \$1.25/day line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	54.1	0.0	1.2:1
≤9	0.3	50.4	5.0	1.0:1
≤14	1.3	43.6	16.5	0.8:1
≤19	3.2	32.3	30.2	0.5:1
≤24	6.7	25.9	50.6	0.3:1
≤29	11.2	20.0	66.0	0.2:1
≤34	17.7	15.3	79.3	0.2:1
≤39	25.7	11.9	90.1	0.1:1
≤44	35.2	9.3	95.8	0.1:1
≤49	44.4	7.5	98.3	0.1:1
≤54	53.9	6.3	99.6	0.1:1
≤59	63.2	5.4	99.8	0.1:1
≤64	71.3	4.8	99.8	0.1:1
≤69	79.5	4.3	100.0	0.0:1
≤74	87.2	3.9	100.0	0.0:1
≤79	93.0	3.7	100.0	0.0:1
≤84	97.5	3.5	100.0	0.0:1
≤89	99.1	3.4	100.0	0.0:1
≤94	99.9	3.4	100.0	0.0:1
≤100	100.0	3.4	100.0	0.0:1

**Tables for  
the New-Definition \$2.00/Day 2005 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$2.00/day line deflated by CPI): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	85.9
5-9	85.9
10-14	66.0
15-19	55.2
20-24	49.1
25-29	38.5
30-34	27.1
35-39	16.2
40-44	11.6
45-49	5.3
50-54	2.5
55-59	2.2
60-64	1.0
65-69	0.2
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$2.00/day line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+19.0	11.5	13.7	18.6
10-14	-0.2	7.5	8.6	12.2
15-19	-1.4	5.9	7.2	9.1
20-24	+4.5	4.0	4.7	6.0
25-29	+10.9	3.0	3.6	4.8
30-34	+7.2	2.2	2.6	3.9
35-39	+0.2	1.9	2.2	3.0
40-44	-1.3	2.2	2.6	3.8
45-49	-1.3	1.3	1.5	1.9
50-54	-0.1	0.6	0.7	0.9
55-59	-0.1	0.9	1.1	1.4
60-64	-0.1	0.5	0.6	0.8
65-69	+0.1	0.1	0.1	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$2.00/day line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.3	55.7	68.7	75.7
4	+0.3	20.4	28.8	42.4
8	+0.7	14.2	18.1	28.2
16	+0.5	10.1	12.5	18.9
32	+0.6	7.3	9.4	13.5
64	+0.6	5.3	6.6	8.7
128	+0.6	3.9	4.6	5.8
256	+0.6	2.6	3.0	3.9
512	+0.6	1.8	2.2	3.0
1,024	+0.6	1.3	1.6	2.1
2,048	+0.6	0.9	1.1	1.5
4,096	+0.6	0.7	0.8	1.0
8,192	+0.6	0.5	0.6	0.8
16,384	+0.6	0.3	0.4	0.6



**Figure 12 (New-definition \$2.00/day line deflated by CPI): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	11.0	0.0	89.0	89.0	-100.0
≤9	0.2	10.8	0.1	88.9	89.1	-94.8
≤14	0.9	10.1	0.4	88.6	89.5	-80.1
≤19	2.1	8.9	1.1	87.9	90.0	-52.0
≤24	3.8	7.2	2.9	86.1	89.9	-5.2
≤29	5.4	5.6	5.8	83.2	88.5	+46.9
≤34	7.2	3.8	10.5	78.5	85.6	+4.4
≤39	8.7	2.3	17.0	72.0	80.6	-54.9
≤44	9.7	1.3	25.5	63.5	73.2	-131.9
≤49	10.4	0.6	34.0	55.0	65.3	-209.5
≤54	10.7	0.3	43.2	45.8	56.5	-292.8
≤59	10.9	0.1	52.3	36.7	47.6	-375.2
≤64	11.0	0.0	60.3	28.7	39.7	-448.4
≤69	11.0	0.0	68.5	20.5	31.5	-522.8
≤74	11.0	0.0	76.2	12.8	23.8	-592.6
≤79	11.0	0.0	82.0	7.0	18.0	-645.6
≤84	11.0	0.0	86.5	2.5	13.5	-686.6
≤89	11.0	0.0	88.1	0.9	11.9	-701.4
≤94	11.0	0.0	88.9	0.1	11.1	-708.1
≤100	11.0	0.0	89.0	0.0	11.0	-709.1

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

**Figure 13 (New-definition \$2.00/day line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	85.9	0.0	6.1:1
≤9	0.3	67.3	2.1	2.1:1
≤14	1.3	69.6	8.2	2.3:1
≤19	3.2	65.9	19.1	1.9:1
≤24	6.7	56.9	34.4	1.3:1
≤29	11.2	48.0	49.0	0.9:1
≤34	17.7	40.5	65.1	0.7:1
≤39	25.7	33.7	78.7	0.5:1
≤44	35.2	27.6	88.5	0.4:1
≤49	44.4	23.3	94.2	0.3:1
≤54	53.9	19.9	97.6	0.2:1
≤59	63.2	17.2	99.1	0.2:1
≤64	71.3	15.4	99.8	0.2:1
≤69	79.5	13.8	100.0	0.2:1
≤74	87.2	12.6	100.0	0.1:1
≤79	93.0	11.8	100.0	0.1:1
≤84	97.5	11.3	100.0	0.1:1
≤89	99.1	11.1	100.0	0.1:1
≤94	99.9	11.0	100.0	0.1:1
≤100	100.0	11.0	100.0	0.1:1

**Tables for  
the New-Definition \$2.50/Day 2005 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$2.50/day line deflated by CPI): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	91.5
5-9	91.5
10-14	78.2
15-19	71.5
20-24	67.0
25-29	57.1
30-34	41.3
35-39	31.4
40-44	20.7
45-49	12.8
50-54	6.8
55-59	5.1
60-64	2.1
65-69	0.7
70-74	0.6
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$2.50/day line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+4.9	7.4	9.2	12.6
10-14	-5.1	5.6	6.8	8.7
15-19	-2.6	5.9	6.8	8.8
20-24	+7.6	3.8	4.6	6.1
25-29	+17.2	3.5	4.0	5.4
30-34	+3.2	3.4	4.1	5.3
35-39	+4.7	2.2	2.7	3.5
40-44	-2.7	2.6	3.0	4.0
45-49	+0.2	1.7	2.0	2.7
50-54	-0.1	1.0	1.2	1.6
55-59	-4.5	3.3	3.6	3.9
60-64	+0.2	0.6	0.7	1.0
65-69	-3.3	2.5	2.7	3.0
70-74	+0.5	0.1	0.1	0.1
75-79	-0.1	0.1	0.1	0.1
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$2.50/day line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.5	60.3	72.2	83.2
4	+0.4	26.7	36.0	50.2
8	+0.8	18.7	26.4	35.3
16	+0.3	15.1	18.1	24.4
32	+0.5	10.6	12.9	17.5
64	+0.3	7.6	8.8	11.9
128	+0.1	5.6	6.7	8.5
256	+0.1	4.0	4.6	6.0
512	+0.2	2.8	3.3	4.3
1,024	+0.1	1.9	2.3	2.9
2,048	+0.1	1.4	1.7	2.1
4,096	+0.1	1.0	1.1	1.5
8,192	+0.1	0.7	0.8	1.1
16,384	+0.1	0.5	0.6	0.7

**Figure 12 (New-definition \$2.50/day line deflated by CPI): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	17.4	0.0	82.6	82.6	-100.0
≤9	0.3	17.1	0.1	82.5	82.8	-96.4
≤14	1.1	16.3	0.2	82.4	83.5	-86.4
≤19	2.6	14.8	0.6	82.0	84.6	-66.9
≤24	4.8	12.7	1.9	80.7	85.4	-34.6
≤29	7.0	10.4	4.2	78.3	85.3	+4.6
≤34	9.8	7.7	7.9	74.6	84.4	+54.5
≤39	12.3	5.2	13.4	69.1	81.4	+22.9
≤44	14.4	3.0	20.8	61.7	76.1	-19.6
≤49	15.6	1.8	28.8	53.8	69.5	-65.0
≤54	16.5	0.9	37.4	45.2	61.7	-114.7
≤59	17.0	0.4	46.1	36.5	53.5	-164.7
≤64	17.3	0.2	54.0	28.5	45.8	-210.2
≤69	17.4	0.0	62.1	20.5	37.9	-256.4
≤74	17.4	0.0	69.8	12.8	30.2	-300.4
≤79	17.4	0.0	75.6	7.0	24.4	-333.8
≤84	17.4	0.0	80.1	2.5	19.9	-359.7
≤89	17.4	0.0	81.7	0.9	18.3	-369.0
≤94	17.4	0.0	82.5	0.1	17.5	-373.3
≤100	17.4	0.0	82.6	0.0	17.4	-373.9

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

**Figure 13 (New-definition \$2.50/day line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	91.5	0.0	10.8:1
≤9	0.3	83.8	1.6	5.2:1
≤14	1.3	84.4	6.2	5.4:1
≤19	3.2	81.4	14.9	4.4:1
≤24	6.7	71.4	27.3	2.5:1
≤29	11.2	62.2	40.1	1.6:1
≤34	17.7	55.1	56.0	1.2:1
≤39	25.7	47.7	70.4	0.9:1
≤44	35.2	40.9	82.7	0.7:1
≤49	44.4	35.2	89.8	0.5:1
≤54	53.9	30.7	94.9	0.4:1
≤59	63.2	27.0	97.8	0.4:1
≤64	71.3	24.2	99.0	0.3:1
≤69	79.5	21.9	99.8	0.3:1
≤74	87.2	20.0	99.9	0.2:1
≤79	93.0	18.7	100.0	0.2:1
≤84	97.5	17.9	100.0	0.2:1
≤89	99.1	17.6	100.0	0.2:1
≤94	99.9	17.4	100.0	0.2:1
≤100	100.0	17.4	100.0	0.2:1



**Tables for  
the New-Definition \$3.75/Day 2005 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$3.75/day line deflated by CPI): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	97.9
5-9	97.9
10-14	95.1
15-19	91.2
20-24	86.9
25-29	81.7
30-34	71.4
35-39	58.8
40-44	45.9
45-49	36.4
50-54	25.2
55-59	17.6
60-64	10.9
65-69	6.5
70-74	4.3
75-79	1.6
80-84	0.7
85-89	0.2
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$3.75/day line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	-0.5	2.1	2.6	3.5
10-14	+4.5	4.8	5.5	7.0
15-19	-1.6	2.4	2.8	3.6
20-24	+2.9	2.9	3.5	4.6
25-29	+7.3	3.5	4.3	5.7
30-34	+2.1	3.3	3.9	4.8
35-39	-1.3	2.8	3.2	4.2
40-44	+0.1	2.8	3.4	4.3
45-49	+1.8	2.7	3.2	4.1
50-54	+5.2	1.9	2.4	3.0
55-59	-5.1	3.8	4.0	4.6
60-64	+3.2	1.2	1.5	1.9
65-69	-2.2	2.0	2.2	2.8
70-74	-0.2	1.1	1.3	1.7
75-79	+0.7	0.4	0.5	0.7
80-84	+0.7	0.0	0.0	0.0
85-89	+0.2	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$3.75/day line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.4	66.8	76.9	90.8
4	+0.1	34.2	41.0	58.3
8	+0.7	25.3	31.6	42.5
16	+1.0	18.6	23.6	29.5
32	+1.1	13.3	16.0	20.6
64	+0.8	9.6	11.5	14.7
128	+0.7	6.8	7.8	10.2
256	+0.7	4.7	5.4	6.9
512	+0.7	3.3	3.9	4.9
1,024	+0.7	2.2	2.7	3.4
2,048	+0.7	1.6	1.9	2.5
4,096	+0.7	1.1	1.3	1.9
8,192	+0.7	0.8	1.0	1.3
16,384	+0.6	0.6	0.7	0.9

