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# Variations in Health Outcomes with Alternative Measures of Urbanicity, Using Demographic and Health Surveys 2013-18 (AS73)

*An Analysis Brief from The DHS Program*

## Why study the role of urbanicity on health and service provision outcomes?

Two-thirds of the global population are forecasted to live in urban areas in 2050. Previous studies have shown linkages between urbanicity, the impact of living in urban areas, and positive health outcomes, such as reduced child mortality, due to an increase in access to and utilization of health services. Living in urban areas is also linked with poor health outcomes, such as higher mean body mass index compared to other groups, and a higher probability of reporting poor health from social isolation, overcrowding, and pollution.



Photo by Rainer, stock.adobe.com

## Which countries were included in the study?

Data from 30 countries that had a DHS survey between 2014 and 2018 are included in this analysis, which includes an in-depth analysis of six countries: Bangladesh, DRC, India, Kenya, Nigeria, and Senegal.

## What methods were used to conduct this analysis?

Previous studies have typically relied on a two-category urban-rural place of residence variable available in DHS datasets to measure urbanicity and its relationship to health. There is a dearth of research that measures the complex and more nuanced features of urbanicity beyond these two categories. This study uses three additional urbanicity variables (and a country-specific slum variable in India) to examine how four health and service provision outcomes—modern contraceptive prevalence rate (mCPR), mothers who presented for at least four antenatal care visits, children age 12-23 months who have completed three doses of DPT vaccine, and children age 6-23 months who have received the minimum acceptable diet (MAD)—vary between levels of urbanicity.

For the urbanicity variables, the in-depth analysis includes descriptive statistics, maps, and crosstabulation with the four health outcomes of interest. Unadjusted and adjusted regression models are fit for six countries. In further analysis, two models are fit for the adjusted logistic regressions for 30 countries to find patterns for the SMOD and urban poor cluster variables.

Urbanicity Variable	Categories		
	Rural	Urban	
<p><b>Place of residence</b></p> <p>Two-category variable available in DHS datasets</p>			
<p><b>SMOD</b></p> <p>Derived from the Global Human Settlement Model grid (GHS-SMOD), uses population density, built-up areas, and settlement size</p>		<p>Peri-urban</p> <p>Urban centers</p>	
<p><b>Urban poor/Slum</b></p> <p>Constructed from data available in DHS datasets based on the definition of a slum household from UN Habitat (slum variable available in India DHS dataset)</p>		<p>Urban poor/slum</p> <p>Urban non-slum/non-poor</p>	
<p><b>Nightlights</b></p> <p>Continuous variable that measures level of luminosity during nighttime hours</p>	0-1 	2-10 	>10 

## What are some key results?

**Inter-urban differentials are noteworthy.** Differences are detected in health outcomes between:

- *Peri-urban and urban centers.* Significant differences in mCPR are found in four surveys between peri-urban and urban centers (see Figure 1). Significant differences in children receiving the minimum acceptable diet (MAD) are detected in three surveys between peri-urban and urban centers.
- *Urban poor and urban non-poor areas.* The largest disparities are observed between urban poor and urban non-poor clusters, including significant differences in mCPR between urban poor and urban non-poor in 10 surveys. Significant differences in MAD are found in three surveys between urban poor and urban non-poor (see Figure 2).

