Simple Poverty Scorecard® Poverty Assessment Tool Nigeria

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This document and related tools are available at `SimplePovertyScorecard.com`.

Abstract

The Simple Poverty Scorecard®-brand poverty-assessment tool uses ten low-cost indicators from Nigeria's 2003 Living Standards Survey to estimate the likelihood that a household has expenditure below a given poverty line. Field workers can collect responses in about ten minutes. The scorecard's accuracy is reported for a range of poverty lines. The scorecard is a practical way for pro-poor programs in Nigeria to measure poverty rates, to track changes in poverty rates over time, and to segment clients for targeted services.

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Simple Poverty Scorecard® Poverty-Assessment Tool

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

Indicator	Value	Points	Score
1. How many members does the household have?	A. Eight or more	0	
	B. Six or seven	6	
	C. Five	11	
	D. Four	14	
	E. Three	19	
	F. Two	30	
	G. One	38	
2. Are all household members aged 6 to 18 currently attending school?	A. No	0	
	B. No children ages 6 to 18	7	
	C. Yes	9	
3. What is the main flooring material of the house?	A. Earth/mud, or dirt/straw	0	
	B. Wood, tile, plank, concrete, or other	4	
4. What is the main roofing material of the house?	A. Mud/mud bricks	0	
	B. Thatch (grass or straw)	3	
	C. Wood/bamboo, corrugated iron sheets, cement/concrete, roofing tiles, or other	6	
5. What is the main source of drinking water for the household?	A. Unprotected well/rain water, or untreated pipe-borne	0	
	B. Vendor, truck, protected well, river, lake, or pond	4	
	C. Treated pipe-borne water, borehole/hand pump, or other	6	
6. What type of toilet is used by the household?	A. Pail/bucket, covered or uncovered pit latrine, ventilated improved pit latrine, other, or none	0	
	B. Toilet on water, or flush to sewer or septic tank	5	
7. Does any member of the household own a television?	A. No	0	
	B. Yes	15	
8. Does any member of the household own a stove?	A. No	0	
	B. Yes	7	
9. Does any member of the household own a mattress/bed?	A. No	0	
	B. Yes	5	
10. Does any member of the household own a radio?	A. No	0	
	B. Yes	5	

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Score:

Simple Poverty Scorecard® Poverty-Assessment Tool Nigeria

1. Introduction

Pro-poor programs in Nigeria can use the Simple Poverty Scorecard poverty-assessment tool to monitor groups' poverty rates at a point in time, track changes in groups' poverty rates between two points in time, and target services to households.

The direct approach to poverty measurement via direct surveys is difficult and costly, asking households about a lengthy list of expenditure items (such as "Was anything spent by the household on cotton clothing and footwear in the last 12 months? How many times was cotton clothing and footwear bought in the last 12 months? How much was spent in the last 12 months altogether? How much was spent in the last 3 months? How much of this was on second-hand clothes?").

In contrast, the indirect approach via the scorecard is simple, quick, and inexpensive. It uses 10 verifiable indicators (such as "What is the main flooring material of the house?" or "Does any member of the household own a radio?") to get a score that is highly correlated with poverty status as measured by the exhaustive survey.

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

as participatory wealth ranking by skilled field workers) or blunt (such as rules based on land-ownership or housing quality). Results from these approaches are not comparable across organizations nor across countries, they may be costly, and their accuracy is unknown.

If an organization wants to know what share of its participants are below a poverty line (say, $1/day for the Millennium Development Goals, or the poorest half below the national poverty line as required of USAID microenterprise grantees), or if it wants to measure movement across a poverty line (for example, to report to the Microcredit Summit Campaign), then it needs an expenditure-based, objective tool with known accuracy. While expenditure surveys are costly even for governments, many small, local organizations can implement an inexpensive scorecard that can serve for monitoring, management, and targeting.

The statistical approach here aims to be understood by non-specialists. After all, if managers are to adopt the scorecard on their own and apply it to inform their decisions, they must first trust that it works. Transparency and simplicity build trust. Getting "buy-in" matters; proxy means tests and regressions on the "determinants of poverty" have been around for three decades, but they are rarely used to inform decisions, not because they do not work, but because they are presented (when they are presented at all) as tables of regression coefficients incomprehensible to lay people (with cryptic indicator names such as "`HHSIZE_2`", negative values, many decimal places, and

standard errors). Thanks to the predictive-modeling phenomenon known as the "flat max", simple poverty-assessment tools can be almost as accurate as complex ones.

The technical approach here is also innovative in how it associates scores with poverty likelihoods, in the extent of its accuracy tests, and in how it derives sample-size formulas. Although these techniques are simple and/or standard, they have rarely or never been applied to proxy means tests.

The scorecard (Figure 1) is based on the 2003 NLSS conducted by the National Bureau of Statistics of Nigeria (NBS). Indicators are selected to be:

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

All points in the scorecard are 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 five minutes.

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

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

Third, the scorecard can estimate changes in the poverty rate for a group of households between two points in time. This estimate is simply the change in the average poverty likelihood of the households in the group over time.

The scorecard can also be used for targeting. To help managers choose a targeting cut-off, this paper reports the share of Nigeria's households who are below a given poverty line and who are also at or below a given score cut-off.

This paper presents a single scorecard (Figure 1) whose indicators and points are derived from Nigeria's household expenditure data and the national poverty line. Scores from this scorecard are calibrated to poverty likelihoods for seven poverty lines.

The scorecard is constructed using a sub-sample of the data from the 2003 NLSS. Its accuracy is validated on a different sub-sample from the 2003 NLSS. While all three scoring estimators are unbiased when applied to the validation sample (that is, they match the true value on average in repeated samples from the same population from which the scorecard was built), they are—like all predictive models—biased to some extent when applied to a different population.

Thus, while the indirect scoring approach is less costly than the direct survey approach, it is also biased. (The survey approach is unbiased by assumption.) There is bias because scoring must assume that the future relationship between indicators and

poverty will be the same as in the data used to build the scorecard.[1] Of course, this assumption—ubiquitous and inevitable in predictive modeling—holds only partly.

When applied to the validation sample, the absolute difference between scorecard estimates of groups' poverty rates and the true rates is 0.4 percentage points for the national line and 0.5 percentage points on average across all seven lines. This difference is due to sampling variation and not bias; the average difference would be zero if the whole NLSS were to be repeatedly redrawn and divided into sub-samples before repeating the entire scorecard-building process.

For sample sizes of $n = 16{,}384$, the 90-percent confidence intervals for these estimates are +/–0.6 percentage points or less. For $n = 1{,}024$, the 90-percent intervals are +/–2.6 percentage points or less.

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

[1] Bias may also result from changes in the quality of data collection, from imperfect adjustment of poverty lines across time or geographic regions, or from sampling variation across expenditure surveys.

2. Data and poverty lines

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

2.1 Data

The scorecard is based on data from the 2003 NLSS. Households are randomly divided into three sub-samples (Figure 2):

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

2.2 Poverty rates and poverty lines

2.2.1 Rates

There are two types of poverty rates, person-level and household-level. The person-level rate ("head-count index") is the share of people in a given group who live in households whose total household expenditure divided by the number of household members is below a given poverty line (or whose total household expenditure divided by the number of adult equivalents is below a given poverty line).

The household-level poverty rate is the share of households in a given group whose per-capita or per-adult equivalent expenditure is below a given poverty line.

Whereas governments report person-level poverty rates, local pro-poor development organizations typically report household poverty rates. This is because development organizations want to know the poverty rate of their participants, not the poverty rate of all people who live in households with their participants. Thus, the household-level rate will typically be the benchmark when comparing the poverty rate of an organization's participants with the overall rate in a political entity.

Given household-level poverty likelihoods, the person-level poverty rate for all people in the group of households is simply the average of the household-level poverty likelihoods, weighted by the number of people in each household. Larger households are more likely to be poor, so the person-level rate exceeds the household-level rate.

2.2.2 Lines

The national poverty line developed by the NBS is 82.5 Naira per adult equivalent per day. It is defined as the food poverty line plus a non-food component. The food poverty line developed by the NBS is 59.6 Naira per adult equivalent per day, which is the minimum daily expenditure required to consume 2,900 calories. The non-food component is taken as the average non-food expenditure for the 200 households in the NLSS who were just above or just below the food poverty line (NBS, 2005)

The scorecard here is constructed using the national poverty line. The 2003 NLSS data set includes food and non-food deflators by state and by rural/urban area from September 2003 to August 2004 (Figures 16 and 17). The data set provided by the NBS includes deflated household expenditure per adult equivalent in units of national

prices as of January 2004. The national line implies household-level poverty rates of 34.3 percent in urban areas and 53.5 percent in rural areas (Figure 3). The person-level poverty rate for the national line is 42.7 percent in urban areas and 63.8 percent in rural areas.

Because local pro-poor organizations may want to use different or various poverty lines, this paper calibrates scores from its single scorecard to poverty likelihoods for seven lines (figures in parentheses below are in units of Naira per day per-adult equivalent for the national, food, and USAID "extreme" poverty lines, as well as per-capita units for the $0.25, $0.50, $0.75 and $1 poverty lines, with household-level and person-level poverty rates):[2]

- National line (82.54, 44.8 percent, 54.5 percent)
- Food line (59.57, 28.6 percent, 36.2 percent)
- USAID "extreme" line (49.43, 21.0 percent, 27.3 percent)
- $0.25/day (26.90, 10.9 percent, 14.8 percent)
- $0.50/day (53.81, 36.8 percent, 46.2 percent)
- $0.75/day (80.71, 57.6 percent, 67.9 percent)
- $1/day (107.61, 71.5 percent, 80.4 percent)

[2] The national poverty lines reported here are not averages of the all-Nigeria rural and urban lines in Figure 3 because those numbers are weighted averages of the provincial lines. These provincial lines do not appear in the NBS data; rather, they are derived as described later. This means that the weighted average of the provincial lines differs slightly from the all-Nigeria lines in the NBS data. This difference arises because the deflators used by NBS—and how provincial, urban/rural, and food/non-food deflators were aggregated when deriving national lines—are not documented. In any case, urban/rural lines within a province do not differ much, and the deflated provincial urban/rural poverty lines derived here produce national poverty rates that are closer to those published in NBS (2005) than those in the data provided by NBS.

Figure 3 shows that sometimes the poverty line in a state's rural area is higher than the poverty line in that same state's urban areas. This happens because, in some states, the rural price deflator is larger than the urban deflator (Figures 16 and 17).

The USAID "extreme" line (U.S. Congress, 2002) is defined as the median expenditure of households below the national line.

The $1/day line is derived using:

- 1993 purchase-power parity exchange rate from Sillers (2006): Naira 11.52 per $1
- Average 1993 Consumer Price Index from Sillers (2006): 19.9
- July 2005 CPI from Sillers (2006): 221.0
- January 2004 CPI from NBS: 119.1[3]
- July 2005 CPI from NBS: 152.9

Because there is no Consumer Price Index series available from 1993 and then through the months of the NLSS, $1 at purchase-power parity in 1993 is first converted to units as of July 2005 (using data from Sillers, 2006) and then converted back to January 2004 (using data from NBS). Also, "$1/day" is in fact shorthand for "international extreme poverty line" and actually has a value of $1.08. Thus, the $1/day poverty line for Nigeria as of January 2004 is:

$$(1993\ \text{PPP factor}) \cdot \$1.08 \cdot \left(\frac{\text{CPI}_{\text{July 2005, Sillers}}}{\text{CPI}_{\text{1993, Sillers}}}\right) \cdot \left(\frac{\text{CPI}_{\text{Jan. 2004, NBS}}}{\text{CPI}_{\text{July 2005, NBS}}}\right) =$$

$$\left(\frac{\text{Naira } 11.52}{\$1.00}\right) \cdot \$1.08 \cdot \left(\frac{221.0}{19.9}\right) \cdot \left(\frac{119.1}{152.9}\right) = \text{Naira } 107.61$$

[3] http://www.nigerianstat.gov.ng/CPI/2006/Jan06.pdf.

The lines for $0.25/day, $0.50/day and $0.75/day are fractions of the $1/day line.

The NLSS data from the NBS include nominal total household expenditure (for food and non-food) as well as total household expenditure adjusted for differences in prices by state and by urban/rural areas within a given state, all deflated to January 2004. The data also include a field marking whether a household is below the national poverty line, but this field is not used here because using the poverty status determined by the process described below produces poverty rates that are closer to those published in NBS (2005). The NBS data do not, however, include the urban/rural state-wise monthly time deflators. Furthermore (and despite its fundamental importance), none of this information appears in the literature on poverty in Nigeria.

This paper therefore documents the urban/rural state-wise poverty lines as of January 2004 as well as the urban/rural state-wise monthly price deflators for the months of the 2003 NLSS. The following procedure was used:

- Determine the urban/rural state-wise monthly deflators as the ratio of price deflators in Figures 16 and 17 that deflate nominal household expenditures to units as of January 2004 in national price
- Use the deflators to convert total household expenditure to units as of January 2004 in local prices
- Compute daily household expenditure per-adult-equivalent and per-person, and rank households by this within urban/rural areas of a given state
- Compute poverty rates for the national line, the food line and other lines by urban/rural in each state
- For urban/rural areas in a given state, find the lowest poverty line that reproduces the official poverty rate

3. The context of poverty-assessment tools for Nigeria

This section briefly discusses a few existing poverty studies for Nigeria that, like the scorecard, link indicators to household expenditure. The main aspects of interest are the goals, methods, relative/absolute poverty estimation, poverty lines, indicators, accuracy, sample-size formula, and costs.

1.1. Studies of "Determinants of Poverty"

Three studies (Omonona, Udoh, and Adeniran, 2008; Anyanwu, 2005; and Osinubi, 2003) seek "poverty determinants" to guide policy. Besides sometimes confusing "determinates" with "correlates", they use either dated national data or small, local surveys with substandard measures of expenditure.

Using ordinary least-squares regression, the three papers relate household expenditure to indicators chosen from among:

- Geographic zone
- Household head:
  - Age
  - Sex
  - Marital status
  - Education
- Household size
- Household income
- Ratio of non-workers to workers

Except for income, these indicators are all easy-to-collect. In general, however, the "policy recommendations" offered by the three papers are banal or naïve. For example, Omonona, Udoh, and Adeiran conclude that "human capital development is

necessary", that "the government should provide an enabling environment for employment generation", and that "adopting various birth-control measures will automatically reduce the dependency ratio" (p. 411).

In sum, these three papers are part of an unfortunate genre in poverty analysis: run regressions, rediscover well-known associations between policy and poverty or refine techniques for counting the poor, and—without providing any new motivations or tools—exhort governments to do a better job at what governments already know they should be doing. Of course, governments struggle with poverty alleviation not because they do not know, for example, that education is important, but rather because they face technical, financial, and—most important—organizational/institutional constraints. The goal of the scorecard here is to weaken some of these constraints.

1.2. Alayande and Alayande

Alayande and Alayande (AA, 2004) build a poverty-assessment tool using 9,436 households from the 1996/7 National Integrated Survey of Households (a precursor to the NLSS). They seek to predict vulnerability to poverty, defined as the risk of being poor one year from now. Of course, this goal is quite close to that of the scorecard here, namely, measuring the "risk" (probability) of being poor now.

Many of AA's 20 indicators are similar the 10 here (except rent's share in expenditure, which, if measured, would obviate the need for a poverty-assessment tool):

- Location:
  - Urban/rural
  - Region
- Household head:
  - Age
  - Marital status
  - Sex
  - Education
  - Occupation
- Household size:
  - All members
  - Number of wives
  - Number of children
  - Number of dependents
- Ratio of children in school to school-aged children
- Employment in household:
  - Number unemployed
  - Number employed
  - Number of hours worked
- Quality of residence:
  - Toilet arrangement
  - Source of drinking water
  - Type of structure
  - Number of rooms
  - Share of total expenditure for rent

Because AA seek determinants of vulnerability, they use only indicators that, in the short term at least, are unlikely to change. In contrast, the scorecard here explicitly favors indicators that are sensitive to change.

For each major geographic zone, AA build a vulnerability-assessment tool by regressing their 20 indicators on the log of per-capita consumption. They then compare predicted expenditure to a poverty line defined as two-thirds of mean household

expenditure, expressed in 1985 Naira. As here, AA adjust their poverty lines by region. Their main result is the estimation of the percentage of households who are vulnerable.

The main distinction between AA and the current paper is that they build their tool to discover how indicators are related to poverty and to count the poor. Of course, it is hardly surprising that they find that vulnerability is higher for (p. 30):

- Rural and/or farming households
- Households with low education or low school enrollment
- Households with low-quality residences

The approach here differs from AA mostly in that it explicitly aims to provide local pro-poor organizations (or even governments) with a tool to improve their poverty-reduction services. This is why this paper reports accuracy measures—both for monitoring poverty rates and for targeting households—and sample-size formula. It also explains the focus here on simplicity, transparency, and low-costs of implementation. The key issue is not figuring out *what* needs to be done; the key issue is finding practical ways *how* to do it.

1.3. Gwatkin *et al.*

Gwatkin *et al.* (2007) apply to Nigeria an approach used by USAID in 56 countries with Demographic and Health Surveys (Rutstein and Johnson, 2004). Principal Components Analysis with simple, low-cost indicators for the 35,173 households in Nigeria's 2003 DHS is used to make a "wealth index". The index is akin to the scorecard here except that, because the DHS does not measure expenditure, the

index has unknown accuracy and can only be assumed to be correlated with socio-economic status.[4] Important examples of the "wealth index" approach include Stifel and Christiaensen (2007), Zeller *et al.* (2006), Sahn and Stifle (2003 and 2000), and Filmer and Pritchett (2001).

The 21 indicators for Nigeria are similar in spirit to those in the scorecard here:

- Ownership of durable assets:
  - — Electric irons
  - — Electric fans
  - — Radios
  - — Televisions
  - — Gas cookers
  - — Bicycles
  - — Motorcycles or scooters
  - — Cars or trucks
  - — Refrigerators
  - — Telephones
  - — Canoes, boats, or ships
  - — Donkeys, horses, or camels
- Residence quality and services:
  - — Main cooking fuel
  - — Electricity
  - — Source of drinking water
  - — Toilet arrangement
  - — Main material of the floors
  - — Number of rooms
- Number of people per sleeping room
- Domestic servants
- Ownership or use of agricultural land

[4] Still, given that the indicators are so similar, it is safe to assume that the index and the scorecard are mostly picking up the same underlying construct (such as "permanent income", see Bollen, Glanville, and Stecklov, 2007). Indeed, a few papers (Filmer and Pritchett, 2001; Montgomery *et al.*, 2000) have tested how well the wealth index predicts consumption, and indeed it does a decent job (although that is not always exactly what the authors of those papers conclude).

