

**Poverty Assessment Tool Accuracy Submission: Addendum for New Poverty Lines  
USAID/IRIS Tool for Indonesia  
Submitted: September 15, 2011**

In order to improve the functionality of the existing PAT for Indonesia, the IRIS Center has updated the tool with the following features:

- Re-ran the models at the \$1.25/day line, using the new purchasing power parity (PPP) rates lines released by the World Bank
- Calibrated the model to also allow predictions at the \$2.50/day line
- Incorporated the prediction models into a CSPro data entry template. This template closely resembles the paper questionnaire and allows the entry, storage, and retrieval of household demographics. The output of the data entry permits poverty prediction at two poverty lines, \$1.25 and \$2.50. In addition, poverty status at the both lines is cross tabulated with regional location, the household head's characteristics, household size, and housing conditions. This additional information provided is intended for indicative purposes rather than statistical inference. Please see attached document with screenshots of this template.
- Revised the paper questionnaire to reflect best practice in survey design

The data source used for the PAT in Indonesia remains the same as when the tool was originally submitted for certification, as has the general tool construction process, aside from a more rigorous screening process to ensure that the variables are in line with the project's current best practices on practical indicators. Because of these similarities, this document should be viewed as an addendum to the original tool's certification document. The document proceeds by detailing how the new \$1.25 PPP was applied and the results at the \$1.25/day and \$2.50/day lines. Accompanying this document are the revised questionnaire and screenshots of the CSPro data entry template and output.

### **Updating the poverty line**

The legislation governing the development of USAID tools defines the "very poor" as either the bottom (poorest) 50 percent of those living below the poverty line established by the national government or those living on the local equivalent of less than the international poverty line (\$1.25/day in 2005 PPP terms)<sup>1</sup>. The applicable poverty line for USAID tool development is the one that yields the higher household poverty rate for a given country.

In Indonesia the applicable threshold is the international poverty line of \$1.25/day in 2005 PPP terms. The value of this line at the time of the survey is 127,619 Rupiah per capita per year, indexed to average 2002 prices. This line identifies 28.1% of households in the sample as "very poor."

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<sup>1</sup> The congressional legislation specifies the international poverty line as the "equivalent of \$1 per day (as calculated using the purchasing power parity (PPP) exchange rate method)." USAID and IRIS interpret this to mean the international poverty line used by the World Bank to track global progress toward the Millennium Development Goal of cutting the prevalence of extreme poverty in half by 2015. This poverty line has recently been recalculated by the Bank to accompany new, improved estimates of PPP. The 2002 equivalent of the applicable 2005 PPP rate for Indonesia is 127,619 Rupiah per capita.

## Results for \$1.25/day model

Table 1 summarizes the accuracy results achieved by eight estimation methods in predicting household poverty relative to the new \$1.25/day poverty line. The selection of the best model was based on the Balanced Poverty Accuracy Criterion (BPAC) and the Poverty Incidence Error (PIE), along with practicality considerations.<sup>2</sup> For Indonesia, the most accurate method, on the basis of BPAC and PIE, is the 1-step Quantile regression. Table 2 presents a 2x2 matrix of the poverty status predicted by the model versus the true poverty status according to the expenditure benchmark. Table 3 provides the regression results from the \$1.25/day model.

*Table 1: In-sample Accuracy Results for Prediction at the Legislative Poverty Line*

<b>Indonesia</b> \$1.25/day line* Share of “very poor”: 28.1%	<b>Total Accuracy</b>	<b>Poverty Accuracy</b>	<b>Under-coverage</b>	<b>Leakage</b>	<b>PIE</b>	<b>BPAC</b>
<b>Single-step methods --</b>						
OLS	78.90	44.80	55.20	20.50	-9.60	10.20
Quantile regression (estimation point: 40 percentile)	<b>78.30</b>	<b>61.00</b>	<b>39.00</b>	<b>39.00</b>	<b>0.00</b>	<b>61.00</b>
Linear Probability	79.20	45.00	55.00	19.60	-9.90	9.60
Probit	79.40	49.40	50.60	23.40	-7.60	22.30
<b>Two-step methods --</b>						
OLS – 29 percentile cutoff	79.40	46.60	53.40	20.50	-9.20	13.70
Quantile (estimation points: 40, 12) 29 percentile cutoff	78.60	63.70	36.30	40.60	1.20	59.40
LP – 38 percentile cutoff	79.60	51.70	48.30	24.90	-6.50	28.20
Probit – 38 percentile cutoff	79.50	51.30	48.70	24.80	-6.60	27.40
* The \$1.25/day poverty line is 127,619 Rupiahs per capita per year.						

