Variation in HIV prevalence and the population-level effects of antiretroviral therapy in reducing tuberculosis incidence in South Africa

To the Editor: The current year (2018) marks the 10th year after the tuberculosis (TB) epidemic in South Africa (SA) reached a historic peak of 848 incident TB cases per 100 000 population in 2008.[1,2] TB incidence has since decreased at an average of 2.0% annually to 781 per 100 000 in 2016.[1,2] The decline observed in the past decade has mainly been attributed to the expansion of HIV testing and antiretroviral therapy (ART).[1,2] Despite these and other public health efforts, TB remains a leading cause of death in SA,[1] and at the current rate of decline, SA will not reach the 2035 targets of the End TB Strategy.[3]

National-level observational and mathematical modelling studies suggest that further scale-up of ART could yield substantial reductions in TB incidence and mortality over the next two decades.[4,5] The effect of ART on halting and reversing local TB incidence depends on the extent to which TB (and transmission) in the population is attributable to HIV infection. To date, there is limited information about trends in HIV prevalence, ART coverage and TB at subnational level in SA. We reviewed data from the National Antenatal Sentinel HIV Prevalence Survey[6] and the District Health Barometer[7] to compare rates of TB and HIV in the 52 SA health districts. HIV prevalence estimates ranged from 2.3% to 46.9% in 2013 and were poorly associated with rates of reported TB in the districts (Fig. 1).

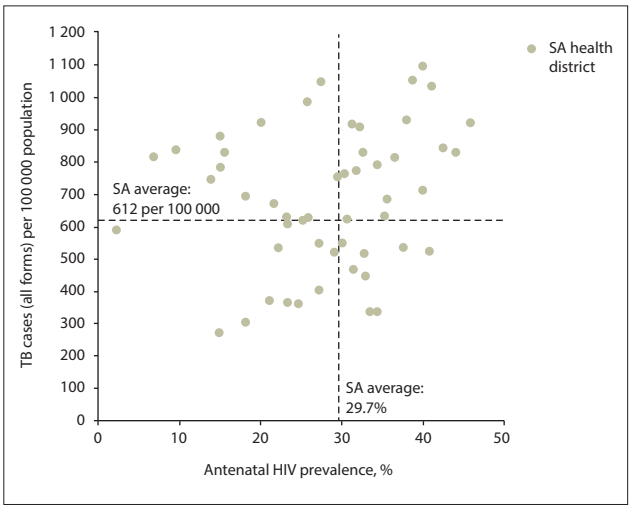

Fig. 1. Antenatal HIV prevalence[6] and rates of diagnosed TB cases (all forms) per 100 000 population[7] in the 52 SA health districts in 2013 (Pearson correlation coefficient r=*0.21; test for correlation* p=*0.15). (TB = tuberculosis; SA = South Africa/n.)*

Several districts reported high TB rates (exceeding 700 per 100 000) despite relatively low estimates of HIV prevalence. We note that the observed variation in HIV and TB rates at subnational level has important implications for TB control in SA and therefore deserves further investigation. It is currently not known whether varying levels of ART coverage in the SA population explain the poor association between local TB and HIV rates, or to what extent other factors, such as poor TB case detection, initial loss to follow-up, failing delivery of integrated HIV-TB services and poor treatment outcomes, contribute to ongoing transmission and high TB rates.

We conclude that efforts are needed to better understand the determinants of local variation in TB and HIV rates in SA. Comprehensive data on the uptake and coverage of ART can guide ART scale-up in the forthcoming years and will inform projections of the effects that ART will have towards reducing TB in different parts of the country. An integrated control strategy that further strengthens HIV prevention and treatment but also effectively addresses other important barriers to TB control will help the country to make significant progress in the forthcoming years.[8]

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