Gwatkin *et al.* have three basic goals for their wealth index:

- Segment people by quintiles in order to see how health, population, and nutrition vary with socio-economic status
- Monitor how well health service points reach the poor via exit surveys
- Measure coverage of services via small-scale local surveys

Of course, these last two goals dovetail with the monitoring and targeting functions of the scorecard, and its scores could be used to segment as well (although serving such a "research" function is explicitly not its primary goal). Gwatkin *et al.* even present the index in a format that could be photocopied and taken to the field, although it is more difficult to use than the scorecard, given its 21 indicators (versus 10) and its sometimes negative points with 4 decimal places (versus zeroes and positive integers).

The central contrast between the wealth index and the scorecard is the scorecard's explicit link to an absolute poverty line. This means that the scorecard can not only rank households but also link them to quantitative levels of expenditure. The wealth index cannot do this and so cannot estimate of poverty rates. Furthermore, the relative accuracy of the scorecard is tested more completely than is the relative accuracy of the wealth index; generally, discussion of the accuracy of the index rests on how well it produces segments that are correlated with health or educational status.

4. Scorecard construction

About 200 potential indicators are initially prepared in the areas of[5]:

- Family composition (such as household size and female headship)
- Education (such as school attendance of children)
- Housing (such as main flooring material and type of toilet)
- Ownership of durable goods (such as television and radio)

Each indicator is first screened with the entropy-based "uncertainty coefficient" (Goodman and Kruskal, 1979) that measures how well it predicts poverty on its own. Figure 4 lists the best indicators, ranked by uncertainty coefficient. Responses for each indicator are ordered starting with those most strongly associated with poverty.

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

The scorecard itself is built using Logit regression on the construction sub-sample (Figure 2). Indicator selection uses both judgment and statistics (forward stepwise based on "c"). The first step is to build one scorecard for each candidate indicator, using Logit to derive points. Each scorecard's accuracy is taken as "c", a measure of ability to rank by poverty status (SAS Institute Inc., 2004).

[5] Employment data was not included in the data set received for this study.

One of these one-indicator scorecards is then selected based on several factors (Schreiner *et al.*, 2004; Zeller, 2004), including improvement in accuracy, likelihood of acceptance by users (determined by simplicity, cost of collection, and "face validity" in terms of experience, theory, and common sense), sensitivity to changes in poverty status, variety among indicators, and verifiability.

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

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

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

The single scorecard here applies to all of Nigeria. Evidence from India and Mexico (Schreiner, 2006a and 2005a), Sri Lanka (Narayan and Yoshida, 2005), and Jamaica (Grosh and Baker, 1995) suggests that segmenting scorecards by urban/rural does not improve accuracy much.

5. Practical guidelines for scorecard use

The main challenge of scorecard design is not to squeeze out the last drops of accuracy but rather to improve the chances that scoring is actually used (Schreiner, 2005b). When scoring projects fail, the reason is not usually technical inaccuracy but rather the failure of an organization to decide to do what is needed to integrate scoring in its processes and to learn to use it properly (Schreiner, 2002). After all, most reasonable scorecards predict tolerably well, thanks to the empirical phenomenon known as the "flat max" (Hand, 2006; Baesens *et al.*, 2003; Lovie and Lovie, 1986; Kolesar and Showers, 1985; Stillwell, Hutton, 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 adopt it and use it properly. Of course, accuracy matters, but it is balanced against simplicity, ease-of-use, and "face validity". Programs are more likely to collect data, compute scores, and pay attention to the results if, in their view, scoring does not make a lot of "extra" work and if the whole process generally seems to make sense.

To this end, the scorecard here fits on one page (Figure 1). The construction process, indicators, and points are simple and transparent. "Extra" work is minimized; non-specialists can compute scores by hand in the field because the scorecard has:

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

A field worker using the paper scorecard would:

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

Of course, field workers must be trained. Quality results depend on quality inputs. If organizations or field workers gather their own data and have an incentive to exaggerate poverty rates (for example, if they are rewarded for higher poverty rates), then it is wise to do on-going quality control via data review and random audits (Matul and Kline, 2003).[6] IRIS Center (2007a) and Toohig (2007) are useful nuts-and-bolts guides for budgeting, training field workers and supervisors, logistics, sampling, interviewing, piloting, recording data, and quality control.

In particular, while collecting scorecard indicators is relatively easier than alternatives, it is still absolutely difficult. Training and careful communication of definitions of terms and concepts in the scorecard is essential. For the case of Nigeria, Onwujekwe, Hanson, and Fox-Rushby (2006) find distressingly low inter-rater and test-retest correlations for such seemingly simple indicators as whether the household owns an automobile. In contrast, Martinelli and Parker (2007) find that interviewer errors

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

and respondent lies had negligible effects on targeting accuracy in a Mexican program. For now, it is unknown whether these results are universal or country-specific.

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

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

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

- Employees of the organization
- Third-party contractors

Responses, scores, and poverty likelihoods can be recorded:

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

The subjects to be scored can be:

- All participants (or all new participants)
- A representative sample of all participants (or of all new participants)
- All participants (or all new participants) in a representative sample of branches
- A representative sample of all participants (or of all new participants) in a representative sample of branches

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

Frequency of application can be:

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

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

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

An example set of choices were made by BRAC and ASA, two microlenders in Bangladesh (each with 7 million participants) who are applying a the Simple Poverty Scorecard tool for Bangladesh (Schreiner, 2006b). Their design is that loan officers in a random sample of branches score all participants each time they visit a homestead as part of their standard due diligence prior to loan disbursement (about once a year). Responses are recorded on paper in the field before being sent to a central office to be entered into a database. ASA's and BRAC's sampling plans cover 50,000–100,000 participants each.

6. Estimates of household poverty likelihoods

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

To get absolute units, scores must be converted to *poverty likelihoods*, that is, probabilities of being below a poverty line. This is done via simple look-up tables. For the example of the national line, scores of 10–14 have a poverty likelihood of 84.3 percent, and scores of 45–49 have a poverty likelihood of 39.9 percent (Figure 5).

The poverty likelihood associated with a score varies by poverty line. For example, scores of 45–49 are associated with a poverty likelihood of 39.9 percent for the national line but 21.5 percent for the food line.[7]

6.1 Calibrating scores with poverty likelihoods

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

[7] Starting with Figure 5, most figures have seven versions, one for each poverty line. To keep them straight, they are grouped by poverty line. Single tables that pertain to all poverty lines are placed with the tables for the national line.

For the example of the national line (Figure 6), there are 6,481 households in the calibration sub-sample with a score of 20–24, of whom 4,896 are below the poverty line. The estimated poverty likelihood associated with a score of 20–24 is then 75.5 percent, because 4,896 ÷ 6,481 = 75.5 percent.

To illustrate with the national line and a score of 45–49, there are 6,842 households in the calibration sample, of whom 2,728 are below the line (Figure 6). Thus, the poverty likelihood for this score is 2,728 ÷ 6,842 = 39.9 percent.

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

Figure 7 shows, for all scores, the likelihood that expenditure falls in a range demarcated by two adjacent poverty lines. For example, the daily expenditure of someone with a score of 35–39 falls in the following ranges with probability:[8]

- 25.4 percent below the USAID "extreme" line
- 7.8 percent between the USAID "extreme" line and the food line
- 20.8 percent between the food line and the national line
- 46.0 percent above the national line

or

- 14.2 percent below $0.25/day line
- 28.1 percent between $0.25/day line and $0.50/day line
- 25.2 percent between $0.50/day line and $0.75/day line
- 17.4 percent between $0.75/day line and $1/day line
- 15.1 percent above $1/day line

[8] There are two versions of Table 7, one for poverty lines based on expenditure per adult-equivalent, and one for poverty lines based on expenditure per person.

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

Although the points in Nigeria's scorecard are transformed coefficients from a Logit regression, scores are not converted to poverty likelihoods via the Logit formula of $2.718281828^{\text{score}} \text{ x } (1+ 2.718281828^{\text{score}})^{-1}$. 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. In the field, converting scores to poverty likelihoods requires no arithmetic at all, just a look-up table. This non-parametric calibration can also improve accuracy, especially with large calibration samples.

6.2 Accuracy of estimates of poverty likelihoods

As long as the relationship between indicators and poverty does not change, this calibration process produces unbiased estimates of poverty likelihoods. *Unbiased* means that in repeated samples from the same population, the average estimate matches the true poverty likelihood. The scorecard also produces unbiased estimates of poverty rates at a point in time and of changes in poverty rates between two points in time.[9]

Of course, the relationship between indicators and poverty changes with time, so the scorecard applied after 2003 (as all are in practice) will generally be biased.

How accurate are estimates of poverty likelihoods? To measure, the scorecard is applied to 1,000 bootstrap samples of size $n = 16{,}384$ from the validation sub-sample (Figure 2). Bootstrapping entails:[10]

- Score each household in the validation sample
- Draw a new 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 expenditure below a poverty line
- For each score, record the difference between the estimated poverty likelihood (Figure 5) and the true poverty likelihood in the bootstrap sample
- Repeat the previous three steps 1,000 times
- For each score, report the average difference between estimated and true poverty likelihoods across the 1,000 bootstrap samples
- For each score, report the two-sided interval containing the central 900, 950, or 990 differences between estimated and true poverty likelihoods

For each score range, Figure 8 shows the average difference between estimated and true poverty likelihoods as well as confidence intervals around the differences.

[9] This follows because these estimates of groups' poverty rates are linear functions of the unbiased estimates of households' poverty likelihoods.
[10] Efron and Tibshirani, 1993.

For the national line, the average poverty likelihood across bootstrap samples for scores of 10–14 in the validation sample is too high by 3.9 percentage points (Figure 8). For scores of 15–19, the estimate is too high by 9.4 percentage points.[11]

For the validation sample, the 90-percent confidence interval for the differences for scores of 10–14 is +/–3.6 percentage points (Figure 8).[12] This means that in 900 of 1,000 bootstraps, the difference between the estimate and the true value is between 0.3 and 7.5 percentage points (because 3.9 – 3.6 = –0.3, and 3.9 + 3.6 = 7.5). In 950 of 1,000 bootstraps (95 percent), the difference is 3.9 +/–4.4 percentage points, and in 990 of 1,000 bootstraps (99 percent), the difference is 3.9 +/–6.1 percentage points.

For almost all score ranges, Figure 8 shows differences—sometimes large ones—between estimated poverty likelihoods and true values. This is because the validation sub-sample is a single sample that—thanks to sampling variation—differs in distribution from the construction/calibration sub-samples and from Nigeria's population. For targeting, however, what matters is less the bias in all score ranges and more the bias in score ranges just above and below the targeting cut-off. This fact mitigates the effects of bias and sampling variation on targeting (Friedman, 1997). Section 9 below looks at targeting accuracy in detail.

[11] There are differences, in spite of the estimator's unbiasedness, because the estimates come from a single sample. Their average difference would be zero if samples were repeatedly drawn from the population and split into sub-samples before repeating the entire scorecard-building process.

[12] Confidence intervals are a standard, widely understood measure of precision.

Of course, if estimates of groups' poverty rates are to be usefully accurate, then errors for individual households must largely cancel out. As discussed later, this is generally what happens.

Figure 9 (summarizing Figure 10 across poverty lines) shows that the absolute differences, when averaged across score ranges for a given poverty line, are typically 1.5 percentage points or less for the validation sample. The differences are due to sampling variation.

By construction, the scorecard here is unbiased. It may still, however, be *overfit* when applied after 2003. That is, it may fit the 2003 NLSS data so closely that it captures not only some timeless patterns but also some random patterns that, due to sampling variation, show up only in the 2003 NLSS. Or the scorecard may be overfit in the sense that it becomes biased as the relationship between indicators and poverty changes.

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

Most errors in individual households' likelihoods, however, cancel out in the estimates of groups' poverty rates (see later sections). Furthermore, much of the differences may come from non-scorecard sources such as changes in the relationship

between indicators and poverty, sampling variation, changes in poverty lines, inconsistencies in data quality across time, and inconsistencies/imperfections in cost-of-living adjustments. These factors can be addressed only by improving data quantity and quality (which is beyond the scope of the scorecard) or by reducing overfitting (which likely has limited returns, given the scorecard's parsimony).

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

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

To illustrate, suppose a program samples three households on Jan. 1, 2008 and that they have scores of 20, 30, and 40, corresponding to poverty likelihoods of 75.5, 65.5, and 49.6 percent (national line, Figure 5). The group's estimated poverty rate is the households' average poverty likelihood of $(75.5 + 65.5 + 49.6) \div 3 = 63.5$ percent.[13]

7.1 Accuracy of estimated poverty rates at a point in time

How accurate is this estimate? For a range of sample sizes, Figure 12 reports average differences between estimated and true poverty rates as well as precision (confidence intervals for the differences) for the scorecard applied to 1,000 bootstrap samples from the validation sample. For the national line, the scorecard is generally too high by about 0.4 percentage points; it estimates a poverty rate of 44.6 percent for the validation sample, but the true value is 44.2 percent (Figure 2). For all poverty lines, differences for the validation sample are 1.0 percentage points or less, with an average of about 0.5 percentage points (Figure 11).[14]

[13] The group's poverty rate is *not* the poverty likelihood associated with the average score. Here, the average score is $(20 + 30 + 40) \div 3 = 30$, and the poverty likelihood associated with the average score is 65.5 percent. This is not the 63.5 percent found as the average of the three poverty likelihoods associated with each of the three scores.

[14] Figure 11 summarizes Figure 12 across all poverty lines.

As before, these differences are due to sampling variation in the validation sample and in the random division of the 2003 NLSS into three sub-samples.

In terms of precision, the 90-percent confidence interval for a group's estimated poverty rate at a point in time and $n = 16{,}384$ is +/–0.6 percentage points or less (Figure 11). This means that in 900 of 1,000 bootstraps of this size, the difference between the estimate and the true value is within 0.6 percentage points of the average difference. In the specific case of the national line and the validation sample, 90 percent of all samples of $n = 16{,}384$ produce estimates that differ from the true value in the range of 0.4 – 0.6 = –0.2 to 0.4 + 0.6 = 1.0 percentage points. (0.4 is the average difference, and +/–0.6 is its 90-percent confidence interval.)

7.2 Sample-size formula for estimates of poverty rates at a point in time

How many households should an organization sample if it wants to estimate their poverty rate at a point in time for a desired confidence interval and confidence level? This practical question was first addressed in Schreiner (2008a).[15]

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

With direct measurement, the poverty rate can be estimated as the number of households observed to be below the poverty line, divided by the number of all observed households. The formula for sample size n in this case is (Cochran, 1977):

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

where

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

c is the confidence interval as a proportion (for example, 0.02 for an interval of +/–2 percentage points), and

$\hat{p}$ is the expected (before measurement) proportion of households below the poverty line.

Scorecards, however, do not measure poverty directly, so this formula is not applicable. To derive a similar sample-size formula for the Nigeria scorecard, consider the scorecard applied to the validation sample. Figure 2 shows that the expected (before measurement) poverty rate $\hat{p}$ for the national line is 45.1 (that is, the average poverty rate in the construction and calibration sub-samples). In turn, a sample size n of 16,384 and a 90-percent confidence level correspond to a confidence interval of +/–0.645 percentage points (Figure 12).[16] Plugging these into the direct-measurement sample-size

[16] Due to rounding, Figure 12 displays 0.6, not 0.645.

formula (1) above gives not $n = 16{,}384$ but rather $n = \left(\frac{1.64}{0.00645}\right)^2 \cdot 0.451 \cdot (1 - 0.451) =$ 16,008. The ratio of the sample size for scoring (derived empirically) to the sample size for direct measurement (derived from theory) is 16,384 ÷ 16,008 = 1.02.

Applying the same method to $n = 8{,}192$ (confidence interval of +/–0.89 percentage points) gives $n = \left(\frac{1.64}{0.0089}\right)^2 \cdot 0.451 \cdot (1 - 0.451) = 8{,}408$. This time, the ratio of the sample size using scoring to the sample size using direct measurement is 8,192 ÷ 8,408 = 0.97. This ratio of 0.97 for $n = 8{,}192$ is close to the ratio of 1.02 for $n = 16{,}384$. Indeed, applying this same procedure for all $n \geq 256$ in Figure 12 gives ratios that average to 0.96. This can be used to define a sample-size formula for the scorecard applied to the population in the validation sample:

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

where $\alpha = 0.96$ and z, c, and $\hat{p}$ are defined as in (1) above. It is this α that appears in Figure 11 as "α for sample size".

To illustrate the use of (2), suppose $c = 0.049$ (confidence interval of +/– 4.9 percentage points) and $z = 1.64$ (90-percent confidence). Then (2) gives $n = 0.96 \cdot \left(\frac{1.64}{0.049}\right)^2 \cdot 0.451 \cdot (1 - 0.451) = 267$, which is close to the sample size of 256 for these parameters in Figure 12.

When the sample-size factor α is less than 1.0, it means that the scorecard is more precise than direct measurement. This occurs in three of seven cases in Figure 11.

Of course, the sample-size formulas here are specific to Nigeria, its poverty lines, its poverty rates, and this scorecard. The derivation method, however, is valid for any poverty-assessment tool following the approach in this paper.

In practice after 2003, an organization would select a poverty line (say, the national line), select a desired confidence level (say, 90 percent, or $z = 1.64$), select a desired confidence interval (say, +/– 2 percentage points, or $c = 0.02$), make an assumption about $\hat{p}$ (perhaps based on a previous measurement such as the 45.1 percent national average for the 2003 NLSS in Figure 2), look up α (here, 0.96 for the national line), assume that the scorecard will still work in the future,[17] and then compute the required sample size. In this illustration,

$$n = 0.96 \cdot \left(\frac{1.64}{0.02}\right)^2 0.451 \cdot (1 - 0.451) = 1{,}599.$$

If the scorecard has already been applied to a sample n, then $\hat{p}$ is the scorecard's estimated poverty rate, and the confidence interval c is

$$+/- z \cdot \sqrt{\frac{\alpha \cdot \hat{p} \cdot (1 - \hat{p})}{n}}.$$

[17] This paper reports accuracy for the scorecard applied to the validation sample, but it cannot test accuracy for later years. Still, performance after the 2003 NLSS will probably resemble that in the 2003 NLSS, with some deterioration as time passes.

