Zimbabwe

EquityTool: Update released April 5, 2017
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 The original version is no longer active but is available upon request.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: Zimbabwe DHS 2015

# of survey questions in original wealth index: 43
# of variables in original index: 107

# of survey questions in EquityTool: 15
# of variables in EquityTool: 16

Questions:

	Question	Option 1	Option 2	Option 3
	DETERMINE IF THE RESPONDENT LIVES IN AN URBAN OR RURAL AREA	Urban	Rural	
Q1	Does your household have … a refrigerator?	Yes	No	
Q2	… a computer?	Yes	No	
Q3	… a plow?	Yes	No	
Q4	… an axe/hoe?	Yes	No	
Q5	… a satellite dish/decoder?	Yes	No	
Q6	Does any member of this household own a car/truck?	Yes	No	
Q7	Does any member of this household have a bank account?	Yes	No	

Q8	How many of the following does your household own: ...cattle?	None	1 or more	
Q9	… chickens?	None	1 or more	
Q10	…goats?	None	1 or more	
Q11	What kind of toilet facility do members of your household usually use?	Flush or pour flush toilet to piped sewer (not shared with other households)	Other type toilet facility	
Q12	What is the main source of drinking water for members of your household?	Piped water into dwelling	Other source of drinking water	
Q13	What is the main material of the floor in your household?	Cement	Other floor material	
Q14	What is the main material of the exterior walls in your household?	Cement	Other wall material	
Q15	What type of cooking fuel does your household mainly use for cooking?	Electricity	Wood	Other

Technical notes:
We were unable to achieve agreement of kappa>=0.75 between the original DHS wealth index and a simplified index using our standard simplification process (detailed in this article). Using a revised approach, detailed below, high agreement (kappa>=0.75 for both urban and national indices) was achieved. The data used to identify important variables comes from the factor weights released by ICF.

We were unable to achieve a reduction in questions or an agreement of kappa>=0.75 between the original DHS wealth index quintiles and quintiles created using factor weights from the 'Common' tab of ICF's factor weight file for Zimbabwe DHS 2015. The factor weights in the common tab come from an analysis of the national population, and contain only those variables which are related to the construct of wealth in the same way in both rural and urban areas. These variables are usually used in EquityTools to calculate national quintiles, as they reduce some known areas of respondent error in the survey.

To overcome this problem of low agreement, we instead used the factor weights from the rural

and urban tabs, which select variables that relate to wealth differently in urban and rural areas. For example, in an urban area, ownership of chickens may be associated with being relatively poor, while in rural areas, it may be associated with being relatively wealthy. This is the case in Zimbabwe. Selection of variables specific to urban and rural areas is already provided in the factor weight file. A short list of variables, common to both urban and rural areas, are iteratively selected to find those which result in high agreement (kappa>=0.75) against the original wealth index quintiles for national and urban populations. For Zimbabwe, the scores for urban and rural residents were combined into a national score using linear regression, in a process similar to that used by ICF. Specifically, a score from the simplified index for urban residents (Uscore) was regressed against the wealth index score variable in the dataset (HV271), the same was done for rural residents (Rscore), and the resulting coefficients are used to create a single national score (NatScore).

$HV271=\beta_1 Uscore + \alpha_1$
$HV271=\beta_2 Rscore + \alpha_2$
$NatScore=\beta_1(Uscore)(Urban)+ \alpha_1(Urban)+\beta_2(Rscore)(Rural)+\alpha_2(Rural)$
Where Urban=1 if respondent lives in urban area and 0 if otherwise, and Rural =1 if respondent lives in rural area and 0 if otherwise.

Respondents quintile assignments resulting from NatScore, the national wealth index score created from a simplified list of questions, were compared to the quintile assignments resulting from the original wealth index with 133 variables using the kappa statistic.

