

# Childhood diarrhea has genetic links, study finds

March 31 2023, by Sanjeet Bagcchi

---



Credit: CC0 Public Domain

Susceptibility to diarrhea, a major cause of infant deaths in low- and middle-income countries, has genetic links which could hold the key to new treatments, research suggests.

Diarrheal disease kills 525,000 [children](#) aged under-five each year, making it the second leading cause of death in that age group, according to the World Health Organization (WHO). The problem, prevalent in Africa, Asia and South America, is fuelled by poor sanitation and lack of access to clean drinking water.

Published March 27 in *The Journal of Infectious Diseases*, the study notes that many children, particularly in low- and [middle-income countries](#), suffer from multiple bouts of diarrhea during the first year of life, despite improvements in toilet facilities, clean water access, immunization services and exclusive breastfeeding.

According to the researchers, although water-borne microorganisms cause diarrhea, the frequency and duration of diarrhoeal disease among children facing similar exposure to them differs. This suggests other factors at play.

"We have shown for the first time a genetic association of diarrhea in children," says Rashidul Haque, co-author of the study and affiliated with the International Centre for Diarrhoeal Disease Research in Bangladesh.

An understanding of the genetic basis of diarrhea in [young children](#) "may provide targets for treatment and prevention," Haque explains to us the significance of the findings.

"We evaluated human genetic variants in infants with no diarrhea to those with either many episodes of diarrhea (six or more in the first year of life) or many days of diarrhea (25 or more in the first year of life)," says Rebecca Munday, first author of the study and a Ph.D. candidate in the [human genetics](#) program at the US-based Johns Hopkins University School of Medicine.

Munday explains that all the children involved in the study were from an urban slum in Dhaka, Bangladesh and exposed to many pathogens throughout their first year of life.

The researchers found human genetic variants in or near three [specific genes](#) which were more common in children with no diarrhea, suggesting that protection from diarrhea may be accorded by these genes identified as SAMD12, NCAM2 and WSCD1.

They found an association with genes involved in enteric (intestinal) nervous system development and intestinal inflammation, which they say potentially could be targets for diarrhea therapeutics, or treatments.

"[These genetic] variants were discovered because of the intense exposure these infants had to different pathogens, and yet they still did not have a reported diarrheal infection in the first year of life," Munday tells us.

"These three novel protective [genetic] variants could lead to potential therapeutic targets for all young children to prevent diarrheic infection."

The authors admitted to limitations in the study arising from the fact that children get diarrhea for different reasons, including pathogens, stress, dietary changes, and bowel disorders and they could not evaluate the cause in each case.

Chiranjib Chakraborty, professor at the School of Life Science and Biotechnology at Adamas University, Kolkata, India, tells us, "The study model can help to explore infant diarrhea frequency and duration and their genome-wide association."

He agrees it could help develop better therapeutics, and adds, "It can also help understand the genome-wide association with other infectious diseases."

**More information:** Rebecca M Munday et al, Genome-wide association studies of diarrhea frequency and duration in the first year of life in Bangladeshi infants, *The Journal of Infectious Diseases* (2023).  
[DOI: 10.1093/infdis/jiad068](https://doi.org/10.1093/infdis/jiad068)

Provided by SciDev.Net

Citation: Childhood diarrhea has genetic links, study finds (2023, March 31) retrieved 24 June 2024 from <https://medicalxpress.com/news/2023-03-childhood-diarrhea-genetic-links.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.