Cambodia

EquityTool: Update released November 1, 2016
The EquityTool has been updated based upon new source data. The original version is no longer active but is available upon request.

Previous version released December 9, 2015

Source data: Cambodia DHS 2014

# of survey questions in full wealth index: 39
# of variables in full index: 132

# of survey questions in EquityTool: 14
# of variables in EquityTool: 19

Questions:

	Question	Option 1	Option 2	Option 3	Option 4
Q1	Does your household have… electricity?	Yes	No		
Q2	… a television?	Yes	No		
Q3	… refrigerator?	Yes	No		
Q4	… CD / DVD player	Yes	No		
Q5	… wardrobe?	Yes	No		
Q6	… generator / battery / solar panel	Yes	No		
Q7	Does any member of your household own a … motorcycle / scooter	Yes	No		
Q8	… a watch?	Yes	No		
Q9	Does any member of this household have a bank account?	Yes	No		

Q10	What is the main source of drinking water during the wet season for members of your household?	Piped into dwelling	Other water source		
Q11	What is the main material of the floor?	Ceramic tiles	Wood planks	Other material	
Q12	What is the main material of the exterior walls?	Cement blocks	Palm / bamboo / thatch	Other material	
Q13	What type of fuel does your household mainly use for cooking?	LPG	Wood	Other type of fuel	
Q14	What kind of toilet facility do members of your household usually use?	Flush to piped sewer system (not shared with other households)	Flush to septic tank (not shared with other households)	No facility / bush / field	Other type of toilet

Technical notes:
The standard simplification process was applied to achieve high agreement with the original wealth index. Kappa was greater than 0.75 for the national and urban indices. Details on the standard process can be found in this article. The data used to identify important variables comes from the factor weights released by ICF.

Level of agreement:

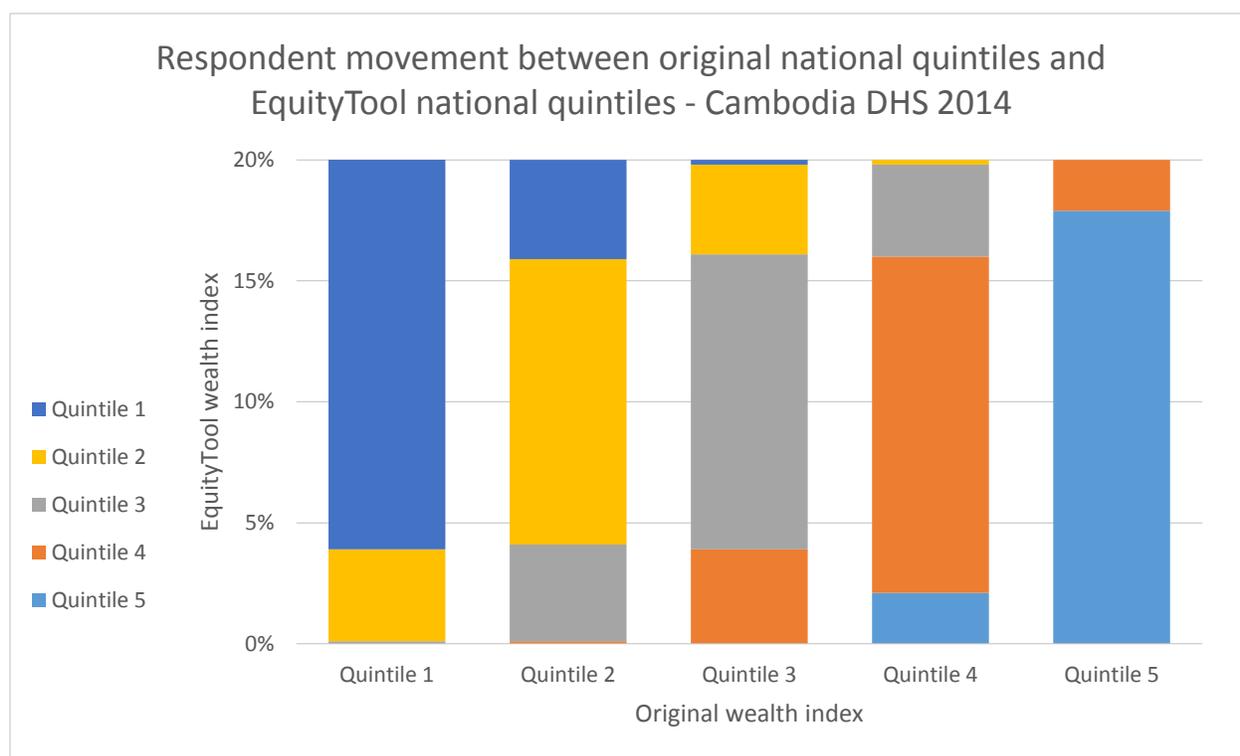|	National Population (n=15,825)	Urban only population (n=4,366)
% agreement	84%	84.3%
Kappa statistic	0.75	0.755

