

# Open Defecation and Anemia in Children: The Case of Nepal

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## INTRODUCTION

Anemia—defined by low levels of the protein hemoglobin in the blood—is a widespread problem in many developing countries. Anemia in children impairs their physical and cognitive development. While large bodies of literature have studied the relationships between poor nutrition and anemia and malaria and anemia, little research has focused on the impact of poor sanitation on anemia.

The authors look specifically at the practice of open defecation, or defecating outside on open ground without a toilet or latrine. When people defecate in the open, they often spread intestinal parasites that are known to cause anemia. The medical literature also suggests that exposure to fecal germs can lead to environmental enteropathy, a disease which decreases the intestines' ability to absorb the nutrients that are important for preventing anemia. Over one billion people practice open defecation, and it is especially common in South Asia.

In 2006, half of Nepali households practiced open defecation, but this number declined dramatically—to about 35 percent—by 2011. The authors explore the causal relationship between open defecation and anemia in Nepal using the 2006 and 2011 Demographic and Health Surveys (DHS) for that country.

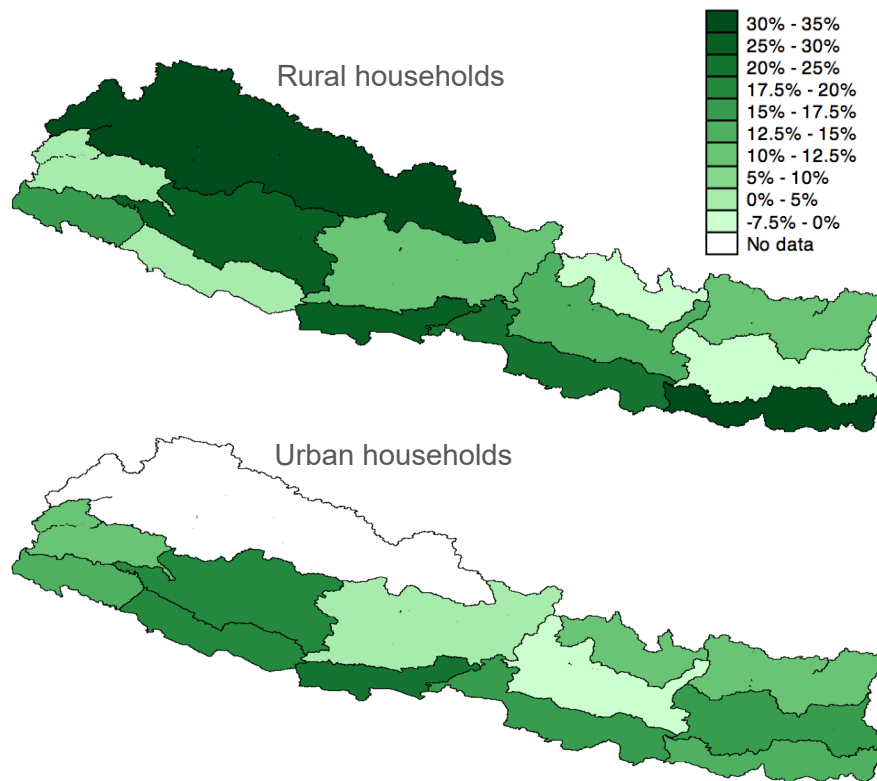
## POLICY IMPLICATIONS

Anemia is typically thought of as a nutritional outcome, with a corresponding policy focus on improving nutrient intake. The authors convincingly show that the disease environment affects nutrient absorption. Policy makers interested in reducing anemia in developing countries should also prioritize reducing open defecation alongside traditional approaches such as like fortification, iron supplementation, and deworming. This recommendation is especially relevant in South Asia, which has both high rates of open defecation, and high rates of child malnutrition and anemia.

## KEY FINDINGS

- > There has been a 13 percentage point decline in open defecation in Nepal between 2006 and 2011, with some regions posting over a 30 percentage point reduction in open defecation in just 5 years (see Figure).
- > Declines in open defecation over time in Nepal correlate with improvements over time in children's hemoglobin levels. That is, children exposed to better community sanitation had higher hemoglobin levels.
- > Statistical checks increase confidence that these associations are causal rather than merely correlations.
  - > These results are unlikely to be driven by medicine, changes in diet, or other forms of infrastructure improvements.
- > The research highlights the importance of distinguishing household-level open defecation from neighborhood- or region-level open defecation.
  - > Because open defecation hurts children through negative externalities (one household's germs spread to another household's children), it is necessary to use neighborhood- or region-level sanitation as a measure of the disease environment to which children are exposed, not what an individual household does for defecation.

## REGIONAL SANITATION IMPROVEMENTS IN NEPAL, 2006 TO 2011



These maps show improvements in sanitation between the 2006 and 2011 rounds of the Nepal DHS. Regions are color-coded according to the change in the percentage of households using toilets and latrines (equal to 100 minus the percentage of households defecating in the open). Darker greens indicate greater improvements in sanitation while lighter greens indicate lesser improvements. The top map includes only rural households within each of the 13 regions. The bottom map includes only urban households in 12 regions because the Western Mountain Region (upper left) contained no urban areas.

### ABOUT THE AUTHORS

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### REFERENCE

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