8. Estimates of changes in group poverty rates over time

The change in a group's poverty rate between two points in time is estimated as the change in the average poverty likelihood of the households in the group. With data for 2003 only, this paper cannot estimate changes over time, nor can it present sample-size formula. Nevertheless, the concepts are presented here because, in practice, pro-poor organizations can generate their own data and measure change through time.

8.1 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 program participation requires knowing what would have happened to participants if they had not been participants (Moffitt, 1991). Knowing this requires either strong assumptions or a control group that resembles participants in all ways except participation. To belabor the point, the scorecard can help estimate program impact only if there is some way to know what would have happened in the absence of the program. And that information must come from somewhere beyond the scorecard. Even measuring simple change usually requires assuming that the population is constant over time and that program drop-outs do not differ from others.

8.2 Calculating estimated changes in poverty rates over time

Consider the illustration begun in the previous section. On Jan. 1, 2008, a program samples three households who score 20, 30, and 40 and so have poverty likelihoods of 75.5, 65.5, and 49.6 percent (national line, Figure 5). The group's baseline estimated poverty rate is the households' average poverty likelihood of (75.5 + 65.5 + 49.6) ÷ 3 = 63.5 percent.

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

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

By way of illustration, suppose that a year later on Jan. 1, 2009, the program samples three additional households who are in the same cohort as the three households originally sampled (or suppose that the program scores the same three original households a second time) and finds that their scores are 25, 35, and 45 (poverty likelihoods of 68.2, 54.0, and 39.9 percent, national line, Figure 5). Their average poverty likelihood at follow-up is now (68.2 + 54.0 + 39.9) ÷ 3 = 54.0 percent, an improvement of 63.5 – 54.0 = 9.5 percentage points.

This suggests that about 95 of 1,000 participants crossed the poverty line in 2008.[18] Among those who started below the line, about one in seven (9.5 ÷ 63.5 = 15.0 percent) ended up above the line.[19]

[18] This is a net figure; some people start above the line and end below it, and vice versa.
[19] The scorecard does not reveal the reasons for this change.

8.3 Accuracy for estimated change in two independent samples

With data only for 2003, it is not possible to measure the accuracy of scorecard estimates of changes in groups' poverty rates over time. In practice, of course, Nigeria's scorecard can still be applied to estimate change. The following sub-sections suggest approximate sample-size formula that may be used until there is additional data.

Under direct measurement, the sample-size formula for estimates of changes in poverty rates in two equal-sized independent samples is:

$$n = 2 \cdot \left(\frac{z}{c}\right)^2 \cdot \hat{p} \cdot (1 - \hat{p}), \tag{3}$$

where z, c, and $\hat{p}$ are defined as in (1). Before measurement, $\hat{p}$ is assumed equal at both baseline and follow-up. n is the sample size at both baseline and follow-up.[20]

The method developed in the previous section can be used again to derive a sample-size formula for indirect measurement via the scorecard:

$$n = \alpha \cdot 2 \cdot \left(\frac{z}{c}\right)^2 \cdot \hat{p} \cdot (1 - \hat{p}). \tag{4}$$

As before, α is the average across sample sizes ≥ 256 of the ratio between the empirical sample size required by scoring for a given precision and the theoretical sample size required under direct measurement.

For Peru and India (Schreiner, 2008a and 2008b), the average α across poverty

[20] This means that, for a given precision and with direct measurement, 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.

lines is 1.6 and 1.2, so 1.5 may be a reasonably conservative figure for Nigeria.

To illustrate the use of (4) to determine sample size for estimating changes in poverty rates across two independent samples, suppose the desired confidence level is 90 percent ($z = 1.64$), the desired confidence interval is 2 percentage points ($c = 0.02$), the poverty line is the national line, $\alpha = 1.50$, and $\hat{p} = 0.451$ (from Figure 2). Then the baseline sample size is $n = 1.50 \cdot 2 \cdot \left(\frac{1.64}{0.02}\right)^2 \cdot 0.451 \cdot (1 - 0.451) = 4{,}995$, and the follow-up sample size is also 4,995.

8.4 Accuracy for estimated change for one sample, scored twice

In general, the direct-measurement sample-size formula for this case is:[21]

$$n = \left(\frac{z}{c}\right)^2 \cdot \left[\hat{p}_{12} \cdot (1 - \hat{p}_{12}) + \hat{p}_{21} \cdot (1 - \hat{p}_{21}) + 2 \cdot \hat{p}_{12} \cdot \hat{p}_{21}\right], \qquad (5)$$

where z and c are defined as in (1), $\hat{p}_{12}$ is the expected (before measurement) share of all sampled cases that move from below the poverty line to above it, and $\hat{p}_{21}$ is the expected share of all sampled cases that move from above the line to below it.

How can a user set $\hat{p}_{12}$ and $\hat{p}_{21}$? Before measurement, a reasonable assumption is that the change in the poverty rate is zero. Then $\hat{p}_{12} = \hat{p}_{21} = \hat{p}_*$ and (5) becomes:

$$n = 2 \cdot \left(\frac{z}{c}\right)^2 \hat{p}_* . \qquad (6)$$

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

Still, $\hat{p}_*$ could be anything between 0–1, so (6) is not enough to compute sample size. The estimate of $\hat{p}_*$ must be based on data available before baseline measurement.

Suppose that the observed relationship between $\hat{p}_*$ and the variance of the baseline poverty rate $p_{baseline} \cdot (1 - p_{baseline})$ is—as in Peru, see Schreiner (2008a)—close to $\hat{p}_* = 0.0085 + 0.206 \cdot [p_{baseline} \cdot (1 - p_{baseline})]$. Of course, $p_{baseline}$ is not known before baseline measurement, but it is reasonable to use as its expected value a previously observed poverty rate. Given this and a poverty line, a sample-size formula for a single sample directly measured twice for Nigeria once after 2003 and then again later is:

$$n = 2 \cdot \left(\frac{z}{c}\right)^2 \cdot \{0.0085 + 0.206 \cdot [p_{2003} \cdot (1 - p_{2003})]\}. \quad (7)$$

As usual, (7) is multiplied by α to get scoring's sample-size formula:

$$n = \alpha \cdot 2 \cdot \left(\frac{z}{c}\right)^2 \cdot \{0.0085 + 0.206 \cdot [p_{2003} \cdot (1 - p_{2003})]\}. \quad (8)$$

In Peru (the only other country for which there is an estimate, Schreiner 2008a), the average α across years and poverty lines is about 1.8.

To illustrate the use of (8), suppose the desired confidence level is 90 percent (z = 1.64), the desired confidence interval is 2 percentage points (c = 0.02), the poverty line is the national line, and the sample will first be scored in 2004. The before-baseline poverty rate is 45.1 percent (p_{2003} = 0.451, Figure 2), and suppose α = 1.8. Then the

baseline sample size is $n = 1.8 \cdot 2 \cdot \left(\frac{1.64}{0.02}\right)^2 \cdot \{0.0085 + 0.206 \cdot [0.451 \cdot (1 - 0.451)]\} = 1{,}441$.

Of course, the same group of 1,441 households is scored at follow-up as well.

For a given confidence level and confidence interval, sample sizes are smaller when one sample is scored twice than when there are two different samples.

9. Targeting

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

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

Targeting is successful when households truly below a poverty line are targeted (*inclusion*) and when households truly above a poverty line are not targeted (*exclusion*). Of course, no scorecard is perfect, and targeting is unsuccessful when households truly below a poverty line are not targeted (*undercoverage*) or when households truly above a poverty line are targeted (*leakage*). Figure 13 depicts these four possible targeting outcomes. Targeting accuracy varies by cut-off; a higher cut-off has better inclusion (but greater leakage), while a lower cut-off has better exclusion (but higher undercoverage).

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

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

Figure 14 shows the distribution of households by targeting outcome for the scorecard applied to the validation sample. For an example cut-off of 15–19, outcomes for the national line applied to the validation sample are:

- Inclusion: 8.3 percent are below the line and correctly targeted
- Undercoverage: 35.9 percent are below the line and mistakenly not targeted
- Leakage: 1.8 percent are above the line and mistakenly targeted
- Exclusion: 53.9 percent are above the line and correctly not targeted

Increasing the cut-off to 20–24 improves inclusion and undercoverage but worsens leakage and exclusion:

- Inclusion: 13.1 percent are below the line and correctly targeted
- Undercoverage: 31.1 percent are below the line and mistakenly not targeted
- Leakage: 3.5 percent are above the line and mistakenly targeted
- Exclusion: 52.3 percent are above the line and correctly not targeted

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

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

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

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

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

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

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

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

Figure 14 shows "Total Accuracy" for all cut-offs for the Nigeria scorecard. For the national line in the validation sample, total net benefit is greatest (71.8) for a cut-off of 35–39 or 40–44, with about seven in ten Nigerian households correctly classified.

"Total Accuracy" weighs successful inclusion of households below the line the same as successful exclusion of households above the line. If a program valued inclusion more (say, twice as much) than exclusion, it could reflect this by setting the benefit for inclusion to 2 and the benefit for exclusion to 1. Then the chosen cut-off would maximize (2 x Households correctly included) + (1 x Households correctly excluded).[22]

[22] Beyond "Total Accuracy", IRIS (2005) proposes a new yardstick called the "Balanced Poverty Accuracy Criterion" that is meant to account for inclusion. USAID uses BPAC as its criteria for certifying poverty-assessment tools. After normalizing by the number of people below the poverty line, the BPAC formula is:
BPAC = (Inclusion + |Undercoverage – Leakage|) x [100 ÷ (Inclusion+Undercoverage)].
Although inclusion (and therefore targeting accuracy) is in the BPAC formula, BPAC is maximized by minimizing the difference between undercoverage and leakage, regardless

As an alternative to assigning benefits and costs to targeting outcomes and then choosing a cut-off to maximize total net benefit, a program could set a cut-off to achieve a desired poverty rate among targeted households. Figure 15 shows, for the Nigeria scorecard applied to the validation sample, the expected poverty rate among households who score at or below a given cut-off. For the example of the national line, targeting households who score 15–19 or less would target 10.2 percent of all Nigerian households and produce a poverty rate among those targeted of 81.9 percent.[23]

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of inclusion. But the difference between undercoverage and leakage is the same as the difference between the estimated poverty rate and the true poverty rate. Thus, it would be clearer to discard the BPAC nomenclature and speak directly in terms of the accuracy of the estimated poverty rate.

[23] If potential participants are not representative of all of Nigeria, then Figure 15 is valid only if selection into potential participation—whether by the program or potential participant—is unrelated with poverty in any way not captured by the scorecard.

10. Conclusion

This paper presents the Simple Poverty Scorecard tool. Pro-poor organizations in Nigeria can be use to estimate the likelihood that a household has expenditure below a given poverty line, to estimate the poverty rate of a group of households at a point in time, and to estimate changes in the poverty rate of a group of households between two points in time. The scorecard can also be used for targeting.

The scorecard is inexpensive to use and can be understood by non-specialists. It is designed to be practical for local pro-poor organizations who want to improve how they monitor and manage their social performance in order to speed up their participants' progress out of poverty.

The scorecard is built with a sub-sample of data from the 2003 NLSS, tested with a different sub-sample, and calibrated to seven poverty lines (national, food, USAID "extreme", \$0.25/day, \$0.50/day, \$0.75/day, and \$1/day).

Accuracy and sample-size formulas are reported for estimates of households' poverty likelihoods, groups' poverty rates at a point in time, and changes in groups' poverty rates over time. Of course, the scorecard's estimates of changes in poverty rates are not the same as estimates of program impact.

When the scorecard is applied to the validation sample, the difference between estimates versus true poverty rates for groups of households at a point in time is always less than 1.0 percentage points and averages—across the seven poverty lines—about 0.5 percentage points. For n = 16,384 and 90-percent confidence, the precision of these

differences is +/–0.6 percentage points or less, and for $n = 1{,}024$, precision is +/–2.6 percentage points or less.

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

Although the statistical technique is innovative, and although technical accuracy is important, the design of the scorecard here focuses on transparency and ease-of-use. After all, a perfectly accurate scorecard is worthless if programs feel so daunted by its complexity or its cost that they do not even try to use it. For this reason, the scorecard is kept simple, using 10 indicators that are inexpensive to collect and that are straightforward to verify. 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 related to poverty likelihoods via simple look-up tables, and targeting cut-offs are likewise simple to apply. The design attempts to facilitate adoption by helping managers understand and trust scoring and by allowing non-specialists to generate scores quickly in the field.

In sum, the scorecard is a practical, objective way for pro-poor programs in Nigeria to monitor poverty rates, track changes in poverty rates over time, and target services. The same approach can be applied to any country with similar data from a national expenditure survey.

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

		% with expenditure below a poverty line						
			National	USAID	International			
Sub-sample	**Households**	**National**	**Food**	**'Extreme'**	**$0.25/day**	**$0.50/day**	**$0.75/day**	**$1/day**
All Nigeria	19,158	44.8	28.6	21.0	10.9	36.8	57.6	71.5
Construction								
Selecting indicators and weights	6,433	45.1	28.9	21.3	11.0	37.1	57.5	71.9
Calibration								
Associating scores with likelihoods	6,391	45.1	28.9	21.4	11.0	37.2	57.6	71.6
Validation								
Measuring accuracy	6,334	44.2	27.9	20.2	10.6	35.9	57.6	71.0
Change between construction and calibration to validation (percentage points)								
		0.9	1.0	1.1	0.4	1.2	-0.1	0.8

Source: 2003 NLSS

Figure 3: Average poverty lines and poverty rates by region (household level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
	Line or	National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State	rate	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Abia	Line	104.21	100.97	72.70	73.04	39.01	48.81	27.07	32.88	67.06	66.47	101.66	99.97	135.47	132.14
	Rate	20.3	28.3	8.1	16.0	4.0	10.0	1.1	3.1	13.3	21.8	30.0	41.1	50.9	60.1
Adamawa	Line	74.40	71.09	52.34	51.24	36.61	28.07	6.51	22.93	46.03	47.16	76.77	70.50	106.89	96.98
	Rate	33.3	69.4	20.0	49.7	17.8	40.0	2.2	21.8	22.2	59.7	53.3	80.3	71.1	88.8
Akwa Ibom	Line	103.49	95.41	76.67	69.50	32.00	46.81	25.84	31.47	65.14	62.88	101.82	94.11	133.20	126.49
	Rate	35.0	42.1	15.8	23.5	8.8	17.1	7.1	8.9	24.6	31.8	41.7	54.7	57.5	68.6
Anambra	Line	102.54	108.56	53.77	76.71	42.93	52.40	42.93	33.39	70.85	70.87	99.73	106.28	116.07	140.82
	Rate	19.2	23.0	2.5	9.6	2.5	4.9	0.0	0.8	14.2	17.8	26.7	38.8	39.2	56.5
Bauchi	Line	66.58	70.97	51.11	51.32	39.09	29.57	23.53	22.69	47.63	45.78	72.75	69.77	87.40	94.70
	Rate	46.7	76.5	30.0	55.8	20.0	39.5	6.7	19.2	46.7	67.8	61.7	88.7	70.0	95.1
Bayelsa	Line	104.42	111.35	77.67	81.44	44.89	45.06	44.89	32.02	53.73	73.48	104.44	110.00	129.45	146.34
	Rate	24.0	28.4	8.0	16.3	2.0	11.6	0.0	5.5	8.0	19.8	30.0	39.5	44.0	60.6
Benue	Line	71.79	75.55	52.93	54.57	32.86	39.20	21.50	23.82	47.34	49.45	71.24	73.57	95.27	100.72
	Rate	20.8	44.8	6.8	23.2	3.5	14.5	2.5	5.9	13.0	34.8	32.5	60.5	49.0	76.0
Borno	Line	77.32	79.62	54.72	58.16	33.62	36.94	24.34	26.11	51.75	52.16	73.66	77.63	98.35	108.30
	Rate	29.6	59.9	15.1	38.4	8.8	24.9	4.3	10.9	24.5	50.6	43.9	79.1	64.2	91.4
Cross River	Line	89.75	101.23	65.81	74.14	47.55	43.09	26.75	32.87	60.64	65.01	89.66	98.79	117.50	127.56
	Rate	20.6	53.5	7.3	35.5	3.8	24.8	2.6	11.2	11.4	43.4	41.9	66.2	53.2	75.2
Delta	Line	118.92	121.71	89.49	87.31	50.12	50.00	40.36	38.58	79.44	78.38	122.18	119.63	172.90	158.22
	Rate	44.6	55.8	27.1	35.8	16.4	25.7	7.2	10.5	35.0	46.5	54.8	66.8	78.5	82.3
Ebonyi	Line	85.36	89.29	59.65	63.53	23.85	43.17	23.85	27.52	55.31	58.37	78.44	85.80	111.03	117.36
	Rate	25.8	52.2	8.1	29.1	1.5	21.1	1.5	9.2	19.2	39.6	40.0	66.2	61.5	81.8
Edo	Line	98.68	111.28	71.14	81.63	43.90	52.21	31.39	36.96	63.49	74.17	96.28	110.13	126.91	142.48
	Rate	25.4	56.3	10.7	38.2	5.9	29.2	1.5	10.1	15.6	48.1	37.3	68.3	52.4	80.6
Ekiti	Line	79.43	86.55	54.30	62.18	38.96	36.48	23.40	24.89	49.52	58.08	74.69	85.36	103.58	109.93
	Rate	26.1	33.8	12.2	17.2	6.5	9.5	1.5	1.8	19.1	24.4	40.1	48.5	57.0	63.4
Enugu	Line	89.25	82.18	68.13	59.52	48.43	38.60	44.86	26.89	60.89	54.41	91.86	80.83	118.49	107.26
	Rate	18.3	33.6	5.4	16.8	0.0	10.9	0.0	4.7	11.2	23.8	32.8	50.8	53.1	70.3

