

**Poverty Assessment Tool Accuracy Submission: Addendum for New Poverty Lines
USAID/IRIS Tool for Jamaica
Submitted: September 12, 2011**

In order to improve the functionality of the existing PAT for Jamaica, the IRIS Center has updated the tool in the following manner

- Re-ran the models at the median poverty line, which is line delineating the bottom 50 percent of those living below the national poverty line
- Calibrated the model to also allow predictions at the national poverty line
- Incorporated the updated prediction models into the Epi Info 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 now permits poverty prediction at two poverty lines, national poverty line and median line. 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 Jamaica 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 median line was applied and the results at the median line and national poverty lines. Accompanying this document are the revised questionnaire and screenshots of the Epi Info 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)¹. The applicable poverty line for USAID tool development is the one that yields the higher household poverty rate for a given country.

In Jamaica the applicable threshold is the median poverty line in the year 2000. The value of this line at the time of the survey is 24,911.81 Jamaican dollars per capita per year in 2000. This line identifies 7.6% of households as "very poor."

¹ 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.

Results for median poverty line model

Table 1 summarizes the accuracy results achieved by four estimation methods in predicting household poverty relative to the median poverty line. For Jamaica, the 1-step Quantile was selected as the best model with the highest BPAC value, taking into consideration both accuracy and practicality. 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 median poverty line model.

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

Jamaica Median line* Share of “very poor”: 7.6 percent	Total Accuracy	Poverty Accuracy	Under-coverage	Leakage	PIE	BPAC
Single-step methods						
OLS	92.73	32.55	67.44	26.48	-3.16	-8.39
Quantile regression (estimation point: 34)	91.24	43.13	56.87	56.29	-0.04	42.54
Linear Probability	92.49	3.84	96.16	0.93	-7.37	-91.39
Probit	93.67	26.11	73.88	7.90	-5.10	-39.86
Two-step methods						
OLS – 95 percentile cutoff	92.73	32.55	67.44	26.48	-3.16	-8.39
Quantile (estimation points: 34, 32) 95 percentile cutoff	91.24	43.13	56.87	56.29	-0.04	42.54
LP – 22 percentile cutoff	94.19	37.47	62.52	12.55	-3.86	-12.49
Probit – 22 percentile cutoff	93.97	37.06	62.93	14.91	-3.71	-10.94
*Median poverty line is 24,911.81 Jamaican dollars per person per month in 2000.						

Household does not own home	-0.0432	0.0568	-0.7600	0.4470	-0.1546	0.0682
Household owns a washing machine	0.1376	0.0932	1.4800	0.1400	-0.0452	0.3205
Household owns a radio	0.0265	0.0544	0.4900	0.6260	-0.0803	0.1333
Household owns a TV	-0.0222	0.0798	-0.2800	0.7810	-0.1788	0.1344
Household owns a refrigerator	0.1144	0.0702	1.6300	0.1040	-0.0234	0.2522
Household owns a stove	0.1949	0.0741	2.6300	0.0090	0.0496	0.3402
Household owns a car	0.4966	0.0741	6.7000	0.0000	0.3513	0.6419
Intercept	11.2102	0.2327	48.1700	0.0000	10.7536	11.6667

Results for national poverty model

Table 4 summarizes the predictive accuracy results for the national poverty line. The indicators are the same as those in the model for the median 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 national 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 national poverty line model.

Table 4: Accuracy Results Obtained for Prediction at the national Poverty Line

Jamaica National line* Share of “very poor”: 15.2%	Total Accuracy	Poverty Accuracy	Under-coverage	Leakage	PIE	BPAC
Single-step method						
Quantile regression (estimation point: 70)	86.46	57.88	42.11	46.01	0.59	53.98
* National poverty line is 31,413.90 Jamaican dollars per person per month.						

Table 5: Poverty Status of Sample Households, as Estimated by Model and Revealed by the Benchmark Survey, at National 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)	107 (9.0%)	77 (6.4%)
Number of “true” not poor households (as determined by benchmark survey)	84 (7.0%)	927 (77.6%)

Table 6: Regression Estimates using 1-step Quantile Method for Prediction at the National Poverty Line

.34 Quantile regression

Number of obs = 1,195

Min sum of deviations 405.1048

Pseudo R2 = 0.3507

Variable	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
Household head age	-0.0011	0.0083	-0.1400	0.8910	-0.0174	0.0151
Household size	-0.2621	0.0272	-9.6500	0.0000	-0.3154	-0.2088
Household head age squared	-0.0001	0.0001	-0.7300	0.4630	-0.0002	0.0001
Household size squared	0.0111	0.0024	4.5300	0.0000	0.0063	0.0159
Household lives in St. Ann	-0.0639	0.0998	-0.6400	0.5220	-0.2597	0.1319
Household lives in St. James	0.2327	0.0997	2.3300	0.0200	0.0370	0.4284
Household lives in Westmoreland	-0.1659	0.1021	-1.6300	0.1040	-0.3663	0.0344
Household lives in St. Elizabeth	-0.1389	0.0954	-1.4600	0.1450	-0.3260	0.0482
Household lives in Manchester	0.0815	0.1053	0.7700	0.4390	-0.1251	0.2881
Household lives in Clarendon	0.0687	0.0929	0.7400	0.4600	-0.1135	0.2510
Household lives in St. Catherine	-0.1221	0.0647	-1.8900	0.0590	-0.2490	0.0047
Household lives in rural location	-0.1228	0.0598	-2.0500	0.0400	-0.2400	-0.0055
Household head is female	-0.1018	0.0473	-2.1500	0.0320	-0.1946	-0.0090
Household uses flushing toilet	0.2589	0.0875	2.9600	0.0030	0.0872	0.4306
Household uses latrine	0.0772	0.0669	1.1500	0.2490	-0.0540	0.2084
Household water source is tap	0.0087	0.0723	0.1200	0.9040	-0.1331	0.1505
Household water source is standpipe	-0.0689	0.0809	-0.8500	0.3940	-0.2276	0.0897
Household uses electricity for lighting	0.1424	0.0834	1.7100	0.0880	-0.0212	0.3060

Number of rooms in house	0.0458	0.0205	2.2400	0.0260	0.0056	0.0861
Household owns a telephone	0.1573	0.0570	2.7600	0.0060	0.0456	0.2691
Household does not own home	-0.0432	0.0568	-0.7600	0.4470	-0.1546	0.0682
Household owns a washing machine	0.1376	0.0932	1.4800	0.1400	-0.0452	0.3205
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