**Figure 12 (New-definition \$3.75/day line deflated by CPI): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	33.2	0.0	66.8	66.8	-100.0
≤9	0.3	32.9	0.0	66.8	67.1	-98.0
≤14	1.2	32.0	0.1	66.7	67.9	-92.5
≤19	2.9	30.3	0.3	66.5	69.5	-81.6
≤24	5.9	27.3	0.8	66.0	71.9	-62.3
≤29	9.5	23.7	1.7	65.1	74.6	-37.5
≤34	14.0	19.2	3.6	63.1	77.2	-4.5
≤39	18.9	14.3	6.8	60.0	78.9	+34.4
≤44	23.4	9.9	11.9	54.9	78.3	+64.2
≤49	26.7	6.5	17.7	49.1	75.9	+46.8
≤54	29.2	4.0	24.7	42.1	71.3	+25.5
≤59	31.1	2.1	32.0	34.8	65.9	+3.5
≤64	32.0	1.2	39.3	27.5	59.6	-18.3
≤69	32.7	0.5	46.8	20.0	52.7	-40.9
≤74	33.1	0.1	54.1	12.7	45.8	-62.9
≤79	33.2	0.0	59.8	7.0	40.2	-80.1
≤84	33.2	0.0	64.3	2.5	35.7	-93.7
≤89	33.2	0.0	65.9	0.9	34.1	-98.6
≤94	33.2	0.0	66.7	0.1	33.3	-100.8
≤100	33.2	0.0	66.8	0.0	33.2	-101.2

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

**Figure 13 (New-definition \$3.75/day line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	97.9	0.0	47.7:1
≤9	0.3	97.8	1.0	43.9:1
≤14	1.3	93.5	3.6	14.5:1
≤19	3.2	91.8	8.8	11.2:1
≤24	6.7	88.4	17.7	7.6:1
≤29	11.2	84.7	28.7	5.6:1
≤34	17.7	79.4	42.3	3.8:1
≤39	25.7	73.6	57.0	2.8:1
≤44	35.2	66.3	70.3	2.0:1
≤49	44.4	60.2	80.5	1.5:1
≤54	53.9	54.2	88.0	1.2:1
≤59	63.2	49.3	93.8	1.0:1
≤64	71.3	44.9	96.5	0.8:1
≤69	79.5	41.2	98.5	0.7:1
≤74	87.2	38.0	99.7	0.6:1
≤79	93.0	35.7	100.0	0.6:1
≤84	97.5	34.0	100.0	0.5:1
≤89	99.1	33.5	100.0	0.5:1
≤94	99.9	33.2	100.0	0.5:1
≤100	100.0	33.2	100.0	0.5:1

**Tables for  
the New-Definition \$5.00/Day 2005 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$5.00/day line deflated by CPI): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	100.0
5-9	100.0
10-14	97.7
15-19	95.9
20-24	93.8
25-29	92.7
30-34	84.3
35-39	77.4
40-44	71.5
45-49	59.6
50-54	45.1
55-59	36.7
60-64	25.9
65-69	17.9
70-74	11.7
75-79	6.2
80-84	1.3
85-89	0.4
90-94	0.0
95-100	0.0



**Figure 7 (New-definition \$5.00/day line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+0.1	0.2	0.3	0.4
10-14	-2.3	1.1	1.1	1.1
15-19	-1.8	1.5	1.6	2.2
20-24	+3.2	2.4	2.8	3.6
25-29	+1.0	1.9	2.4	3.1
30-34	-5.0	3.4	3.6	4.0
35-39	+1.4	2.6	3.1	4.1
40-44	+10.4	2.9	3.4	4.5
45-49	+6.0	2.9	3.4	4.3
50-54	-1.1	2.9	3.4	4.6
55-59	-7.0	4.9	5.1	5.5
60-64	+4.2	2.1	2.4	3.2
65-69	-3.5	3.1	3.4	3.9
70-74	-1.9	1.9	2.3	3.1
75-79	+2.3	1.0	1.2	1.6
80-84	+0.2	0.6	0.7	0.9
85-89	+0.4	0.1	0.1	0.1
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$5.00/day line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.4	67.4	75.7	90.8
4	+0.6	37.7	46.0	55.8
8	+0.3	29.1	35.2	44.9
16	+1.2	21.8	25.8	30.8
32	+0.7	16.2	18.8	24.0
64	+0.7	11.3	13.3	17.4
128	+0.6	8.1	9.4	12.7
256	+0.6	5.8	6.7	9.3
512	+0.5	4.1	4.8	6.2
1,024	+0.4	2.8	3.3	4.3
2,048	+0.4	2.0	2.3	3.0
4,096	+0.5	1.4	1.7	2.2
8,192	+0.5	1.0	1.2	1.6
16,384	+0.5	0.7	0.9	1.1

**Figure 12 (New-definition \$5.00/day line deflated by CPI): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	47.7	0.0	52.3	52.3	-100.0
≤9	0.3	47.3	0.0	52.3	52.7	-98.6
≤14	1.3	46.4	0.0	52.3	53.6	-94.6
≤19	3.1	44.6	0.1	52.3	55.4	-86.8
≤24	6.3	41.4	0.3	52.0	58.3	-72.8
≤29	10.6	37.1	0.7	51.6	62.2	-54.3
≤34	16.2	31.5	1.5	50.8	67.0	-29.0
≤39	22.4	25.3	3.3	49.0	71.3	+0.8
≤44	28.6	19.0	6.6	45.7	74.4	+34.0
≤49	34.1	13.6	10.3	42.0	76.1	+64.7
≤54	38.6	9.1	15.4	36.9	75.5	+67.7
≤59	42.3	5.4	20.9	31.4	73.7	+56.2
≤64	44.5	3.2	26.8	25.5	70.0	+43.8
≤69	46.2	1.5	33.3	19.0	65.2	+30.1
≤74	47.3	0.4	39.9	12.4	59.7	+16.3
≤79	47.6	0.1	45.4	6.9	54.5	+4.8
≤84	47.7	0.0	49.8	2.5	50.1	-4.5
≤89	47.7	0.0	51.5	0.9	48.5	-7.9
≤94	47.7	0.0	52.2	0.1	47.8	-9.5
≤100	47.7	0.0	52.3	0.0	47.7	-9.7

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

**Figure 13 (New-definition \$5.00/day line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.3	99.6	0.7	228.0:1
≤14	1.3	99.9	2.7	864.7:1
≤19	3.2	98.2	6.6	54.4:1
≤24	6.7	95.1	13.3	19.5:1
≤29	11.2	93.9	22.1	15.4:1
≤34	17.7	91.4	33.9	10.6:1
≤39	25.7	87.0	46.9	6.7:1
≤44	35.2	81.3	60.1	4.3:1
≤49	44.4	76.8	71.5	3.3:1
≤54	53.9	71.5	80.9	2.5:1
≤59	63.2	66.9	88.7	2.0:1
≤64	71.3	62.4	93.3	1.7:1
≤69	79.5	58.1	96.8	1.4:1
≤74	87.2	54.2	99.2	1.2:1
≤79	93.0	51.2	99.8	1.0:1
≤84	97.5	48.9	100.0	1.0:1
≤89	99.1	48.1	100.0	0.9:1
≤94	99.9	47.7	100.0	0.9:1
≤100	100.0	47.7	100.0	0.9:1

**Tables for  
the New-Definition \$1.90/Day 2011 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$1.90/day 2011 PPP line  
deflated by CPI): Estimated poverty likelihoods  
associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	74.5
5-9	74.5
10-14	50.7
15-19	39.9
20-24	32.6
25-29	25.1
30-34	16.5
35-39	7.9
40-44	5.1
45-49	2.4
50-54	1.0
55-59	0.9
60-64	0.4
65-69	0.1
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$1.90/day 2011 PPP line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+19.0	12.1	14.0	18.7
10-14	+4.0	7.8	9.6	12.5
15-19	+0.3	5.3	6.4	7.9
20-24	+1.4	3.6	4.2	5.8
25-29	+10.8	2.3	2.7	3.6
30-34	+7.0	1.4	1.6	2.2
35-39	-1.0	1.3	1.6	2.2
40-44	-5.0	3.6	3.8	4.6
45-49	-1.8	1.5	1.6	1.9
50-54	+0.5	0.2	0.2	0.3
55-59	-0.9	0.9	1.1	1.4
60-64	0.0	0.3	0.4	0.5
65-69	+0.1	0.0	0.0	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$1.90/day 2011 PPP line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.3	42.6	55.9	68.0
4	+0.1	15.9	19.9	37.7
8	+0.2	10.4	14.0	24.2
16	+0.1	7.9	11.2	16.7
32	+0.2	6.1	7.9	11.7
64	+0.2	4.3	5.3	7.6
128	+0.2	3.2	3.6	4.9
256	+0.1	2.2	2.6	3.4
512	+0.1	1.6	1.9	2.6
1,024	+0.1	1.1	1.4	1.8
2,048	+0.1	0.8	0.9	1.2
4,096	+0.1	0.6	0.7	0.8
8,192	+0.1	0.4	0.5	0.6
16,384	+0.1	0.3	0.4	0.5



**Figure 12 (New-definition \$1.90/day 2011 PPP line deflated by CPI):**  
**Percentages of households by cut-off score and targeting classification,**  
**along with the hit rate and BPAC, 2012/13 scorecard applied to the**  
**2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	6.9	0.0	93.1	93.1	-100.0
≤9	0.2	6.7	0.1	93.0	93.2	-92.2
≤14	0.7	6.1	0.6	92.6	93.3	-70.7
≤19	1.6	5.3	1.6	91.5	93.1	-30.8
≤24	2.8	4.1	3.9	89.2	92.0	+37.2
≤29	3.7	3.1	7.5	85.6	89.3	-9.8
≤34	4.7	2.2	13.0	80.1	84.8	-89.8
≤39	5.6	1.3	20.1	73.0	78.6	-193.6
≤44	6.3	0.6	29.0	64.2	70.4	-322.7
≤49	6.6	0.2	37.8	55.4	62.0	-451.4
≤54	6.7	0.1	47.2	45.9	52.6	-589.1
≤59	6.8	0.0	56.4	36.8	43.6	-722.2
≤64	6.8	0.0	64.5	28.7	35.5	-840.3
≤69	6.8	0.0	72.6	20.5	27.4	-959.8
≤74	6.9	0.0	80.3	12.8	19.7	-1,071.9
≤79	6.9	0.0	86.2	7.0	13.8	-1,156.8
≤84	6.9	0.0	90.7	2.5	9.3	-1,222.7
≤89	6.9	0.0	92.3	0.9	7.7	-1,246.4
≤94	6.9	0.0	93.0	0.1	7.0	-1,257.2
≤100	6.9	0.0	93.1	0.0	6.9	-1,258.9

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

**Figure 13 (New-definition \$1.90/day 2011 PPP line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	74.5	0.0	2.9:1
≤9	0.3	57.5	2.9	1.4:1
≤14	1.3	56.1	10.5	1.3:1
≤19	3.2	49.1	22.8	1.0:1
≤24	6.7	41.4	40.2	0.7:1
≤29	11.2	33.0	54.2	0.5:1
≤34	17.7	26.5	68.2	0.4:1
≤39	25.7	21.7	81.3	0.3:1
≤44	35.2	17.8	91.3	0.2:1
≤49	44.4	14.9	96.4	0.2:1
≤54	53.9	12.4	97.9	0.1:1
≤59	63.2	10.8	99.3	0.1:1
≤64	71.3	9.6	99.8	0.1:1
≤69	79.5	8.6	99.9	0.1:1
≤74	87.2	7.9	100.0	0.1:1
≤79	93.0	7.4	100.0	0.1:1
≤84	97.5	7.0	100.0	0.1:1
≤89	99.1	6.9	100.0	0.1:1
≤94	99.9	6.9	100.0	0.1:1
≤100	100.0	6.9	100.0	0.1:1