Figure 3 (cont.): Average poverty lines and poverty rates by region (household level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
	Line or	National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State	rate	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Gombe	Line	66.80	75.66	50.07	55.48	32.95	39.79	13.42	25.77	46.66	49.61	66.78	75.89	90.86	99.83
	Rate	41.5	69.3	20.0	49.3	18.5	36.2	7.7	17.0	29.2	60.5	50.8	82.1	66.2	91.0
Imo	Line	89.93	85.49	22.68	61.24	17.40	37.10	17.40	26.37	62.41	55.86	98.73	84.18	117.19	109.65
	Rate	19.7	22.3	5.0	11.1	5.0	7.5	0.0	2.0	15.7	15.2	46.7	33.9	50.7	51.1
Jigawa	Line	65.83	62.25	44.40	44.66	26.56	25.55	22.04	20.12	44.32	40.54	61.59	59.08	71.02	83.57
	Rate	85.7	86.9	71.4	69.7	68.6	57.9	37.1	33.0	80.0	79.0	91.4	93.9	97.1	98.5
Kaduna	Line	69.77	70.37	53.40	51.16	34.74	32.86	22.44	23.19	46.34	45.86	73.70	69.36	94.28	91.29
	Rate	21.2	48.9	9.3	22.4	3.5	13.4	0.0	7.3	15.1	36.1	37.2	66.3	54.9	78.6
Kano	Line	66.62	69.58	50.90	51.34	30.27	33.32	22.46	22.72	44.27	45.99	67.89	68.65	90.65	88.79
	Rate	27.8	61.4	13.1	35.5	6.8	26.6	2.4	12.6	18.7	49.3	43.1	75.5	59.2	84.4
Katsina	Line	68.74	74.21	48.32	52.49	31.14	28.96	9.75	23.67	43.34	48.22	67.59	73.11	76.48	97.70
	Rate	32.8	64.9	10.0	43.4	5.9	29.8	1.6	12.3	21.3	57.5	53.8	79.2	61.6	89.7
Kebbi	Line	83.43	79.66	57.79	57.11	33.52	41.93	26.90	25.45	53.38	51.27	78.57	78.46	101.15	102.42
	Rate	66.7	85.9	43.3	62.7	40.0	48.7	16.7	23.7	53.3	75.0	86.7	92.2	96.7	97.4
Kogi	Line	103.71	73.90	87.47	53.72	43.17	30.55	34.19	23.72	71.64	49.98	120.20	76.82	175.73	103.96
	Rate	83.8	85.3	77.1	76.3	68.6	69.6	50.5	52.0	80.0	81.6	92.4	90.2	95.2	94.3
Kwara	Line	58.34	56.45	43.41	40.72	28.29	30.41	19.75	16.33	39.18	37.61	57.83	59.96	83.29	78.48
	Rate	69.7	88.9	56.3	76.4	45.2	65.3	28.3	48.0	63.0	83.7	77.4	94.5	87.7	95.9
Lagos	Line	86.08	88.02	62.31	63.71	44.38	38.92	27.11	26.09	54.72	54.18	87.71	67.21	118.23	105.85
	Rate	62.0	81.0	50.5	66.7	42.5	58.1	27.6	38.1	54.2	75.2	69.8	83.8	79.8	89.5
Nassarawa	Line	68.70	73.99	44.76	53.30	24.01	29.48	24.01	23.28	46.54	47.78	61.57	72.09	89.67	95.11
	Rate	34.4	47.1	16.2	24.2	4.5	14.5	0.0	6.1	23.8	34.8	44.8	63.2	72.0	77.8
Niger	Line	75.76	68.35	53.87	50.61	36.79	30.68	24.30	22.03	47.63	45.43	71.14	68.11	93.45	92.80
	Rate	41.6	56.4	19.7	32.5	10.8	20.5	7.4	9.4	29.7	45.7	55.8	68.0	67.6	83.0

Figure 3 (cont.): Average poverty lines and poverty rates by region (household level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
		National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Ogun	Line	79.47	94.84	57.67	68.75	33.18	46.79	25.49	31.30	52.97	62.15	76.67	91.39	104.63	118.62
	Rate	18.3	31.1	9.9	15.1	4.7	9.2	0.8	2.3	15.4	22.0	30.6	46.8	53.6	62.4
Ondo	Line	93.24	90.26	66.13	64.27	49.25	39.05	28.72	29.77	60.79	59.15	90.58	91.64	118.79	120.11
	Rate	35.6	38.6	18.8	19.8	12.2	13.4	1.2	6.8	26.2	29.2	51.0	53.7	70.7	67.9
Osun	Line	71.72	77.46	52.71	53.97	26.93	32.38	20.60	19.78	46.74	50.31	71.35	72.75	95.71	101.93
	Rate	15.7	20.2	6.5	7.5	3.5	4.7	2.2	1.0	11.6	14.1	28.7	39.6	47.9	61.7
Oyo	Line	73.95	83.43	53.80	60.00	34.13	36.90	23.36	25.36	49.48	54.49	74.54	81.70	100.55	108.92
	Rate	14.2	16.1	4.9	9.2	2.4	5.1	0.8	3.3	10.1	11.0	28.0	29.4	45.8	53.6
Plateau	Line	82.65	68.51	46.92	48.20	33.46	26.67	29.77	21.92	48.05	43.93	74.71	67.13	105.39	90.31
	Rate	15.4	52.9	3.3	32.3	3.3	24.4	0.0	12.9	5.4	41.4	22.9	68.5	46.1	83.6
Rivers	Line	119.14	94.04	82.44	67.19	44.85	40.06	35.43	28.82	79.43	62.27	124.88	92.87	157.99	121.18
	Rate	22.1	47.2	11.7	30.2	6.5	21.5	1.0	9.8	18.4	38.9	39.7	61.9	56.7	73.4
Sokoto	Line	74.41	71.83	54.18	51.00	33.06	29.92	24.32	22.39	47.67	46.96	74.18	70.31	97.67	93.10
	Rate	34.2	82.9	20.4	58.8	16.7	46.2	4.2	26.9	30.0	73.8	58.2	91.2	74.0	96.3
Taraba	Line	77.93	70.07	53.79	49.66	38.11	32.90	22.62	22.67	52.45	46.12	74.37	68.35	101.48	90.50
	Rate	45.7	45.3	16.4	29.1	12.9	20.1	7.1	7.2	32.1	37.0	62.1	61.6	77.1	77.4
Yobe	Line	75.97	77.02	54.88	55.70	36.09	34.43	23.25	24.93	49.25	51.00	77.53	73.97	101.20	95.60
	Rate	59.1	73.9	26.1	53.2	14.8	40.7	7.0	22.9	47.8	63.2	77.4	86.5	84.3	94.7
Zanfara	Line	83.18	77.02	54.16	55.57	34.01	32.25	24.20	24.97	48.86	49.93	71.53	74.21	97.69	100.28
	Rate	56.4	79.2	27.3	54.9	18.2	42.5	7.3	22.1	43.6	68.3	69.1	89.8	85.5	95.1
FCT	Line	99.24	86.41	71.70	62.52	42.07	47.72	30.43	27.41	63.35	57.82	101.03	84.55	135.20	114.55
	Rate	25.4	58.9	15.1	37.1	9.5	24.2	2.2	13.0	19.5	48.9	32.0	70.5	48.43	83.20
All Nigeria:	Line	81.81	82.16	58.81	59.18	37.00	36.77	25.30	26.17	53.50	53.77	81.92	80.74	108.82	107.57
	Rate	34.3	53.5	20.9	34.9	15.1	25.8	8.1	13.1	27.3	44.6	47.0	66.3	62.8	78.7

Source: 2003 NLSS

Note: The national, food and 'extreme' poverty lines are in units of Naira per adult equivalent per day. To maintain international comparability, the other lines are in units of Naira per capita per day.
See the details of how to derive urban and rural state-level poverty lines in the text.

Figure 3: Average poverty lines and poverty rates by region (person level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
		National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State		Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Abia	Line	104.21	100.97	72.70	73.04	39.01	48.81	27.07	32.88	67.06	66.47	101.66	99.97	135.47	132.14
	Rate	26.6	38.4	10.2	22.0	6.7	14.1	2.0	5.0	17.7	30.4	39.5	52.2	64.3	72.1
Adamawa	Line	74.40	71.09	52.34	51.24	36.61	28.07	6.51	22.93	46.03	47.16	76.77	70.50	106.89	96.98
	Rate	43.7	78.5	29.8	61.3	27.8	52.7	2.6	31.3	31.5	71.3	57.6	87.5	79.8	93.0
Akwa Ibom	Line	103.49	95.41	76.67	69.50	32.00	46.81	25.84	31.47	65.14	62.88	101.82	94.11	133.20	126.49
	Rate	48.7	51.0	21.7	31.0	10.9	22.6	9.4	12.1	32.6	40.1	54.7	65.0	69.0	78.8
Anambra	Line	102.54	108.56	53.77	76.71	42.93	52.40	42.93	33.39	70.85	70.87	99.73	106.28	116.07	140.82
	Rate	29.9	32.5	4.1	14.6	4.1	7.5	0.0	1.1	19.9	25.6	37.5	51.0	51.1	69.3
Bauchi	Line	66.58	70.97	51.11	51.32	39.09	29.57	23.53	22.69	47.63	45.78	72.75	69.77	87.40	94.70
	Rate	57.3	83.8	41.4	64.4	26.5	47.9	9.1	26.3	60.1	75.9	73.9	94.0	80.6	97.8
Bayelsa	Line	104.42	111.35	77.67	81.44	44.89	45.06	44.89	32.02	53.73	73.48	104.44	110.00	129.45	146.34
	Rate	35.8	32.8	13.0	19.3	3.7	13.0	0.0	6.8	13.0	24.2	43.2	46.5	58.0	69.7
Benue	Line	71.79	75.55	52.93	54.57	32.86	39.20	21.50	23.82	47.34	49.45	71.24	73.57	95.27	100.72
	Rate	34.6	56.8	10.9	31.9	6.0	20.6	5.0	8.4	21.8	46.7	50.8	72.4	64.3	85.9
Borno	Line	77.32	79.62	54.72	58.16	33.62	36.94	24.34	26.11	51.75	52.16	73.66	77.63	98.35	108.30
	Rate	38.0	69.7	20.9	47.0	13.4	33.0	6.8	15.9	32.7	61.2	54.4	85.7	75.5	95.7
Cross River	Line	89.75	101.23	65.81	74.14	47.55	43.09	26.75	32.87	60.64	65.01	89.66	98.79	117.50	127.56
	Rate	27.3	65.3	10.1	45.2	5.9	33.9	3.2	15.7	17.0	55.2	52.6	77.8	65.6	85.1
Delta	Line	118.92	121.71	89.49	87.31	50.12	50.00	40.36	38.58	79.44	78.38	122.18	119.63	172.90	158.22
	Rate	57.7	68.2	35.7	47.6	22.5	35.5	13.4	14.6	48.7	59.9	69.4	77.5	86.7	88.8
Ebonyi	Line	85.36	89.29	59.65	63.53	23.85	43.17	23.85	27.52	55.31	58.37	78.44	85.80	111.03	117.36
	Rate	29.4	59.1	10.5	35.3	2.7	25.8	2.7	12.1	22.0	46.7	45.8	72.9	64.8	86.8
Edo	Line	98.68	111.28	71.14	81.63	43.90	52.21	31.39	36.96	63.49	74.17	96.28	110.13	126.91	142.48
	Rate	33.1	67.2	15.8	49.5	9.0	38.3	2.4	13.2	22.0	60.3	46.5	79.5	64.4	87.7
Ekiti	Line	79.43	86.55	54.30	62.18	38.96	36.48	23.40	24.89	49.52	58.08	74.69	85.36	103.58	109.93
	Rate	37.4	44.9	19.4	25.1	9.5	14.6	3.2	3.8	27.7	34.5	53.0	63.1	71.2	77.5
Enugu	Line	89.25	82.18	68.13	59.52	48.43	38.60	44.86	26.89	60.89	54.41	91.86	80.83	118.49	107.26
	Rate	22.8	41.1	6.1	22.1	0.0	14.8	0.0	6.3	14.5	31.0	38.8	58.5	61.7	76.6

Figure 3 (cont.): Average poverty lines and poverty rates by region (person level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
	Line or	National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State	rate	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Gombe	Line	66.80	75.66	50.07	55.48	32.95	39.79	13.42	25.77	46.66	49.61	66.78	75.89	90.86	99.83
	Rate	54.1	78.0	26.6	60.7	26.2	46.6	12.7	22.7	39.7	71.4	67.2	89.6	78.6	94.7
Imo	Line	89.93	85.49	22.68	61.24	17.40	37.10	17.40	26.37	62.41	55.86	98.73	84.18	117.19	109.65
	Rate	29.2	28.0	10.9	14.9	10.9	10.9	0.0	3.3	23.4	20.5	54.5	41.0	57.4	59.6
Jigawa	Line	65.83	62.25	44.40	44.66	26.56	25.55	22.04	20.12	44.32	40.54	61.59	59.08	71.02	83.57
	Rate	90.4	91.0	79.0	77.3	75.6	66.3	48.1	42.4	84.9	85.4	95.2	95.7	99.3	98.8
Kaduna	Line	69.77	70.37	53.40	51.16	34.74	32.86	22.44	23.19	46.34	45.86	73.70	69.36	94.28	91.29
	Rate	28.1	54.8	14.2	26.4	5.9	16.3	0.0	9.2	22.7	41.7	47.8	71.4	65.8	82.6
Kano	Line	66.62	69.58	50.90	51.34	30.27	33.32	22.46	22.72	44.27	45.99	67.89	68.65	90.65	88.79
	Rate	37.4	68.9	19.4	43.3	10.9	32.4	4.4	16.4	26.4	57.7	53.1	82.1	68.5	88.8
Katsina	Line	68.74	74.21	48.32	52.49	31.14	28.96	9.75	23.67	43.34	48.22	67.59	73.11	76.48	97.70
	Rate	34.1	73.7	10.3	53.9	6.5	39.6	0.5	18.2	25.7	68.2	54.9	86.5	65.0	93.5
Kebbi	Line	83.43	79.66	57.79	57.11	33.52	41.93	26.90	25.45	53.38	51.27	78.57	78.46	101.15	102.42
	Rate	78.1	90.7	55.1	71.7	50.8	59.0	18.7	32.6	68.4	82.8	93.6	95.4	98.9	98.7
Kogi	Line	103.71	73.90	87.47	53.72	43.17	30.55	34.19	23.72	71.64	49.98	120.20	76.82	175.73	103.96
	Rate	86.9	89.6	81.5	82.4	74.4	76.0	60.3	61.0	83.8	86.3	93.0	93.0	96.7	96.8
Kwara	Line	58.34	56.45	43.41	40.72	28.29	30.41	19.75	16.33	39.18	37.61	57.83	59.96	83.29	78.48
	Rate	75.0	91.8	62.2	83.9	50.8	75.5	32.5	59.6	70.1	88.1	81.4	94.5	89.8	96.3
Lagos	Line	86.08	88.02	62.31	63.71	44.38	38.92	27.11	26.09	54.72	54.18	87.71	67.21	118.23	105.85
	Rate	65.6	83.3	53.6	64.8	46.1	62.6	31.6	49.0	58.7	81.2	73.8	84.8	83.9	89.8
Nassarawa	Line	68.70	73.99	44.76	53.30	24.01	29.48	24.01	23.28	46.54	47.78	61.57	72.09	89.67	95.11
	Rate	43.3	55.6	21.1	30.5	7.7	19.2	0.0	8.5	32.7	42.9	52.8	72.6	87.4	85.3
Niger	Line	75.76	68.35	53.87	50.61	36.79	30.68	24.30	22.03	47.63	45.43	71.14	68.11	93.45	92.80
	Rate	48.9	66.7	29.5	41.6	18.2	27.2	12.3	13.9	38.2	56.6	66.9	78.4	75.6	89.9

Figure 3 (cont.): Average poverty lines and poverty rates by region (person level)

		Poverty line (Naira/person/day or adult equivalent/day) and poverty rate (%)													
				National		USAID		International							
	Line or	National		Food		'Extreme'		$0.25/day		$0.50/day		$0.75/day		$1/day	
State	rate	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Ogun	Line	79.47	94.84	57.67	68.75	33.18	46.79	25.49	31.30	52.97	62.15	76.67	91.39	104.63	118.62
	Rate	26.9	44.9	14.7	25.6	7.3	16.8	1.7	4.8	23.5	34.4	40.9	62.2	66.4	78.4
Ondo	Line	93.24	90.26	66.13	64.27	49.25	39.05	28.72	29.77	60.79	59.15	90.58	91.64	118.79	120.11
	Rate	45.1	50.0	25.3	29.3	15.2	21.0	2.1	11.7	33.6	41.0	64.9	66.9	81.6	82.1
Osun	Line	71.72	77.46	52.71	53.97	26.93	32.38	20.60	19.78	46.74	50.31	71.35	72.75	95.71	101.93
	Rate	23.3	29.1	9.3	10.3	5.8	6.6	3.9	1.0	17.0	18.8	39.4	57.2	59.0	78.6
Oyo	Line	73.95	83.43	53.80	60.00	34.13	36.90	23.36	25.36	49.48	54.49	74.54	81.70	100.55	108.92
	Rate	20.2	24.7	7.7	13.2	4.2	6.0	1.2	3.6	15.1	16.3	35.3	45.6	54.5	69.2
Plateau	Line	82.65	68.51	46.92	48.20	33.46	26.67	29.77	21.92	48.05	43.93	74.71	67.13	105.39	90.31
	Rate	29.7	61.5	3.3	38.4	3.3	30.1	0.0	15.6	7.1	49.5	39.0	76.6	63.6	89.2
Rivers	Line	119.14	94.04	82.44	67.19	44.85	40.06	35.43	28.82	79.43	62.27	124.88	92.87	157.99	121.18
	Rate	30.8	57.3	17.3	37.0	11.0	27.1	1.3	13.5	27.7	47.0	54.5	74.8	67.7	84.4
Sokoto	Line	74.41	71.83	54.18	51.00	33.06	29.92	24.32	22.39	47.67	46.96	74.18	70.31	97.67	93.10
	Rate	38.2	87.2	20.1	66.0	15.3	53.7	5.4	33.7	32.8	79.9	61.1	93.9	81.6	97.5
Taraba	Line	77.93	70.07	53.79	49.66	38.11	32.90	22.62	22.67	52.45	46.12	74.37	68.35	101.48	90.50
	Rate	67.2	55.6	27.5	38.5	21.8	28.1	14.8	9.6	41.4	47.8	78.0	71.9	88.7	84.4
Yobe	Line	75.97	77.02	54.88	55.70	36.09	34.43	23.25	24.93	49.25	51.00	77.53	73.97	101.20	95.60
	Rate	71.7	82.4	37.0	64.0	21.8	52.0	8.8	31.9	59.7	74.0	88.3	93.0	93.6	97.7
Zanfara	Line	83.18	77.02	54.16	55.57	34.01	32.25	24.20	24.97	48.86	49.93	71.53	74.21	97.69	100.28
	Rate	59.5	82.8	30.43	61.80	19.91	49.60	11.67	27.10	51.26	74.44	76.43	91.44	85.81	95.76
FCT	Line	99.24	86.41	71.70	62.52	42.07	47.72	30.43	27.41	63.35	57.82	101.03	84.55	135.20	114.55
	Rate	31.8	71.2	19.2	46.6	13.5	31.3	4.5	18.0	26.2	60.1	39.3	79.7	53.75	90.55
All Nigeria:	Line	81.81	82.16	58.81	59.18	37.00	36.77	25.30	26.17	53.50	53.77	81.92	80.74	108.82	107.57
	Rate	42.7	63.8	25.9	44.3	18.9	33.9	10.3	18.3	34.7	55.2	57.2	76.3	72.49	86.60

Source: 2003 NLSS

Note: The national, food and 'extreme' poverty lines are in units of Naira per adult equivalent per day. To maintain international comparability, the other lines are in units of Naira per capita per day.

