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*Anti-Tuberculosis resistance in patients co-infected with HIV and TB*

Globally, levels of HIV and TB co-infection are high and continue to increase rapidly. UNAIDS and WHO data indicate that one third of all people with HIV have TB co-infection and similarly that up to 70% of TB cases are HIV positive. In sub-Saharan Africa, lack of access to affordable TB screening and treatment and poor referral and follow-up systems are some of the reasons why individuals default on their TB treatment, a situation which can lead to patients developing resistance to TB drugs. Botswana implemented 100% coverage of the DOTS (directly observed therapy short course) strategy in 1986 for all newly infected HIV individuals in all health centers. Two surveys undertaken in Botswana in the 1990's recorded low rates of anti-tuberculosis drug resistance despite a three-fold rise in tuberculosis since 1989. Sputum specimens obtained from patients nationwide in 2002 who also underwent anonymous rapid HIV testing by use of Oraquick showed that of the 2200 sputum smear positive patients and 219 previously treated patients with suspected recurrent tuberculosis, 1457 (60%) were infected with HIV.

Resistance to atleast one drug in new patients rose from 3.7% in 1995 to 10.4% in 2002. We construct a model to investigate

- (i) whether the 100% coverage of DOTS is responsible for the rise in TB drug resistance, and
- (ii) whether screening newly infected HIV patients for TB and administering DOTS to those without TB and treating those with TB would reduce the possibility of developing resistance.