

Study analyzes complex causes of premature and low-birthweight babies in India

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Women in India who spend more time fetching water, use a shared latrine, and endure harassment from others are more apt to give birth to a pre-term or low-birthweight baby, according to a new study from the University of Iowa.

The findings by researchers in the University of Iowa College of Public Health came from a study that examines the complex relationships between [water](#) and sanitation access and social conditions on birth outcomes among women in India.

Globally, preterm birth (PTB) and low infant birth weight (LBW) are leading causes of maternal and child illnesses and death. In low-income countries, the challenges women face to meet their basic water, sanitation, and hygiene (WASH) needs may be a major contributor to adverse health outcomes.

"Many homes in low-income countries have no private drinking water source. Women and girls are tasked with fetching water from outside the home, which can be physically stressful," says Kelly Baker, assistant professor of occupational and environmental health, who co-authored the study. "In addition, homes often lack private toilet facilities, meaning women must use shared or public latrines or manage their sanitation needs in open spaces."

The lack of water and sanitation in the home forces women to navigate challenging, and sometimes personally threatening, social and

environmental public conditions to collect water and to find a safe, private place to defecate, bathe, or manage menstruation, leading to psychosocial stress.

"Determining whether WASH-related stress—both physical and psychosocial—affects birth outcomes for women in low- and middle-income countries is critical for understanding whether the global prevalence of preterm birth and low infant birth weight could be reduced by improving the social and environmental conditions in which pregnant women seek clean water and proper sanitation," says study co-author William Story, assistant professor of community and behavioral health.

For the study, the researchers used data from the India Human Development Survey. The survey asked women about their drinking water source, walking time to that source, time spent fetching water, sanitation (toilet) access, harassment of women and girls, local crime, whether community problems are solved collectively or individually, the amount of conflict within the community, as well as education, household wealth, and other characteristics.

The researchers examined the effect of pre-birth WASH and social conditions on self-reported PTB status and LBW status for 7,926 women who gave birth between 2004/2005 and 2011/2012. Of these women, 14.9 percent experienced premature birth and 15.5 percent delivered a low birth weight baby.

The study found that increased time daily spent fetching household water increased women's risk of delivering a low birth weight baby. Open defecation and using a shared latrine within a woman's building or compound were also associated with higher odds of low birth weight and preterm birth, respectively, compared to having a private household toilet.

Harassment of women and girls in the community also was associated with both low birth weight and [preterm birth](#). The data also showed a possible association of local crime with [low birth weight](#).

"This study contributes to the limited evidence related to environmental causes of PTB and LBW by demonstrating that lack of household WASH infrastructure and social factors, like crime and harassment of women and girls, are risk factors for adverse [birth](#) outcomes in women in low- and [middle-income countries](#)," the researchers write.

"Additionally, the findings suggest that gender norms that sanction harassment of women and girls and place the burden of household water fetching on women are key determinants of vulnerability to PTB and LBW among Indian [women](#)."

Interventions that reduce domestic responsibilities related to water and [sanitation](#) and that change social norms related to gender-based harassment may reduce rates of PTB and LBW in India, the authors note.

More information: Kelly K. Baker et al. Impact of social capital, harassment of women and girls, and water and sanitation access on premature birth and low infant birth weight in India, *PLOS ONE* (2018). [DOI: 10.1371/journal.pone.0205345](https://doi.org/10.1371/journal.pone.0205345)

Provided by University of Iowa

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