<sup>2</sup> For a detailed discussion of these accuracy criteria, see “Note on Assessment and Improvement of Tool Accuracy” at [www.povertytools.org](http://www.povertytools.org).

**Table 2: Poverty Status of Sample Households, as Estimated by Model and Revealed by the Benchmark Survey**

	<b>Number of households identified as very-poor by the tool</b>	<b>Number of households identified as not very-poor by the tool</b>
<b>Number of “true” very-poor households (as determined by benchmark survey)</b>	5,470 (17.0%)	3,500 (10.9%)
<b>Number of “true” not very-poor households (as determined by benchmark survey)</b>	3,497 (10.8%)	19,744 (61.3%)

**Table 3: Regression Estimates using 1-step Quantile Method for Prediction at the \$1.25/day Poverty Line**

.4 Quantile regression  
Min sum of deviations 9887.476

Number of obs = 32,211  
Pseudo R2 = 0.2606

<b>Variable</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>[95% Conf. Interval]</b>	
Intercept	12.5875	0.0287	438.7300	0.0000	12.5313	12.6438
Household size	-0.2477	0.0059	-42.1700	0.0000	-0.2592	-0.2362
Household age	0.0097	0.0012	8.1200	0.0000	0.0073	0.0120
Household size squared	0.0146	0.0006	23.9800	0.0000	0.0134	0.0158
Household head age squared	-0.0001	0.0000	-8.5900	0.0000	-0.0001	-0.0001
Household lives in Sumatra	0.0863	0.0072	11.9300	0.0000	0.0722	0.1005
Household lives in Nusa Tenggara	0.0191	0.0089	2.1500	0.0320	0.0017	0.0366
Household lives in Kalimantan	0.1752	0.0098	17.8300	0.0000	0.1560	0.1945
Household lives in Sulawesi	0.0077	0.0092	0.8400	0.4010	-0.0103	0.0257
Household lives in rural area	-0.2126	0.0064	-33.0300	0.0000	-0.2252	-0.2000
Household head has had no education	-0.0978	0.0097	-10.0500	0.0000	-0.1168	-0.0787
Household head has completed senior high school	0.1330	0.0074	17.9500	0.0000	0.1185	0.1475
Share of family member with no education	-0.2861	0.0200	-14.2900	0.0000	-0.3254	-0.2469
Share of family members who have completed senior high school	0.4840	0.0199	24.3800	0.0000	0.4451	0.5230
Household head widowed	-0.0962	0.0098	-9.8400	0.0000	-0.1154	-0.0770

Variable	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Household leases dwelling	0.0715	0.0125	5.7400	0.0000	0.0470	0.0959
Parents own dwelling	-0.0515	0.0114	-4.5000	0.0000	-0.0739	-0.0291
Walls of dwelling are made of wood	-0.1189	0.0070	-16.9500	0.0000	-0.1327	-0.1051
Walls of dwelling are made of bamboo	-0.1702	0.0091	-18.7400	0.0000	-0.1880	-0.1524
Floors of dwelling are made of dirt	-0.1491	0.0080	-18.6900	0.0000	-0.1648	-0.1335
Main source of drinking water is tap water	0.2253	0.0075	29.9700	0.0000	0.2105	0.2400
Main source of drinking water is a water pump	0.1523	0.0083	18.2700	0.0000	0.1359	0.1686
Household shares toilet facility	-0.0244	0.0080	-3.0400	0.0020	-0.0402	-0.0087
Main lighting source of light is from an oil lamp	-0.1218	0.0086	-14.1000	0.0000	-0.1387	-0.1049
Household owns one or more stalls or shops	0.0958	0.0086	11.1600	0.0000	0.0790	0.1127

### Results for \$2.50/day model

Table 4 summarizes the predictive accuracy results for the \$2.50/day poverty line using the Quantile model specification from the \$1.25/day poverty line. The indicators are the same as those in the model for the \$1.25/day line, but the percentile of estimation and the coefficients of the model were allowed to change (compare Tables 3 and 6). This methodology allows the content and length of the questionnaire to remain the same, but permits greater accuracy in predicting at the \$2.50/day poverty line. Table 5 presents a 2x2 matrix of the poverty status predicted by the model versus the true poverty status according to the expenditure benchmark. Table 6 provides the regression results from the \$2.50/day model.