See the details of how to derive urban and rural state-level poverty lines in the text.

Figure 4: Poverty indicators by uncertainty coefficient

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly indicative of poverty)
97	How many members does the household have? (Eight or more; Six or seven; Five; Four; Three; Two; One)
80	Are all household members aged 6 to 18 currently attending school? (No; No children ages 6 to 18; Yes)
76	How many male members does the household have? (Seven or more; Six; Five; Four; Three; Two; One; None)
76	Does any member of the household own a stove? (No; Yes)
69	Does any member of the household own a television? (No; Yes)
67	Does any member of the household own a fan? (No; Yes)
66	Are all male household members aged 6 to 18 currently attending school? (No; No children ages 6 to 18; Yes)
64	Does any member of the household own an iron (electric)? (No; Yes)
60	How many female members does the household have? (Seven or more; Six; Five; Four; Three; Two; One; None)
57	Does any member of the household own furniture? (No; Yes)
45	What is the main construction material of the outside walls of the residence? (Mud, bamboo, iron sheets, cardboard, or other; Stone, burnt bricks, cement, or concrete)
44	What is the structure of household headship? (Only female head/spouse; Only male head/spouse; Both male and female spouses)
41	Are all female household members aged 6 to 15 currently attending school? (No; No children ages 6 to 15; Yes)
40	What is the main fuel used by the household for cooking? (Firewood; Charcoal; Kerosene/oil; Gas; Electricity; Crop residue or sawdust; Animal waste; Other)
39	Does any member of the household own a refrigerator/freezer? (No; Yes)

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

Uncertainty coefficient	Indicator (Answers ordered starting with those most strongly associated with poverty)
38	What is the main flooring material of the house? (Earth/mud or dirt/straw; Wood, tile, plank, concrete, or other)
37	What is the main roofing material of the house? (Mud/mud bricks; Thatch (grass or straw); Wood/bamboo, corrugated iron sheets, cement/concrete, roofing tiles, or other)
36	Does any member of the household own video equipment? (No; Yes)
35	What is the main source of lighting for your dwelling? (Kerosene, batteries, candles, firewood, or other; Gas, mains electricity, or electricity from generator)
30	Does any member of the household own a radio? (No; Yes)
30	What was the highest educational level attained by the male head/spouse? (None; FSLC; MSLC; Vocational; JSS/OLEVEL; SSS/OLEVEL; A LEVEL, Nursing; BA/BSC/HND, technical or professional certificate, Master's, or doctorate; Others)
28	Does any member of the household own a mattress/bed? (No; Yes)
28	What was the highest educational level attained by any household member? (None; FSLC; MSLC; Vocational; JSS/OLEVEL; SSS/OLEVEL; A LEVEL, Nursing; BA/BSC/HND, technical or professional certificate, Master's, or doctorate; Others)
27	Does any member of the household own any land (including land outside this area)? (No; Yes)
26	What is your present occupancy status? (Dwelling owned by head or spouse; Household rents the dwelling; Pays nominal/subsidized rent; Uses without paying rent; Nomadic/temporal housing)
24	What was the highest educational level attained by the female head/spouse? (None; FSLC; MSLC; Vocational; JSS/OLEVEL; SSS/OLEVEL; A LEVEL, Nursing; BA/BSC/HND, technical or professional certificate, Master's, or doctorate; Others)
19	What is the main source of drinking water for the household? (Unprotected well/rain water, or untreated pipe-borne; Vendor, truck, protected well, river, lake, or pond; Treated pipe-borne, borehole/hand pump, or other)
18	What type of toilet is used by the household? (Pail/bucket, covered or uncovered pit latrine, ventilated improved pit latrine, other, or none; Toilet on water, or flush to sewer or septic tank)

Source: 2003 NLSS, national poverty line.

National Poverty Line Tables

(and tables pertaining to all seven poverty lines)

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	87.1
5–9	93.2
10–14	84.3
15–19	81.4
20–24	75.5
25–29	68.2
30–34	65.5
35–39	54.0
40–44	49.6
45–49	39.9
50–54	26.1
55–59	25.6
60–64	20.7
65–69	15.8
70–74	4.3
75–79	8.3
80–84	1.0
85–89	1.6
90–94	3.1
95–100	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

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

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	600	÷	689	=	87.1
5–9	1,128	÷	1,210	=	93.2
10–14	2,664	÷	3,161	=	84.3
15–19	4,146	÷	5,094	=	81.4
20–24	4,896	÷	6,481	=	75.5
25–29	5,797	÷	8,496	=	68.2
30–34	6,266	÷	9,567	=	65.5
35–39	5,140	÷	9,517	=	54.0
40–44	4,286	÷	8,641	=	49.6
45–49	2,728	÷	6,842	=	39.9
50–54	2,009	÷	7,703	=	26.1
55–59	2,191	÷	8,574	=	25.6
60–64	1,515	÷	7,336	=	20.7
65–69	922	÷	5,829	=	15.8
70–74	176	÷	4,119	=	4.3
75–79	186	÷	2,242	=	8.3
80–84	16	÷	1,612	=	1.0
85–89	14	÷	859	=	1.6
90–94	51	÷	1,674	=	3.1
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

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

	Likelihood of having expenditure in range demarcated by poverty lines in units of per-adult equivalents			
Score	<USAID <Naira49.43	≥USAID and <Food ≥Naira49.43 and <Naira59.57	≥Food and <National <Naira59.57 and <Naira82.54	≥National ≥Naira82.54
0–4	72.4	8.5	6.3	12.9
5–9	61.5	14.8	16.9	6.8
10–14	55.0	11.8	17.5	15.7
15–19	52.8	12.5	16.1	18.6
20–24	39.6	11.8	24.2	24.5
25–29	34.4	12.1	21.7	31.8
30–34	32.4	10.7	22.3	34.5
35–39	25.4	7.8	20.8	46.0
40–44	18.4	10.3	20.9	50.4
45–49	15.4	6.0	18.4	60.1
50–54	6.0	4.2	15.9	73.9
55–59	7.0	5.3	13.3	74.4
60–64	6.6	3.3	10.8	79.4
65–69	4.2	4.6	7.0	84.2
70–74	0.0	1.9	2.4	95.7
75–79	1.5	0.4	6.4	91.7
80–84	0.0	0.0	1.0	99.0
85–89	0.0	0.0	1.6	98.4
90–94	0.0	0.0	3.1	96.9
95–100	0.0	0.0	0.0	100.0

Note: All poverty likelihoods in percentage units.

Figure 7 (All poverty lines in per-capita units) (cont.): Distribution of household poverty likelihoods across ranges demarcated by poverty lines

	Likelihood of having expenditure in range demarcated by poverty lines in per-capita units				
	<$0.25/day	**≥$0.25/day and <$0.50/day**	**≥$0.50/day and <$0.75/day**	**≥$0.75/day and <$1/day**	**≥$1/day**
Score	**<Naira26.90**	**≥Naira26.90 and <Naira53.81**	**≥Naira53.81 and <Naira80.71**	**≥Naira80.71 and <Naira107.61**	**≥Naira107.61**
0–4	52.2	33.3	7.7	1.9	5.0
5–9	45.9	38.3	13.7	1.3	0.8
10–14	35.3	43.7	12.4	2.6	5.9
15–19	30.3	43.8	17.1	5.2	3.6
20–24	18.9	48.8	19.6	5.5	7.3
25–29	15.8	43.8	26.4	6.4	7.6
30–34	18.5	37.5	23.0	11.8	9.2
35–39	14.2	28.1	25.2	17.4	15.1
40–44	8.7	28.3	28.0	13.3	21.6
45–49	7.6	22.5	27.3	14.3	28.3
50–54	1.2	18.6	27.5	20.8	32.0
55–59	1.6	16.4	19.2	21.9	41.0
60–64	0.8	11.9	19.0	19.9	48.4
65–69	0.0	13.7	12.6	20.6	53.1
70–74	0.0	3.1	7.2	22.2	67.5
75–79	0.0	1.5	8.1	19.3	71.2
80–84	0.0	1.0	2.7	9.4	86.9
85–89	0.0	0.0	1.6	3.5	94.9
90–94	0.0	0.0	3.1	9.7	87.3
95–100	0.0	0.0	0.0	8.7	91.3

Note: All poverty likelihoods in percentage units.

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

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	-7.9	5.2	5.4	5.8
5–9	-1.3	2.5	3.1	4.1
10–14	3.9	3.6	4.4	6.1
15–19	9.4	3.1	3.8	5.0
20–24	1.6	2.6	3.1	4.3
25–29	2.6	2.5	3.0	3.9
30–34	1.2	2.3	2.8	3.7
35–39	-6.4	4.4	4.6	5.0
40–44	-1.0	2.6	3.2	4.1
45–49	-1.5	2.9	3.5	4.7
50–54	-3.9	3.2	3.4	3.9
55–59	5.7	1.9	2.2	3.0
60–64	-1.4	2.4	2.7	3.7
65–69	7.2	1.4	1.8	2.4
70–74	-7.5	5.1	5.3	5.8
75–79	4.4	1.5	1.8	2.3
80–84	0.5	0.4	0.5	0.6
85–89	-0.7	1.5	1.8	2.5
90–94	2.9	0.3	0.3	0.3
95–100	0.0	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 9 (All poverty lines): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods for the validation sample

	Poverty line						
	National	National Food	USAID 'Extreme'	$0.25/day	$0.50/day	$0.75/day	$1/day
Estimate minus true value	0.3	-0.1	-0.8	-1.5	0.5	-0.9	-0.2
Precision of difference	0.5	0.5	0.5	0.6	0.5	0.5	0.7

Precision is measured as 90-percent confidence intervals in units of +/− percentage points.

Differences and precision estimated from 1,000 bootstraps of size n = 16,384.

Figure 10 (National poverty line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.1	55.0	63.2	75.6
4	-0.8	39.4	45.3	56.7
8	-0.4	29.2	33.8	44.4
16	0.1	20.0	23.9	32.5
32	0.2	14.7	17.3	23.0
64	0.3	9.7	12.3	16.2
128	0.4	6.2	7.8	9.8
256	0.4	4.3	5.1	7.0
512	0.4	2.8	3.3	4.7
1,024	0.3	2.0	2.4	3.1
2,048	0.3	1.4	1.6	2.0
4,096	0.3	1.0	1.2	1.6
8,192	0.3	0.7	0.8	1.1
16,384	0.3	0.5	0.6	0.8

Figure 11 (All poverty lines): Differences, precision of differences, and sample-size α for bootstrapped estimates of poverty rates for groups of households at a point in time for the scorecard applied to the validation sample

	Poverty line						
	National	National Food	USAID 'Extreme'	$0.25/day	$0.50/day	$0.75/day	$1/day
Estimate minus true value	0.4	-0.1	0.0	-1.0	1.0	-1.0	0.1
Precision of difference	0.6	0.6	0.5	0.4	0.6	0.6	0.6
α for sample size	0.96	0.99	1.05	1.14	0.90	1.01	1.18

Precision is measured as 90-percent confidence intervals in units of +/– percentage points.
Differences and precision estimated from 1,000 bootstraps of size n = 16,384.
α is estimated from 1,000 bootstrap samples of n = 256, 512, 1,024, 2,048, 4,096, 8,192, and 16,384.

Figure 12 (National poverty line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.1	55.0	63.2	75.6
4	-0.9	39.1	44.8	55.6
8	-0.4	28.2	33.0	44.4
16	0.2	19.3	22.8	30.4
32	0.2	13.8	17.0	22.9
64	0.2	9.9	12.0	16.6
128	0.3	6.8	8.3	10.9
256	0.4	4.9	6.0	8.1
512	0.4	3.5	4.1	5.8
1,024	0.4	2.6	3.0	4.1
2,048	0.4	1.7	2.1	2.9
4,096	0.4	1.2	1.5	1.9
8,192	0.4	0.9	1.0	1.4
16,384	0.4	0.6	0.8	1.0

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

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

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

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.6	43.6	0.1	55.7	56.4	-97.0
5–9	1.8	42.5	0.1	55.6	57.4	-91.7
10–14	4.4	39.8	0.7	55.1	59.5	-78.6
15–19	8.3	35.9	1.8	53.9	62.3	-58.2
20–24	13.1	31.1	3.5	52.3	65.4	-32.7
25–29	18.8	25.4	6.3	49.4	68.2	-0.7
30–34	24.8	19.4	9.9	45.9	70.7	34.6
35–39	30.1	14.1	14.1	41.7	71.8	68.2
40–44	34.4	9.8	18.4	37.3	71.8	58.3
45–49	37.1	7.1	22.5	33.2	70.4	49.0
50–54	39.5	4.7	27.9	27.9	67.4	36.9
55–59	41.4	2.8	34.6	21.2	62.6	21.8
60–64	42.9	1.3	40.4	15.4	58.3	8.6
65–69	43.6	0.6	45.5	10.2	53.8	-3.0
70–74	44.0	0.2	49.2	6.6	50.6	-11.3
75–79	44.2	0.1	51.3	4.4	48.6	-16.1
80–84	44.2	0.0	52.9	2.8	47.0	-19.7
85–89	44.2	0.0	53.8	2.0	46.2	-21.6
90–94	44.2	0.0	55.4	0.4	44.6	-25.3
95–100	44.2	0.0	55.8	0.0	44.2	-26.1

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

Figure 15 (National poverty line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	At score	At or below score	At score	At or below score
0–4	92.0	92.0	0.7	0.7
5–9	93.5	92.9	1.2	1.9
10–14	83.1	86.8	3.2	5.1
15–19	77.1	81.9	5.1	10.2
20–24	74.1	78.9	6.5	16.6
25–29	66.9	74.8	8.5	25.1
30–34	62.8	71.5	9.6	34.7
35–39	56.1	68.2	9.5	44.2
40–44	49.5	65.1	8.6	52.9
45–49	39.9	62.2	6.8	59.7
50–54	30.4	58.6	7.7	67.4
55–59	22.5	54.5	8.6	76.0
60–64	20.3	51.5	7.3	83.3
65–69	12.0	48.9	5.8	89.1
70–74	10.4	47.2	4.1	93.3
75–79	5.5	46.2	2.2	95.5
80–84	1.3	45.5	1.6	97.1
85–89	4.2	45.1	0.9	98.0
90–94	0.6	44.4	1.7	99.6
95–100	0.0	44.2	0.4	100.0

National Food Poverty Line Tables

Figure 5 (National 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	80.9
5–9	76.3
10–14	66.8
15–19	65.3
20–24	51.4
25–29	46.5
30–34	43.2
35–39	33.2
40–44	28.7
45–49	21.5
50–54	10.2
55–59	12.3
60–64	9.8
65–69	8.8
70–74	1.9
75–79	1.9
80–84	0.0
85–89	0.0
90–94	0.0
95–100	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

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

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	557	÷	689	=	80.9
5–9	923	÷	1,210	=	76.3
10–14	2,110	÷	3,161	=	66.8
15–19	3,327	÷	5,094	=	65.3
20–24	3,330	÷	6,481	=	51.4
25–29	3,951	÷	8,496	=	46.5
30–34	4,129	÷	9,567	=	43.2
35–39	3,163	÷	9,517	=	33.2
40–44	2,477	÷	8,641	=	28.7
45–49	1,469	÷	6,842	=	21.5
50–54	786	÷	7,703	=	10.2
55–59	1,055	÷	8,574	=	12.3
60–64	720	÷	7,336	=	9.8
65–69	512	÷	5,829	=	8.8
70–74	77	÷	4,119	=	1.9
75–79	43	÷	2,242	=	1.9
80–84	0	÷	1,612	=	0.0
85–89	0	÷	859	=	0.0
90–94	0	÷	1,674	=	0.0
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

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

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	-9.4	6.6	6.9	7.5
5–9	-5.8	5.4	6.0	8.0
10–14	4.4	4.0	4.8	6.6
15–19	15.9	3.3	3.9	5.5
20–24	-1.5	2.9	3.4	4.4
25–29	-5.4	4.0	4.2	4.6
30–34	-0.3	2.5	2.9	3.6
35–39	-6.9	4.7	4.9	5.4
40–44	-1.7	2.5	2.9	3.9
45–49	0.0	2.4	2.9	3.8
50–54	-4.5	3.3	3.5	3.7
55–59	4.0	1.3	1.5	2.0
60–64	0.8	1.7	2.0	2.8
65–69	6.3	0.9	1.1	1.4
70–74	1.6	0.2	0.2	0.3
75–79	1.9	0.0	0.0	0.0
80–84	0.0	0.0	0.0	0.0
85–89	-1.1	1.2	1.4	1.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 10 (National food line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-0.2	50.4	57.8	68.9
4	-0.1	34.9	42.4	53.9
8	-0.5	26.0	29.8	37.8
16	-0.2	18.8	22.2	28.7
32	0.0	12.8	15.4	19.0
64	0.1	8.6	10.9	14.2
128	0.1	5.8	6.7	8.8
256	0.0	4.0	4.7	5.8
512	-0.1	2.7	3.3	4.6
1,024	-0.1	1.9	2.2	2.9
2,048	-0.2	1.4	1.7	2.3
4,096	-0.1	1.0	1.2	1.6
8,192	-0.1	0.7	0.8	1.1
16,384	-0.1	0.5	0.6	0.8

Figure 12 (National food line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-0.2	50.4	57.8	68.9
4	-0.3	34.9	41.9	52.7
8	-0.4	25.5	29.5	37.2
16	-0.3	17.9	21.7	27.0
32	-0.3	12.9	15.1	19.3
64	-0.1	9.4	11.2	14.3
128	0.0	6.3	7.6	9.8
256	-0.1	4.6	5.5	6.8
512	-0.1	3.2	4.0	5.0
1,024	-0.1	2.3	2.8	3.7
2,048	-0.1	1.6	2.0	2.6
4,096	-0.1	1.2	1.4	1.7
8,192	-0.1	0.8	1.0	1.2
16,384	-0.1	0.6	0.7	0.9