Respondents in the original dataset were divided into three groups for analysis – those in the 1st and 2nd quintiles (poorest 40%), those in the 3rd quintile, and those in the 4th and 5th quintiles (richest 40%). After calculating their wealth using the simplified index, they were again divided into the same three groups for analysis against the original data in the full DHS. Agreement between the original data and our simplified index is presented above.

What does this mean?

When shortening and simplifying the index to make it easier for programs to use to assess equity, it no longer matches the original index with 100% accuracy. At an aggregate level, this error is minimal, and this methodology was deemed acceptable for programmatic use by an expert panel. However, for any given individual, especially those already at a boundary between two quintiles, the quintile the EquityTool assigns them to may differ to their quintile according to the original DHS wealth index.

The graph below illustrates the difference between the EquityTool generated index and the full DHS wealth index. Among all of those people (20% of the population) originally identified as being in the poorest quintile, approximately 81% are still identified as being in the poorest quintile when we use the simplified index. However, approximately 19% of people are now classified as being in Quintile 2. From a practical standpoint, all of these people are relatively poor. Yet, it is worthwhile to understand that the simplified index of 14 questions produces results that are not identical to using all 39 questions in the original survey.

Respondent movement between original national quintiles and EquityTool national quintiles - Cambodia DHS 2014
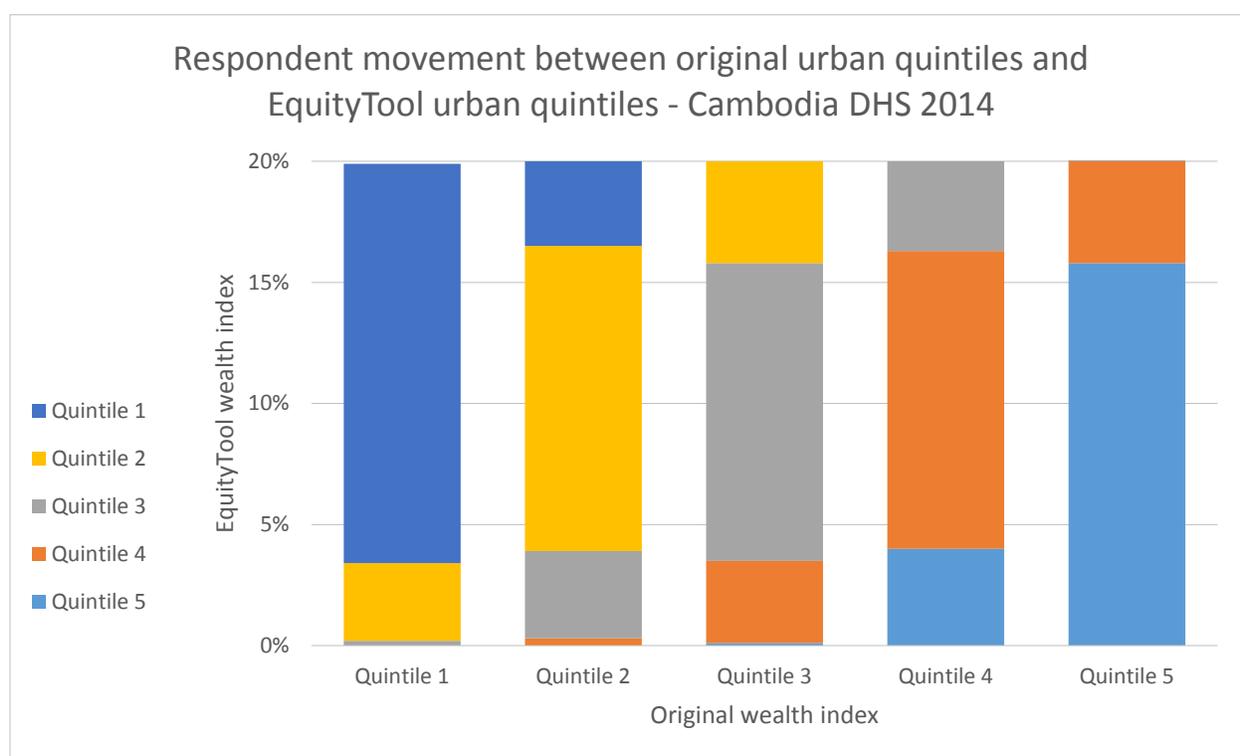
The following table provides the same information on the movement between national quintiles when using the EquityTool versus the original DHS wealth index:

