EDOREN
Education Data, Research and Evaluation in Nigeria

Research Summary 01 | May 2014

Education data from Nigerian Household Surveys

This Research Summary outlines the approach, findings and recommendations of a review of education data collected from national household surveys in Nigeria. The review assessed the comparability of published survey data and the extent to which it can be used to draw inferences about changes in educational outcomes at the state and national level over time.

Background

Between 2003 and 2011, there were at least 19 national-level household surveys conducted in Nigeria that included questions on the education of household members. Good-quality survey data are valuable, as they can be used to triangulate and complement administrative data collected through the Education Management Information System (EMIS), and to monitor educational outcomes. However, this requires that the education indicators measured by different surveys are comparable and relatively accurate. This Research Summary outlines the conclusions of the EDOREN review, and offers some recommendations for enhancing the comparability of survey data on education.

Approach

The authors of the review examined 10 nationally-representative household surveys with a significant education component that were carried out since 2000 (see Table 1 below). They first compared published estimates of attendance and literacy indicators, identifying discrepancies or outliers that would point to differences in survey design or indicator definitions, rather than actual changes in outcomes. The authors then re-estimated a set of indicators using survey microdata and harmonised indicator definitions. Finally, they calculated confidence intervals for these estimates to assess whether changes from one survey to the next were statistically significant.

Table 1: Reports and microdata examined

	DHS	EdData	CWIQ	MICS	DHS	GHS	HNLSS	Literacy survey	NEDS	MICS
	2003	2004	2006	2007	2008	2008	2009	2010	2010	2011
Reports	●		●	●	●	●		●	●	●
Microdata	●	●		●	●		●		●	●

Notes: DHS: Demographic and Health Survey; EdData: Education Data for Decision-making survey; CWIQ: Core Welfare Indicators Questionnaire survey; MICS: Multiple Indicator Cluster Surveys; GHS: General Household Survey; HNLSS: Harmonised Nigeria Living Standards Survey; NEDS: Nigeria Education Data Survey. Note: EdData and NEDS are two rounds of the same survey programme.

Are education data comparable across household surveys?

The comparison of published estimates pointed to a number of discrepancies that were likely to reflect methodological differences between surveys or the way data are analysed, rather than actual changes in outcomes. For instance, estimates of the national-level primary net attendance rate (NAR) based on the MICS generally exceed estimates based on the DHS and NEDS. The MICS 2007 report estimated the primary NAR in the North East at 13.7%, whereas five other surveys carried out between 2003 and 2011 all placed it in the range of 41-49%. Similarly, the MICS 2007 estimated the female literacy rate amongst 15-24 year olds at 56.3%, while other surveys conducted between 2006 and 2010 placed it at 70-82%.

There are a number of potential explanations for these discrepancies. Different surveys sometimes use varying **indicator definitions**. For instance, some report adjusted NARs whereas others report non-adjusted NARs. Most define the primary school age range as 6-11 years, but some use 6-12 years instead. It is likely that these differences are driven by variation in the internationally-standardised indicator definitions used by different suites of surveys. In some cases, differences in definitions can be addressed by recalculating estimates from survey microdata.

Differences may also be driven by **survey design**.[1] Surveys may use different sampling frames, depending on the population data that are available. The timing of fieldwork may vary, creating biases in indicators such as school attendance, which tend to fluctuate over the school year. Surveys may have different respondents, which may create inconsistencies as some household members, such as the child's parent, are likely to know more about her schooling than others. They may collect data on different age groups within the population. Measurement techniques may vary, for instance self-reported literacy versus tested literacy. Different surveys may ask slightly different questions, such as current school attendance versus attendance at any point during the school year. Questionnaire routing can also have a significant impact on responses by influencing the respondent's interpretation of a given question.

A third factor may be **survey management**. Differences in the way that data entry is organised; the types of data checks used; and the treatment of missing values at the analysis stage can all influence published estimates. Finally, estimates of education indicators are particularly vulnerable to errors in the measurement of the age of household members, as this affects the denominator for indicators such as NARs. The extent of such errors may vary across surveys, undermining comparability.

It is important to note that there are often sound reasons for methodological differences across surveys. First, most of the surveys reviewed were multipurpose surveys, of which education was not the main component. Their design would therefore have been influenced by their other objectives. Second, most surveys aim to generate robust estimates of indicators for a particular year. They are typically not designed to be comparable with other surveys, unless they are part of the same suite of surveys (such as the DHS and MICS). As a result, the finding that education data generated by household surveys in Nigeria are not fully comparable is not a criticism of these surveys, but a note of caution to those who seek to use the data to draw inferences about changes in educational outcomes over time.