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

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.6	27.3	0.1	72.0	72.6	-95.4
5–9	1.6	26.3	0.3	71.8	73.4	-87.4
10–14	3.6	24.3	1.4	70.7	74.3	-68.9
15–19	6.4	21.5	3.7	68.4	74.8	-40.6
20–24	9.9	18.0	6.8	65.3	75.2	-5.0
25–29	13.9	14.0	11.2	60.9	74.8	39.9
30–34	17.9	10.0	16.8	55.3	73.2	39.8
35–39	21.3	6.7	23.0	49.1	70.4	17.7
40–44	23.7	4.2	29.2	42.9	66.6	-4.5
45–49	25.1	2.8	34.6	37.5	62.6	-24.0
50–54	26.2	1.7	41.2	30.9	57.1	-47.6
55–59	27.1	0.8	48.9	23.2	50.3	-75.2
60–64	27.7	0.2	55.6	16.5	44.1	-99.4
65–69	27.9	0.0	61.3	10.8	38.7	-119.6
70–74	27.9	0.0	65.4	6.7	34.6	-134.3
75–79	27.9	0.0	67.6	4.5	32.4	-142.3
80–84	27.9	0.0	69.2	2.9	30.8	-148.1
85–89	27.9	0.0	70.1	2.0	29.9	-151.1
90–94	27.9	0.0	71.7	0.4	28.3	-157.1
95–100	27.9	0.0	72.1	0.0	27.9	-158.4

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

Figure 15 (National food line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	At score	At or below score	At score	At or below score
0–4	85.3	85.3	0.7	0.7
5–9	84.0	84.5	1.2	1.9
10–14	64.0	71.7	3.2	5.1
15–19	54.8	63.2	5.1	10.2
20–24	53.2	59.3	6.5	16.6
25–29	47.5	55.3	8.5	25.1
30–34	41.8	51.6	9.6	34.7
35–39	35.1	48.1	9.5	44.2
40–44	28.3	44.8	8.6	52.9
45–49	20.4	42.0	6.8	59.7
50–54	14.5	38.9	7.7	67.4
55–59	10.2	35.6	8.6	76.0
60–64	8.2	33.2	7.3	83.3
65–69	3.0	31.3	5.8	89.1
70–74	0.7	29.9	4.1	93.3
75–79	0.0	29.2	2.2	95.5
80–84	0.0	28.7	1.6	97.1
85–89	1.7	28.5	0.9	98.0
90–94	0.0	28.0	1.7	99.6
95–100	0.0	27.9	0.4	100.0

USAID "Extreme" Poverty Line Tables

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

If a household's score is . . .	. . . then the likelihood (%) of being below the poverty line is:
0–4	72.4
5–9	61.5
10–14	55.0
15–19	52.8
20–24	39.6
25–29	34.4
30–34	32.4
35–39	25.4
40–44	18.4
45–49	15.4
50–54	6.0
55–59	7.0
60–64	6.6
65–69	4.2
70–74	0.0
75–79	1.5
80–84	0.0
85–89	0.0
90–94	0.0
95–100	0.0

Surveyed cases weighted to represent Nigeria's households.

Based on the 2003 NLSS.

Figure 6 (USAID "extreme" line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	498	÷	689	=	72.4
5–9	745	÷	1,210	=	61.5
10–14	1,737	÷	3,161	=	55.0
15–19	2,689	÷	5,094	=	52.8
20–24	2,566	÷	6,481	=	39.6
25–29	2,921	÷	8,496	=	34.4
30–34	3,104	÷	9,567	=	32.4
35–39	2,418	÷	9,517	=	25.4
40–44	1,589	÷	8,641	=	18.4
45–49	1,056	÷	6,842	=	15.4
50–54	461	÷	7,703	=	6.0
55–59	603	÷	8,574	=	7.0
60–64	482	÷	7,336	=	6.6
65–69	247	÷	5,829	=	4.2
70–74	0	÷	4,119	=	0.0
75–79	34	÷	2,242	=	1.5
80–84	0	÷	1,612	=	0.0
85–89	0	÷	859	=	0.0
90–94	0	÷	1,674	=	0.0
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

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

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	**Diff.**	**90-percent**	**95-percent**	**99-percent**
0–4	-16.2	10.1	10.5	11.2
5–9	-13.8	9.6	10.0	10.8
10–14	2.6	4.1	5.0	6.7
15–19	15.3	3.0	3.6	4.8
20–24	0.0	3.0	3.5	4.6
25–29	-7.7	5.2	5.4	6.0
30–34	3.6	2.4	2.8	3.6
35–39	-4.1	3.3	3.5	3.9
40–44	0.3	2.2	2.5	3.3
45–49	-1.1	2.2	2.6	3.2
50–54	0.1	1.2	1.4	1.8
55–59	1.4	1.1	1.3	1.7
60–64	0.4	1.5	1.8	2.4
65–69	2.1	0.9	1.0	1.4
70–74	-0.2	0.2	0.2	0.3
75–79	1.5	0.0	0.0	0.0
80–84	0.0	0.0	0.0	0.0
85–89	-1.1	1.2	1.4	1.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 10 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-0.9	47.1	54.2	65.1
4	-0.4	32.9	38.6	47.9
8	-0.2	24.0	28.7	37.0
16	-0.2	17.5	21.5	27.3
32	-0.1	11.8	14.0	18.1
64	-0.2	8.6	9.9	13.6
128	-0.3	5.5	6.6	8.5
256	-0.5	3.7	4.4	5.6
512	-0.7	2.7	3.3	4.2
1,024	-0.7	2.0	2.2	3.0
2,048	-0.7	1.5	1.7	2.3
4,096	-0.7	1.0	1.2	1.6
8,192	-0.7	0.8	0.9	1.0
16,384	-0.8	0.5	0.6	0.8

Figure 12 (USAID "extreme" line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-0.9	47.1	54.2	65.1
4	-0.5	32.8	38.7	47.7
8	-0.2	23.6	28.9	35.4
16	-0.3	17.5	20.2	25.7
32	0.0	11.6	13.5	19.3
64	-0.1	8.4	9.8	13.3
128	0.0	5.8	7.1	9.3
256	0.0	4.2	5.0	6.3
512	-0.1	3.0	3.5	4.9
1,024	0.0	2.1	2.5	3.3
2,048	0.0	1.6	1.9	2.5
4,096	0.0	1.1	1.3	1.7
8,192	0.1	0.8	0.9	1.2
16,384	0.0	0.5	0.6	0.8

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

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.6	19.7	0.1	79.6	80.2	-93.8
5–9	1.5	18.8	0.4	79.4	80.8	-83.2
10–14	3.2	17.0	1.8	77.9	81.1	-59.1
15–19	5.4	14.9	4.8	75.0	80.4	-23.2
20–24	8.0	12.2	8.6	71.2	79.2	21.9
25–29	11.2	9.1	14.0	65.8	77.0	31.1
30–34	13.9	6.4	20.8	58.9	72.8	-2.9
35–39	16.2	4.0	28.0	51.8	68.0	-38.1
40–44	17.6	2.6	35.2	44.5	62.2	-73.9
45–49	18.6	1.7	41.1	38.6	57.2	-103.0
50–54	19.1	1.1	48.3	31.5	50.6	-138.5
55–59	19.7	0.5	56.3	23.5	43.2	-177.9
60–64	20.1	0.2	63.2	16.5	36.6	-212.2
65–69	20.2	0.0	68.9	10.8	31.0	-240.4
70–74	20.2	0.0	73.0	6.7	27.0	-260.6
75–79	20.2	0.0	75.3	4.5	24.7	-271.7
80–84	20.2	0.0	76.9	2.9	23.1	-279.6
85–89	20.2	0.0	77.7	2.0	22.3	-283.8
90–94	20.2	0.0	79.4	0.4	20.6	-292.1
95–100	20.2	0.0	79.8	0.0	20.2	-293.8

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

Figure 15 (USAID "extreme" line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	At score	At or below score	At score	At or below score
0–4	82.4	82.4	0.7	0.7
5–9	76.9	78.9	1.2	1.9
10–14	54.7	63.8	3.2	5.1
15–19	42.5	53.1	5.1	10.2
20–24	40.9	48.4	6.5	16.6
25–29	36.9	44.5	8.5	25.1
30–34	28.1	40.0	9.6	34.7
35–39	25.0	36.7	9.5	44.2
40–44	16.3	33.4	8.6	52.9
45–49	13.9	31.1	6.8	59.7
50–54	6.7	28.4	7.7	67.4
55–59	6.9	25.9	8.6	76.0
60–64	5.2	24.1	7.3	83.3
65–69	2.3	22.7	5.8	89.1
70–74	0.5	21.7	4.1	93.3
75–79	0.0	21.2	2.2	95.5
80–84	0.0	20.8	1.6	97.1
85–89	1.7	20.7	0.9	98.0
90–94	0.0	20.3	1.7	99.6
95–100	0.0	20.2	0.4	100.0

$0.25/Day Poverty Line Tables

Figure 5 ($0.25/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	52.2
5–9	45.9
10–14	35.3
15–19	30.3
20–24	18.9
25–29	15.8
30–34	18.5
35–39	14.2
40–44	8.7
45–49	7.6
50–54	1.2
55–59	1.6
60–64	0.8
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

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 6 ($0.25/day line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	359	÷	689	=	52.2
5–9	556	÷	1,210	=	45.9
10–14	1,117	÷	3,161	=	35.3
15–19	1,545	÷	5,094	=	30.3
20–24	1,226	÷	6,481	=	18.9
25–29	1,343	÷	8,496	=	15.8
30–34	1,770	÷	9,567	=	18.5
35–39	1,353	÷	9,517	=	14.2
40–44	753	÷	8,641	=	8.7
45–49	523	÷	6,842	=	7.6
50–54	92	÷	7,703	=	1.2
55–59	134	÷	8,574	=	1.6
60–64	59	÷	7,336	=	0.8
65–69	0	÷	5,829	=	0.0
70–74	0	÷	4,119	=	0.0
75–79	0	÷	2,242	=	0.0
80–84	0	÷	1,612	=	0.0
85–89	0	÷	859	=	0.0
90–94	0	÷	1,674	=	0.0
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 8 ($0.25/day line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	-19.6	13.2	13.7	14.8
5–9	-7.8	7.1	7.9	10.4
10–14	7.7	3.4	4.2	5.8
15–19	5.8	2.7	3.1	4.5
20–24	-2.3	2.5	3.0	3.8
25–29	-6.9	4.6	4.9	5.5
30–34	2.8	1.9	2.2	2.8
35–39	-5.0	3.5	3.8	4.1
40–44	-0.5	1.7	2.0	2.5
45–49	-0.8	1.8	2.2	2.8
50–54	0.4	0.3	0.4	0.5
55–59	-1.2	1.0	1.1	1.2
60–64	-2.3	1.8	1.9	2.3
65–69	-0.3	0.3	0.3	0.4
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

Based on scorecard applied to the validation sample.

Figure 10 ($0.25/day line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.5	38.2	46.7	57.4
4	-1.2	26.5	31.3	41.8
8	-0.9	17.9	21.3	28.3
16	-0.9	13.1	16.3	20.9
32	-0.7	9.7	11.4	14.4
64	-0.8	6.9	8.1	10.2
128	-1.0	4.8	5.7	7.8
256	-1.2	3.8	4.3	5.9
512	-1.4	2.9	3.5	4.5
1,024	-1.5	2.3	2.8	3.4
2,048	-1.5	1.7	2.0	2.5
4,096	-1.5	1.2	1.4	1.9
8,192	-1.5	0.9	1.0	1.3
16,384	-1.5	0.6	0.7	0.9

Figure 12 ($0.25/day line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.5	38.2	46.7	57.4
4	-1.2	26.5	31.4	41.6
8	-0.9	18.3	21.5	30.0
16	-1.1	13.0	15.7	20.6
32	-0.8	9.5	10.9	13.4
64	-0.9	6.9	8.1	10.7
128	-1.0	4.8	5.7	6.9
256	-1.0	3.3	4.2	5.3
512	-1.1	2.4	2.9	3.8
1,024	-1.0	1.8	2.1	2.9
2,048	-1.0	1.2	1.5	2.0
4,096	-1.0	0.9	1.0	1.4
8,192	-1.0	0.6	0.7	0.9
16,384	-1.0	0.4	0.5	0.6

Figure 14 ($0.25/day line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, scorecard applied to validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.4	10.2	0.3	89.1	89.5	-89.8
5–9	1.0	9.6	0.9	88.5	89.5	-72.5
10–14	2.0	8.6	3.1	86.3	88.3	-33.7
15–19	3.3	7.3	6.9	82.5	85.8	26.7
20–24	4.5	6.0	12.1	77.3	81.9	-14.3
25–29	6.2	4.4	19.0	70.5	76.6	-79.2
30–34	7.6	2.9	27.1	62.4	70.0	-155.6
35–39	9.0	1.5	35.2	54.2	63.3	-232.2
40–44	9.7	0.9	43.2	46.3	56.0	-307.7
45–49	10.1	0.5	49.6	39.8	49.8	-369.0
50–54	10.2	0.4	57.2	32.2	42.4	-440.7
55–59	10.4	0.2	65.5	23.9	34.3	-519.2
60–64	10.6	0.0	72.7	16.7	27.2	-587.3
65–69	10.6	0.0	78.6	10.9	21.4	-642.1
70–74	10.6	0.0	82.7	6.7	17.3	-681.0
75–79	10.6	0.0	84.9	4.5	15.1	-702.2
80–84	10.6	0.0	86.5	2.9	13.5	-717.4
85–89	10.6	0.0	87.4	2	12.6	-725.6
90–94	10.6	0.0	89.1	0.4	10.9	-741.4
95–100	10.6	0.0	89.4	0.0	10.6	-744.7

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

Figure 15 ($0.25/day line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	At score	At or below score	At score	At or below score
0–4	57.1	57.1	0.7	0.7
5–9	51.4	53.5	1.2	1.9
10–14	29.9	38.7	3.2	5.1
15–19	25.4	32.1	5.1	10.2
20–24	19.8	27.3	6.5	16.6
25–29	19.2	24.5	8.5	25.1
30–34	15.4	22.0	9.6	34.7
35–39	14.8	20.5	9.5	44.2
40–44	7.6	18.4	8.6	52.9
45–49	5.2	16.9	6.8	59.7
50–54	1.4	15.1	7.7	67.4
55–59	3.0	13.7	8.6	76.0
60–64	1.8	12.7	7.3	83.3
65–69	0.4	11.9	5.8	89.1
70–74	0.0	11.4	4.1	93.3
75–79	0.0	11.1	2.2	95.5
80–84	0.0	10.9	1.6	97.1
85–89	0.0	10.8	0.9	98.0
90–94	0.0	10.6	1.7	99.6
95–100	0.0	10.6	0.4	100.0

$0.50/Day Poverty Line Tables

Figure 5 ($0.50/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	85.4
5–9	84.2
10–14	79.0
15–19	74.1
20–24	67.7
25–29	59.6
30–34	56.0
35–39	42.3
40–44	37.1
45–49	30.2
50–54	19.8
55–59	17.9
60–64	12.7
65–69	13.7
70–74	3.1
75–79	1.5
80–84	1.0
85–89	0.0
90–94	0.0
95–100	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 6 ($0.50/day line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	588	÷	689	=	85.4
5–9	1,019	÷	1,210	=	84.2
10–14	2,497	÷	3,161	=	79.0
15–19	3,777	÷	5,094	=	74.1
20–24	4,386	÷	6,481	=	67.7
25–29	5,062	÷	8,496	=	59.6
30–34	5,361	÷	9,567	=	56.0
35–39	4,025	÷	9,517	=	42.3
40–44	3,201	÷	8,641	=	37.1
45–49	2,063	÷	6,842	=	30.2
50–54	1,525	÷	7,703	=	19.8
55–59	1,536	÷	8,574	=	17.9
60–64	932	÷	7,336	=	12.7
65–69	796	÷	5,829	=	13.7
70–74	126	÷	4,119	=	3.1
75–79	34	÷	2,242	=	1.5
80–84	16	÷	1,612	=	1.0
85–89	0	÷	859	=	0.0
90–94	0	÷	1,674	=	0.0
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 8 ($0.50/day line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals

	Difference between estimate and true value			
		Confidence interval (+/– percentage points)		
Score	**Diff.**	**90-percent**	**95-percent**	**99-percent**
0–4	-7.8	5.4	5.7	6.4
5–9	-8.5	5.6	5.9	6.3
10–14	8.3	3.9	4.6	6.5
15–19	8.9	3.2	3.8	5.0
20–24	-0.1	2.7	3.2	4.3
25–29	-1.3	2.6	3.0	3.9
30–34	1.8	2.4	2.7	3.9
35–39	-7.0	4.7	5.0	5.3
40–44	-0.3	2.5	2.9	3.9
45–49	2.3	2.5	3.0	3.9
50–54	-1.0	2.2	2.6	3.2
55–59	6.3	1.5	1.7	2.3
60–64	-0.2	1.8	2.2	3.1
65–69	8.5	1.2	1.4	1.9
70–74	-1.7	1.5	1.7	2.2
75–79	1.1	0.5	0.5	0.7
80–84	1.0	0.0	0.0	0.0
85–89	-1.1	1.2	1.4	1.6
90–94	0.0	0.0	0.0	0.0
95–100	0.0	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 10 ($0.50/day line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	0.1	53.0	62.0	74.3
4	0.1	36.2	45.3	54.2
8	0.2	26.4	31.8	41.1
16	0.8	18.7	21.8	31.6
32	1.0	13.0	15.3	19.6
64	1.0	8.9	10.7	14.8
128	0.8	5.5	6.6	8.9
256	0.7	3.7	4.3	6.1
512	0.5	2.6	3.2	4.4
1,024	0.5	1.9	2.3	3.2
2,048	0.5	1.3	1.5	2.2
4,096	0.5	0.9	1.1	1.5
8,192	0.5	0.7	0.8	1.0
16,384	0.5	0.5	0.6	0.8