The questions in the simplified index which resulted from this process differ from our standard approach in two important ways. First, the index for Zimbabwe includes questions on livestock ownership. Their inclusion was essential to create a reliable index, but responding to these questions may not be easy for all potential respondents, or when outside of the house. Since skipping a question is not advisable in this shortened list, we suggest asking a respondent to make their best guess from the choices provided, if they are unsure of a response. Second, we need to know whether the respondent lives in an urban or rural area. An additional question was added to the EquityTool: 'DETERMINE IF THE RESPONDENT LIVES IN AN URBAN OR RURAL AREA'. In principle, the definition of 'urban' and 'rural' should match the definition used in the Zimbabwe DHS 2015. In reality, the user needs to decide how to determine if each respondent lives in an urban or rural area. Three approaches are presented below, with some notes on each. Whichever method is chosen, it should be uniformly applied across all surveys conducted.

1. Ask the respondent directly - 'is your home in an urban or rural area'. This relies on the respondent's understanding of what 'urban' and 'rural' is.
2. Allow the data collector to determine, based on guidance provided. This will work best if interviews take place in or very near to people's homes, and if the data collectors can be trained on the same rules to determine if an area is urban or rural. One example of a rule is to classify 'peri-urban' areas on the edges of a city or town as urban. Another rule

might be to classify an area as urban if it has a market center which operates daily.

3. If the interviews are taking place outside the home, then classify respondents based upon the location of the interview. For example, if interviews occur in health facilities, classify respondents as urban if the facilities are located in urban areas. Individuals may travel, so this method is also subject to error.

Level of agreement:

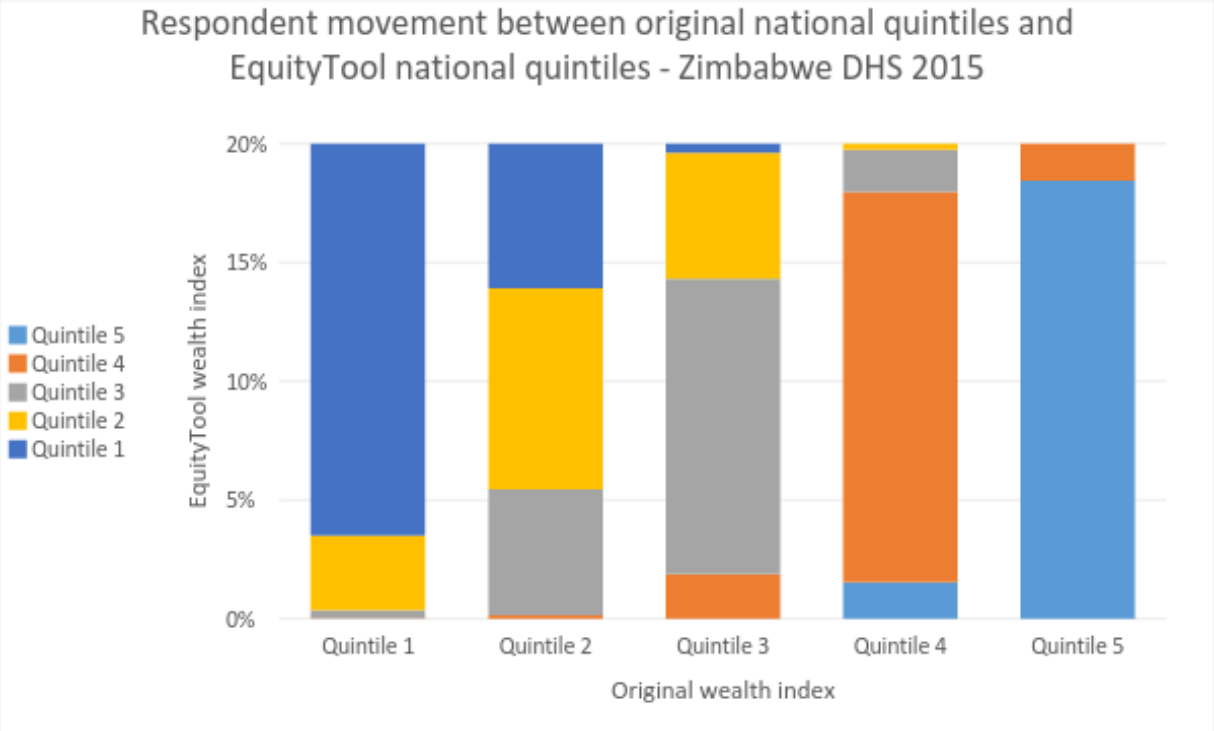
	National Population (n=10534)	Urban only population (n=4341)
% agreement	84.6%	84.0%
Kappa statistic	0.759	0.751

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.

