

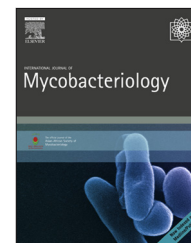


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Application of highly portable MinION nanopore sequencing technology for the monitoring of nosocomial tuberculosis infection

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ABSTRACT

Referral hospitals in sub-Saharan Africa concentrate large numbers of tuberculosis (TB) and multidrug-resistant TB (MDR-TB) patients, failed by community TB services. We have previously shown, from enhanced screening and through autopsy studies, a significant burden of missed TB infections at the University Teaching Hospital, Lusaka, Zambia, with many patients dying or being discharged without treatment. With minimal TB isolation facilities and minimal political will to invest in broader screening and isolation, the risk of nosocomial transmission is likely to be extremely high. Studies from other hospitals in low burden settings and in South Africa have shown that next generation sequencing (NGS) is a very powerful tool for rapidly sequencing whole TB genomes and comparing them to confirm or rule out nosocomial transmission. The established platforms for NGS analysis, such as Illumina, are very expensive, immobile, and require regular maintenance, making them a costly inclusion on a research proposal or programmatic intervention grant in Africa. MinION nanopore sequencing has changed the NGS landscape with cheap portable sequencers, rapid simple library preparation (15 min), and automated real-time analysis tools. The application of highly portable MinION nanopore sequencing technology for the monitoring of nosocomial TB infection will be discussed. Preliminary data from our pediatric pneumonia study will demonstrate the detection of TB in induced sputum from children admitted to the University Teaching Hospital.

Conflicts of interest

The authors have no conflicts of interest to declare.

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