EquityTool National Quintiles					
Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total

Original DHS National Quintiles	Quintile 1	16.20%	3.80%	0.10%	0.00%	0.00%	20.00%
	Quintile 2	4.10%	11.80%	4.00%	0.10%	0.00%	20.00%
	Quintile 3	0.20%	3.70%	12.20%	3.90%	0.00%	20.00%
	Quintile 4	0.00%	0.20%	3.80%	13.90%	2.10%	20.00%
	Quintile 5	0.00%	0.00%	0.00%	2.10%	17.90%	20.00%
	Total	20.50%	19.50%	20.00%	19.90%	20.10%	100.00%

The following graph provides information on the movement between urban quintiles when using the EquityTool versus the original DHS wealth index:

Respondent movement between original urban quintiles and EquityTool urban quintiles - Cambodia DHS 2014

The following table provides the same information on the movement between urban quintiles when using the EquityTool versus the original DHS wealth index:

		EquityTool Urban Quintiles					
		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Original DHS Urban	Quintile 1	16.50%	3.20%	0.20%	0.00%	0.00%	20.00%
	Quintile 2	3.50%	12.60%	3.60%	0.30%	0.00%	20.00%
	Quintile 3	0.00%	4.20%	12.30%	3.40%	0.10%	20.00%

Quintiles	Quintile 4	0.00%	0.00%	3.70%	12.30%	4.00%	20.00%
	Quintile 5	0.00%	0.00%	0.10%	4.20%	15.80%	20.10%
	Total	20.00%	20.00%	20.00%	20.10%	19.90%	100.00%

Data interpretation considerations:
1. This tool provides information on relative wealth – 'ranking' respondents within the national or urban population. The most recent available data from the WorldBank indicates that 6.2% of people in Cambodia live below $1.90/day[1]. This information can be used to put relative wealth into context.
2. People who live in urban areas are more likely to be wealthy. In Cambodia, 67.7% of people living in urban areas are in the richest national quintile, compared to only 8.6% of those living in rural areas[2].
   a. If your population of interest is predominantly urban, we recommend you look at the urban results to understand how relatively wealthy or poor they are, in comparison to other urban dwellers.
   b. If the people you interviewed using the EquityTool live in rural areas, or a mix of urban and rural areas, we recommend using the national results to understand how relatively wealthy or poor they are, in comparison to the whole country.
3. Some districts in Cambodia are wealthier than others. It is important to understand the country context when interpreting your results.
4. In most cases, your population of interest is not expected to be equally distributed across the five wealth quintiles. For example, if your survey interviewed people exiting a shopping mall, you would probably expect most of them to be relatively wealthy.

Changes from the previous EquityTool

We released an EquityTool on 9 December 2015 which compared user data to a benchmark of 2010. A new source survey, the Cambodia DHS 2014 was recently released, and allows us to benchmark results to a more recent population. This is important, because wealth generally increases over time, and comparing your respondents to an old benchmark population will lead to over-estimating the relatively wealthy in your survey. The new EquityTool was generated using the exact same methodology as the previous version, and in generating the new EquityTool, no attempt was made to account for the fact that a previous version existed. In other words, we did not explicitly try to keep the same questions or response options as the previous tool.

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[1] From povertydata.worldbank.org, reporting Poverty headcount ratio at $1.90/day at 2011 international prices.
[2] From the Cambodia DHS 2014 dataset household recode, available at http://dhsprogram.com/

For those who have not previously conducted an EquityTool based study in Cambodia, the remainder of this section is not particularly relevant. For those who have used the previous EquityTool, you may be interested to know how the two versions compare.