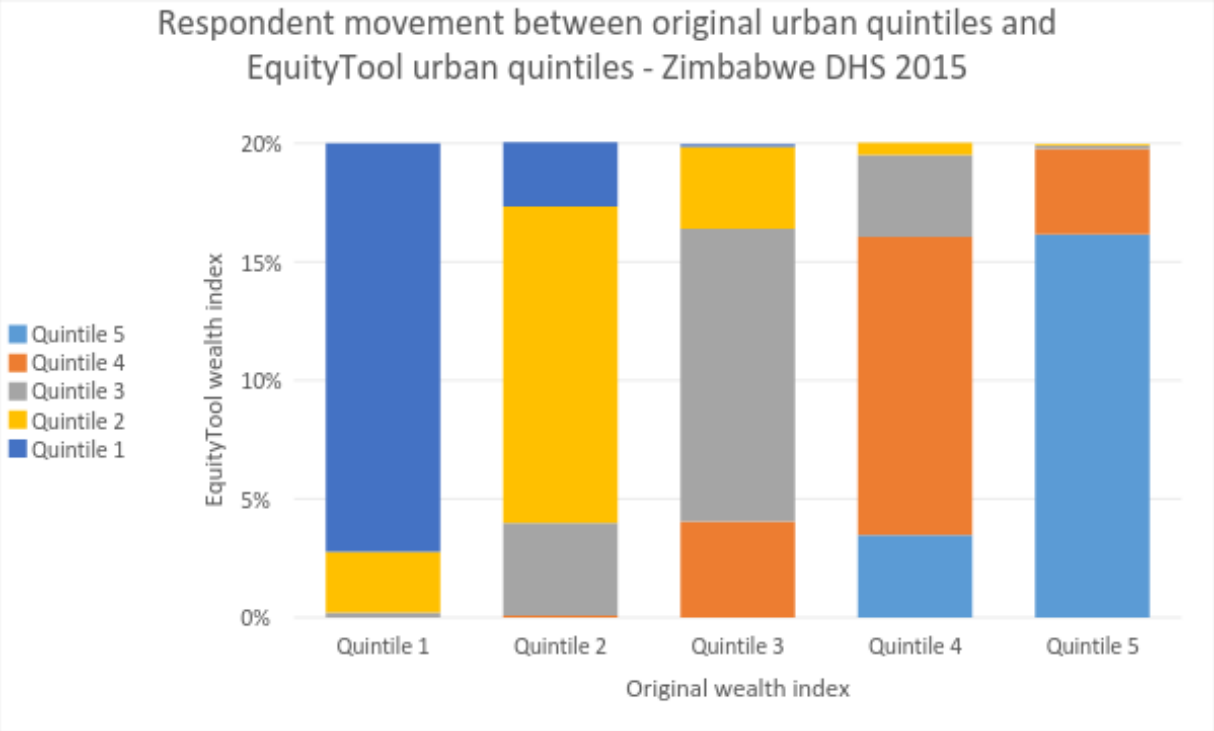
The graph below illustrates the difference between the EquityTool generated index and the full DHS wealth index. Among all of those people (20% of the population) originally identified as being in the poorest quintile, approximately 82.5% are still identified as being in the poorest quintile when we use the simplified index. However, approximately 17.5% 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 15 questions produces results that are not identical to using all 43 questions in the original survey.



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	16.5%	3.1%	0.3%	0.0%	0.0%	20%
	Quintile 2	6.1%	8.5%	5.3%	0.1%	0.0%	20%
	Quintile 3	0.4%	5.3%	12.4%	1.9%	0.0%	20%
	Quintile 4	0.0%	0.3%	1.8%	16.4%	1.5%	20%
	Quintile 5	0.0%	0.0%	0.0%	1.6%	18.4%	20%
	Total	20%	20%	20%	20%	20%	100%

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



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 Quintiles	Quintile 1	17.2%	2.6%	0.2%	0.0%	0.0%	20%
	Quintile 2	2.7%	13.3%	3.9%	0.1%	0.0%	20%
	Quintile 3	0.1%	3.5%	12.3%	4.1%	0.0%	20%
	Quintile 4	0.0%	0.5%	3.4%	12.6%	3.5%	20%
	Quintile 5	0.0%	0.1%	0.1%	3.6%	16.2%	20%
	Total	20.1%	20.0%	20.0%	20.3%	19.6%	100%

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 21.4% of people in Zimbabwe live below $1.90/day[1]. This information can

[1] From povertydata.worldbank.org, reporting Poverty headcount ratio at $1.90/day at 2011 international prices.

be used to put relative wealth into context.

