Simple Poverty Scorecards

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PROBLEM: Direct Measures Are Costly

1–2 day household expenditure survey

Last week, did you eat carrots? How many?

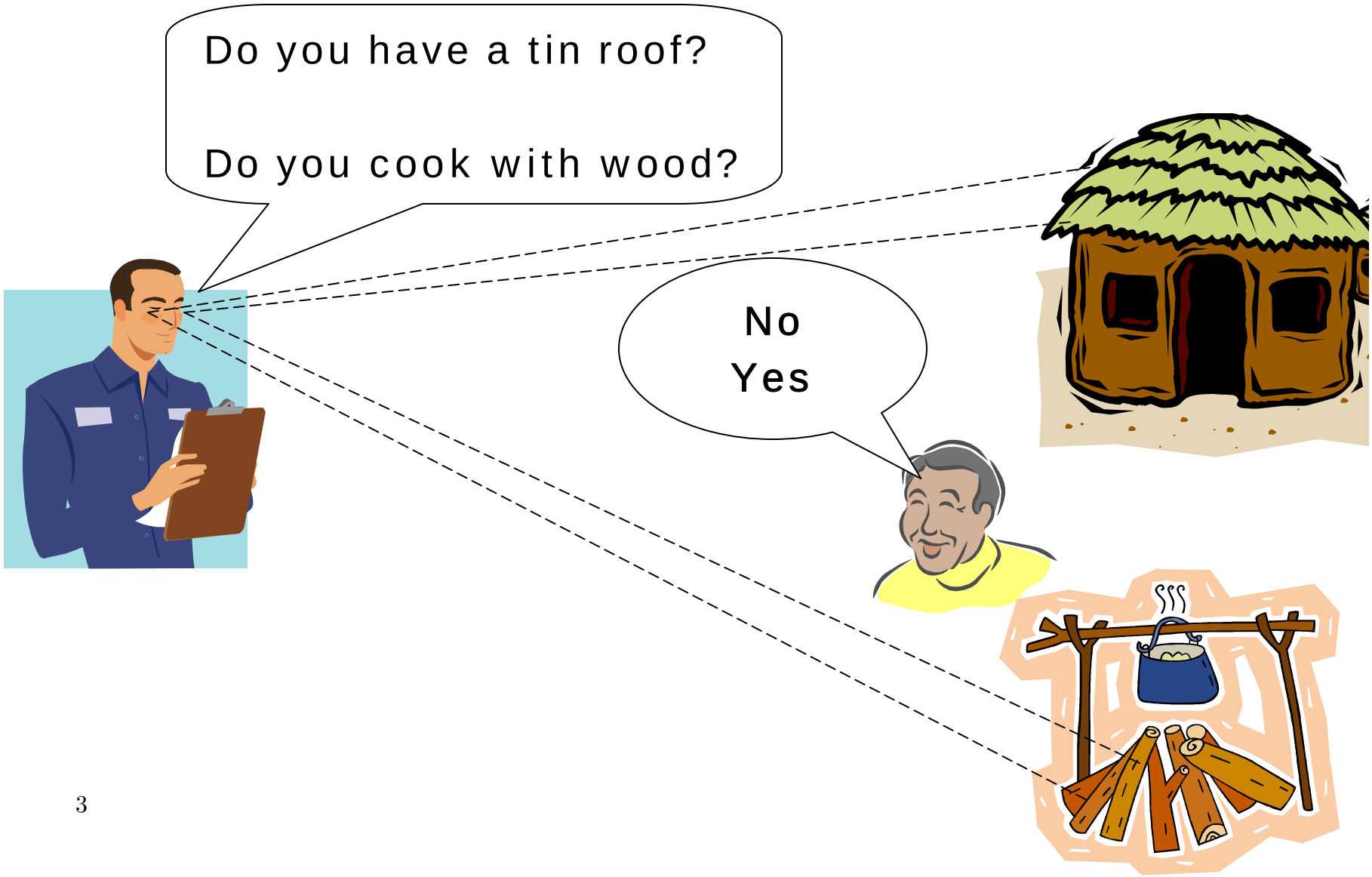
Did you buy them? What price would you have paid, if you had bought them?