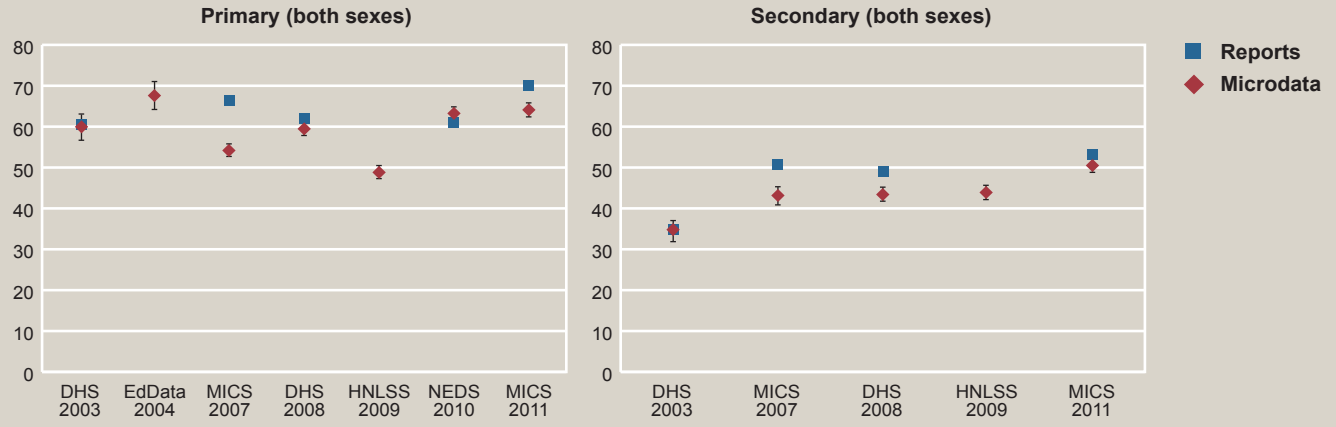
Do survey data point to statistically significant changes in educational outcomes over time?

A second challenge with using household survey data to draw inferences about trends in educational outcomes is that changes in point estimates may not be statistically significant. To assess whether this is the case, point estimates of NARs were recalculated from survey microdata using harmonised indicator definitions. Confidence intervals at the 95% level were then calculated for these point estimates and plotted as error bars around them. If confidence intervals do not overlap, that points to a statistically significant change in NARs.

As Figure 1 shows, at the national level there is evidence of statistically significant changes in secondary NARs over time. However, there is less evidence of statistically significant changes in primary NARs.

1 The review could not comment on this conclusively as it was restricted to an ex-post comparison of survey data and available metadata, and did not involve any monitoring of the survey design and execution.

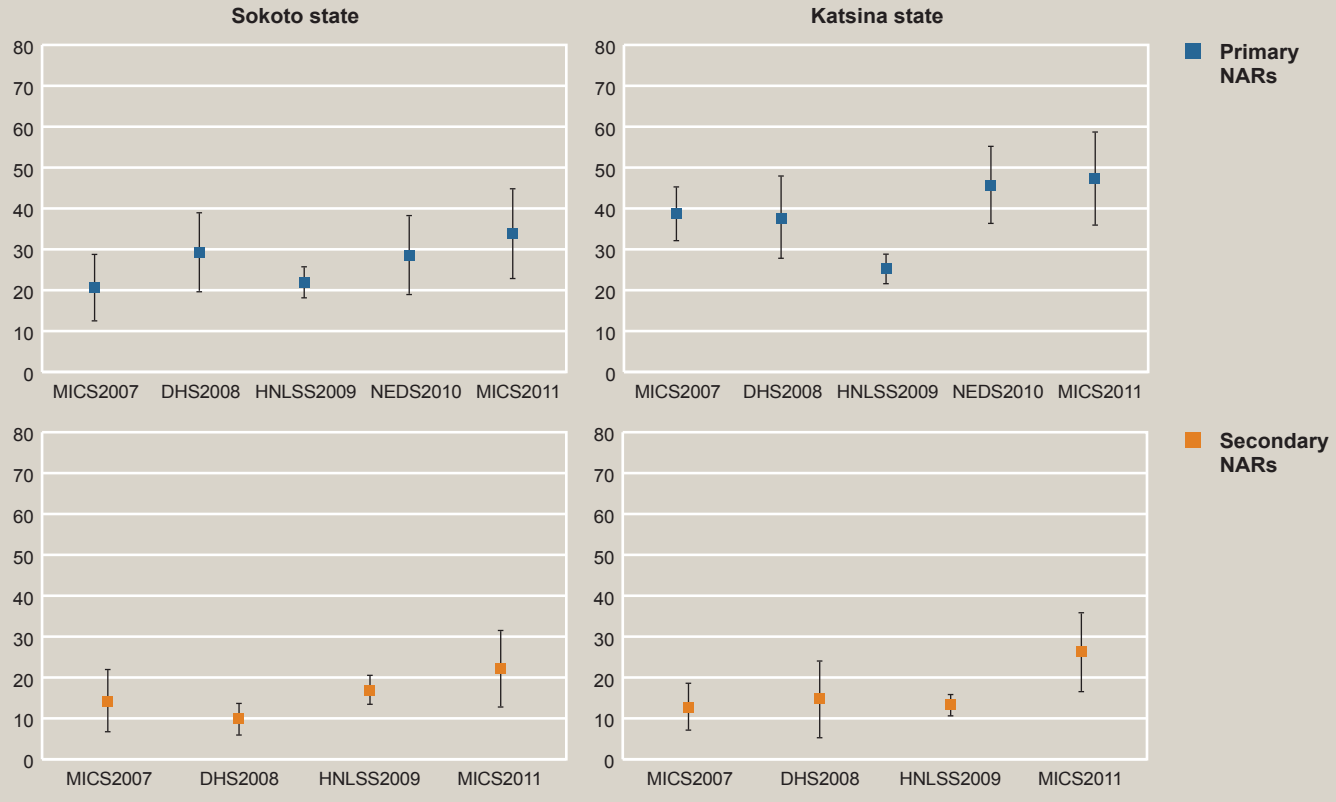
Figure 1: Estimates of National NARs from household survey data (95% confidence intervals)



