

Factors associated with multi-drug resistant tuberculosis in Kenya

Herman Owuor Weyenga

A thesis submitted in partial fulfilment for the degree of Master of
Science in Applied Epidemiology in the Jomo Kenyatta University of
Agriculture and Technology.

2011

ABSTRACT

Multi-drug resistant tuberculosis (MDR-TB) and weak health systems threaten global tuberculosis control. Kenya is ranked 13th among the 22 high TB burden countries worldwide, and currently has an estimated 2,300 MDR-TB patients. A case-control study to determine factors associated with MDR-TB in Kenya was conducted to inform policy in designing public health interventions that are best suited to the country's needs. This was an unmatched case control study conducted in 41 health facilities in 20 districts across the eight provinces in Kenya from September 2009 to January 2010. Cases were confirmed MDR-TB (resistance to at least rifampicin and isoniazid) patients while controls were sputum-smear positive TB patients with clinical response and negative sputum smear at the fifth month of treatment with first-line anti-tuberculosis drugs. Study approval was sought and obtained from relevant institutions. Using the health facility TB register as the sampling frame, MDR-TB patients and two randomly selected unmatched controls per case were enrolled. A pretested structured interviewer administered questionnaire was used for patient interviews and to abstract information from records. Data on socio-demographic, behavioural, and clinical exposure history were obtained. Data were entered and analyzed using *Epi-info* and Stata versions 3.5 and 9.0 software respectively. A total of 81 cases {mean age: 32 years (SD: 10), 62% males} and 162 controls {mean age: 35 years (SD: 13), 59% males} there was no statistically significant difference with respect to baseline socio-demographic characteristics. Six (7.4%) of the MDR-TB cases having no previous history of TB, reported living in the same house with a known MDR-TB patient. Cases were more likely to have history of previous exposure to first line anti-Tuberculosis drugs (OR= 85, 95% CI=29.7-243.3; $P<0.0001$) and be non Kenyan (OR=5.5, 95% CI=1.4-21.8; $P=0.007$). Case patients with positive HIV status (OR=0.34, 95% CI= 0.1-0.9;

P=0.025) and those who had received TB treatment under the Directly Observed Therapy program (DOT) (OR=0.23, 95% CI= 0.1-0.6; P=0.002) were less likely to have MDR-TB. The study established that MDR-TB was associated with previous TB treatment, and being non Kenyan while use of DOT was protective. MDR-TB could be transmitted to otherwise healthy individuals. The protective association with HIV positive serostatus may reflect selective survival of HIV negative MDR-TB and thus need to be investigated. We recommend strengthening of MDR-TB surveillance among previously treated TB cases and refugees and active MDR-TB case finding among HIV infected TB patients. More rapid MDR-TB diagnostic tests should be used among the HIV infected patients. Access to TB care services by all population groups including immigrants, implementation of DOT, MDR-TB contact tracing and screening and infection prevention should be strengthened in Kenya.