**Tables for  
the New-Definition \$3.10/Day 2011 PPP Poverty Line  
Deflated by the CPI**

**Figure 4 (New-definition \$3.10/day 2011 PPP line  
deflated by CPI): Estimated poverty likelihoods  
associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	96.7
5-9	96.7
10-14	81.7
15-19	74.7
20-24	70.6
25-29	62.1
30-34	45.4
35-39	35.4
40-44	24.0
45-49	16.1
50-54	9.5
55-59	5.8
60-64	2.9
65-69	1.3
70-74	0.8
75-79	0.1
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$3.10/day 2011 PPP line deflated by CPI): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+7.9	7.4	8.9	12.2
10-14	-2.7	5.6	6.7	8.7
15-19	+0.3	5.8	6.9	8.9
20-24	+7.6	3.8	4.4	5.8
25-29	+13.9	3.6	4.1	5.4
30-34	+4.6	3.4	4.0	5.3
35-39	+3.6	2.5	2.9	3.9
40-44	-3.8	3.2	3.5	4.0
45-49	+2.2	1.8	2.2	2.6
50-54	+2.1	1.0	1.3	1.8
55-59	-4.8	3.4	3.7	4.1
60-64	+0.7	0.6	0.8	1.0
65-69	-2.9	2.3	2.4	2.7
70-74	+0.4	0.2	0.3	0.3
75-79	0.0	0.1	0.1	0.1
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$3.10/day 2011 PPP line deflated by CPI): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.8	60.7	73.0	84.4
4	+0.9	29.4	37.7	50.3
8	+1.3	21.0	26.0	35.8
16	+0.7	15.6	19.3	24.6
32	+0.8	10.9	13.0	18.5
64	+0.7	7.9	9.2	11.9
128	+0.4	5.7	6.9	8.3
256	+0.5	4.1	4.8	6.2
512	+0.5	2.9	3.3	4.3
1,024	+0.5	2.0	2.3	3.0
2,048	+0.5	1.5	1.7	2.2
4,096	+0.5	1.0	1.2	1.5
8,192	+0.5	0.7	0.8	1.1
16,384	+0.4	0.5	0.6	0.7

**Figure 12 (New-definition \$3.10/day 2011 PPP line deflated by CPI):**  
**Percentages of households by cut-off score and targeting classification,**  
**along with the hit rate and BPAC, 2012/13 scorecard applied to the**  
**2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	19.1	0.0	80.9	80.9	-100.0
≤9	0.3	18.8	0.0	80.8	81.1	-96.7
≤14	1.1	18.0	0.2	80.7	81.8	-87.5
≤19	2.6	16.5	0.6	80.3	82.9	-69.6
≤24	4.9	14.2	1.7	79.1	84.1	-39.5
≤29	7.4	11.7	3.8	77.0	84.4	-2.6
≤34	10.4	8.8	7.3	73.5	83.9	+46.5
≤39	13.2	5.9	12.5	68.4	81.6	+34.7
≤44	15.7	3.5	19.6	61.3	76.9	-2.3
≤49	17.1	2.1	27.3	53.5	70.6	-42.7
≤54	18.0	1.1	35.9	45.0	63.0	-87.5
≤59	18.7	0.5	44.5	36.4	55.1	-132.4
≤64	18.9	0.2	52.4	28.5	47.4	-173.6
≤69	19.1	0.1	60.4	20.4	39.5	-215.6
≤74	19.1	0.0	68.1	12.8	31.9	-255.5
≤79	19.1	0.0	73.9	7.0	26.1	-285.8
≤84	19.1	0.0	78.4	2.5	21.6	-309.4
≤89	19.1	0.0	80.0	0.9	20.0	-317.9
≤94	19.1	0.0	80.7	0.1	19.3	-321.8
≤100	19.1	0.0	80.9	0.0	19.1	-322.4

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

**Figure 13 (New-definition \$3.10/day 2011 PPP line deflated by CPI): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	96.7	0.0	29.5:1
≤9	0.3	87.4	1.6	7.0:1
≤14	1.3	86.5	5.8	6.4:1
≤19	3.2	82.7	13.7	4.8:1
≤24	6.7	74.3	25.8	2.9:1
≤29	11.2	65.9	38.7	1.9:1
≤34	17.7	58.6	54.2	1.4:1
≤39	25.7	51.4	69.0	1.1:1
≤44	35.2	44.4	81.8	0.8:1
≤49	44.4	38.5	89.2	0.6:1
≤54	53.9	33.5	94.3	0.5:1
≤59	63.2	29.6	97.6	0.4:1
≤64	71.3	26.5	98.8	0.4:1
≤69	79.5	24.0	99.7	0.3:1
≤74	87.2	21.9	99.9	0.3:1
≤79	93.0	20.6	100.0	0.3:1
≤84	97.5	19.6	100.0	0.2:1
≤89	99.1	19.3	100.0	0.2:1
≤94	99.9	19.2	100.0	0.2:1
≤100	100.0	19.1	100.0	0.2:1



**Tables for  
the New-Definition \$1.25/Day 2005 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$1.25/day line deflated by the change in the national line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	83.9
5-9	83.9
10-14	59.6
15-19	47.3
20-24	39.4
25-29	31.1
30-34	20.3
35-39	10.6
40-44	7.8
45-49	3.5
50-54	1.5
55-59	1.5
60-64	0.7
65-69	0.1
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$1.25/day line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+23.9	12.0	14.3	19.2
10-14	-3.3	7.6	9.0	11.7
15-19	+1.1	5.7	6.7	8.7
20-24	+1.2	3.9	4.5	5.8
25-29	+11.0	2.6	3.2	4.2
30-34	+6.8	1.8	2.2	2.9
35-39	+0.1	1.4	1.7	2.4
40-44	-3.4	2.8	3.0	3.8
45-49	-2.4	1.8	2.0	2.3
50-54	+0.2	0.5	0.6	0.7
55-59	-0.3	0.9	1.1	1.4
60-64	-0.3	0.5	0.6	0.8
65-69	+0.1	0.0	0.0	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$1.25/day line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.6	50.0	62.0	71.9
4	+0.0	17.7	25.5	41.4
8	+0.3	12.1	16.0	26.8
16	+0.2	8.5	11.5	17.0
32	+0.4	6.3	8.4	12.8
64	+0.3	4.7	5.8	8.1
128	+0.3	3.4	4.1	5.4
256	+0.2	2.3	2.8	3.5
512	+0.3	1.8	2.0	2.7
1,024	+0.3	1.2	1.4	1.9
2,048	+0.2	0.9	1.0	1.3
4,096	+0.2	0.6	0.7	0.9
8,192	+0.2	0.4	0.5	0.7
16,384	+0.2	0.3	0.4	0.5

**Figure 12 (New-definition \$1.25/day line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	8.6	0.0	91.4	91.4	-100.0
≤9	0.2	8.4	0.1	91.3	91.5	-93.5
≤14	0.8	7.7	0.4	91.0	91.8	-75.2
≤19	1.8	6.7	1.3	90.1	91.9	-41.5
≤24	3.3	5.3	3.4	88.1	91.4	+15.9
≤29	4.5	4.1	6.7	84.7	89.2	+21.6
≤34	5.8	2.8	11.9	79.5	85.3	-38.6
≤39	6.9	1.7	18.8	72.6	79.5	-119.5
≤44	7.7	0.9	27.5	63.9	71.6	-221.0
≤49	8.2	0.4	36.2	55.2	63.4	-322.0
≤54	8.4	0.2	45.6	45.9	54.3	-430.9
≤59	8.5	0.1	54.7	36.8	45.3	-537.2
≤64	8.6	0.0	62.7	28.7	37.3	-631.2
≤69	8.6	0.0	70.9	20.5	29.1	-726.6
≤74	8.6	0.0	78.6	12.8	21.4	-816.2
≤79	8.6	0.0	84.4	7.0	15.6	-884.1
≤84	8.6	0.0	88.9	2.5	11.1	-936.7
≤89	8.6	0.0	90.6	0.9	9.4	-955.6
≤94	8.6	0.0	91.3	0.1	8.7	-964.3
≤100	8.6	0.0	91.4	0.0	8.6	-965.6

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

**Figure 13 (New-definition \$1.25/day line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	83.9	0.0	5.2:1
≤9	0.3	62.5	2.5	1.7:1
≤14	1.3	65.2	9.8	1.9:1
≤19	3.2	57.6	21.4	1.4:1
≤24	6.7	49.5	38.4	1.0:1
≤29	11.2	40.1	52.6	0.7:1
≤34	17.7	32.8	67.6	0.5:1
≤39	25.7	26.7	80.0	0.4:1
≤44	35.2	21.8	89.7	0.3:1
≤49	44.4	18.5	95.6	0.2:1
≤54	53.9	15.6	97.8	0.2:1
≤59	63.2	13.5	99.0	0.2:1
≤64	71.3	12.0	99.9	0.1:1
≤69	79.5	10.8	99.9	0.1:1
≤74	87.2	9.8	100.0	0.1:1
≤79	93.0	9.2	100.0	0.1:1
≤84	97.5	8.8	100.0	0.1:1
≤89	99.1	8.7	100.0	0.1:1
≤94	99.9	8.6	100.0	0.1:1
≤100	100.0	8.6	100.0	0.1:1

**Tables for  
the New-Definition \$2.00/Day 2005 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$2.00/day line deflated by the change in the national line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	96.7
5-9	96.7
10-14	84.5
15-19	78.7
20-24	75.1
25-29	66.0
30-34	51.1
35-39	39.8
40-44	27.5
45-49	18.8
50-54	12.6
55-59	7.0
60-64	4.0
65-69	1.9
70-74	1.7
75-79	0.3
80-84	0.1
85-89	0.0
90-94	0.0
95-100	0.0



**Figure 7 (New-definition \$2.00/day line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+7.3	7.3	8.8	11.6
10-14	-0.8	5.6	6.6	8.6
15-19	+3.3	5.8	7.0	8.9
20-24	+7.2	3.8	4.4	5.7
25-29	+14.6	3.6	4.2	5.4
30-34	+3.7	3.6	4.2	5.4
35-39	+2.5	2.5	3.0	4.0
40-44	-6.3	4.5	4.7	5.3
45-49	+0.2	2.0	2.4	3.1
50-54	+4.7	1.1	1.3	1.7
55-59	-7.2	4.8	4.9	5.3
60-64	+1.0	0.8	0.9	1.2
65-69	-2.4	2.0	2.2	2.6
70-74	-1.3	1.2	1.3	1.6
75-79	+0.2	0.1	0.1	0.1
80-84	+0.1	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$2.00/day line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.6	61.8	76.7	86.6
4	+0.2	32.2	40.1	54.2
8	+0.5	23.0	28.7	37.5
16	+0.2	17.0	20.1	28.4
32	+0.4	11.4	14.7	19.1
64	+0.1	8.4	10.1	13.0
128	-0.1	6.2	7.2	9.3
256	-0.0	4.3	5.0	6.6
512	+0.0	3.0	3.5	4.4
1,024	-0.0	2.1	2.4	3.1
2,048	+0.0	1.5	1.9	2.5
4,096	-0.0	1.1	1.3	1.6
8,192	-0.0	0.8	0.9	1.2
16,384	-0.1	0.5	0.6	0.8

**Figure 12 (New-definition \$2.00/day line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	22.0	0.0	78.0	78.0	-100.0
≤9	0.3	21.7	0.0	78.0	78.3	-97.1
≤14	1.1	20.8	0.2	77.9	79.0	-89.0
≤19	2.7	19.3	0.5	77.5	80.2	-73.3
≤24	5.1	16.8	1.5	76.5	81.7	-46.3
≤29	7.8	14.2	3.4	74.6	82.4	-13.4
≤34	11.2	10.8	6.5	71.5	82.7	+31.4
≤39	14.4	7.5	11.2	66.8	81.2	+48.8
≤44	17.4	4.5	17.8	60.2	77.7	+19.0
≤49	19.2	2.7	25.2	52.9	72.1	-14.6
≤54	20.3	1.7	33.6	44.4	64.7	-53.1
≤59	21.2	0.7	41.9	36.1	57.4	-90.8
≤64	21.6	0.4	49.7	28.3	49.9	-126.3
≤69	21.8	0.2	57.7	20.3	42.1	-162.7
≤74	22.0	0.0	65.2	12.8	34.8	-196.9
≤79	22.0	0.0	71.0	7.0	29.0	-223.3
≤84	22.0	0.0	75.6	2.5	24.4	-243.9
≤89	22.0	0.0	77.2	0.9	22.8	-251.2
≤94	22.0	0.0	77.9	0.1	22.1	-254.6
≤100	22.0	0.0	78.0	0.0	22.0	-255.1