2. People who live in urban areas are more likely to be wealthy. In Zimbabwe, 60.3% of people living in urban areas are in the richest national quintile, compared to only 2.4% 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.
    c. If you want results for rural residents only in comparison to other rural dwellers, contact the EquityTool support team to receive instructions on how to do this calculation yourself.
3. Some provinces in Zimbabwe 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 December 9, 2015 which compared user data to a benchmark of 2011. A new source survey, the Zimbabwe DHS 2015 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. Because we were unable to achieve agreement of kappa>=0.75 between the original DHS wealth index and a simplified index using our standard simplification process, the new EquityTool was generated using a different methodology than the previous version. Furthermore, 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.

For those who have not previously conducted an EquityTool based study in Zimbabwe, 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

[2] From the Zimbabwe DHS 2015 dataset household recode, available at http://dhsprogram.com/

Source Data	DHS 2011	DHS 2015
# of questions in EquityTool	16	15
# of questions in full wealth index	36	43
Kappa statistic (EquityTool vs full wealth Index) for 3 groups	National: 0.773 Urban: 0.749	National: 0.759 Urban: 0.751

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, 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.

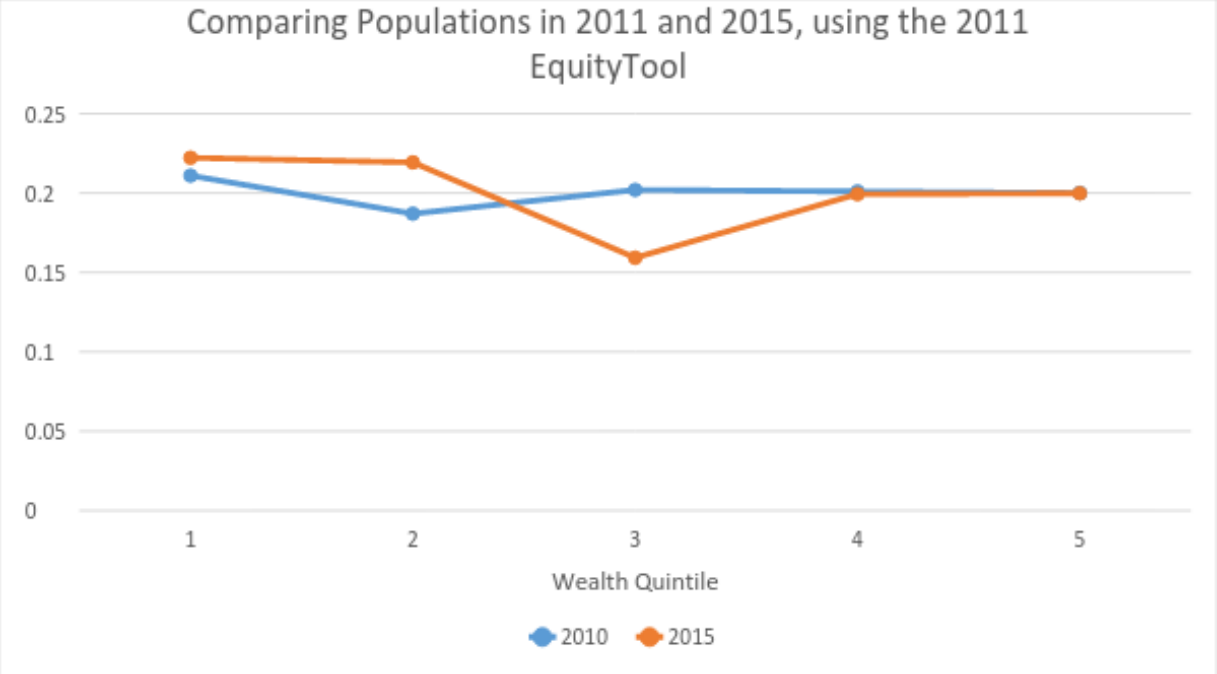
Technical comparison between the current and previous EquityTool