Yes. Ummm, 5, I think.

No. I don't know.

SOLUTION: Indirect Scoring Costs Less

5–10 minute scorecard with observable indicators



Features of Poverty Scorecards (PPIs)

1. *Objective*: Based on national survey data:
   - LSMS-type expenditure measurement
   - Quantitative, observable indicators
2. *Accurate*: 90-percent confidence, estimates are:
   - +/– 10 pct. points, individual poverty likelihood
   - +/– 2 pct. points, group poverty rate
3. *Practical*: Accepted and used:
   - Indicators are few and inexpensive-to-collect
   - Simple enough to understand and compute on paper, in the field, in real time (no software)
4. *Universal*: For all, not just microfinance

3 Uses of Poverty Scoring

1. *Target services* (classify individuals):
   - — If score < cut-off, treat as if poor *for program purposes*
   - — Managers choose program's cut-off

2. *Measure poverty rates*:
   - — Report USAID, MiX, Microcredit Summit
   - — Managers set goals and track progress

3. *Track changes in poverty over time*:
   - — Measure poverty rates for a group twice
   - — Look at change in poverty rates

Bangladesh Scorecard

Indicator	Value	Points	Total
1. What type of latrine does the household use?	Open field	0	
	Kacha (temporary or permanent) or pit Pacca	8	
	Sanitary or water-seal Pacca	15	
2. How many household members are 11 years old or younger?	4 or more	0	
	3	7	
	2	12	
	1	19	
	0	27	
3. Does any household member work for a daily wage?	Yes	0	
	No	9	
4. How many rooms does the house have (excluding ones used for business)?	1	0	
	2 or 3	3	
	4 or more	12	
5. Do all children ages 6 to 17 attend school?	No	0	
	No children ages 6 to 17	4	
	Yes	5	
6. Does the household own a television set?	No	0	
	Yes	13	
7. How many decimals of cultivable land does the household own?	Less than 34	0	
	34 to 99	2	
	100 to 199	4	
	200 or more	6	
8. What is the main construction material of the walls of the house?	Hemp/hay/bamboo or mud brick	0	
	C.I. sheet/wood	6	
	Brick/cement	7	
9. Does the household own any cattle?	No	0	
	Yes	2	
10. Does the house have a separate kitchen?	No	0	
	Yes	5	
		Total:	

PPIs Based on Natl. Survey Data

- B'desh derived from 2001 'Household Income and Expenditure Survey' by Bureau of Statistics
- 7,440 households
- Includes costly LSMS-type expenditure module
- Analyst uses statistics (logit regression) to select indicators and assign points to accurately relate indicators to known poverty status for surveyed HH
- Analyst does not 'make up' points or pick indicators based only on judgment or other countries
- Scorecard derived from 2001 national expenditure survey is then applied to MF clients today

How Are Indicators Selected?

'Practicality', not just accuracy

Pick indicators most strongly linked with poverty (statistics) that also are ('experts'):

— Common sense
— Objective
— Verifiable
— Quick to ask/answer
— Liable to change over time

How Are Indicators Selected? (cont.)

Exclude:

- Annual expenditure on clothes & shoes
- Total value of assets
- Ratios, squares, logarithms
- Subjective judgments
- Events in the past

Include:

- Current presence of physical objects
- Objective and verifiable
- Variety
- Liable to change over time
- Related to Millennium Development Goals

How Are Points Derived?

