



# A Scoping Review of Pit Latrine Design and Childhood Enteric Pathogen Prevalence in Kibera, Nairobi: An African Perspective

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## Abstract

In densely populated informal settlements such as Kibera, Nairobi, poor sanitation is a key driver of childhood diarrhoeal disease. Pit latrines are the primary sanitation infrastructure, but their design and condition vary considerably, which may influence enteric pathogen transmission. This scoping review aimed to map and synthesise evidence on the association between improved pit latrine design features and the prevalence of enteric pathogens among children in Kibera, Nairobi. Its objectives were to identify key design characteristics, contextual factors, and gaps in the research literature. The review followed a scoping review framework. Multiple electronic databases and grey literature sources were searched systematically. Included studies were published in English and focused on pit latrine design, structure, or maintenance in relation to childhood enteric pathogen prevalence in Kibera. Data were charted and analysed thematically. The review identified a limited but consistent body of literature. A key theme was that latrine design features which reduced faecal exposure, including functional slabs and well-sealed drop holes, were frequently associated with lower reported pathogen prevalence. However, no studies provided direct, quantified measures of pathogen reduction attributable to specific design improvements. The evidence was predominantly observational and cross-sectional. The available literature suggests a plausible link between improved pit latrine design and reduced enteric pathogen risk for children in Kibera, but causal evidence is absent. Existing research is insufficient to isolate the impact of design from other socio-environmental factors. Future research should employ longitudinal or comparative study designs to quantify the health impact of specific latrine design improvements. Interdisciplinary studies integrating engineering, microbiological, and epidemiological data are needed. Policy should consider latrine design standards alongside the promotion of maintenance and hygiene behaviours. pit latrine, design, sanitation, enteric pathogens, diarrhoea, child health, informal settlement, Kibera, scoping review. This review consolidates the available evidence on pit latrine design

and child health in a major informal settlement, highlighting critical evidence gaps and providing direction for future research and policy in sub-Saharan African contexts.

**Keywords:** *pit latrine design, enteric pathogens, informal settlements, Kibera, Nairobi, sanitation, scoping review*

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