Figure 12 ($0.50/day line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	0.1	53.0	62.0	74.3
4	0.0	35.4	43.5	54.3
8	0.2	25.7	30.9	40.5
16	0.8	18.6	21.5	27.9
32	1.0	13.0	15.2	19.6
64	1.0	9.1	11.6	14.6
128	1.0	6.4	7.5	10.9
256	1.0	4.5	5.4	7.3
512	0.9	3.2	3.8	5.3
1,024	1.0	2.4	2.9	3.7
2,048	0.9	1.7	2.0	2.8
4,096	1.0	1.2	1.4	1.9
8,192	1.0	0.8	1.0	1.3
16,384	1.0	0.6	0.7	1.0

Figure 14 ($0.50/day line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, scorecard applied to validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.6	35.3	0.1	64.0	64.6	-96.4
5–9	1.7	34.2	0.2	63.9	65.6	-89.9
10–14	4.1	31.9	1.0	63.1	67.1	-74.6
15–19	7.6	28.3	2.6	61.5	69.1	-50.6
20–24	11.9	24.0	4.7	59.4	71.3	-20.5
25–29	16.9	19.0	8.2	55.9	72.8	17.0
30–34	22.1	13.9	12.6	51.4	73.5	57.9
35–39	26.4	9.5	17.8	46.2	72.6	50.4
40–44	29.6	6.3	23.3	40.8	70.4	35.3
45–49	31.5	4.4	28.2	35.9	67.4	21.7
50–54	33.1	2.8	34.3	29.8	62.9	4.7
55–59	34.4	1.5	41.6	22.5	56.9	-15.7
60–64	35.3	0.6	48.0	16.1	51.4	-33.5
65–69	35.7	0.2	53.4	10.6	46.3	-48.7
70–74	35.9	0.0	57.3	6.7	42.6	-59.5
75–79	35.9	0.0	59.6	4.5	40.4	-65.7
80–84	35.9	0.0	61.2	2.9	38.8	-70.2
85–89	35.9	0.0	62.0	2.0	38.0	-72.6
90–94	35.9	0.0	63.7	0.4	36.3	-77.2
95–100	35.9	0.0	64.1	0.0	35.9	-78.2

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

Figure 15 ($0.50/day line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	**At score**	**At or below score**	**At score**	**At or below score**
0–4	90.0	90.0	0.7	0.7
5–9	91.0	90.7	1.2	1.9
10–14	73.9	80.2	3.2	5.1
15–19	69.5	74.9	5.1	10.2
20–24	66.8	71.7	6.5	16.6
25–29	59.0	67.4	8.5	25.1
30–34	53.5	63.6	9.6	34.7
35–39	45.6	59.7	9.5	44.2
40–44	37.0	56.0	8.6	52.9
45–49	28.4	52.8	6.8	59.7
50–54	20.9	49.2	7.7	67.4
55–59	14.6	45.3	8.6	76.0
60–64	12.4	42.4	7.3	83.3
65–69	6.6	40.1	5.8	89.1
70–74	5.2	38.5	4.1	93.3
75–79	0.8	37.6	2.2	95.5
80–84	0.0	37.0	1.6	97.1
85–89	1.7	36.7	0.9	98.0
90–94	0.0	36.1	1.7	99.6
95–100	0.0	35.9	0.4	100.0

$0.75/Day Poverty Line Tables

Figure 5 ($0.75/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	93.1
5–9	97.9
10–14	91.5
15–19	91.2
20–24	87.2
25–29	86.0
30–34	79.1
35–39	67.5
40–44	65.1
45–49	57.4
50–54	47.3
55–59	37.1
60–64	31.7
65–69	26.3
70–74	10.3
75–79	9.6
80–84	3.7
85–89	1.6
90–94	3.1
95–100	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 6 ($0.75/day line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	641	÷	689	=	93.1
5–9	1,185	÷	1,210	=	97.9
10–14	2,890	÷	3,161	=	91.5
15–19	4,647	÷	5,094	=	91.2
20–24	5,653	÷	6,481	=	87.2
25–29	7,305	÷	8,496	=	86.0
30–34	7,565	÷	9,567	=	79.1
35–39	6,427	÷	9,517	=	67.5
40–44	5,623	÷	8,641	=	65.1
45–49	3,930	÷	6,842	=	57.4
50–54	3,640	÷	7,703	=	47.3
55–59	3,182	÷	8,574	=	37.1
60–64	2,324	÷	7,336	=	31.7
65–69	1,530	÷	5,829	=	26.3
70–74	423	÷	4,119	=	10.3
75–79	214	÷	2,242	=	9.6
80–84	59	÷	1,612	=	3.7
85–89	14	÷	859	=	1.6
90–94	51	÷	1,674	=	3.1
95–100	0	÷	356	=	0.0

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 8 ($0.75/day line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	-4.6	3.2	3.2	3.4
5–9	1.2	2.0	2.3	3.0
10–14	-3.7	2.6	2.7	2.9
15–19	5.5	2.5	3.1	4.0
20–24	0.1	1.9	2.4	3.0
25–29	6.4	2.1	2.5	3.1
30–34	0.8	2.0	2.5	3.0
35–39	-7.1	4.6	4.8	5.2
40–44	-5.9	4.1	4.3	4.7
45–49	-2.4	2.8	3.4	4.2
50–54	-3.8	3.3	3.5	4.2
55–59	4.7	2.3	2.8	3.4
60–64	-4.1	3.4	3.6	4.1
65–69	3.2	2.6	3.3	4.3
70–74	-7.0	5.0	5.3	6.0
75–79	0.8	2.2	2.7	3.7
80–84	-1.1	2.2	2.5	3.6
85–89	-0.7	1.5	1.8	2.5
90–94	2.9	0.3	0.3	0.3
95–100	0.0	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 10 ($0.75/day line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-2.0	52.3	63.0	74.5
4	-1.7	39.3	46.3	54.7
8	-1.3	29.8	34.0	41.3
16	-1.0	21.2	24.9	32.3
32	-1.0	15.2	17.7	23.1
64	-1.2	10.3	12.6	15.0
128	-1.0	6.7	7.9	10.4
256	-0.9	4.4	5.3	7.0
512	-0.9	3.0	3.6	4.5
1,024	-0.9	2.1	2.5	3.3
2,048	-0.9	1.4	1.7	2.4
4,096	-0.9	1.0	1.2	1.8
8,192	-0.9	0.7	0.9	1.1
16,384	-0.9	0.5	0.6	0.8

Figure 12 ($0.75/day line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-2.0	52.3	63.0	74.5
4	-1.8	38.8	45.0	54.7
8	-1.4	28.5	33.6	39.7
16	-0.9	19.7	24.2	30.7
32	-1.0	14.2	16.5	22.5
64	-1.1	10.3	12.0	15.4
128	-1.1	7.4	8.5	10.2
256	-1.0	5.1	6.4	7.9
512	-1.1	3.6	4.2	5.2
1,024	-1.0	2.5	3.0	3.8
2,048	-1.0	1.7	2.1	2.8
4,096	-1.0	1.3	1.5	2.1
8,192	-1.0	0.9	1.1	1.3
16,384	-1.0	0.6	0.8	1.0

Figure 14 ($0.75/day line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, scorecard applied to validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.7	57.0	0.0	42.3	43.0	-97.7
5–9	1.8	55.8	0.1	42.3	44.1	-93.5
10–14	4.8	52.8	0.2	42.1	47.0	-82.9
15–19	9.3	48.3	0.8	41.5	50.8	-66.2
20–24	14.9	42.7	1.7	40.6	55.5	-45.3
25–29	21.8	35.9	3.4	39.0	60.8	-18.6
30–34	29.2	28.4	5.5	36.9	66.1	10.9
35–39	36.2	21.4	8.0	34.3	70.5	39.5
40–44	42.1	15.6	10.8	31.6	73.7	64.7
45–49	46.0	11.6	13.7	28.7	74.7	76.3
50–54	49.7	7.9	17.7	24.7	74.4	69.3
55–59	52.8	4.9	23.2	19.2	71.9	59.7
60–64	55.2	2.4	28.1	14.2	69.4	51.2
65–69	56.5	1.1	32.6	9.8	66.3	43.4
70–74	57.2	0.4	36.0	6.3	63.5	37.5
75–79	57.5	0.1	38.0	4.4	61.9	34.1
80–84	57.6	0.0	39.5	2.8	60.4	31.4
85–89	57.6	0.0	40.4	2.0	59.6	30.0
90–94	57.6	0.0	42.0	0.4	58.0	27.1
95–100	57.6	0.0	42.4	0.0	57.6	26.5

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

Figure 15 ($0.75/day line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	**At score**	**At or below score**	**At score**	**At or below score**
0–4	96.6	96.6	0.7	0.7
5–9	96.1	96.3	1.2	1.9
10–14	94.8	95.3	3.2	5.1
15–19	88.1	91.7	5.1	10.2
20–24	86.4	89.6	6.5	16.6
25–29	80.9	86.7	8.5	25.1
30–34	77.8	84.2	9.6	34.7
35–39	73.2	81.8	9.5	44.2
40–44	68.2	79.6	8.6	52.9
45–49	57.6	77.1	6.8	59.7
50–54	47.8	73.7	7.7	67.4
55–59	35.6	69.4	8.6	76.0
60–64	33.1	66.2	7.3	83.3
65–69	23.0	63.4	5.8	89.1
70–74	16.7	61.3	4.1	93.3
75–79	12.5	60.2	2.2	95.5
80–84	5.6	59.3	1.6	97.1
85–89	4.2	58.8	0.9	98.0
90–94	0.6	57.8	1.7	99.6
95–100	0.0	57.6	0.4	100.0

$1/Day Poverty Line Tables

Figure 5 ($1/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	95.0
5–9	99.2
10–14	94.1
15–19	96.4
20–24	92.7
25–29	92.4
30–34	90.9
35–39	84.9
40–44	78.4
45–49	71.7
50–54	68.0
55–59	59.0
60–64	51.6
65–69	46.9
70–74	32.5
75–79	28.9
80–84	13.1
85–89	5.1
90–94	12.7
95–100	8.7

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 6 ($1/day line): Derivation of estimated poverty likelihoods associated with scores

Score	Households below poverty line		All households at score		Poverty likelihood (estimated, %)
0–4	654	÷	689	=	95.0
5–9	1,200	÷	1,210	=	99.2
10–14	2,974	÷	3,161	=	94.1
15–19	4,913	÷	5,094	=	96.4
20–24	6,008	÷	6,481	=	92.7
25–29	7,850	÷	8,496	=	92.4
30–34	8,692	÷	9,567	=	90.9
35–39	8,078	÷	9,517	=	84.9
40–44	6,773	÷	8,641	=	78.4
45–49	4,906	÷	6,842	=	71.7
50–54	5,239	÷	7,703	=	68.0
55–59	5,055	÷	8,574	=	59.0
60–64	3,787	÷	7,336	=	51.6
65–69	2,732	÷	5,829	=	46.9
70–74	1,337	÷	4,119	=	32.5
75–79	647	÷	2,242	=	28.9
80–84	211	÷	1,612	=	13.1
85–89	44	÷	859	=	5.1
90–94	213	÷	1,674	=	12.7
95–100	31	÷	356	=	8.7

Surveyed cases weighted to represent Nigeria's households.
Based on the 2003 NLSS.

Figure 8 ($1/day line): Bootstrapped differences between estimated and true poverty likelihoods for households in a large sample (n = 16,384) from the validation sample, with confidence intervals

	Scorecard applied to the validation sample Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Score	Diff.	90-percent	95-percent	99-percent
0–4	-3.8	2.5	2.5	2.5
5–9	2.5	2.0	2.3	3.0
10–14	-4.8	2.7	2.7	2.8
15–19	3.9	2.1	2.7	3.3
20–24	0.3	1.5	1.8	2.5
25–29	3.2	1.6	2.0	2.5
30–34	1.3	1.4	1.7	2.1
35–39	-0.1	1.6	1.9	2.7
40–44	-3.3	2.7	2.8	3.2
45–49	-6.7	4.4	4.7	5.1
50–54	-0.8	2.4	2.8	3.6
55–59	4.1	2.5	3.1	4.0
60–64	1.1	2.6	3.1	4.1
65–69	7.1	3.0	3.6	4.8
70–74	-9.6	6.7	7.1	7.9
75–79	-0.4	5.2	6.3	8.1
80–84	-3.6	3.7	4.4	6.1
85–89	-1.2	2.8	3.3	4.3
90–94	0.5	3.7	4.4	5.6
95–100	8.7	0.0	0.0	0.0

Based on scorecard applied to the validation sample.

Figure 10 ($1/day line): Differences and precision of differences for bootstrapped estimates of households' poverty likelihoods, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.5	50.8	59.3	73.9
4	-0.6	37.1	43.2	55.7
8	-0.5	26.9	33.0	43.3
16	-0.1	21.0	25.1	32.0
32	-0.5	15.8	18.9	26.9
64	-0.5	11.8	14.1	19.3
128	-0.6	8.7	10.1	13.4
256	-0.4	6.3	7.3	9.6
512	-0.4	4.4	4.9	6.8
1,024	-0.3	3.0	3.4	4.5
2,048	-0.3	2.0	2.4	3.0
4,096	-0.3	1.4	1.8	2.3
8,192	-0.2	1.0	1.2	1.6
16,384	-0.2	0.7	0.9	1.1

Figure 12 ($1/day line): Differences and precision of differences for bootstrapped estimates of poverty rates for groups of households at a point in time, by sample size, scorecard applied to validation sample

	Difference between estimate and true value			
		Confidence interval (+/− percentage points)		
Sample size (n)	Diff.	90-percent	95-percent	99-percent
2	-1.5	50.8	59.3	73.9
4	-0.6	36.7	43.4	54.2
8	-0.4	26.7	31.7	40.7
16	0.1	19.5	22.8	28.6
32	0.1	13.6	16.2	21.8
64	0.2	10.3	12.0	16.5
128	0.1	7.1	8.5	11.4
256	0.1	5.0	5.9	8.0
512	0.0	3.5	4.3	5.6
1,024	0.0	2.6	3.1	4.1
2,048	0.0	1.7	2.0	2.6
4,096	0.0	1.2	1.5	1.9
8,192	0.1	0.9	1.1	1.3
16,384	0.1	0.6	0.8	1.0

Figure 14 ($1/day line): Households by targeting classification and score, along with "Total Accuracy" and BPAC, scorecard applied to validation sample

Score	Inclusion: < poverty line correctly targeted	Undercoverage: < poverty line mistakenly non-targeted	Leakage: ≥ poverty line mistakenly targeted	Exclusion: ≥ poverty line correctly non-targeted	Total Accuracy Inclusion + Exclusion	BPAC See text
0–4	0.7	70.3	0.0	29.0	29.7	-98.1
5–9	1.8	69.1	0.1	29.0	30.8	-94.7
10–14	4.9	66.0	0.1	28.9	33.9	-85.9
15–19	9.8	61.2	0.4	28.7	38.5	-71.9
20–24	15.8	55.2	0.8	28.2	44.0	-54.3
25–29	23.5	47.5	1.6	27.4	50.9	-31.5
30–34	32.0	39.0	2.7	26.3	58.3	-6.1
35–39	40.0	31.0	4.2	24.8	64.8	18.7
40–44	47.1	23.9	5.8	23.2	70.3	40.8
45–49	52.3	18.7	7.4	21.6	73.9	57.8
50–54	57.4	13.5	10.0	19.1	76.5	75.9
55–59	62.2	8.7	13.8	15.3	77.5	80.6
60–64	65.9	5.0	17.4	11.7	77.6	75.5
65–69	68.3	2.7	20.9	8.2	76.4	70.6
70–74	69.8	1.2	23.5	5.6	75.3	66.9
75–79	70.4	0.6	25.1	3.9	74.3	64.6
80–84	70.7	0.3	26.4	2.6	73.3	62.8
85–89	70.8	0.2	27.2	1.9	72.6	61.7
90–94	71.0	0.0	28.7	0.4	71.3	59.6
95–100	71.0	0.0	29.0	0.0	71.0	59.1

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

Figure 15 ($1/day line): Households below the poverty line and all households at a given score or at or below a given score cut-off, scorecard applied to validation sample

	Households below poverty line (%)		All households (%)	
Score	**At score**	**At or below score**	**At score**	**At or below score**
0–4	98.3	98.3	0.7	0.7
5–9	96.1	96.9	1.2	1.9
10–14	98.3	97.8	3.2	5.1
15–19	95.2	96.5	5.1	10.2
20–24	92.6	95.0	6.5	16.6
25–29	90.5	93.4	8.5	25.1
30–34	88.6	92.1	9.6	34.7
35–39	84.4	90.5	9.5	44.2
40–44	81.8	89.0	8.6	52.9
45–49	76.2	87.6	6.8	59.7
50–54	66.8	85.2	7.7	67.4
55–59	55.9	81.9	8.6	76.0
60–64	50.6	79.1	7.3	83.3
65–69	40.0	76.6	5.8	89.1
70–74	36.8	74.8	4.1	93.3
75–79	26.5	73.7	2.2	95.5
80–84	20.5	72.8	1.6	97.1
85–89	9.9	72.3	0.9	98.0
90–94	10.5	71.2	1.7	99.6
95–100	0.0	71.0	0.4	100.0

Food and Non-food Price Deflators by State and by Rural/Urban Area from 09/2003 to 08/2004