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

**Figure 13 (New-definition \$2.00/day line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	96.7	0.0	29.5:1
≤9	0.3	88.6	1.4	7.8:1
≤14	1.3	87.7	5.1	7.1:1
≤19	3.2	84.1	12.2	5.3:1
≤24	6.7	77.4	23.4	3.4:1
≤29	11.2	69.4	35.5	2.3:1
≤34	17.7	63.3	51.0	1.7:1
≤39	25.7	56.2	65.8	1.3:1
≤44	35.2	49.5	79.3	1.0:1
≤49	44.4	43.3	87.5	0.8:1
≤54	53.9	37.6	92.4	0.6:1
≤59	63.2	33.6	96.7	0.5:1
≤64	71.3	30.2	98.2	0.4:1
≤69	79.5	27.4	99.1	0.4:1
≤74	87.2	25.2	99.9	0.3:1
≤79	93.0	23.6	100.0	0.3:1
≤84	97.5	22.5	100.0	0.3:1
≤89	99.1	22.2	100.0	0.3:1
≤94	99.9	22.0	100.0	0.3:1
≤100	100.0	22.0	100.0	0.3:1

**Tables for  
the New-Definition \$2.50/Day 2005 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$2.50/day line deflated by the change in the national line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	97.9
5-9	97.9
10-14	93.5
15-19	88.2
20-24	86.1
25-29	79.4
30-34	69.4
35-39	54.9
40-44	42.0
45-49	31.3
50-54	22.5
55-59	15.5
60-64	9.0
65-69	5.6
70-74	3.7
75-79	0.8
80-84	0.5
85-89	0.2
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$2.50/day line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	-0.5	2.1	2.6	3.5
10-14	+4.5	4.9	5.8	7.3
15-19	-4.6	3.4	3.6	4.1
20-24	+4.2	3.1	3.8	4.9
25-29	+10.0	3.7	4.4	5.7
30-34	+4.8	3.3	3.9	5.1
35-39	-0.6	2.7	3.2	4.5
40-44	-1.8	2.9	3.4	4.3
45-49	-0.3	2.7	3.1	4.3
50-54	+4.9	1.8	2.2	2.7
55-59	-4.4	3.4	3.6	4.1
60-64	+2.2	1.2	1.4	1.8
65-69	-2.1	2.0	2.1	2.8
70-74	-0.5	1.1	1.3	1.7
75-79	+0.1	0.4	0.4	0.6
80-84	+0.5	0.0	0.0	0.0
85-89	+0.2	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$2.50/day line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-1.6	66.2	77.0	90.3
4	+0.2	34.2	41.7	59.0
8	+0.8	25.3	30.4	42.0
16	+0.9	17.6	22.7	31.1
32	+0.9	13.2	15.6	20.0
64	+0.6	9.6	11.0	14.2
128	+0.4	6.7	7.8	10.2
256	+0.5	4.7	5.6	7.1
512	+0.5	3.4	3.8	5.1
1,024	+0.4	2.3	2.6	3.4
2,048	+0.5	1.6	1.9	2.5
4,096	+0.5	1.1	1.3	1.8
8,192	+0.4	0.8	1.0	1.3
16,384	+0.4	0.6	0.7	0.9



**Figure 12 (New-definition \$2.50/day line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	30.9	0.0	69.1	69.1	-100.0
≤9	0.3	30.6	0.0	69.1	69.4	-97.8
≤14	1.2	29.7	0.1	69.0	70.2	-92.0
≤19	2.9	28.0	0.3	68.8	71.7	-80.3
≤24	5.8	25.1	0.8	68.2	74.0	-59.7
≤29	9.3	21.7	2.0	67.1	76.4	-33.7
≤34	13.5	17.4	4.2	64.9	78.4	+0.8
≤39	18.1	12.9	7.6	61.4	79.5	+41.4
≤44	22.3	8.7	13.0	56.1	78.4	+58.1
≤49	25.3	5.6	19.1	50.0	75.3	+38.4
≤54	27.5	3.4	26.4	42.6	70.1	+14.6
≤59	29.2	1.8	34.0	35.1	64.3	-9.8
≤64	29.9	1.0	41.4	27.7	57.6	-33.7
≤69	30.5	0.4	49.0	20.1	50.6	-58.3
≤74	30.9	0.1	56.3	12.7	43.6	-82.0
≤79	30.9	0.0	62.1	7.0	37.9	-100.6
≤84	30.9	0.0	66.6	2.5	33.4	-115.2
≤89	30.9	0.0	68.2	0.9	31.8	-120.4
≤94	30.9	0.0	68.9	0.1	31.1	-122.8
≤100	30.9	0.0	69.1	0.0	30.9	-123.2

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

**Figure 13 (New-definition \$2.50/day line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	97.9	0.0	47.7:1
≤9	0.3	97.8	1.1	43.9:1
≤14	1.3	92.7	3.9	12.6:1
≤19	3.2	91.3	9.4	10.5:1
≤24	6.7	87.3	18.8	6.9:1
≤29	11.2	82.5	30.0	4.7:1
≤34	17.7	76.4	43.7	3.2:1
≤39	25.7	70.3	58.4	2.4:1
≤44	35.2	63.2	72.0	1.7:1
≤49	44.4	57.1	81.9	1.3:1
≤54	53.9	51.0	88.9	1.0:1
≤59	63.2	46.2	94.3	0.9:1
≤64	71.3	42.0	96.8	0.7:1
≤69	79.5	38.4	98.6	0.6:1
≤74	87.2	35.4	99.8	0.5:1
≤79	93.0	33.3	100.0	0.5:1
≤84	97.5	31.7	100.0	0.5:1
≤89	99.1	31.2	100.0	0.5:1
≤94	99.9	31.0	100.0	0.4:1
≤100	100.0	30.9	100.0	0.4:1

**Tables for  
the New-Definition \$3.75/Day 2005 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$3.75/day line deflated by the change in the national line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	100.0
5-9	100.0
10-14	97.9
15-19	96.4
20-24	96.3
25-29	94.4
30-34	87.5
35-39	79.6
40-44	74.5
45-49	64.3
50-54	49.4
55-59	41.7
60-64	31.3
65-69	22.4
70-74	15.5
75-79	7.7
80-84	2.2
85-89	0.7
90-94	0.2
95-100	0.0

**Figure 7 (New-definition \$3.75/day line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+0.1	0.2	0.3	0.4
10-14	-2.1	1.0	1.0	1.0
15-19	-2.2	1.5	1.6	1.7
20-24	+3.9	2.3	2.5	3.2
25-29	-0.3	1.6	1.8	2.5
30-34	-2.5	2.1	2.3	2.7
35-39	-0.4	2.5	2.9	3.9
40-44	+5.8	2.7	3.3	4.6
45-49	+7.9	2.8	3.5	4.4
50-54	-0.8	2.9	3.5	4.6
55-59	-7.1	4.9	5.2	5.7
60-64	+7.8	2.2	2.6	3.2
65-69	-0.8	2.6	3.2	3.9
70-74	-0.3	2.1	2.4	3.1
75-79	0.0	1.5	1.8	2.4
80-84	-0.6	0.9	1.1	1.4
85-89	+0.6	0.1	0.1	0.1
90-94	+0.2	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$3.75/day line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.4	71.6	78.6	91.4
4	+0.7	37.4	45.5	56.5
8	+0.6	29.3	34.9	45.4
16	+1.4	20.9	24.9	32.3
32	+1.0	15.8	18.6	24.6
64	+0.9	11.1	12.5	17.0
128	+0.9	8.1	9.3	12.1
256	+0.9	5.6	6.5	8.5
512	+0.8	3.8	4.6	6.3
1,024	+0.8	2.7	3.4	4.3
2,048	+0.8	2.0	2.4	3.1
4,096	+0.8	1.4	1.7	2.4
8,192	+0.8	1.0	1.2	1.6
16,384	+0.8	0.7	0.8	1.2

**Figure 12 (New-definition \$3.75/day line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	51.0	0.0	49.0	49.0	-100.0
≤9	0.3	50.6	0.0	49.0	49.4	-98.7
≤14	1.3	49.7	0.0	49.0	50.3	-95.0
≤19	3.1	47.8	0.0	49.0	52.1	-87.6
≤24	6.4	44.6	0.3	48.8	55.1	-74.4
≤29	10.7	40.3	0.5	48.5	59.2	-56.9
≤34	16.4	34.6	1.3	47.8	64.2	-33.1
≤39	23.0	28.0	2.7	46.3	69.3	-4.5
≤44	29.7	21.3	5.6	43.4	73.1	+27.3
≤49	35.4	15.6	9.0	40.0	75.5	+56.6
≤54	40.3	10.6	13.6	35.4	75.8	+73.3
≤59	44.5	6.5	18.6	30.4	74.9	+63.5
≤64	47.0	4.0	24.3	24.7	71.7	+52.3
≤69	48.9	2.1	30.6	18.5	67.4	+40.1
≤74	50.3	0.7	36.9	12.1	62.4	+27.6
≤79	50.8	0.2	42.2	6.8	57.6	+17.2
≤84	51.0	0.0	46.5	2.5	53.5	+8.7
≤89	51.0	0.0	48.2	0.9	51.8	+5.5
≤94	51.0	0.0	48.9	0.1	51.1	+4.1
≤100	51.0	0.0	49.0	0.0	51.0	+3.9

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

**Figure 13 (New-definition \$3.75/day line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.3	99.6	0.7	228.0:1
≤14	1.3	99.9	2.5	864.7:1
≤19	3.2	98.7	6.2	74.0:1
≤24	6.7	96.1	12.5	24.4:1
≤29	11.2	95.4	21.0	21.0:1
≤34	17.7	92.9	32.2	13.0:1
≤39	25.7	89.4	45.1	8.5:1
≤44	35.2	84.2	58.2	5.3:1
≤49	44.4	79.8	69.5	4.0:1
≤54	53.9	74.8	79.1	3.0:1
≤59	63.2	70.5	87.3	2.4:1
≤64	71.3	65.9	92.2	1.9:1
≤69	79.5	61.6	96.0	1.6:1
≤74	87.2	57.7	98.6	1.4:1
≤79	93.0	54.6	99.7	1.2:1
≤84	97.5	52.3	100.0	1.1:1
≤89	99.1	51.4	100.0	1.1:1
≤94	99.9	51.0	100.0	1.0:1
≤100	100.0	51.0	100.0	1.0:1



**Tables for  
the New-Definition \$5.00/Day 2005 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$5.00/day line deflated by the change in the national line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	100.0
5-9	100.0
10-14	99.4
15-19	98.9
20-24	98.7
25-29	97.3
30-34	95.4
35-39	90.2
40-44	85.7
45-49	79.7
50-54	68.2
55-59	60.3
60-64	52.1
65-69	42.6
70-74	31.9
75-79	18.3
80-84	6.9
85-89	4.4
90-94	1.2
95-100	0.0

**Figure 7 (New-definition \$5.00/day line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	+0.1	0.2	0.3	0.4
10–14	–0.6	0.3	0.3	0.3
15–19	–1.1	0.5	0.5	0.5
20–24	+2.2	1.5	1.8	2.5
25–29	–0.6	1.2	1.4	1.8
30–34	–0.3	1.0	1.2	1.5
35–39	–0.2	2.0	2.4	3.1
40–44	+0.2	1.9	2.2	2.9
45–49	–0.5	2.1	2.4	3.2
50–54	–2.8	2.7	3.1	4.4
55–59	–6.8	4.6	4.8	5.2
60–64	+7.2	3.0	3.4	4.7
65–69	+7.7	2.8	3.2	4.1
70–74	+5.2	2.5	3.1	3.9
75–79	+2.9	2.1	2.6	3.4
80–84	–2.2	2.0	2.1	2.5
85–89	+3.3	0.7	0.8	1.1
90–94	+1.1	0.2	0.2	0.3
95–100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$5.00/day line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-1.8	62.8	73.9	94.2
4	+0.4	39.2	45.7	58.1
8	+0.9	28.4	34.2	42.6
16	+1.3	21.8	25.1	32.3
32	+1.4	15.4	17.8	24.5
64	+1.3	10.8	12.5	17.9
128	+1.2	7.6	9.2	12.2
256	+1.3	5.3	6.3	8.3
512	+1.2	3.7	4.5	5.8
1,024	+1.2	2.7	3.2	4.1
2,048	+1.2	1.9	2.3	3.2
4,096	+1.2	1.4	1.7	2.2
8,192	+1.2	1.0	1.2	1.6
16,384	+1.2	0.7	0.8	1.1