Not all of the questions and response options for the previous EquityTool are found in the new source data (DHS 2015). Of 94 variables in the source data for the 2011 EquityTool, 69 could be found in the 2015 DHS dataset. Additionally, the methodology used to create each EquityTool is different. This makes comparison between the two versions of the EquityTool and the two different data sources more difficult.

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

1. Using the questions and response options from the previous EquityTool that remain available to us in the new DHS dataset, and applying the same scoring system as in the previous EquityTool to two different benchmark populations.

This analysis attempts to simulate the result if the only thing which changes is the benchmark against which respondents are compared. In the graph below, the previous EquityTool, derived from the 2011 DHS, is applied to the 2011 DHS data and the newer 2015 DHS data. In 2011, the proportion of households in each of the 5 quintiles is very close to 20%. The discrepancy seen is due to the use of a shorter questionnaire than used by the DHS survey originally. However, in 2015, the 2011 EquityTool no longer separates the population into even quintiles. In the 4 years since the previous benchmark population was surveyed, some indicators of wealth have changed.



We do not use the previous questions and weights, because over time, both population wealth and indicators of wealth can change, which can skew the resulting wealth distribution. Thus, comparing your respondents to this skewed distribution becomes challenging.

2. Keeping the questions and response options from the previous EquityTool that are available to us in the new DHS dataset, but calculating scores based upon the 2015 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.

In addition to updating the weighting, we also had to calculate scores for urban and rural households separately, since this process was necessary to create the new EquityTool. Two different comparisons are presented below, however, both of these comparisons are again complicated by the absence of some questions from the previous EquityTool in the new DHS dataset.

Nonetheless, the table below presents the agreement between the quintiles created from the full wealth index in the DHS 2015 dataset and the quintiles created by the previous EquityTool, the available previous EquityTool variables with updated weighting, the available previous EquityTool variables with updating weighting and revised methodolgy, and the current EquityTool. As with the agreement statistics above, these figures are for the bottom 2 quintiles, middle quintile and top 2 quintiles.

	2011 EquityTool	2011 questions, 2015 scoring, standard simplification process	2011 questions, 2015 scoring, revised simplification process	2015 EquityTool
Agreement	63.0%	64.1%	67.8%	72.3%
Kappa	0.68	0.68	0.74	0.76

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 and methodology are updated, falls slightly short of this standard. The reason for this difference is because the previous questions are no longer the best predictors of the overall wealth distribution.

3. Comparing the previous EquityTool questions and scores, and the new EquityTool (15 questions)

The table below shows how the previous and current EquityTool compare, using the same population. Because not all of the questions from the previous EquityTool are available in the updated source data, this isn't indicative of the way your respondents' wealth may be distributed as measured by the previous EquityTool. Indeed, removing those variables from the previous EquityTool would limit its level of agreement to the 2011 benchmark population as well.

		Previous EquityTool Quintiles					
		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
Current EquityTool Quintiles	Quintile 1	15%	6%	2%	0%	0%	23%
	Quintile 2	6%	6%	4%	1%	0%	17%
	Quintile 3	1%	9%	7%	3%	0%	20%
	Quintile 4	0%	1%	3%	13%	3%	20%
	Quintile 5	0%	0%	0%	3%	17%	20%
	Total	22%	22%	16%	20%	20%	100%

The rightmost column indicates that the current EquityTool does in fact evenly divide the population into 5 quintiles, with a lack of distinction between the first and second quintiles. The bottom row shows that using the older EquityTool does not divide the population into equal quintiles – it puts more people into the lower quintiles, at the cost of the middle quintile. If you had used the previous EquityTool, you can expect that with the current version, your respondents may look different. This is not incorrect, but rather reflects the reality that we are measuring their wealth with updated indicators, against a more accurate benchmark population.

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.