Sources: DHS 2003 report and microdata; EdData Survey 2004 microdata; MICS 2007 report and microdata; DHS 2008 report and microdata; HNLSS microdata; NEDS/DHS 2010 report and NEDS 2010 microdata; MICS 2011 report and microdata.
Note: Error bars on microdata estimates indicate 95% confidence intervals.

At the state-level, the review found no evidence of statistically significant changes in NARs. Point estimates and confidence intervals were calculated for Katsina, Sokoto, Bauchi, Niger and Zamfara (the five states in which the UNICEF-managed and DFID-funded Girls' Education Program 3 is being implemented). In all cases, confidence intervals did overlap. The data for Sokoto and Katsina states are plotted in Figure 2. The figure underlines a key challenge with state-level data, which is that 95% confidence intervals are wide, and so the data does not pick up on relatively small changes in educational outcomes.

Figure 2: Primary and secondary NARs in Sokoto and Katsina (95% confidence intervals)



Sources: MICS 2007 microdata; DHS 2008 microdata; HNLSS microdata; NEDS 2010 microdata; MICS 2011 microdata.
Note: Error bars indicate 95% confidence intervals.

The main determinant of the width of the confidence interval is the size of the sample. Other factors include large variation in survey weights across sampling units, and sample designs with high levels of clustering (the selection of relatively large numbers of households from the same geographical clusters).

However, as with the issue of comparability, it is likely that there are sound reasons for current survey design practices. Both larger samples and more widely dispersed samples boost the costs of implementing a survey. This creates a trade-off between precision and expense. There also tends to be a trade-off between sampling and non-sampling error. As sample sizes increase, sampling errors decline but non-sampling errors tend to increase owing to the challenges of managing large volumes of field workers and data.

Another key factor is that with education indicators, the group of interest is a subset of the population (6-11 year olds, 12-17 year olds). This means that the effective sample size for these indicators is smaller than the total sample size (i.e. all household members). For surveys whose main area of interest is not education, sample sizes that are sufficient for other indicators are likely to be inadequate for education.

Recommendations

The evidence suggests that, at present, household survey data in Nigeria are not suitable for assessing changes in educational outcomes, particularly at the sub-national level. There are a few steps that can be taken to improve the **comparability** of survey data:

- **Indicator definitions could be harmonised across surveys:** In the case of large, multi-country surveys, where definitions are governed by international norms, it would be useful for published reports to contain a supplement presenting key indicators for a national audience. This would involve recalculating indicators from microdata using harmonised definitions that are used for all household surveys in Nigeria.
- **The education component of survey questionnaires could be harmonised in line with international best practice:** This may involve, for example, the use of standardised literacy tests across all surveys, harmonised questionnaire routing, and clarification in all survey questionnaires of the type of schools that are being referred to.
- **A consistent approach to fieldwork and data analysis would boost comparability:** Greater collaboration between the technical teams and agencies involved in different surveys would be desirable.

If comparability were improved, survey data could be used to gauge changes in educational outcomes at the national level and, to some extent, at the zonal level. However, the issue of large standard errors would continue to limit their utility in tracking changes in educational outcomes at the state-level.

Credits

This EDOREN Research Summary was written by Shefali Rai, with inputs from Cora Mezger and Leah Murphy. It is based on the EDOREN report titled “Education Data in Nigerian National Household Survey Data: Review of Survey Reports and Evidence from Microdata” by Cora Mezger (January 2014). Readers are encouraged to quote and reproduce material from EDOREN Research Summaries in their own publication. In return, EDOREN requests due acknowledgement and quotes to be referenced as above.

About EDOREN

The Education Data, Research and Evaluation in Nigeria (EDOREN) project is an initiative funded by the United Kingdom Department for International Development (DFID). It is designed to generate new evidence and understanding of how best to support equitable access and improved learning outcomes for all Nigerian children through innovation and the sustainable development of basic education systems.

EDOREN is a consortium of leading organisations in international development and education managed by Oxford Policy Management (OPM) and including the Institute of Development Studies (IDS) at the University of Sussex.

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