**Figure 12 (New-definition \$5.00/day line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	64.4	0.0	35.6	35.6	-100.0
≤9	0.3	64.0	0.0	35.6	36.0	-98.9
≤14	1.3	63.1	0.0	35.6	36.9	-96.0
≤19	3.2	61.2	0.0	35.6	38.8	-90.1
≤24	6.5	57.8	0.1	35.5	42.1	-79.5
≤29	11.1	53.3	0.2	35.5	46.5	-65.4
≤34	17.1	47.2	0.6	35.1	52.2	-45.9
≤39	24.5	39.8	1.2	34.5	59.0	-22.0
≤44	32.6	31.7	2.6	33.0	65.6	+5.4
≤49	39.9	24.4	4.5	31.2	71.1	+31.0
≤54	46.7	17.7	7.3	28.4	75.1	+56.3
≤59	52.6	11.8	10.6	25.1	77.7	+79.9
≤64	56.8	7.5	14.5	21.2	78.0	+77.5
≤69	60.1	4.3	19.4	16.3	76.4	+69.9
≤74	62.6	1.7	24.6	11.1	73.7	+61.9
≤79	63.7	0.6	29.3	6.4	70.1	+54.5
≤84	64.3	0.0	33.2	2.4	66.8	+48.4
≤89	64.4	0.0	34.8	0.9	65.2	+46.0
≤94	64.4	0.0	35.5	0.1	64.5	+44.8
≤100	64.4	0.0	35.6	0.0	64.4	+44.6

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

**Figure 13 (New-definition \$5.00/day line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.3	99.6	0.5	228.0:1
≤14	1.3	99.9	2.0	864.7:1
≤19	3.2	99.9	4.9	1,023.7:1
≤24	6.7	98.4	10.2	63.3:1
≤29	11.2	98.4	17.2	60.6:1
≤34	17.7	96.8	26.6	30.6:1
≤39	25.7	95.5	38.1	21.0:1
≤44	35.2	92.6	50.7	12.4:1
≤49	44.4	89.9	62.0	8.9:1
≤54	53.9	86.5	72.5	6.4:1
≤59	63.2	83.3	81.7	5.0:1
≤64	71.3	79.7	88.3	3.9:1
≤69	79.5	75.6	93.4	3.1:1
≤74	87.2	71.8	97.3	2.6:1
≤79	93.0	68.5	99.0	2.2:1
≤84	97.5	66.0	99.9	1.9:1
≤89	99.1	64.9	100.0	1.9:1
≤94	99.9	64.4	100.0	1.8:1
≤100	100.0	64.4	100.0	1.8:1

**Tables for  
the New-Definition \$1.90/Day 2011 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$1.90/day 2011 PPP line  
deflated by the change in the national line):  
Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	89.0
5-9	89.0
10-14	74.9
15-19	65.6
20-24	62.4
25-29	50.8
30-34	35.4
35-39	25.8
40-44	17.3
45-49	10.3
50-54	4.7
55-59	3.6
60-64	1.5
65-69	0.5
70-74	0.4
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0



**Figure 7 (New-definition \$1.90/day 2011 PPP line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	+6.3	8.8	10.4	13.2
10–14	–3.8	6.3	7.5	9.5
15–19	–3.9	5.8	6.8	8.8
20–24	+5.3	3.8	4.6	5.8
25–29	+16.2	3.3	3.8	5.1
30–34	+9.2	2.5	3.0	4.0
35–39	+3.5	2.1	2.5	3.2
40–44	+0.1	2.3	2.7	3.7
45–49	+1.5	1.3	1.6	2.1
50–54	+0.3	0.8	1.0	1.3
55–59	–3.4	2.6	2.8	3.2
60–64	–0.2	0.6	0.7	1.0
65–69	+0.2	0.1	0.1	0.2
70–74	+0.4	0.0	0.0	0.0
75–79	0.0	0.0	0.0	0.0
80–84	0.0	0.0	0.0	0.0
85–89	0.0	0.0	0.0	0.0
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$1.90/day 2011 PPP line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.3	54.8	66.7	80.4
4	+0.9	23.3	32.2	48.4
8	+1.4	16.2	20.9	34.9
16	+1.0	12.0	16.1	23.5
32	+1.1	9.3	11.4	14.7
64	+1.1	6.5	7.8	10.0
128	+1.0	4.6	5.4	6.6
256	+1.1	3.1	3.8	4.9
512	+1.1	2.3	2.7	3.6
1,024	+1.1	1.6	1.8	2.3
2,048	+1.1	1.1	1.4	1.8
4,096	+1.1	0.8	0.9	1.2
8,192	+1.1	0.6	0.7	0.9
16,384	+1.1	0.4	0.5	0.6

**Figure 12 (New-definition \$1.90/day 2011 PPP line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	14.6	0.0	85.4	85.4	-100.0
≤9	0.3	14.3	0.1	85.3	85.6	-95.8
≤14	1.0	13.5	0.3	85.2	86.2	-84.1
≤19	2.4	12.1	0.7	84.7	87.1	-61.5
≤24	4.5	10.1	2.2	83.3	87.7	-23.6
≤29	6.5	8.1	4.8	80.6	87.1	+21.4
≤34	8.8	5.8	8.9	76.5	85.3	+39.1
≤39	10.9	3.7	14.8	70.6	81.5	-1.6
≤44	12.5	2.1	22.8	62.6	75.1	-56.3
≤49	13.4	1.2	31.0	54.4	67.8	-112.7
≤54	14.0	0.6	39.9	45.5	59.5	-173.9
≤59	14.4	0.2	48.8	36.6	51.0	-234.7
≤64	14.5	0.1	56.8	28.6	43.2	-289.3
≤69	14.6	0.0	64.9	20.5	35.1	-345.2
≤74	14.6	0.0	72.6	12.8	27.4	-397.9
≤79	14.6	0.0	78.4	7.0	21.6	-437.8
≤84	14.6	0.0	82.9	2.5	17.1	-468.8
≤89	14.6	0.0	84.6	0.9	15.4	-479.9
≤94	14.6	0.0	85.3	0.1	14.7	-485.0
≤100	14.6	0.0	85.4	0.0	14.6	-485.8

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

**Figure 13 (New-definition \$1.90/day 2011 PPP line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

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
≤4	0.0	89.0	0.0	8.1:1
≤9	0.3	79.7	1.9	3.9:1
≤14	1.3	80.5	7.1	4.1:1
≤19	3.2	76.5	16.7	3.3:1
≤24	6.7	67.5	30.8	2.1:1
≤29	11.2	57.5	44.3	1.4:1
≤34	17.7	49.8	60.3	1.0:1
≤39	25.7	42.3	74.6	0.7:1
≤44	35.2	35.3	85.4	0.5:1
≤49	44.4	30.2	91.8	0.4:1
≤54	53.9	26.0	96.0	0.4:1
≤59	63.2	22.7	98.4	0.3:1
≤64	71.3	20.4	99.6	0.3:1
≤69	79.5	18.3	100.0	0.2:1
≤74	87.2	16.7	100.0	0.2:1
≤79	93.0	15.7	100.0	0.2:1
≤84	97.5	15.0	100.0	0.2:1
≤89	99.1	14.7	100.0	0.2:1
≤94	99.9	14.6	100.0	0.2:1
≤100	100.0	14.6	100.0	0.2:1

**Tables for  
the New-Definition \$3.10/Day 2011 PPP Poverty Line  
Deflated by the Change in the National Poverty Line**

**Figure 4 (New-definition \$3.10/day 2011 PPP line  
deflated by the change in the national line):  
Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	99.1
5-9	99.1
10-14	95.2
15-19	91.2
20-24	87.9
25-29	82.1
30-34	71.6
35-39	59.1
40-44	46.1
45-49	36.7
50-54	25.8
55-59	18.1
60-64	11.3
65-69	6.6
70-74	4.3
75-79	1.6
80-84	0.7
85-89	0.2
90-94	0.0
95-100	0.0

**Figure 7 (New-definition \$3.10/day 2011 PPP line deflated by the change in the national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2012/13 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0–4	0.0	0.0	0.0	0.0
5–9	+0.7	2.1	2.6	3.5
10–14	+4.6	4.8	5.5	7.0
15–19	–2.0	2.3	2.7	3.4
20–24	+1.9	2.6	3.2	4.2
25–29	+7.3	3.5	4.3	5.8
30–34	–3.2	3.0	3.4	4.4
35–39	–1.5	2.8	3.2	4.2
40–44	–0.1	2.8	3.4	4.3
45–49	+1.8	2.6	3.2	4.2
50–54	+5.6	1.9	2.4	2.9
55–59	–5.6	4.0	4.2	4.8
60–64	+3.5	1.2	1.5	1.8
65–69	–2.4	2.1	2.3	2.9
70–74	–0.2	1.1	1.3	1.7
75–79	+0.7	0.4	0.5	0.7
80–84	+0.1	0.4	0.5	0.7
85–89	+0.2	0.1	0.1	0.1
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

**Figure 8 (New-definition \$3.10/day 2011 PPP line deflated by the change in the national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2012/13 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.9	66.7	76.8	91.2
4	-0.2	33.8	40.4	57.4
8	+0.2	25.3	30.5	41.5
16	+0.6	18.1	22.7	29.9
32	+0.7	13.4	15.6	20.7
64	+0.5	9.6	11.2	14.7
128	+0.3	6.8	7.8	9.9
256	+0.4	4.7	5.5	6.8
512	+0.3	3.2	3.9	5.0
1,024	+0.3	2.2	2.6	3.5
2,048	+0.3	1.6	1.9	2.5
4,096	+0.3	1.2	1.3	1.9
8,192	+0.3	0.8	1.0	1.3
16,384	+0.3	0.6	0.7	1.0



**Figure 12 (New-definition \$3.10/day 2011 PPP line deflated by the change in the national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2012/13 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	33.7	0.0	66.3	66.3	-100.0
≤9	0.3	33.4	0.0	66.3	66.6	-98.0
≤14	1.2	32.5	0.1	66.2	67.4	-92.6
≤19	2.9	30.8	0.3	66.0	69.0	-81.9
≤24	5.9	27.8	0.7	65.6	71.5	-62.7
≤29	9.6	24.1	1.6	64.6	74.2	-38.2
≤34	14.2	19.5	3.5	62.8	77.0	-5.4
≤39	19.1	14.6	6.6	59.7	78.9	+32.9
≤44	23.6	10.1	11.6	54.7	78.3	+65.6
≤49	27.1	6.6	17.3	49.0	76.0	+48.6
≤54	29.6	4.1	24.3	41.9	71.6	+27.9
≤59	31.6	2.1	31.6	34.7	66.3	+6.4
≤64	32.5	1.2	38.8	27.5	60.0	-15.0
≤69	33.2	0.5	46.3	20.0	53.2	-37.2
≤74	33.6	0.1	53.6	12.7	46.3	-58.9
≤79	33.7	0.0	59.3	7.0	40.7	-75.8
≤84	33.7	0.0	63.8	2.5	36.2	-89.2
≤89	33.7	0.0	65.4	0.9	34.6	-93.9
≤94	33.7	0.0	66.2	0.1	33.8	-96.2
≤100	33.7	0.0	66.3	0.0	33.7	-96.5

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

**Figure 13 (New-definition \$3.10/day 2011 PPP line deflated by the change in the national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2012/13 validation sample**

