



A Scoping Review of the Prevalence and Risk Factors for Multidrug-Resistant Tuberculosis Among Artisanal Gold Miners in Geita District, Tanzania: A Molecular Epidemiological Perspective, 2003

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Abstract

Artisanal and small-scale gold mining is a major economic activity in sub-Saharan Africa, linked to occupational and environmental health hazards. Miners in Tanzania's Geita District are exposed to silica dust and overcrowded living conditions, which are known risk factors for tuberculosis (TB). The emergence of multidrug-resistant tuberculosis (MDR-TB) in such high-risk, mobile populations threatens regional TB control, but the specific burden and determinants within this group are not well summarised. This scoping review aimed to map and synthesise existing evidence on the prevalence and risk factors for MDR-TB among artisanal gold miners in Geita District, Tanzania, from a molecular epidemiological perspective. Its objective was to identify key themes, research gaps, and methodological approaches to inform future research and public health action. A scoping review was conducted following Joanna Briggs Institute guidance. Five electronic databases and grey literature sources were searched. Studies of any design reporting on MDR-TB prevalence, risk factors, or molecular epidemiology among artisanal gold miners in Geita District were included. Data were extracted and analysed thematically. The search identified a limited but focused body of evidence. A consistent theme was the association between longer mining duration and increased risk of MDR-TB. One key study reported a high MDR-TB prevalence of approximately 8.5% among symptomatic miners in the district. Molecular data indicated the circulation of specific *Mycobacterium tuberculosis* strains, suggesting active transmission networks within mining communities. Available evidence suggests a disproportionate burden of MDR-TB among artisanal gold miners in

Geita District, associated with occupational and social risk factors. The current literature is sparse, highlighting a critical need for enhanced surveillance and targeted research in this vulnerable population. Future research should employ longitudinal and molecular epidemiological designs to better understand transmission dynamics. Public health programmes should prioritise tailored TB and MDR-TB screening, infection control, and treatment adherence support for artisanal mining communities in Geita District. multidrug-resistant tuberculosis, artisanal mining, gold miners, molecular epidemiology, prevalence, risk factors, Tanzania, scoping review. This review consolidates the available evidence on MDR-TB in a high-risk occupational group in Tanzania, clarifying the extent of the problem and identifying specific gaps for future investigation and intervention.

Keywords: *Multidrug-resistant tuberculosis, Artisanal and small-scale gold mining, Molecular epidemiology, Sub-Saharan Africa, Occupational health, Risk factors, Tanzania*

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