*Table 4: Accuracy Results Obtained for Prediction at the \$2.50/day Poverty Line*

<b>Indonesia</b> \$2.50/day Line* Share of “very poor”: 74.9%	<b>Total Accuracy</b>	<b>Poverty Accuracy</b>	<b>Under-coverage</b>	<b>Leakage</b>	<b>PIE</b>	<b>BPAC</b>
<b>Single-step methods</b>						
Quantile regression (estimation point : 60%)	80.30	87.05	12.95	13.26	0.23	86.74

\* The \$2.50/day line is 127,619 Rupiah per capita per year in 2002 prices.

**Table 5: Poverty Status of Sample Households, as Estimated by Model and Revealed by the Benchmark Survey, at \$2.50 Poverty Line**

	Number of households identified as poor by the tool	Number of households identified as not poor by the tool
Number of “true” poor households (as determined by benchmark survey)	21,071 (65.4%)	3,136 (9.7%)
Number of “true” not poor households (as determined by benchmark survey)	3,210 (10.0%)	4,794 (14.9%)

**Table 6: Regression Estimates using 1-step Quantile Method for Prediction at the \$2.50/day Poverty Line**

.60 Quantile regression  
Min sum of deviations 10368.08

Number of obs = 32,211  
Pseudo R2 = 0.2751

Variable	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Intercept	12.8391	0.0360	356.2800	0.0000	12.7685	12.9097
Household size	-0.2697	0.0071	-37.8100	0.0000	-0.2837	-0.2557
Household age	0.0105	0.0015	7.0800	0.0000	0.0076	0.0135
Household size squared	0.0167	0.0007	23.3400	0.0000	0.0153	0.0182
Household head age squared	-0.0001	0.0000	-7.3600	0.0000	-0.0001	-0.0001
Household lives in Sumatra	0.1018	0.0089	11.3800	0.0000	0.0843	0.1194
Household lives in Nusa Tenggara	0.0393	0.0110	3.5800	0.0000	0.0178	0.0608
Household lives in Kalimantan	0.1861	0.0121	15.3400	0.0000	0.1623	0.2099
Household lives in Sulawesi	0.0203	0.0113	1.7900	0.0730	-0.0019	0.0425
Household lives in rural area	-0.2478	0.0077	-32.1700	0.0000	-0.2629	-0.2327
Household head has had no education	-0.1073	0.0119	-9.0000	0.0000	-0.1306	-0.0839
Household head has completed senior high school	0.1323	0.0092	14.3100	0.0000	0.1142	0.1504
Percent of family member with no education	-0.3093	0.0244	-12.6500	0.0000	-0.3572	-0.2614
Percent of family members who have completed senior high school	0.4432	0.0243	18.2200	0.0000	0.3955	0.4909

<b>Variable</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>t</b>	<b>P&gt; t </b>	<b>[95% Conf. Interval]</b>	
Household head widowed	-0.0938	0.0120	-7.8100	0.0000	-0.1173	-0.0702
Household leases dwelling	0.0771	0.0150	5.1500	0.0000	0.0478	0.1065
Parents own dwelling	-0.0550	0.0141	-3.9100	0.0000	-0.0825	-0.0274
Walls of dwelling are made of wood	-0.1317	0.0085	-15.5200	0.0000	-0.1483	-0.1151
Walls of dwelling are made of bamboo	-0.1910	0.0110	-17.3700	0.0000	-0.2126	-0.1695
Floors of dwelling are made of dirt	-0.1657	0.0097	-17.0800	0.0000	-0.1847	-0.1467
Main source of drinking water is tap water	0.2547	0.0091	28.1100	0.0000	0.2369	0.2725
Main source of drinking water is a water pump	0.1609	0.0101	15.9500	0.0000	0.1412	0.1807
Household shares toilet facility	-0.0494	0.0097	-5.0700	0.0000	-0.0686	-0.0303
Main lighting source of light is from an oil lamp	-0.1386	0.0106	-13.0200	0.0000	-0.1595	-0.1177
Household owns one or more stalls or shops	0.0938	0.0105	8.9300	0.0000	0.0732	0.1144