<b>Targeting cut-off</b>	<b>% all HHs who are targeted</b>	<b>% targeted HHs who are poor</b>	<b>% poor HHs who are targeted</b>	<b>Poor HHs targeted per non-poor HH targeted</b>
≤4	0.0	99.1	0.0	108.4:1
≤9	0.3	97.8	1.0	43.9:1
≤14	1.3	93.5	3.6	14.5:1
≤19	3.2	92.1	8.7	11.6:1
≤24	6.7	89.3	17.6	8.4:1
≤29	11.2	85.4	28.5	5.9:1
≤34	17.7	80.4	42.2	4.1:1
≤39	25.7	74.5	56.8	2.9:1
≤44	35.2	67.1	70.1	2.0:1
≤49	44.4	61.0	80.3	1.6:1
≤54	53.9	54.9	87.8	1.2:1
≤59	63.2	50.0	93.6	1.0:1
≤64	71.3	45.6	96.4	0.8:1
≤69	79.5	41.8	98.5	0.7:1
≤74	87.2	38.5	99.6	0.6:1
≤79	93.0	36.2	99.9	0.6:1
≤84	97.5	34.6	100.0	0.5:1
≤89	99.1	34.0	100.0	0.5:1
≤94	99.9	33.8	100.0	0.5:1
≤100	100.0	33.7	100.0	0.5:1

**Tables for  
the Old-Definition Food Poverty Line**

**Figure 4 (Old-definition food line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	70.4
5-9	70.4
10-14	50.7
15-19	38.4
20-24	31.0
25-29	21.5
30-34	15.1
35-39	8.1
40-44	5.4
45-49	2.2
50-54	1.3
55-59	1.2
60-64	0.4
65-69	0.1
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (Old-definition food line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+16.2	12.3	14.2	18.0
10-14	+4.7	8.0	9.6	12.6
15-19	+8.3	4.8	5.7	7.5
20-24	+4.2	3.5	4.1	5.3
25-29	+10.2	1.9	2.2	2.9
30-34	+5.8	1.4	1.6	2.1
35-39	+0.7	1.2	1.5	1.9
40-44	-4.0	3.1	3.3	4.1
45-49	-2.5	1.8	1.9	2.2
50-54	+0.8	0.2	0.3	0.4
55-59	-0.6	0.9	1.1	1.4
60-64	-0.7	0.6	0.7	0.8
65-69	+0.1	0.0	0.0	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (Old-definition food line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.6	41.6	58.0	67.3
4	+0.3	15.4	18.7	37.0
8	+0.4	9.8	13.5	24.4
16	+0.3	7.6	11.0	16.7
32	+0.4	5.9	7.9	11.4
64	+0.3	4.1	5.3	7.5
128	+0.3	3.1	3.6	4.8
256	+0.3	2.1	2.6	3.5
512	+0.3	1.6	1.8	2.4
1,024	+0.3	1.1	1.3	1.7
2,048	+0.3	0.7	0.9	1.2
4,096	+0.3	0.5	0.6	0.8
8,192	+0.3	0.4	0.5	0.6
16,384	+0.3	0.3	0.4	0.5

**Figure 12 (Old-definition food line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	6.3	0.0	93.7	93.7	-100.0
≤9	0.2	6.1	0.2	93.5	93.7	-91.6
≤14	0.7	5.6	0.6	93.1	93.8	-68.5
≤19	1.4	4.9	1.8	91.9	93.3	-27.3
≤24	2.5	3.8	4.2	89.5	92.0	+33.9
≤29	3.3	3.0	7.9	85.8	89.1	-25.7
≤34	4.3	2.1	13.4	80.3	84.5	-112.8
≤39	5.0	1.3	20.7	73.0	78.1	-227.4
≤44	5.6	0.7	29.6	64.1	69.7	-369.1
≤49	6.0	0.3	38.4	55.3	61.3	-508.2
≤54	6.1	0.2	47.8	45.9	52.0	-657.7
≤59	6.2	0.1	56.9	36.7	43.0	-802.4
≤64	6.3	0.0	65.0	28.7	35.0	-930.0
≤69	6.3	0.0	73.2	20.5	26.8	-1,059.7
≤74	6.3	0.0	80.9	12.8	19.1	-1,181.6
≤79	6.3	0.0	86.7	7.0	13.3	-1,273.8
≤84	6.3	0.0	91.2	2.5	8.8	-1,345.4
≤89	6.3	0.0	92.8	0.9	7.2	-1,371.1
≤94	6.3	0.0	93.6	0.1	6.4	-1,382.8
≤100	6.3	0.0	93.7	0.0	6.3	-1,384.6

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

**Figure 13 (Old-definition food line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	70.4	0.0	2.4:1
≤9	0.3	55.4	3.0	1.2:1
≤14	1.3	54.3	11.1	1.2:1
≤19	3.2	44.1	22.3	0.8:1
≤24	6.7	37.2	39.2	0.6:1
≤29	11.2	29.4	52.4	0.4:1
≤34	17.7	24.1	67.4	0.3:1
≤39	25.7	19.6	79.8	0.2:1
≤44	35.2	16.0	89.2	0.2:1
≤49	44.4	13.6	95.4	0.2:1
≤54	53.9	11.4	97.1	0.1:1
≤59	63.2	9.8	98.5	0.1:1
≤64	71.3	8.8	99.8	0.1:1
≤69	79.5	7.9	99.9	0.1:1
≤74	87.2	7.2	100.0	0.1:1
≤79	93.0	6.8	100.0	0.1:1
≤84	97.5	6.5	100.0	0.1:1
≤89	99.1	6.4	100.0	0.1:1
≤94	99.9	6.3	100.0	0.1:1
≤100	100.0	6.3	100.0	0.1:1



**Tables for  
100% of the Old-Definition National Poverty Line**

**Figure 4 (100% of Old-definition national line):  
 Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	89.0
5-9	89.0
10-14	74.4
15-19	62.3
20-24	58.7
25-29	48.0
30-34	33.9
35-39	24.2
40-44	16.6
45-49	10.1
50-54	5.0
55-59	3.6
60-64	1.7
65-69	0.7
70-74	0.7
75-79	0.2
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (100% of Old-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+8.9	9.2	10.8	13.7
10-14	-4.0	6.5	7.5	9.4
15-19	-4.2	5.8	7.0	8.9
20-24	+5.0	4.0	4.8	6.0
25-29	+15.7	3.2	3.7	5.2
30-34	-0.9	3.4	4.0	5.2
35-39	+5.4	1.8	2.2	2.8
40-44	-1.1	2.4	2.9	3.6
45-49	+1.6	1.3	1.6	2.0
50-54	+1.3	0.7	0.9	1.1
55-59	+0.9	1.0	1.2	1.5
60-64	-0.1	0.6	0.7	0.9
65-69	-3.5	2.6	2.8	3.1
70-74	+0.7	0.1	0.1	0.1
75-79	+0.1	0.1	0.1	0.1
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (100% of Old-definition national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.3	58.4	65.7	78.7
4	+1.1	22.5	31.4	46.1
8	+1.4	15.4	20.7	31.1
16	+1.1	11.5	14.6	21.3
32	+1.2	8.4	10.8	14.9
64	+0.9	6.5	7.9	9.8
128	+0.8	4.7	5.7	7.5
256	+0.9	3.2	3.8	5.5
512	+0.8	2.4	2.9	3.7
1,024	+0.8	1.7	2.0	2.7
2,048	+0.8	1.2	1.4	1.9
4,096	+0.8	0.8	1.0	1.3
8,192	+0.8	0.6	0.7	0.9
16,384	+0.7	0.4	0.5	0.6

**Figure 12 (100% of Old-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	14.2	0.0	85.8	85.8	-100.0
≤9	0.3	13.9	0.1	85.7	86.0	-95.8
≤14	1.0	13.1	0.3	85.6	86.6	-83.7
≤19	2.4	11.8	0.8	85.0	87.4	-60.9
≤24	4.3	9.8	2.3	83.5	87.8	-22.6
≤29	6.2	8.0	5.1	80.8	86.9	+22.9
≤34	8.6	5.6	9.1	76.8	85.4	+36.0
≤39	10.5	3.7	15.2	70.6	81.2	-7.1
≤44	12.1	2.1	23.1	62.7	74.8	-63.1
≤49	13.0	1.2	31.4	54.4	67.5	-121.4
≤54	13.6	0.6	40.4	45.4	59.0	-184.9
≤59	13.8	0.4	49.3	36.5	50.3	-248.2
≤64	14.0	0.2	57.3	28.5	42.5	-304.4
≤69	14.1	0.0	65.3	20.5	34.6	-361.0
≤74	14.2	0.0	73.0	12.8	27.0	-415.2
≤79	14.2	0.0	78.8	7.0	21.2	-456.2
≤84	14.2	0.0	83.3	2.5	16.7	-488.0
≤89	14.2	0.0	85.0	0.9	15.0	-499.5
≤94	14.2	0.0	85.7	0.1	14.3	-504.7
≤100	14.2	0.0	85.8	0.0	14.2	-505.5

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

**Figure 13 (100% of Old-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	89.0	0.0	8.1:1
≤9	0.3	76.5	1.8	3.3:1
≤14	1.3	79.6	7.2	3.9:1
≤19	3.2	74.3	16.7	2.9:1
≤24	6.7	65.0	30.5	1.9:1
≤29	11.2	55.0	43.6	1.2:1
≤34	17.7	48.7	60.7	0.9:1
≤39	25.7	40.9	74.2	0.7:1
≤44	35.2	34.4	85.4	0.5:1
≤49	44.4	29.3	91.9	0.4:1
≤54	53.9	25.1	95.7	0.3:1
≤59	63.2	21.9	97.5	0.3:1
≤64	71.3	19.6	98.6	0.2:1
≤69	79.5	17.8	99.8	0.2:1
≤74	87.2	16.2	99.9	0.2:1
≤79	93.0	15.2	100.0	0.2:1
≤84	97.5	14.5	100.0	0.2:1
≤89	99.1	14.3	100.0	0.2:1
≤94	99.9	14.2	100.0	0.2:1
≤100	100.0	14.2	100.0	0.2:1

**Tables for  
150% of the Old-Definition National Poverty Line**

**Figure 4 (150% of Old-definition national line):**  
**Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	97.9
5-9	97.9
10-14	88.2
15-19	85.5
20-24	84.9
25-29	75.8
30-34	65.5
35-39	53.7
40-44	39.2
45-49	30.9
50-54	21.1
55-59	14.5
60-64	8.5
65-69	4.9
70-74	3.7
75-79	0.9
80-84	0.2
85-89	0.0
90-94	0.0
95-100	0.0



**Figure 7 (150% of Old-definition national line): For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample**

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+2.1	4.7	5.1	6.0
10-14	-0.3	5.1	5.9	7.3
15-19	-4.1	3.4	3.7	4.8
20-24	+5.9	3.3	3.8	4.9
25-29	+8.5	3.7	4.6	5.7
30-34	+11.5	3.6	4.4	5.6
35-39	+3.5	2.8	3.2	4.6
40-44	-3.4	3.1	3.3	4.4
45-49	-1.8	2.7	3.1	4.3
50-54	+3.8	1.9	2.2	2.7
55-59	-4.0	3.1	3.4	3.9
60-64	+1.6	1.2	1.4	1.7
65-69	-2.8	2.3	2.5	3.0
70-74	-2.8	2.2	2.4	2.6
75-79	-1.0	1.0	1.1	1.2
80-84	-0.3	0.4	0.5	0.7
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (150% of Old-definition national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.7	72.2	80.7	90.3
4	-0.0	35.4	42.0	58.9
8	+0.5	25.7	30.9	40.2
16	+0.3	19.2	23.4	30.1
32	+0.5	13.5	16.0	21.6
64	+0.4	9.8	11.7	15.5
128	+0.2	7.0	8.1	10.4
256	+0.2	5.0	5.8	7.1
512	+0.2	3.4	4.0	5.3
1,024	+0.2	2.3	2.8	3.8
2,048	+0.2	1.6	2.0	2.7
4,096	+0.2	1.2	1.4	1.9
8,192	+0.2	0.9	1.0	1.4
16,384	+0.1	0.6	0.7	0.9