	Previous	Current
Source Data	DHS 2010	DHS 2014
# of questions in EquityTool	14	14
# of questions in full wealth index	54	39
Kappa statistic (EquityTool vs full wealth Index) for 3 groups	National - 0.826 Urban – 0.778	National – 0.75 Urban – 0.755

Practical considerations for users of the previous EquityTool

Comparing the results of surveys that used the previous EquityTool against those that use the current EquityTool is difficult. It will not always be clear whether any difference is because of actual differences in the wealth level of the respondents or because the EquityTool has changed.

The technical comparison section below, particularly the 3rd comparison, illustrates how quintile results compare when using the previous EquityTool and the current one. Generally, there is a partial shift down in quintiles when using a more recent EquityTool. In other words, the current EquityTool will usually put some respondents into a lower quintile than the previous one would.

It is generally best to use the current version of the EquityTool, since it will give a more accurate quintile estimates. If you are currently collecting data with the previous tool, it is best to continue to use the previous tool. Note that if you have created a survey in the EquityTool web application using the previous EquityTool, that survey will continue to use the previous EquityTool.

If conducting a follow-up survey to a baseline that used the previous EquityTool, and the most important result is change from the baseline, it may be preferable to continue to use the previous EquityTool for comparability. If you need to do this, please contact us at equitytool@m4mgmt.org.

Technical comparison between the current and previous EquityTool

All of the questions and response options for the previous EquityTool are found in the new source data (DHS 2014). This makes comparison between the two versions of the EquityTool,

and two different data sources, easier. Although both the previous and current version have 14 questions, the questions / response options are not the same.

The comparison will be assessed in 3 different ways, described below.

1. Using the same 14 questions and response options, and scoring system as in the previous EquityTool, with two different benchmark populations.

This analysis simulates results if the only thing which changes is the benchmark against which respondents are compared. In the 4 years between the two source data studies, more people have acquired assets that are indicative of wealth. In the graph below, the previous EquityTool, derived from the DHS 2010, is applied to the DHS 2010 data and the newer DHS 2014 data. In 2010, the proportion of households in each of the 5 quintiles is very close to 20%. However, by 2014, the distribution is skewed towards the wealthy. People became wealthier overall.

Comparing populations in 2010 and 2014, using the EquityTool from 2010
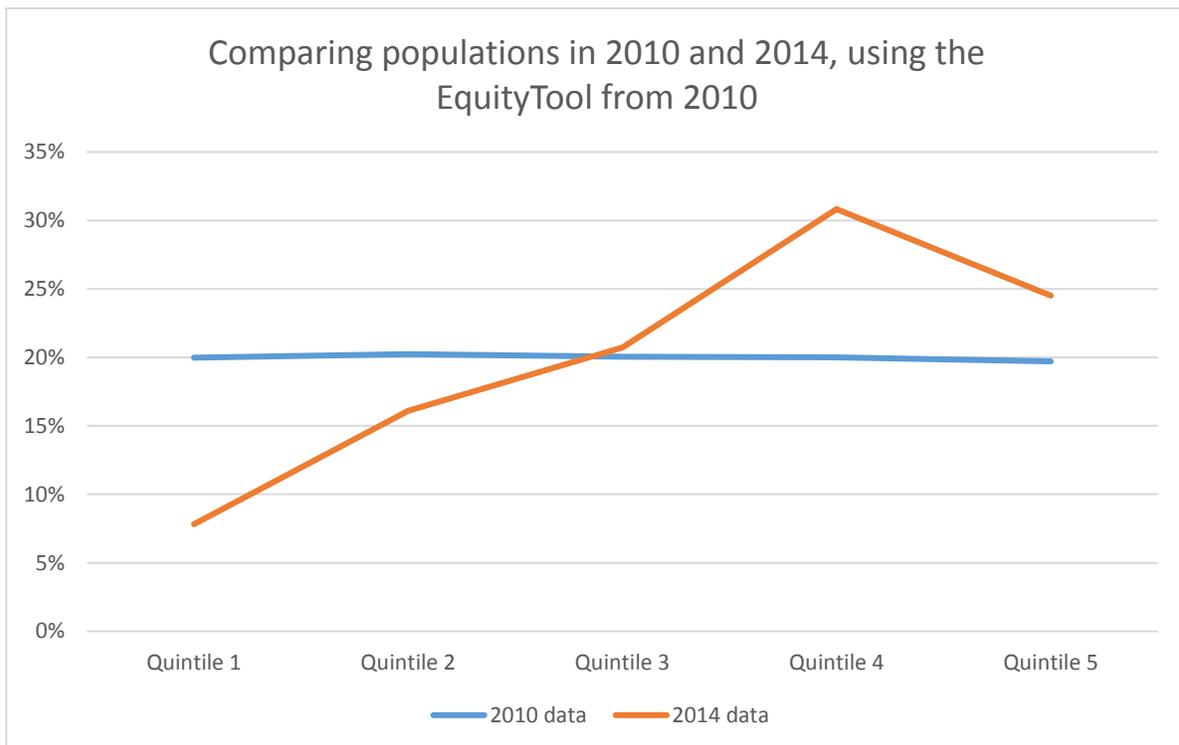
We do not use the previous questions and weights, because over time, the population has become wealthier. Thus, comparing your respondents to this skewed distribution becomes challenging.