- Logit regression, transformed so that:
  - All points are zero or positive integers
  - 0 is lowest score (most likely poor)
  - 100 is highest score (least likely poor)
- Transformation reduces accuracy a little but promotes ease-of-use and acceptance
- Programs can download scorecard & use with no external help (with great effort)
- Field workers compute scores on paper, by hand, in real time; no software needed

Bangladesh Example Use

Indicator	Value	Points	Total
1. What type of latrine does the household use?	Open field	0	**0**
	Kacha (temporary or permanent) or pit Pacca	8	
	Sanitary or water-seal Pacca	15	
2. How many household members are 11 years old or younger?	4 or more	0	**12**
	3	7	
	2	12	
	1	19	
	0	27	
3. Does any household member work for a daily wage?	Yes	0	**0**
	No	9	
4. How many rooms does the house have (excluding ones used for business)?	1	0	**3**
	2 or 3	3	
	4 or more	12	
5. Do all children ages 6 to 17 attend school?	No	0	**5**
	No children ages 6 to 17	4	
	Yes	5	
6. Does the household own a television set?	No	0	**0**
	Yes	13	
7. How many decimals of cultivable land does the household own?	Less than 34	0	**2**
	34 to 99	2	
	100 to 199	4	
	200 or more	6	
8. What is the main construction material of the walls of the house?	Hemp/hay/bamboo or mud brick	0	**0**
	C.I. sheet/wood	6	
	Brick/cement	7	
9. Does the household own any cattle?	No	0	**2**
	Yes	2	
10. Does the house have a separate kitchen?	No	0	**0**
	Yes	5	
		Total:	**24**

What does a poverty score mean?

Score	Probability (%) that someone with a given score is below $1/day
0-4	100.0
5-9	94.0
10-14	92.7
15-19	96.6
20-24	80.5
25-29	83.1
30-34	73.9
35-39	61.4
40-44	42.7
45-49	38.8
50-54	19.7
55-59	16.6
60-64	15.5
65-69	2.8
70-74	1.5
75-79	2.8
80-84	13.3
85-89	0.9
90-94	0.0
95-100	0.0

Source: Calculations based on 2000 HIES.

Score of 20–24 means person is 80.5% likely to be poor. (805 of 1,000 people scoring in this range are poor)

Where do poverty likelihoods come from?

Score	People in national survey with score who were *below* $1/day	People in national survey with score (normalized)	Probability (%) that someone with a given score is below $1/day
0-4	178	178	178 ÷ 178 = 100
5-9	1305	1388	1305 ÷ 1388 = 94
10-14	2221	2395	2221 ÷ 2395 = 92.7
15-19	4320	4472	4320 ÷ 4472 = 96.6
20-24	6240	7752	6240 ÷ 7752 = 80.5
25-29	7640	9193	7640 ÷ 9193 = 83.1
30-34	6574	8900	6574 ÷ 8900 = 73.9
35-39	6737	10971	6737 ÷ 10971 = 61.4
40-44	4050	9488	4050 ÷ 9488 = 42.7
45-49	3041	7830	3041 ÷ 7830 = 38.8
50-54	1600	8117	1600 ÷ 8117 = 19.7
55-59	1095	6589	1095 ÷ 6589 = 16.6
60-64	927	5964	927 ÷ 5964 = 15.5
65-69	137	4969	137 ÷ 4969 = 2.8
70-74	64	4336	64 ÷ 4336 = 1.5
75-79	75	2654	75 ÷ 2654 = 2.8
80-84	282	2121	282 ÷ 2121 = 13.3
85-89	12	1322	12 ÷ 1322 = 0.9
90-94	0	1175	0 ÷ 1175 = 0
95-100	0	188	0 ÷ 188 = 0

Source: Calculations based on 2000 HIES.

A score of 24 corresponds to a poverty likelihood of 80.5% because 6,240 of 7,752 people in Natl. survey (80.5%) had a score of 20–24 and were below $1/day.

1. Estimating Poverty Rates

The share of clients who are poor is the average of their individual poverty likelihoods.

B'desh example, portfolio of 3 clients, 1/1/06

Client	Score 1/1/06	Poverty likelihood (%)
A	20	80.5
B	30	73.9
C	40	42.7
Average(=Poverty rate):		65.7

Given 2,000 clients and 90-percent confidence, Bangladesh estimate is accurate to +/– 1.5 percentage points.