**Figure 12 (150% of Old-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	30.0	0.0	70.0	70.0	-100.0
≤9	0.3	29.7	0.0	69.9	70.3	-97.8
≤14	1.2	28.9	0.1	69.9	71.0	-91.8
≤19	2.9	27.2	0.3	69.6	72.5	-79.9
≤24	5.7	24.4	1.0	69.0	74.6	-59.0
≤29	9.0	21.0	2.2	67.8	76.8	-32.5
≤34	13.0	17.0	4.7	65.3	78.3	+2.3
≤39	17.4	12.6	8.3	61.7	79.1	+43.5
≤44	21.5	8.6	13.8	56.2	77.7	+54.2
≤49	24.6	5.5	19.8	50.1	74.7	+34.0
≤54	26.6	3.4	27.3	42.7	69.3	+9.1
≤59	28.2	1.8	35.0	35.0	63.2	-16.5
≤64	29.0	1.1	42.3	27.6	56.6	-41.0
≤69	29.5	0.5	50.0	20.0	49.5	-66.5
≤74	29.9	0.1	57.3	12.7	42.6	-90.7
≤79	30.0	0.0	63.0	7.0	37.0	-109.7
≤84	30.0	0.0	67.5	2.5	32.5	-124.7
≤89	30.0	0.0	69.1	0.9	30.9	-130.1
≤94	30.0	0.0	69.9	0.1	30.1	-132.6
≤100	30.0	0.0	70.0	0.0	30.0	-132.9

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

**Figure 13 (150% of Old-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	97.9	0.0	47.7:1
≤9	0.3	95.3	1.1	20.5:1
≤14	1.3	91.5	3.9	10.7:1
≤19	3.2	89.6	9.5	8.6:1
≤24	6.7	85.1	18.8	5.7:1
≤29	11.2	80.3	30.0	4.1:1
≤34	17.7	73.7	43.4	2.8:1
≤39	25.7	67.8	58.0	2.1:1
≤44	35.2	60.9	71.5	1.6:1
≤49	44.4	55.3	81.8	1.2:1
≤54	53.9	49.4	88.7	1.0:1
≤59	63.2	44.6	93.8	0.8:1
≤64	71.3	40.6	96.4	0.7:1
≤69	79.5	37.1	98.2	0.6:1
≤74	87.2	34.3	99.6	0.5:1
≤79	93.0	32.3	99.9	0.5:1
≤84	97.5	30.8	100.0	0.4:1
≤89	99.1	30.3	100.0	0.4:1
≤94	99.9	30.1	100.0	0.4:1
≤100	100.0	30.0	100.0	0.4:1

**Tables for  
200% of the Old-Definition National Poverty Line**

**Figure 4 (200% of Old-definition national line):**  
**Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	99.1
5-9	99.1
10-14	96.3
15-19	94.2
20-24	91.8
25-29	89.1
30-34	81.9
35-39	73.9
40-44	65.2
45-49	53.4
50-54	40.8
55-59	30.4
60-64	22.7
65-69	15.4
70-74	9.7
75-79	4.6
80-84	1.1
85-89	0.4
90-94	0.0
95-100	0.0

**Figure 7 (200% of Old-definition national line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	-0.8	0.5	0.5	0.5
10-14	-3.5	1.8	1.8	1.8
15-19	-2.8	2.1	2.2	2.4
20-24	+2.9	2.6	3.0	4.0
25-29	+2.7	2.9	3.5	4.3
30-34	-4.6	3.3	3.5	3.9
35-39	+3.8	2.7	3.2	4.1
40-44	+6.9	2.9	3.5	4.4
45-49	+4.3	2.8	3.4	4.3
50-54	+3.2	2.8	3.4	4.6
55-59	-6.8	4.7	5.0	5.4
60-64	+4.5	2.0	2.4	3.2
65-69	+1.7	2.1	2.6	3.3
70-74	-2.8	2.4	2.7	3.0
75-79	+1.5	0.9	1.1	1.3
80-84	+0.3	0.5	0.6	0.7
85-89	+0.4	0.1	0.1	0.1
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (200% of Old-definition national line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.0	67.4	75.6	91.1
4	+1.2	37.1	43.7	53.8
8	+1.0	27.3	33.3	41.8
16	+1.6	21.0	25.0	30.9
32	+1.3	15.0	18.5	22.2
64	+1.2	10.3	12.4	16.1
128	+1.2	7.6	9.0	11.9
256	+1.2	5.5	6.5	7.9
512	+1.2	3.7	4.6	6.1
1,024	+1.1	2.6	3.1	3.9
2,048	+1.1	1.9	2.3	2.8
4,096	+1.1	1.3	1.5	2.2
8,192	+1.1	0.9	1.1	1.4
16,384	+1.1	0.7	0.8	1.1



**Figure 12 (200% of Old-definition national line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	43.9	0.0	56.1	56.1	-100.0
≤9	0.3	43.6	0.0	56.1	56.4	-98.5
≤14	1.3	42.6	0.0	56.1	57.4	-94.1
≤19	3.1	40.8	0.1	56.0	59.1	-85.7
≤24	6.2	37.7	0.4	55.7	61.9	-70.6
≤29	10.3	33.6	0.9	55.2	65.5	-50.9
≤34	15.7	28.2	2.0	54.1	69.8	-24.0
≤39	21.5	22.4	4.2	51.9	73.4	+7.5
≤44	27.4	16.5	7.9	48.2	75.6	+42.6
≤49	32.3	11.6	12.1	44.0	76.4	+72.5
≤54	36.3	7.6	17.7	38.4	74.7	+59.8
≤59	39.5	4.4	23.7	32.4	71.9	+46.0
≤64	41.4	2.5	29.9	26.2	67.5	+31.8
≤69	42.6	1.3	36.9	19.2	61.8	+16.0
≤74	43.6	0.3	43.6	12.5	56.1	+0.6
≤79	43.8	0.1	49.2	6.9	50.8	-12.0
≤84	43.9	0.0	53.6	2.5	46.4	-22.2
≤89	43.9	0.0	55.2	0.9	44.8	-25.9
≤94	43.9	0.0	56.0	0.1	44.0	-27.5
≤100	43.9	0.0	56.1	0.0	43.9	-27.8

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

**Figure 13 (200% of Old-definition national line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	99.1	0.0	108.4:1
≤9	0.3	99.6	0.8	228.0:1
≤14	1.3	99.6	2.9	242.1:1
≤19	3.2	97.4	7.1	38.1:1
≤24	6.7	93.9	14.2	15.3:1
≤29	11.2	91.7	23.5	11.0:1
≤34	17.7	88.7	35.7	7.9:1
≤39	25.7	83.6	48.9	5.1:1
≤44	35.2	77.7	62.3	3.5:1
≤49	44.4	72.8	73.7	2.7:1
≤54	53.9	67.3	82.7	2.1:1
≤59	63.2	62.5	89.9	1.7:1
≤64	71.3	58.0	94.2	1.4:1
≤69	79.5	53.6	97.1	1.2:1
≤74	87.2	50.0	99.3	1.0:1
≤79	93.0	47.1	99.9	0.9:1
≤84	97.5	45.0	100.0	0.8:1
≤89	99.1	44.3	100.0	0.8:1
≤94	99.9	43.9	100.0	0.8:1
≤100	100.0	43.9	100.0	0.8:1

**Tables for  
the Old-Definition \$1.25/Day 2005 PPP Poverty Line**

**Figure 4 (Old-definition \$1.25/day line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	83.9
5-9	83.9
10-14	59.6
15-19	47.3
20-24	39.4
25-29	31.1
30-34	20.3
35-39	10.6
40-44	7.8
45-49	3.5
50-54	1.5
55-59	1.5
60-64	0.7
65-69	0.1
70-74	0.1
75-79	0.0
80-84	0.0
85-89	0.0
90-94	0.0
95-100	0.0

**Figure 7 (Old-definition \$1.25/day line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+23.9	12.0	14.3	19.2
10-14	-3.3	7.6	9.0	11.7
15-19	+1.1	5.7	6.7	8.7
20-24	+1.2	3.9	4.5	5.8
25-29	+11.0	2.6	3.2	4.2
30-34	+6.8	1.8	2.2	2.9
35-39	+0.1	1.4	1.7	2.4
40-44	-3.4	2.8	3.0	3.8
45-49	-2.4	1.8	2.0	2.3
50-54	+0.2	0.5	0.6	0.7
55-59	-0.3	0.9	1.1	1.4
60-64	-0.3	0.5	0.6	0.8
65-69	+0.1	0.0	0.0	0.1
70-74	+0.1	0.0	0.0	0.0
75-79	0.0	0.0	0.0	0.0
80-84	0.0	0.0	0.0	0.0
85-89	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (Old-definition \$1.25/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-0.6	50.0	62.0	71.9
4	+0.0	17.7	25.5	41.4
8	+0.3	12.1	16.0	26.8
16	+0.2	8.5	11.5	17.0
32	+0.4	6.3	8.4	12.8
64	+0.3	4.7	5.8	8.1
128	+0.3	3.4	4.1	5.4
256	+0.2	2.3	2.8	3.5
512	+0.3	1.8	2.0	2.7
1,024	+0.3	1.2	1.4	1.9
2,048	+0.2	0.9	1.0	1.3
4,096	+0.2	0.6	0.7	0.9
8,192	+0.2	0.4	0.5	0.7
16,384	+0.2	0.3	0.4	0.5

**Figure 12 (Old-definition \$1.25/day line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

<b>Score</b>	<b><u>Inclusion:</u> &lt; poverty line correctly targeted</b>	<b><u>Undercoverage:</u> &lt; poverty line mistakenly non-targeted</b>	<b><u>Leakage:</u> ≥ poverty line mistakenly targeted</b>	<b><u>Exclusion:</u> ≥ poverty line correctly non-targeted</b>	<b><u>Hit rate</u> Inclusion + Exclusion</b>	<b><u>BPAC</u> See text</b>
≤4	0.0	8.6	0.0	91.4	91.4	-100.0
≤9	0.2	8.4	0.1	91.3	91.5	-93.5
≤14	0.8	7.7	0.4	91.0	91.8	-75.2
≤19	1.8	6.7	1.3	90.1	91.9	-41.5
≤24	3.3	5.3	3.4	88.1	91.4	+15.9
≤29	4.5	4.1	6.7	84.7	89.2	+21.6
≤34	5.8	2.8	11.9	79.5	85.3	-38.6
≤39	6.9	1.7	18.8	72.6	79.5	-119.5
≤44	7.7	0.9	27.5	63.9	71.6	-221.0
≤49	8.2	0.4	36.2	55.2	63.4	-322.0
≤54	8.4	0.2	45.6	45.9	54.3	-430.9
≤59	8.5	0.1	54.7	36.8	45.3	-537.2
≤64	8.6	0.0	62.7	28.7	37.3	-631.2
≤69	8.6	0.0	70.9	20.5	29.1	-726.6
≤74	8.6	0.0	78.6	12.8	21.4	-816.2
≤79	8.6	0.0	84.4	7.0	15.6	-884.1
≤84	8.6	0.0	88.9	2.5	11.1	-936.7
≤89	8.6	0.0	90.6	0.9	9.4	-955.6
≤94	8.6	0.0	91.3	0.1	8.7	-964.3
≤100	8.6	0.0	91.4	0.0	8.6	-965.6

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

**Figure 13 (Old-definition \$1.25/day line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	83.9	0.0	5.2:1
≤9	0.3	62.5	2.5	1.7:1
≤14	1.3	65.2	9.8	1.9:1
≤19	3.2	57.6	21.4	1.4:1
≤24	6.7	49.5	38.4	1.0:1
≤29	11.2	40.1	52.6	0.7:1
≤34	17.7	32.8	67.6	0.5:1
≤39	25.7	26.7	80.0	0.4:1
≤44	35.2	21.8	89.7	0.3:1
≤49	44.4	18.5	95.6	0.2:1
≤54	53.9	15.6	97.8	0.2:1
≤59	63.2	13.5	99.0	0.2:1
≤64	71.3	12.0	99.9	0.1:1
≤69	79.5	10.8	99.9	0.1:1
≤74	87.2	9.8	100.0	0.1:1
≤79	93.0	9.2	100.0	0.1:1
≤84	97.5	8.8	100.0	0.1:1
≤89	99.1	8.7	100.0	0.1:1
≤94	99.9	8.6	100.0	0.1:1
≤100	100.0	8.6	100.0	0.1:1



