Aspects of tuberculosis and HIV diagnosis, care and treatment in Rwandan health facilities: operational studies
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Summary
This thesis presents seven studies on the operational aspects of TB and HIV diagnosis, care and treatment in Rwandan health facilities.

Chapter 1 introduces the studies reported in this thesis, describes the epidemiology of TB and HIV in Rwanda, the rationale for the studies and the setting in which the research was conducted.

Chapter 2 reports an assessment of the performance of the Rwandan TB control program in terms of sputum completion rate and sputum conversion rate (SCR; defined as the proportion of patients who had become smear negative out of all of whom a 2-month smear microscopy was done) in a cohort of patients diagnosed and treated between January and June 2006. The study identified a too low sputum completion rate (80% of the patients). The SCR was found to be adequate at 82%. The busiest clinics and clinics located in rural areas were significantly more prone to have poor completion and conversion rates.

Chapter 3 reports the determinants of adherence to TB treatment, sputum smear conversion at two months, TB mortality and the effect of adherence on mortality. HIV infected TB patients that did not start cART were more likely to be non-adherent (defined as taking less than 90% of the expected TB medication doses). Failure to convert at 2 months treatment was identified in 20% patients and was significantly associated with baseline smear grade and HIV infection. The baseline factors associated with mortality were older age, type of TB, HIV infection. Poor adherence to TB treatment is an important independent determinant of mortality.

Chapters 4 through 7 describe results of a large study conducted in 2009-2010 in Rwandan health facilities in which PITC was introduced.

Chapter 4 examines the acceptability of PITC, the reasons for being or not being tested for HIV and factors associated with having been tested on the day of the interview among attendees. The study showed that PITC was highly acceptable (>95%) to both the health facility attendees and health care staff. The desire to know one’s HIV status and the offer of PITC by health care staff were the most common reasons for accepting an HIV test. Known HIV status and not offering the test by health care staff were the most common reasons for not being tested. In the same the study, PITC appeared to increase HIV testing rates, the health care workers’ workload and also the waiting time for patients.
Chapter 5 compares HIV testing uptake and HIV case finding during routine practice with HIV testing uptake and HIV case finding during the intervention period when PITC was introduced at outpatient departments. The study showed that PITC led to a shift of HIV testing from VCT department to the OPD and a significantly higher test-uptake in the six intervention sites. However, it did not lead to increased HIV case finding.

Chapter 6 reports about the time to enrolment and linkage to care and treatment after HIV diagnosis during routine care, before PITC was operational. The study found that less than 50% of the patients had enrolled to care and treatment within 90 days of HIV diagnosis. Enrolment significantly varied by study site; this suggests an effect of health facility such as insufficient staffing that may lead to an overload of patients and stigma related reasons. The same study showed that only few patients were in very advanced stage of infection (none were in WHO stage 4 and only 9% with CD4 count below 100 cells/mm$^3$) and that a low proportion of the eligible patients (56%) had started cART after 90 days of HIV diagnosis.

Chapter 7 examines the proportion of HIV infected patients that linked to cART care in the PITC intervention phase, and examines factors associated with non-linkage, advanced HIV stage, and the start of cART before and during PITC phase. The study found a suboptimal timely linkage to pre-ART care and cART. Psychosocial and health-services related factors contributed to non-enrolment and non-enrolment was significantly higher in the PITC phase. The study found that some patients diagnosed with HIV were already enrolled into care but sought re-testing partly because they thought the infection had been cured by prayers. Others retested due to denial of their HIV status, while others had enrolled, but at different health facilities. Long waiting time at busy clinics, not being told to return for clinical staging and CD4 count measurement, failure to meet a health care provider on the day of the clinic visit, and non-functioning laboratories were some the reasons reported for non-enrolment.

Chapter 8 describes the prevalence and determinants of discordant treatment responses (defined as a good virological response but a poor immunological response to cART, or vice versa) 12 months after start of cART in a Rwandan prospective cohort of cART naïve patients at nine rural health facilities. About 29% of the patients experienced immunological discordant treatment response while 17% (out of 326 patients) had virological discordance. Immunological discordance was significantly associated with older age (≥35 years) and longer travel times to the clinic and virological discordance was negatively associated with female sex.
Chapter 9 discusses the main findings, draws conclusions from the studies and provides recommendations for public health practice and further research. More efforts to improve compliance of health providers to standard diagnostic and TB treatment guidelines during the initial treatment phase are required. The busiest clinics should be prioritized with respect to staffing and other interventions that improve health workers’ performance. Interventions to increase early TB case detection, improve systematic HIV testing, and intensified patient monitoring to augment TB treatment adherence should be implemented. PITC was highly acceptable and increased HIV test uptake, but seems ineffective for increasing HIV case finding in Rwanda. Nonetheless, our findings strongly suggest the need for focused interventions and additional resources to improve linkage to pre-ART care and cART. Low-cost VL tests should be introduced to mitigate the unwarranted treatment changes to second line regimen in settings with limited resources. Operational research to guide improvements in public health practice on aspects of TB and HIV diagnosis, care and treatment is warranted.