

# The risk of intestinal parasites in communities exposed to fecal waste

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In areas that undergo rapid urbanization in low-income countries the safe management of wastewater and fecal sludge is vital to ensure the health of the growing population. In particular, contact with human and animal fecal waste is a risk factor for parasitic infections such as hookworms and intestinal protozoa. *PLOS Neglected Tropical Diseases* reports a cross-sectional survey done by researchers from the Swiss Tropical and Public Health Institute and colleagues from Uganda who examined the prevalence and risk factors for intestinal parasitic infection in the growing suburbs of Kampala, the capital of this East African country.

Only a small proportion of wastewater in Kampala is taken to appropriate treatment plants. Consequently, most of the wastewater is discharged without treatment into open storm water channels. The researchers studied five separate populations likely to be at risk of contact with the wastewater:

- Workers at the wastewater facilities
- Workers collecting fecal sludge from pits using vacuum trucks
- Urban [farmers](#) working downstream of the storm water channels
- Slum dwellers in areas at risk of flooding
- Slum dwellers in areas not at risk of flooding

A cross-sectional survey was carried out between September and October 2013 for each of these five populations. Adults aged 18 years or above were administered a questionnaire to report signs, symptoms and risk factors, and a stool sample was taken for infection diagnosis. In total

915 people completed the analysis.

The highest prevalence of parasitic infection was found in urban farmers with an infection rate of 76%. Compared with the other population groups, farmers had the highest odds of all measured parasitic worms and intestinal protozoa infections. The lowest prevalence was found in workers collecting fecal sludge (36% prevalence). Both farmers and workers self-reported the highest levels of diarrhea and skin symptoms. Females had slightly lower odds of infection than males and higher educational attainment was associated with lower infection risk.

The differences between farmers and sewage workers are likely to reflect working practices: 97% of wastewater workers were employed by the wastewater companies while 95% of farmers lacked any official employment status. Workers at the wastewater treatment facilities were also more likely to wear boots (81%) and gloves (>80%) compared with farmers (49% and 4% respectively).

"Our study shows that urban farmers are particularly vulnerable for infection with soil-transmitted helminths, the blood fluke *Schistosoma mansoni* and intestinal protozoa such as *Entamoeba* and *Giardia*" explains Dr. Samuel Fuhrmann, lead author of this study. "Hence, our findings call for increased public health protection measures for urban farmers and marginalized communities and integrated sanitation safety planning at city level in low-income countries."

While the study has its limitations; including the use of self-reported disease outcomes and the examination of only one stool sample per individual, the results raise important issues concerning the proper treatment of fecal waste. Future work could also consider the impact on children, who are at the highest risk of parasitic worms, in order to develop a wider set of clear recommendations and guidelines to reduce [parasitic infections](#) in rapidly urbanizing areas.

**More information:** Samuel Fuhrmann et al. Risk of Intestinal Parasitic Infections in People with Different Exposures to Wastewater and Fecal Sludge in Kampala, Uganda: A Cross-Sectional Study, *PLOS Neglected Tropical Diseases* (2016). [DOI: 10.1371/journal.pntd.0004469](https://doi.org/10.1371/journal.pntd.0004469)

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