**Tables for  
the Old-Definition \$2.50/Day 2005 PPP Poverty Line**

**Figure 4 (Old-definition \$2.50/day line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	97.9
5-9	97.9
10-14	93.5
15-19	88.2
20-24	86.1
25-29	79.4
30-34	69.4
35-39	54.9
40-44	42.0
45-49	31.3
50-54	22.5
55-59	15.5
60-64	9.0
65-69	5.6
70-74	3.7
75-79	0.8
80-84	0.5
85-89	0.2
90-94	0.0
95-100	0.0

**Figure 7 (Old-definition \$2.50/day line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	-0.5	2.1	2.6	3.5
10-14	+4.5	4.9	5.8	7.3
15-19	-4.6	3.4	3.6	4.1
20-24	+4.2	3.1	3.8	4.9
25-29	+10.0	3.7	4.4	5.7
30-34	+4.8	3.3	3.9	5.1
35-39	-0.6	2.7	3.2	4.5
40-44	-1.8	2.9	3.4	4.3
45-49	-0.3	2.7	3.1	4.3
50-54	+4.9	1.8	2.2	2.7
55-59	-4.4	3.4	3.6	4.1
60-64	+2.2	1.2	1.4	1.8
65-69	-2.1	2.0	2.1	2.8
70-74	-0.5	1.1	1.3	1.7
75-79	+0.1	0.4	0.4	0.6
80-84	+0.5	0.0	0.0	0.0
85-89	+0.2	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (Old-definition \$2.50/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	-1.6	66.2	77.0	90.3
4	+0.2	34.2	41.7	59.0
8	+0.8	25.3	30.4	42.0
16	+0.9	17.6	22.7	31.1
32	+0.9	13.2	15.6	20.0
64	+0.6	9.6	11.0	14.2
128	+0.4	6.7	7.8	10.2
256	+0.5	4.7	5.6	7.1
512	+0.5	3.4	3.8	5.1
1,024	+0.4	2.3	2.6	3.4
2,048	+0.5	1.6	1.9	2.5
4,096	+0.5	1.1	1.3	1.8
8,192	+0.4	0.8	1.0	1.3
16,384	+0.4	0.6	0.7	0.9

**Figure 12 (Old-definition \$2.50/day line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

Score	<u>Inclusion:</u>	<u>Undercoverage:</u>	<u>Leakage:</u>	<u>Exclusion:</u>	<u>Hit rate</u>	<u>BPAC</u>
	< poverty line correctly targeted	< poverty line mistakenly non-targeted	≥ poverty line mistakenly targeted	≥ poverty line correctly non-targeted	Inclusion + Exclusion	See text
≤4	0.0	30.9	0.0	69.1	69.1	-100.0
≤9	0.3	30.6	0.0	69.1	69.4	-97.8
≤14	1.2	29.7	0.1	69.0	70.2	-92.0
≤19	2.9	28.0	0.3	68.8	71.7	-80.3
≤24	5.8	25.1	0.8	68.2	74.0	-59.7
≤29	9.3	21.7	2.0	67.1	76.4	-33.7
≤34	13.5	17.4	4.2	64.9	78.4	+0.8
≤39	18.1	12.9	7.6	61.4	79.5	+41.4
≤44	22.3	8.7	13.0	56.1	78.4	+58.1
≤49	25.3	5.6	19.1	50.0	75.3	+38.4
≤54	27.5	3.4	26.4	42.6	70.1	+14.6
≤59	29.2	1.8	34.0	35.1	64.3	-9.8
≤64	29.9	1.0	41.4	27.7	57.6	-33.7
≤69	30.5	0.4	49.0	20.1	50.6	-58.3
≤74	30.9	0.1	56.3	12.7	43.6	-82.0
≤79	30.9	0.0	62.1	7.0	37.9	-100.6
≤84	30.9	0.0	66.6	2.5	33.4	-115.2
≤89	30.9	0.0	68.2	0.9	31.8	-120.4
≤94	30.9	0.0	68.9	0.1	31.1	-122.8
≤100	30.9	0.0	69.1	0.0	30.9	-123.2

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

**Figure 13 (Old-definition \$2.50/day line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	97.9	0.0	47.7:1
≤9	0.3	97.8	1.1	43.9:1
≤14	1.3	92.7	3.9	12.6:1
≤19	3.2	91.3	9.4	10.5:1
≤24	6.7	87.3	18.8	6.9:1
≤29	11.2	82.5	30.0	4.7:1
≤34	17.7	76.4	43.7	3.2:1
≤39	25.7	70.3	58.4	2.4:1
≤44	35.2	63.2	72.0	1.7:1
≤49	44.4	57.1	81.9	1.3:1
≤54	53.9	51.0	88.9	1.0:1
≤59	63.2	46.2	94.3	0.9:1
≤64	71.3	42.0	96.8	0.7:1
≤69	79.5	38.4	98.6	0.6:1
≤74	87.2	35.4	99.8	0.5:1
≤79	93.0	33.3	100.0	0.5:1
≤84	97.5	31.7	100.0	0.5:1
≤89	99.1	31.2	100.0	0.5:1
≤94	99.9	31.0	100.0	0.4:1
≤100	100.0	30.9	100.0	0.4:1

**Tables for  
the Old-Definition \$3.75/Day 2005 PPP Poverty Line**

**Figure 4 (Old-definition \$3.75/day line): Estimated poverty likelihoods associated with scores**

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0-4	100.0
5-9	100.0
10-14	97.9
15-19	96.4
20-24	96.3
25-29	94.4
30-34	87.5
35-39	79.6
40-44	74.5
45-49	64.3
50-54	49.4
55-59	41.7
60-64	31.3
65-69	22.4
70-74	15.5
75-79	7.7
80-84	2.2
85-89	0.7
90-94	0.2
95-100	0.0



**Figure 7 (Old-definition \$3.75/day line):** For each score range, average differences between estimated and true poverty likelihoods for households, with confidence intervals, from 1,000 bootstraps of  $n = 16,384$ , 2012/13 scorecard applied to the 2005/6 validation sample

Score	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
0-4	0.0	0.0	0.0	0.0
5-9	+0.1	0.2	0.3	0.4
10-14	-2.1	1.0	1.0	1.0
15-19	-2.2	1.5	1.6	1.7
20-24	+3.9	2.3	2.5	3.2
25-29	-0.3	1.6	1.8	2.5
30-34	-2.5	2.1	2.3	2.7
35-39	-0.4	2.5	2.9	3.9
40-44	+5.8	2.7	3.3	4.6
45-49	+7.9	2.8	3.5	4.4
50-54	-0.8	2.9	3.5	4.6
55-59	-7.1	4.9	5.2	5.7
60-64	+7.8	2.2	2.6	3.2
65-69	-0.8	2.6	3.2	3.9
70-74	-0.3	2.1	2.4	3.1
75-79	0.0	1.5	1.8	2.4
80-84	-0.6	0.9	1.1	1.4
85-89	+0.6	0.1	0.1	0.1
90-94	+0.2	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0

**Figure 8 (Old-definition \$3.75/day line): Average differences between estimated poverty rates and true values for a group at a point in time, with confidence intervals, for 1,000 bootstraps of various sample sizes, 2012/13 scorecard applied to the 2005/6 validation sample**

Sample Size <i>n</i>	Difference between estimate and true value			
	Diff.	Confidence interval ( $\pm$ percentage points)		
		90-percent	95-percent	99-percent
1	+0.4	71.6	78.6	91.4
4	+0.7	37.4	45.5	56.5
8	+0.6	29.3	34.9	45.4
16	+1.4	20.9	24.9	32.3
32	+1.0	15.8	18.6	24.6
64	+0.9	11.1	12.5	17.0
128	+0.9	8.1	9.3	12.1
256	+0.9	5.6	6.5	8.5
512	+0.8	3.8	4.6	6.3
1,024	+0.8	2.7	3.4	4.3
2,048	+0.8	2.0	2.4	3.1
4,096	+0.8	1.4	1.7	2.4
8,192	+0.8	1.0	1.2	1.6
16,384	+0.8	0.7	0.8	1.2

**Figure 12 (Old-definition \$3.75/day line): Percentages of households by cut-off score and targeting classification, along with the hit rate and BPAC, 2012/13 scorecard applied to the 2005/6 validation sample**

<b>Score</b>	<b><u>Inclusion:</u> &lt; poverty line correctly targeted</b>	<b><u>Undercoverage:</u> &lt; poverty line mistakenly non-targeted</b>	<b><u>Leakage:</u> ≥ poverty line mistakenly targeted</b>	<b><u>Exclusion:</u> ≥ poverty line correctly non-targeted</b>	<b><u>Hit rate</u> Inclusion + Exclusion</b>	<b><u>BPAC</u> See text</b>
≤4	0.0	51.0	0.0	49.0	49.0	-100.0
≤9	0.3	50.6	0.0	49.0	49.4	-98.7
≤14	1.3	49.7	0.0	49.0	50.3	-95.0
≤19	3.1	47.8	0.0	49.0	52.1	-87.6
≤24	6.4	44.6	0.3	48.8	55.1	-74.4
≤29	10.7	40.3	0.5	48.5	59.2	-56.9
≤34	16.4	34.6	1.3	47.8	64.2	-33.1
≤39	23.0	28.0	2.7	46.3	69.3	-4.5
≤44	29.7	21.3	5.6	43.4	73.1	+27.3
≤49	35.4	15.6	9.0	40.0	75.5	+56.6
≤54	40.3	10.6	13.6	35.4	75.8	+73.3
≤59	44.5	6.5	18.6	30.4	74.9	+63.5
≤64	47.0	4.0	24.3	24.7	71.7	+52.3
≤69	48.9	2.1	30.6	18.5	67.4	+40.1
≤74	50.3	0.7	36.9	12.1	62.4	+27.6
≤79	50.8	0.2	42.2	6.8	57.6	+17.2
≤84	51.0	0.0	46.5	2.5	53.5	+8.7
≤89	51.0	0.0	48.2	0.9	51.8	+5.5
≤94	51.0	0.0	48.9	0.1	51.1	+4.1
≤100	51.0	0.0	49.0	0.0	51.0	+3.9

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

**Figure 13 (Old-definition \$3.75/day line): Share of all households who are targeted (that is, score at or below a cut-off), the share of targeted households who are poor (that is, have consumption below the poverty line), the share of poor households who are targeted, and the number of poor households who are successfully targeted (inclusion) per non-poor household mistakenly targeted (leakage), 2012/13 scorecard applied to the 2005/6 validation sample**

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
≤4	0.0	100.0	0.0	Only poor targeted
≤9	0.3	99.6	0.7	228.0:1
≤14	1.3	99.9	2.5	864.7:1
≤19	3.2	98.7	6.2	74.0:1
≤24	6.7	96.1	12.5	24.4:1
≤29	11.2	95.4	21.0	21.0:1
≤34	17.7	92.9	32.2	13.0:1
≤39	25.7	89.4	45.1	8.5:1
≤44	35.2	84.2	58.2	5.3:1
≤49	44.4	79.8	69.5	4.0:1
≤54	53.9	74.8	79.1	3.0:1
≤59	63.2	70.5	87.3	2.4:1
≤64	71.3	65.9	92.2	1.9:1
≤69	79.5	61.6	96.0	1.6:1
≤74	87.2	57.7	98.6	1.4:1
≤79	93.0	54.6	99.7	1.2:1
≤84	97.5	52.3	100.0	1.1:1
≤89	99.1	51.4	100.0	1.1:1
≤94	99.9	51.0	100.0	1.0:1
≤100	100.0	51.0	100.0	1.0:1