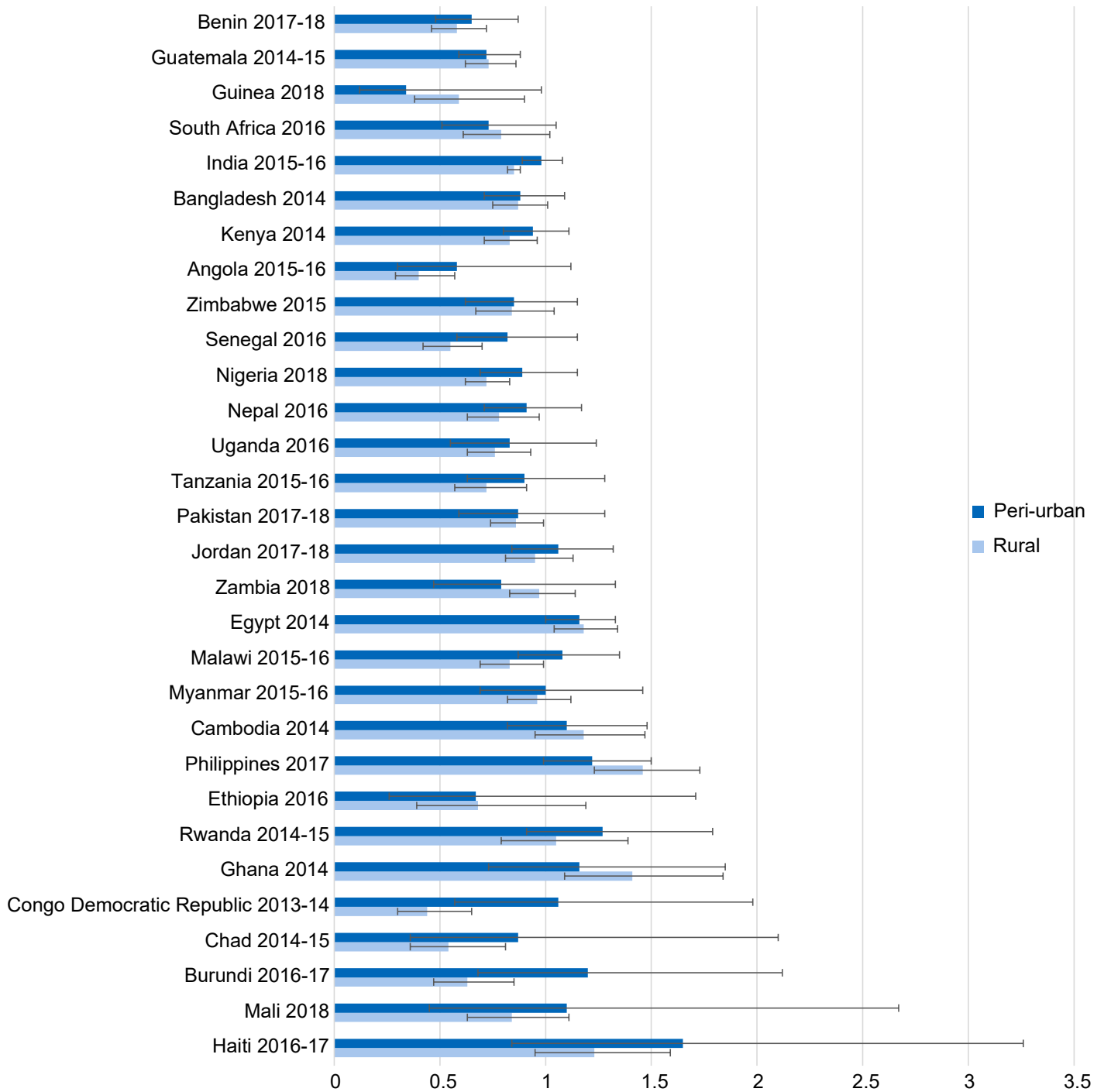
**Rural areas generally have worse health outcomes compared to urban counterparts.**

As expected, in several surveys, rural areas perform worse than urban areas in all outcomes.

**Findings are country-specific.** Some countries exhibit large significant differences in health outcomes in favor of those living in urban centers or urban non-poor clusters.

- Children living in peri-urban clusters in Rwanda are less likely to receive the minimum acceptable diet than children in urban centers. In Tanzania and Mali, children in peri-urban areas are more likely to receive MAD compared to urban centers.
- Women living in urban poor clusters are less likely to use a modern method of contraception compared to women in urban non-poor clusters in nine countries: Burundi, Egypt, Tanzania, Angola, Guatemala, Benin, India, Nigeria, and Uganda. In Tanzania, women in urban poor clusters have 62% lower odds of mCPR compared to women in urban non-poor clusters.
- In three countries (Burundi, Haiti, and Guatemala) children in urban poor clusters are less likely to receive MAD compared to children in urban non-poor clusters (Figure 2). In Haiti and Burundi, children in urban poor clusters have 80% lower odds of receiving MAD compared to their urban non-poor counterparts.

**Figure 1. Adjusted odds ratios for the SMOD variable (reference: urban centers) and mCPR in 30 DHS surveys**



This figure shows the odds ratios of mCPR for women living in peri-urban (dark blue bars) and rural clusters (light blue bars) compared to women in urban centers. If the odds ratios are below 1 and the confidence intervals do not cross the vertical line at 1, women in that category (either peri-urban or rural) have significantly lower odds of mCPR than women in urban centers. In Benin, Guatemala and Guinea, women from peri-urban areas have significantly lower odds of mCPR than women in urban centers. In Egypt, women from peri-urban areas have significantly higher odds of mCPR than women in urban centers. In Benin, Guatemala, Guinea, India, Kenya, Angola, Senegal, Nigeria, Nepal, Uganda, Tanzania, Pakistan, Malawi, Congo Democratic Republic, Chad, and Burundi women from rural areas have significantly lower odds of mCPR than women in urban centers. In Egypt, the Philippines, and Ghana women from rural areas have significantly higher odds of mCPR than women in urban centers.