2. Tracking Change in Poverty Rates

(Change is not the same as impact)

B'desh example, 3 clients, 1/1/06 to 1/1/07

	Score		Poverty likelihood (%)	
Client	1/1/06	1/1/07	1/1/06	1/1/07
A	20	25	80.5	83.1
B	30	35	73.9	61.4
C	40	45	42.7	38.8
Average(=Poverty rate):			65.7	61.1

(65.7 – 61.1) ÷ 65.7 = 7.5% of poor left poverty

Tracking change to +/– 1.0 pct. points w/90-percent confidence requires n=5,000–10,000

3. Applying Cut-Offs for Targeting

Programs can treat, *for their own purposes*, people scoring below a cut-off as 'poor':

- Based on a program's values & mission
- Program choice does not change $1/day line used in estimating poverty rates
- Choose to balance 'benefit' of covering poor versus 'cost' of leaking to non-poor
- Scoring makes explicit targeting errors that inevitably exist, helping to make targeting intentional and quantitative

Trade-offs for Targeting Cut-offs, B'desh

Score cut-off (People at or below this score are treated as 'poor' for program purposes)	Coverage of poor (% of truly poor successfully targeted)	Leakage to non-poor (% of truly non-poor mistakenly targeted)
0-4	0.4	0.0
5-9	3.2	0.2
10-14	8.0	0.5
15-19	17.3	0.8
20-24	30.7	3.6
25-29	47.1	6.5
30-34	61.2	10.8
35-39	75.7	18.8
40-44	84.4	28.9
45-49	91.0	37.9
50-54	94.4	50.0
55-59	96.8	60.3
60-64	98.8	69.7
65-69	99.1	78.8
70-74	99.2	86.7
75-79	99.4	91.6
80-84	100.0	95.0
85-89	100.0	97.5
90-94	100.0	99.6
95-100	100.0	100.0

Source: 2001 HIES and Bangladesh PPI.

Targeting people scoring 30–34 or less would cover 61.2% of the poor and leak to 10.8% of the non-poor

Can We Use Scoring for Targeting at All?

- Depends on costs, benefits, & alternatives:
  - — Provide data on accuracy
  - — Let programs decide for themselves
- For-profiteers Visa, AmEx, etc. bet billions on targeting daily, with scorecards much less accurate than these PPIs
- Used to target public assistance to poor in Mexico, Colombia, Costa Rica, and Chile

"Among all targeting mechanisms, proxy means tests [PPIs] produce the best incidence outcomes"

— Margaret Grosh, World Bank targeting guru

Implementation

- If not used, why do it? (Buy-in and ease-of-use)
- Sample, or apply to every client? How often?
- Data quality is paramount:
  - Output only as good as input
  - Quality requires training and monitoring
  - Reveal indicator points to field agents?
- Photocopy, ask questions, add up points, apply targeting cut-off policy (if desired)
- File paper scorecard, and perhaps record ID data, score, and indicator values in database
- Inform management decisions:
  - GFUSA experience (Jeff Toohig, Frances Sinha)
  - Report poverty rates and changes

Are PPIs Accurate Enough?

No scorecard is perfect (or even close). But poverty is relatively easy to predict, and even simple scorecards are almost as accurate as complex ones ('flat max').

Two aspects of accuracy:

1. Concentrate poor in low scores for targeting
2. Estimated likelihoods and rates match true ones

PPI accuracy is measured correctly, w/no reinvention:

- Tested on data not used to make scorecard
- 'Bootstrap' confidence intervals (standard stats.)
- Targeting accuracy at different cut-offs

Accuracy is almost as high as alternatives, and certainly 'good enough for government work'

Overview of PPIs So Far

Country	Poverty line, person/day	% poor	National Survey	# HH	90% confidence (+/– pct. points) Individual pov. like.	Group pov. rate
Bangladesh	$1	44	’00 HIES	7,440	5	1.5
Bolivia	Bs11 urban Bs8 rural	64	’02 EH	5,741	9	1.3
Haiti	$1	56	’01 ECVH	7,168	7	1.9
India	$1	46	’03 SES	41,013	3	0.7
Mexico	P31 rural, P45 urban	48	’02 ENIGH	17,167	N/A	1.0
Morocco	DH10	19	‘98/’99 ENNVM	5,129	12	1.6
Pakistan	Rs25	40	’01 PIHS	15,503	10	1.1
Peru	NS7	52	’03 ENAHO	17,629	16	1.1
Philippines	P36	31	’01 APIS	38,014	6	1.0