2. Keeping the same 14 questions and response options as the previous EquityTool, but calculating scores based upon the 2014 data.

As an alternative, one might wish to use the same questions as the previous tool, but update the weighting. This seems reasonable, as the relative contribution of each asset towards overall wealth may have changed over time. Using new weights, but the same variables as the previous tool, we can see how well the resulting quintiles compare to the quintiles based on the full wealth index created by ICF.

The table below presents the agreement between the quintiles created from the full wealth index in the DHS 2014 dataset and the quintiles created by the previous EquityTool, the previous EquityTool variables with updated weighting, and the current EquityTool. As with the agreement statistics above, these figures are for the bottom 2 quintiles, middle quintile and top 2 quintiles.

	2010 EquityTool	**2010 questions, 2014 scoring**	**2014 EquityTool**
Agreement	68.4%	81.6%	84.0%
Kappa	0.507	0.713	0.750

The current EquityTool has the best agreement with the full wealth index quintiles and is the only one that exceeds our minimum kappa statistic of 0.75. The previous tool, even when the scoring is updated, falls short of this standard. The reason for this difference is because the 2010 EquityTool questions are no longer the best predictors of the overall wealth distribution.

3. Comparing the previous (DHS 2010) questions and scores, and the new EquityTool (DHS 2014)

We found that DHS 2010 questions were not able to match the full wealth index quintiles to the required level. Because more people may own the assets predictive of wealth in 2010, we need to add questions to differentiate people and households more accurately.

The table below shows how the previous and current EquityTool compare, using the same population. This is analogous to a comparison of the two versions of the EquityTool on the population you surveyed using our previous EquityTool.

		Previous EquityTool Quintiles					
		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Current EquityTool	Quintile 1	7.57%	11.01%	2.04%	0.00%	0.00%	20.62%
	Quintile 2	0.24%	4.91%	12.95%	1.29%	0.00%	19.39%

Quintiles	Quintile 3	0.01%	0.18%	5.56%	14.27%	0.02%	20.04%
	Quintile 4	0.00%	0.01%	0.18%	14.72%	5.15%	20.06%
	Quintile 5	0.00%	0.00%	0.00%	0.55%	19.33%	19.89%
	Total	7.82%	16.11%	20.72%	30.83%	24.51%	100%

The rightmost column indicates that the current EquityTool does in fact evenly divide the population into 5 groups. The bottom row shows that using the older EquityTool does not divide the population into equal quintiles – it puts more people into the higher quintiles. The cells within the table indicate how respondents are categorized, if measured using the two different tools. Of those who are categorized as quintile 1 (poorest) using the current tool, 37% of them would have been considered in quintile 1 in the previous tool (see the first row). Similarly, for those currently categorized as in quintile 3, 71% would have previously been categorized as being in quintile 4. If you had used the previous EquityTool, you can expect that with the current version, your respondents will look slightly more poor. This is not incorrect, but rather reflects the reality that we are measuring them against a more accurate benchmark.

Metrics for Management provides technical assistance services to those using the EquityTool, or wanting to collect data on the wealth of their program beneficiaries. Please contact equitytool@m4mgmt.org and we will assist you.