



# A Meta-Analysis of Community-Led Total Sanitation and Soil-Transmitted Helminth Prevalence in Rural Madagascar, 2021

Rakotomalala Andrianirina<sup>1</sup>

<sup>1</sup> University of Toamasina

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**Correspondence:** [randrianirina@outlook.com](mailto:randrianirina@outlook.com)

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## Author notes

*Rakotomalala Andrianirina is affiliated with University of Toamasina and focuses on Medicine research in Africa.*

## Abstract

Soil-transmitted helminth (STH) infections are a persistent public health burden in rural Madagascar, contributing to childhood morbidity and malnutrition. Community-led total sanitation (CLTS) is a behaviour change intervention designed to eliminate open defecation to improve sanitation and health. This meta-analysis aimed to synthesise evidence quantitatively from rural Madagascar to determine the impact of CLTS interventions on STH infection prevalence. A systematic search of electronic databases and grey literature identified relevant studies. Included studies reported STH prevalence in rural Malagasy communities with and without CLTS implementation. Data were extracted and pooled using a random-effects meta-analysis model to calculate summary odds ratios. Heterogeneity was assessed with the  $I^2$  statistic. The pooled analysis found that communities with CLTS interventions had a statistically significant lower prevalence of any STH infection compared to control communities (summary OR 0.62, 95% CI 0.48 to 0.79). The reduction was most pronounced for *Ascaris lumbricoides* infections. Heterogeneity among studies was moderate. CLTS interventions in rural Madagascar are associated with a meaningful reduction in STH infection prevalence. This supports the role of community-based sanitation programmes within a comprehensive STH control strategy. Programme implementers should integrate CLTS with periodic deworming and hygiene promotion for a sustained impact. Further research is needed to assess the long-term sustainability of CLTS and its effect on STH infection intensity and reinfection rates. Neglected tropical diseases, sanitation, open defecation, behaviour change, WASH, parasitology This meta-analysis provides the first quantitative synthesis of evidence on the effect of CLTS on STH prevalence in rural Madagascar, offering consolidated findings for public health policy and practice.

**Keywords:** *Community-led total sanitation, soil-transmitted helminths, meta-analysis, Sub-Saharan Africa, neglected tropical diseases, public health intervention, rural health*

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