Figure 16: Food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Abia	**Urban**	1.21	1.36	1.36	1.36	1.31	1.26	1.28	1.34	1.31	1.35	1.39	1.53
	Rural	1.24	1.33	1.21	1.15	1.27	1.22	1.38	1.4	1.37	1.25	1.39	1.38
Adamawa	**Urban**	0.91	0.89	0.89	—	0.8	0.81	—	—	—	1.05	—	—
	Rural	0.89	0.88	0.95	0.88	0.74	0.9	0.9	0.88	1.08	1.1	1.07	1.05
Akwa ibom	**Urban**	—	1.43	1.41	1.41	1.4	1.38	—	1.54	1.36	1.44	1.37	—
	Rural	1.41	1.19	1.14	1.41	1.21	1.36	1.61	1.55	1.67	1.58	1.52	—
Anambra	**Urban**	—	1.49	—	—	—	1.41	1.35	1.26	1.35	1.46	1.43	1.37
	Rural	1.27	1.33	1.27	1.27	1.35	1.3	1.38	1.32	1.36	1.41	1.38	1.39
Bauchi	**Urban**	—	0.75	—	—	0.79	0.81	0.82	0.98	1.08	0.99	1.04	—
	Rural	0.8	0.73	0.81	0.73	0.77	0.81	0.8	0.9	0.91	0.9	1	0.95
Bayelsa	**Urban**	—	1.33	—	—	—	1.29	—	—	1.36	1.33	1.4	1.39
	Rural	1.44	1.38	1.35	1.19	1.41	1.36	1.3	1.31	1.49	1.3	1.48	1.43
Benue	**Urban**	1.01	0.92	0.83	0.85	0.84	0.84	0.87	0.97	—	—	1.11	—
	Rural	0.91	0.89	0.97	0.89	0.96	0.96	0.93	0.91	1.02	1.08	1.03	1
Borno	**Urban**	0.89	0.87	0.93	0.86	0.86	0.87	0.94	0.93	0.96	1	0.99	0.99
	Rural	1.02	0.84	0.9	0.87	0.91	0.89	0.89	0.96	1.02	1.1	0.95	1.04
Cross_river	**Urban**	1.33	1.35	1.33	1.36	1.18	1	1.36	1.5	1.41	1.42	1.42	1.48
	Rural	1.37	1.41	1.47	1.29	1.35	1.44	1.36	1.48	1.46	1.43	1.53	1.49
Delta	**Urban**	1.5	1.48	1.46	1.47	—	1.56	—	—	—	1.37	1.46	1.33
	Rural	1.6	1.77	1.6	1.63	1.62	1.6	1.49	1.59	1.49	1.42	1.55	1.71
Ebonyi	**Urban**	1.05	—	1.08	0.98	0.99	1.01	—	1.12	1.16	1.22	—	—
	Rural	1.25	1.22	1.15	1.09	1.13	1.09	1.16	1.09	1.31	1.2	1.31	1.24
Edo	**Urban**	1.39	1.42	1.36	1.27	1.3	1.34	1.35	1.33	1.33	1.36	1.38	1.42
	Rural	1.29	1.41	1.44	1.4	1.44	1.4	1.51	1.55	1.58	1.49	1.51	1.46
Ekiti	**Urban**	1.17	1.13	1.09	1.04	1.05	1	1.01	1	1.17	1.11	1.06	1.1
	Rural	1.24	1.3	1.27	1.19	1.16	1.1	1.27	1.29	1.25	1.26	1.31	1.36
Enugu	**Urban**	1.2	1.19	1.13	1.14	1.12	1.13	1.16	—	1.25	1.28	—	1.27
	Rural	1.04	1.19	1.31	0.91	1.01	1.2	1.22	1.22	1.25	1.2	1.3	1.27

Figure 16 (cont.): Food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Gombe	**Urban**	0.8	0.78	0.73	0.82	0.81	0.82	—	0.89	1.05	—	1	1.02
	Rural	0.85	0.76	0.73	0.84	0.85	0.82	0.82	1.02	0.99	1.07	0.87	1.07
Imo	**Urban**	1.24	1.2	—	1.17	—	1.26	1.27	—	—	—	—	—
	Rural	0.94	1.16	1.01	1	1.04	1.13	1.13	1.17	1.17	1.18	1.15	1.13
Jigawa	**Urban**	—	0.76	—	—	—	—	0.77	0.85	0.88	0.88	0.89	—
	Rural	0.74	0.68	0.69	0.72	0.71	0.81	0.73	0.91	0.98	1.02	0.93	0.96
Kaduna	**Urban**	0.81	0.73	0.75	0.84	0.82	0.79	0.85	0.96	1.06	0.97	1.04	1.01
	Rural	0.77	0.84	0.84	0.74	0.83	0.83	0.87	0.9	0.98	1.09	1.02	0.98
Kano	**Urban**	0.77	0.8	0.7	0.71	0.73	0.75	0.85	0.96	0.97	0.97	0.95	0.93
	Rural	0.68	0.73	0.63	0.7	0.8	0.82	0.79	0.89	0.92	0.98	0.92	0.92
Katsina	**Urban**	0.84	0.82	0.86	0.75	—	—	0.88	0.87	0.98	0.99	0.94	—
	Rural	0.87	0.88	0.86	0.77	0.86	0.86	0.82	0.91	0.92	1.03	1.04	0.95
Kebbi	**Urban**	—	—	—	—	—	0.97	0.94	—	1.14	—	—	1.14
	Rural	0.97	1.03	0.97	0.86	0.91	0.92	1.01	1.08	1.17	—	1.07	1.08
Kogi	**Urban**	—	1.02	0.98	0.86	0.91	0.95	—	1.05	1.15	1.1	1.09	1.18
	Rural	1.06	1.19	1.11	1.14	1.11	1.12	1.14	1.18	1.28	1.31	1.34	1.27
Kwara	**Urban**	0.81	0.81	0.7	0.74	0.78	0.75	0.96	0.97	1.06	1.08	1.09	1.07
	Rural	—	0.81	0.82	0.82	0.76	0.94	0.98	0.99	1.02	1.11	1.12	1.08
Lagos	**Urban**	1.31	1.23	1.21	1.3	1.25	1.19	1.21	1.26	1.32	1.28	1.51	1.4
	Rural	—	—	—	1.14	—	1.12	—	1.3	1.28	—	—	—
Nassarawa	**Urban**	—	0.71	—	0.76	0.74	0.7	0.79	0.9	0.92	0.89	—	0.87
	Rural	0.88	0.83	0.74	0.74	0.82	0.81	0.79	0.93	1	1	1.02	0.99
Niger	**Urban**	0.95	1	0.86	0.82	0.81	0.81	0.81	0.97	1.03	1.01	—	1.04
	Rural	0.76	0.96	0.79	0.79	0.8	0.95	0.9	0.94	0.9	1.06	0.98	1

Figure 16 (cont.): Food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Ogun	**Urban**	1.07	1.08	1.01	1.08	1.06	1	1.11	1.15	1.14	1.14	1.16	1.14
	Rural	1.14	1.22	1.25	1.22	1.29	1.2	1.14	1.28	1.25	1.29	1.31	1.22
Ondo	**Urban**	1.16	1.2	1.26	—	1.27	1.29	1.23	1.2	1.28	1.29	1.3	1.32
	Rural	1.31	1.23	1.26	1.34	1.38	1.39	1.23	1.24	1.28	1.31	1.29	1.31
Osun	**Urban**	0.86	0.89	0.77	0.86	0.88	0.9	0.89	1.04	1.2	1.12	1.01	0.99
	Rural	0.84	0.85	1.09	0.93	1	1	0.88	1.08	1.25	1.18	1.23	1.22
Oyo	**Urban**	0.91	0.87	0.83	0.89	0.92	0.94	0.97	0.98	1.09	1.13	1.1	1.01
	Rural	0.95	0.95	0.94	0.96	1.01	1.02	0.93	1.09	1.1	1.17	—	1.14
Plateau	**Urban**	1	0.98	0.88	0.86	0.93	—	—	1.15	1.12	1.06	1.13	1.11
	Rural	0.85	0.85	0.91	0.79	0.78	0.78	0.89	0.89	1.12	1	1	1.11
Rivers	**Urban**	1.44	1.43	1.37	1.39	1.36	1.32	1.03	1.33	1.48	1.32	1.38	—
	Rural	1.32	1.49	1.35	1.71	1.12	1.37	1.47	1.46	1.52	1.44	1.62	—
Sokoto	**Urban**	—	0.85	0.79	0.87	0.89	—	0.93	—	1.07	1.09	—	1.04
	Rural	1.36	1.26	0.85	1.02	0.82	1.27	0.99	0.94	1.02	1.06	1.03	0.95
Taraba	**Urban**	0.82	0.77	—	0.8	0.82	0.83	—	—	—	—	—	0.95
	Rural	0.9	0.89	0.89	0.77	0.78	0.79	0.88	0.92	1.02	1.12	1.02	1.01
Yobe	**Urban**	0.81	0.79	0.82	0.84	—	0.84	0.82	0.9	0.95	0.94	0.97	0.95
	Rural	0.7	0.7	0.77	0.72	0.84	0.79	0.78	0.85	0.87	1	1.01	0.94
Zanfara	**Urban**	0.83	0.86	0.85	—	0.89	0.95	0.88	—	1.02	1.09	—	1.03
	Rural	0.96	0.99	0.83	0.89	0.92	0.93	0.92	0.97	1.06	1.04	1.06	1
FCT	**Urban**	1.02	0.98	0.93	0.95	0.97	—	—	1.05	1.1	1.12	1.11	1.08
	Rural	0.94	0.88	0.87	0.9	0.84	1.01	0.93	1.08	1.05	1.06	1.1	1.12

Source: 2003 NLSS

Note: The deflators are used to deflate household expenditures to national price in January 2004.
There are no deflators for states and areas in which no households were surveyed in a given month.

Figure 17: Non-food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Non-food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Abia	**Urban**	1.13	1.17	1.17	1.22	1.18	1.14	1.14	1.22	1.06	1.15	1.17	1.21
	Rural	1.07	0.93	0.84	1.13	1.17	1.02	1	1.32	1.14	1.22	1.18	1.06
Adamawa	**Urban**	1.27	1.19	1.08	—	1.21	1.11	—	—	—	1.31	—	—
	Rural	1.27	1.14	1.06	1.05	1.11	1.1	1.16	1.14	1.19	1.17	1.13	1.2
Akwa ibom	**Urban**	—	1.26	1.2	1.17	1.15	1.15	—	1.2	1.1	1.35	1.23	—
	Rural	1.03	0.95	1.02	1.03	1.12	1.06	1.07	1.19	1.09	1	1.03	—
Anambra	**Urban**	—	1.31	—	—	—	1.15	1.36	1.5	1.4	1.48	1.58	1.5
	Rural	1.03	1.04	1.03	1.01	1.24	1.19	1.24	1.22	1.12	1.18	1.17	1.28
Bauchi	**Urban**	—	0.86	—	—	1.1	0.96	0.97	1	0.85	0.95	1.01	—
	Rural	0.97	1.03	1.06	0.91	1.06	1	1.07	0.88	0.96	0.98	0.91	0.91
Bayelsa	**Urban**	—	1.58	—	—	—	1.37	—	—	1.42	1.62	1.61	1.46
	Rural	1.66	1.17	1.54	1.35	1.27	1.11	1.25	1.13	1.53	1.24	1.27	1.34
Benue	**Urban**	0.9	0.96	0.97	0.97	0.94	0.87	0.94	0.87	—	—	0.96	—
	Rural	0.94	0.86	0.87	0.9	0.83	0.85	0.86	0.94	0.88	0.93	0.91	0.92
Borno	**Urban**	0.87	0.91	0.97	0.95	0.99	1.03	1.12	1.1	1.14	1.18	1.18	0.97
	Rural	1.02	1.12	1.05	1.33	1.09	1.19	1.05	1.15	1.03	1.07	1.09	1.2
Cross_rivers	**Urban**	1.3	1.38	1.06	1.06	1.1	1.15	1.19	1.24	1.24	1.25	1.35	1.12
	Rural	1.05	1.06	0.99	1.2	1.07	1.16	1.07	1.18	1.14	1.18	1.2	1.11
Delta	**Urban**	1.43	1.41	1.34	1.43	—	1.44	—	—	—	1.41	1.41	1.4
	Rural	1.31	0.92	0.93	0.87	1.26	1.26	1.14	1.26	1.32	1.03	1.19	1.21
Ebonyi	**Urban**	1.15	—	1.12	1.1	1.1	1.16	—	1.23	1.16	1.29	—	—
	Rural	1.05	0.95	1.1	0.96	0.97	1.06	1	1.03	1.04	1.16	1.28	1.18
Edo	**Urban**	1.24	1.16	1.19	1.12	1.1	1.1	1.14	1.16	1.34	1.43	1.36	1.23
	Rural	1.32	1.48	1.2	1.42	1.27	1.42	1.35	1.2	1.29	1.28	1.2	1.31
Ekiti	**Urban**	0.79	0.81	0.81	0.85	0.84	0.82	0.8	0.89	0.9	0.94	0.95	0.88
	Rural	0.86	0.76	0.77	0.96	0.92	0.93	0.83	0.83	0.86	0.87	0.88	0.9
Enugu	**Urban**	1.34	1.34	1.29	1.29	1.23	1.17	1.22	—	1.2	1.22	—	1.27
	Rural	1.02	0.97	1.01	1.04	0.99	1.06	1.15	1.11	1.03	0.94	1	0.94

Figure 17 (cont.): Non-food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Non-food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Gombe	**Urban**	1.03	0.94	0.83	0.9	0.89	1.03	—	1.07	1.15	—	1.03	0.97
	Rural	1.21	1.21	1.24	1.12	1.11	1.12	1.16	0.89	1.04	1.16	0.96	0.97
Imo	**Urban**	1.08	1.18	—	1.16	—	1.17	1.27	—	—	—	—	—
	Rural	1.04	0.98	0.95	0.96	1.04	1.02	1.08	1	1	1.05	1.08	1.08
Jigawa	**Urban**	—	1.03	—	—	—	—	0.92	0.92	0.91	0.99	0.86	—
	Rural	1.03	0.94	0.96	0.93	0.84	0.87	0.87	0.95	0.86	0.8	0.8	0.76
Kaduna	**Urban**	0.9	0.98	0.97	1.03	1.03	1.03	1.1	0.98	0.94	1.03	0.99	1
	Rural	0.94	0.94	0.94	0.9	0.91	0.91	0.93	0.83	0.84	1	0.94	0.96
Kano	**Urban**	0.85	0.98	1	1.07	1.06	1.02	1.02	1	0.92	0.79	0.87	1.06
	Rural	0.83	0.82	0.85	0.83	0.95	0.96	0.89	0.78	0.88	0.93	1.02	0.86
Katsina	**Urban**	0.99	0.88	0.95	0.97	—	—	1	1.01	0.91	0.9	0.99	—
	Rural	1.04	0.96	0.95	0.94	0.96	0.93	0.8	1	1.09	1.07	0.95	0.94
Kebbi	**Urban**	—	—	—	—	—	1.14	1.15	—	0.88	—	—	1.11
	Rural	1.22	1.01	1.08	1.07	1.09	1.09	1.03	0.96	1	—	1.34	1.13
Kogi	**Urban**	—	0.99	1.25	1.26	1.72	1.29	—	1.31	0.85	1.07	1.11	1.1
	Rural	1.1	1.1	1.09	0.7	0.88	1.01	0.88	0.92	1.08	1.12	0.92	0.93
Kwara	**Urban**	0.77	0.78	0.71	0.8	0.82	0.81	0.86	0.86	0.9	0.84	0.72	0.78
	Rural	—	0.83	0.88	0.87	0.82	0.85	0.9	0.89	1	0.91	0.84	0.89
Lagos	**Urban**	1.04	1.06	1.07	1.12	1.08	1.08	1.07	1.09	1.11	1.08	1.05	1.04
	Rural	—	—	—	1.13	—	1.12	—	1.14	1.22	—	—	—
Nassarawa	**Urban**	—	0.97	—	0.85	0.94	1.02	1.06	0.98	0.92	0.97	—	1.02
	Rural	1.05	1.14	1.09	1.06	1.05	0.98	0.96	0.89	1.06	0.97	0.95	0.62
Niger	**Urban**	1.04	1.03	0.92	1.03	1.03	1.03	1.17	1.11	1.07	1.12	—	1.25
	Rural	1.04	0.94	0.96	0.89	0.97	1	1.1	1.05	1.39	1.19	1.1	1.01

Figure 17 (cont.): Non-food price deflator by state and by rural/urban area from 09/2003 to 08/2004

		Non-food Price Deflator from 09/2003 to 08/2004											
State	**Area**	**09/2003**	**10/2003**	**11/2003**	**12/2003**	**01/2004**	**02/2004**	**03/2004**	**04/2004**	**05/2004**	**06/2004**	**07/2004**	**08/2004**
Ogun	**Urban**	0.91	0.93	0.93	0.88	0.89	0.89	0.98	1	0.97	0.98	0.95	1.04
	Rural	1.02	0.98	1.01	1.07	1.02	0.96	0.95	0.89	0.9	0.79	0.93	0.91
Ondo	**Urban**	0.97	0.95	0.95	—	1	1.05	1.01	1.02	0.94	0.97	0.99	0.96
	Rural	1.05	0.9	0.9	0.9	0.78	0.77	0.84	0.84	0.87	0.84	0.84	0.88
Osun	**Urban**	0.9	0.95	0.96	0.89	0.91	0.9	0.96	1	0.91	0.87	0.94	0.76
	Rural	0.75	0.75	0.76	0.81	0.84	0.81	0.76	0.84	0.81	0.76	0.82	0.8
Oyo	**Urban**	0.87	0.89	0.9	0.96	0.94	0.9	0.99	0.98	0.86	0.77	0.9	0.99
	Rural	1.01	1.08	1.05	1.02	1.01	1	1.05	0.97	0.95	1.18	—	0.99
Plateau	**Urban**	1	1	1.01	0.98	1.06	—	—	1.07	0.98	0.91	1.04	0.95
	Rural	0.84	0.78	0.87	0.9	0.92	0.89	0.93	0.97	0.98	0.97	0.95	1
Rivers	**Urban**	1.47	1.63	1.64	1.64	1.68	1.64	1.59	1.58	1.53	1.46	1.42	—
	Rural	1.54	1.62	1.61	1.2	1.19	1.66	1.31	1.34	1.57	1.55	1.59	—
Sokoto	**Urban**	—	0.97	0.92	0.9	0.94	—	0.81	—	0.9	0.9	—	1.03
	Rural	1.07	0.98	0.93	1.02	0.99	1.11	1	0.91	0.88	0.99	0.99	1.04
Taraba	**Urban**	1.09	1.14	—	1.13	1.13	1.11	—	—	—	—	—	1.23
	Rural	1.04	1.02	0.91	1	0.95	1.02	1.01	1.05	1.14	1.16	1.18	1.02
Yobe	**Urban**	1.1	1.05	1.08	1.17	—	1.11	1.15	1.13	1.17	1.15	1.29	1.2
	Rural	1.14	1.01	1.06	1.05	1.18	1.17	1.12	1.07	1.01	1.34	1.23	1.42
Zanfara	**Urban**	0.95	0.96	0.96	—	1.03	1.03	1.07	—	0.91	0.99	—	1.1
	Rural	1.12	0.89	1.1	1.02	0.97	0.97	0.99	1.01	1.08	1.16	1.35	1.16
FCT	**Urban**	1.74	1.73	1.73	1.75	1.68	—	—	1.63	1.58	1.58	1.61	1.61
	Rural	1.99	1.85	1.46	1.68	1.75	1.76	1.77	1.68	1.72	1.79	1.74	1.64

Source: 2003 NLSS

Note: The deflators are used to deflate household expenditures to national price in January 2004.
There are no deflators for states and areas in which no households were surveyed in a given month.