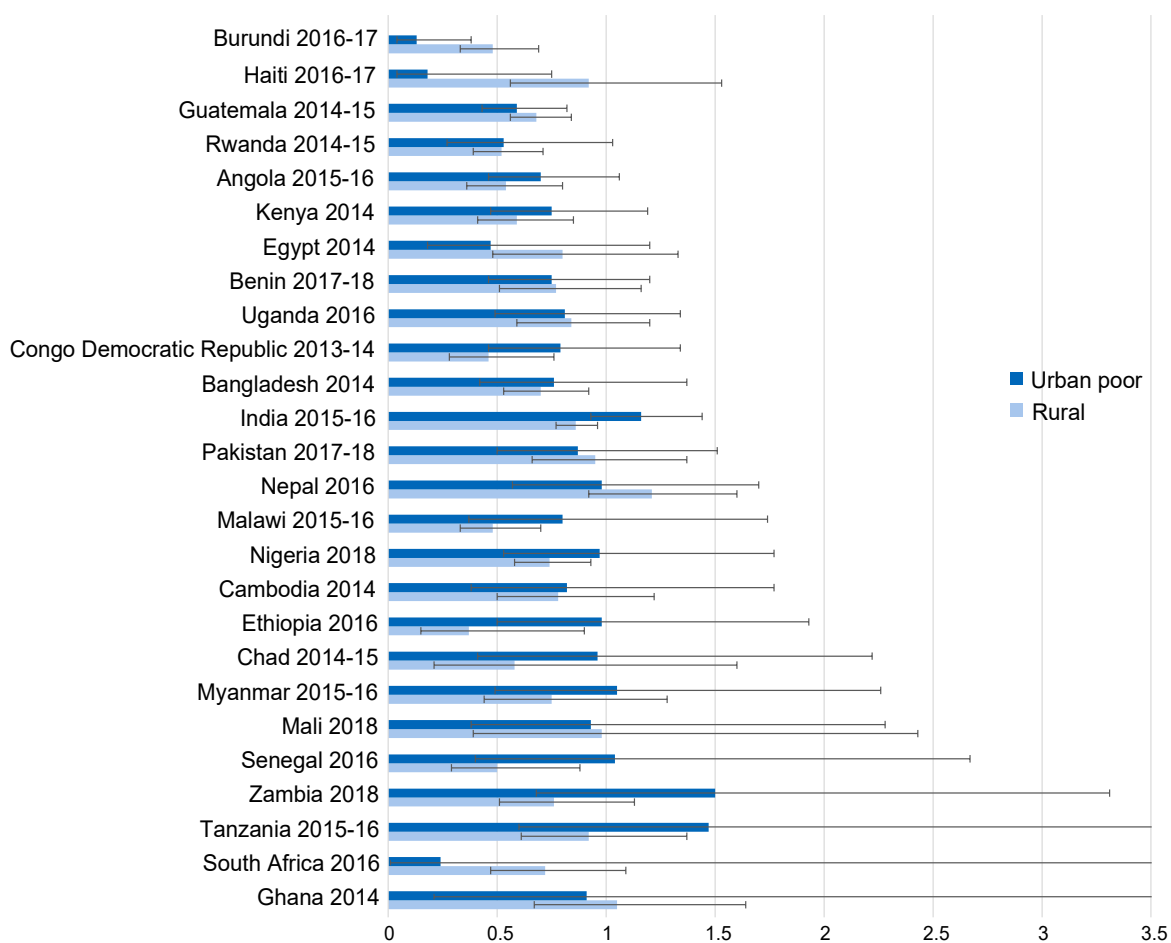
## Socioeconomic factors could be more predictive of better health outcomes than urbanicity indicators.

- Comparing the unadjusted and adjusted logistic regression models in the in-depth analysis, urbanicity variables lose significance after adding controls. Of the urbanicity variables tested in this study, the urban poor cluster classification exhibits the strongest statistical evidence of association with the health outcomes.

### How should these results be used?

Depending on the country context, more health and nutrition services are required in the urban poor cluster and peri-urban areas. In many surveys, intra-urban disparities between peri-urban and urban centers or between the urban poor and urban non-poor are similar to the disparities between rural and urban areas. More research is needed to examine the relationship between urbanicity variables and health indicators that are not related to service provision, to explain the effect of living in different urban environments on the physical health of individuals.

**Figure 2. Adjusted odds ratios for the urban poor cluster variable (reference: urban non-poor) and MAD in 30 DHS surveys**



This figure shows odds ratios of MAD for children living in urban poor (dark blue bars) and rural clusters (light blue bars) compared to children in urban non-poor clusters. Four surveys were removed from this figure due to lack of data on feeding practices and no urban poor clusters found in the sample analyzed. Tanzania, South Africa, and Ghana have upper bounds that do not fit in the figure.

This brief summarizes The DHS Program’s Analytical Studies No 73, by Shireen Assaf and Christina Juan with funding from The United States Agency for International Development through The DHS Program implemented by ICF. For the full report or more information about The DHS Program, please visit [www.dhsprogram.com](http://www.dhsprogram.com). The full report is available at: <https://www.dhsprogram.com/publications/publication-as73-analytical-studies.cfm>