Operational aspects of diagnosing and treating tuberculosis and HIV infection in Ugandan urban areas
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Summary
This thesis reports the results of six observational studies conducted to evaluate the operational aspects of diagnosing and treating tuberculosis (TB) and Human Immunodeficiency Virus (HIV) infection in urban areas in Uganda as the main aim. The studies, employing cross-sectional and longitudinal designs, were part of a larger framework of two prospective cohort studies that were conducted sequentially in three health centres in Kampala city, under routine conditions with minimal or no intervention. The thesis is divided into eight chapters.

Chapter 1 provides a general introduction to operational issues in diagnosing and treating TB and HIV infection and the study setting, and describes the rationale for the various studies.

Chapter 2 is about a cross-sectional study that assessed diagnostic delay among smear-positive pulmonary tuberculosis (PTB) patients registered for treatment at the three health centres. The study findings showed an unacceptably long mean total delay of 8 weeks; patient delay and health service delay was each 4 weeks on average. Patients who visited private doctors and city clinics as the last step before a TB diagnosis was made had shorter diagnostic delays. Women had longer health service delays than men.

Chapter 3 describes a cross-sectional study that assessed the level of HIV test uptake among newly diagnosed smear-positive PTB patients at the three health centres. The study showed a low overall test uptake of 40%, and having been diagnosed with TB at the largest Kampala hospital (versus the health center) was the strongest predictor for having been tested. Other predictors of test uptake were being female, age $\leq$ 25 years of age and being unemployed.

Chapter 4 is about a cross-sectional study that assessed the proportion of patients starting combination anti-retroviral therapy (cART) late, defined as initiating cART at a CD4 cell $<$ 100 cells/μL, and the factors associated with late start, from a cohort of adult, HIV-infected, cART-naive patients seeking care at the three health centres. Thirty-eight percent of the patients had a late start of cART. Being male and having no employment were identified as risk factors for late start of cART.

Chapters 5 and 6 are about two longitudinal studies that assessed defaulting from and adherence to TB treatment among smear-positive PTB patients receiving TB treatment at the three health centres. Whereas the proportion of patients that defaulted from treatment was
high at 20%, that of poor adherence (defined as having missed any daily dose in the preceding 7 days up to three time points during treatment) was low at 6%, reflecting 3% of the measurements. Although defaulting and adherence are to some extent linked, the two indicators measure different phenomena and have different predictors. Change of residence and heavy consumption of alcohol predicted defaulting from TB treatment, while having no contact with the treatment supporter in the preceding week predicted poor adherence.

Chapter 7 describes a longitudinal study that assessed adherence to cART in the first 12 months of treatment. Poor adherence, defined as having taken <90% of the dosages of cART, was observed for only 7% of patients. Poor adherence was associated with poverty, heavy alcohol consumption and receiving care from a health centre located in the slum area.

Chapter 8 is a general discussion of the findings from all the studies and provides some recommendations for policy. The overall challenges of TB and HIV care in Kampala are long diagnostic delays, poor TB-HIV linking, starting cART late, high default rates and poor adherence in some of the patients. A picture emerges with regard to risk factors mainly reflecting social instability and poor services that is probably typical of the African urban setting. Whereas some risk factors may not be easily amenable to change, they provide the sub-population where interventions can be focused. Some of the recommendations can be implemented at the clinic level while others can be implemented in the broader community. The recommendations call for a public-private mix, capacity building at the primary care clinics and community, addressing social instability issues surrounding individual patients in order to address the operational issues identified in this thesis.