Additional Scorecards Done/Planned

Woller/CGAP/Ford

Cambodia
El Salvador
Ethiopia
Guatemala
Honduras
Malawi
Nepal
Nicaragua
Nigeria
Palestine
South Africa
Vietnam

IRIS/USAID

Albania
Bangladesh
Colombia
East Timor
Ghana
Guatemala
India (2 states)
Indonesia
Jamaica
Kazakhstan
Madagascar
Peru
Tajikstan
Tanzania
Uganda, and Vietnam

Compare: CASH-POR Housing Index

Indicator	Values			Points
1. Size of house?	Small	Medium	Big	
	0	2	4	
2. Structural condition?	Dilapidated	Average	Good	
	0	2	6	
3. Quality of walls?	Poor	Average	Good	
	0	2	6	
4. Quality of roof?	Thatch/leaves	Tin/Iron sheets	Permanent roof	
	0	2	6	
Source: "Overcoming the Obstancles of Identifying the Poorest Families", 2000, Simanowitz, Nkuna, and Kasim.				Total:

- What does ‘small’ mean? ‘Poor’? ‘Dilapidated’?
- If score is 10, is the person below $1/day?
- Are all people with scores of 0 below $1/day?
- Are there many thatched roofs on brick walls?
- But common-sense, easy-to-use, & well-accepted

Compare: CGAP PAT

What is it?: Survey 300 clients & non-clients in area, gather indicators and expenditure on clothes & shoes, model principal components, compare terciles of client scores v. non-clients

PAT appears weaker in many aspects (Rosenberg):

- Not based on $1/day or other poverty line
- Looks at relative poverty, not absolute
- Based special-purpose, local survey, and so uses less and non-national data
- Less easy for users to understand model
- Less easy to use on on-going basis
- One application for 1 org. in 1 place costs about as much as PPI for a whole country

BUT . . . PAT works where there is no or old data

Compare: IRIS Poverty Tool

What is it?: Build scorecard w/LSMS-type data to estimate expenditure (not probability poor). Label people 'poor' or not by comparing estimated expenditure to poverty line

IRIS Tools, PPIs are similar in most key ways:

- Both use LSMS-type expenditure data (IRIS sometimes uses smaller data sets)
- Both depend crucially on data quality
- Similar accuracy (IRIS probably somewhat better)
- Can be used for targeting (IRIS says not to, but its preferred measure of accuracy [BPAC] takes targeting accuracy into account)

They are so similar that USAID uses both.

Differences: IRIS Tools, PPIs

1. Transparency (helps get management buy-in):
   - PPI weights are public knowledge (user can choose to omit from scorecards used in field)
   - PPI formula simpler (users can understand, no need for logarithms nor spreadsheets)
   - PPI measures accuracy more completely, in more standard ways (IRIS could do this too)
   - PPI recognizes poverty labels are probabilistic
2. Indicators:

   PPI has somewhat fewer, simpler, more objective indicators, improving data quality but reducing accuracy and sensitivity to changes over time
3. Costs of creation and implementation?

Poverty Scoring Summary

- PPIs are simple, easy-to-use, inexpensive, transparent, objective, and accurate
- They estimate likelihood that a person is poor:
  - Use policy cut-offs for targeting
  - Take average to get portfolio poverty rate
  - Track over time for progress out of poverty
- 'Practicality' and accuracy both matter:
  - One page, few indicators, simple weights
  - Field workers can compute scores on paper in real time (no software required)
- Valid for *any* program, not just microfinance
- Very similar in key ways to IRIS Tools

FOR TARGETING THE POOR,
MEASURING POVERTY RATES,
and TRACKING CHANGE,
POVERTY SCORING IS
SIMPLE,
INEXPENSIVE,
TRANSPARENT,
OBJECTIVE,
and ACCURATE.