Implementation Challenges for Point-of-care Testing:

Evidence from an Infectious Disease Clinic in Durban, South Africa

KJ Stime[1,2], N Dlamini[3], M Msomi[2], N Ngubane[2], NJ Garrett[2], PK Drain[1]

[1]University of Washington School of Medicine
[2]Centre for the AIDS Programme of Research in South Africa (CAPRISA)
[3]eThekwini Municipality

Background

Diagnostic point-of-care (POC) tests are increasingly utilized in resource-limited settings because they provide timely information for clinical management and reduce the need for follow-up visits. Our objective was to describe the implementation challenges of changes in patient flow and health worker roles for sexually transmitted infections (STIs), tuberculosis (TB), and HIV POC services at the Communicable Disease Center (CDC).

The CDC is the largest government out-patient TB and STI treatment facility in Durban, South Africa. It is located in Durban's central business district, directly adjacent to a transport hub for rail, bus, and minibus taxis that serve commuters from local townships.

Methods

- Interviews were conducted with 20 clinic staff, including nurses, physicians, lab technicians, administrators, and guards.
- Patients and practitioners were followed in time-in-motion studies over an eight-week period.
- Descriptive statistics were used to compile and summarize the data.
- POC testing was utilized for HIV screening (ABON Tri-line) and TB testing (Xpert MTB/RIF), but was not used for HIV viral load or STI diagnosis.

Acknowledgements & Contact Info

Thank you to the CDC staff and patients who made this study possible. Funding was provided by the UW MSRTP Program and the Infectious Disease Society of America.

Contact: kjstime@uw.edu

Results

Arrivals

Many patients arrived at 5:30am despite the clinic opening at 7am. Reasons for arriving early included:

- to avoid long lines later in the day
- to avoid confusing queues and losing his or her spot
- to get to work on time
- to avoid disclosing his or her status at work
- to make the cutoff time for bloods to be driven to the central lab

Patients with STIs

- 5 steps to complete a visit (figure 1)
- Average total visit time: 1h 50min (range 0:28 to 3:31, n=39)
- Average clinical appointment: 7min (range 0:01 to 0:20, n=37)

Patients with Chronic HIV

- Patients renewing medications waited in 3 queues (figure 2)
- Average total visit time: 2h 42min (range 1:25 to 3:50, n=27)
- Average clinical appointment: 7min (range 0:03 to 0:15, n=27)

Patients being Screened for TB

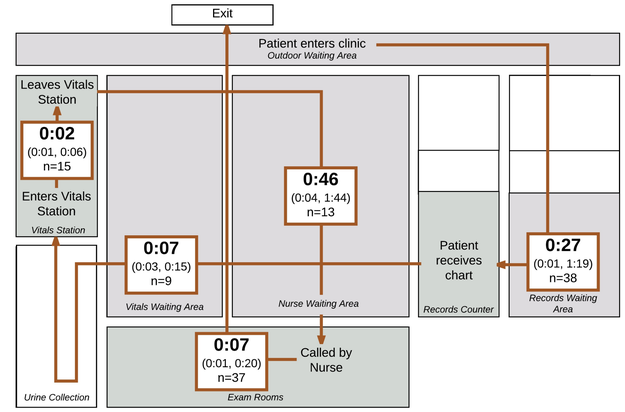
- Xpert MTB/RIF TB testing can be performed in 90min
- Average time from sputum collection to result delivery: 4h 16min (range 3:53 to 4:52, n=6)
- 40% of patients were asked to return the following day for their results (n=10)

Staff Interviews

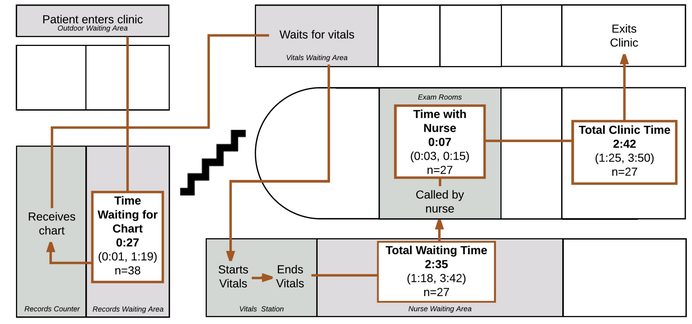
While staff realized the potential benefits of POC testing, they identified significant challenges to implementation including patient volume, long assay times, broken machine slots, and limited clinical space.

"If a patient's TB sputum sample isn't collected by 10am, it's too late and the patient has to come back the next day for results." – CDC Nurse

"It's important that POC tests are actually implemented as POC tests. If it ends up taking 24 hours to get results, then it makes no difference if the test is done at the CDC or at the central lab." – CDC Doctor



(Figure 1) Clinic floor plan and time spent in each room during an STI patient visit



(Figure 2) Clinic floor plan and time spent during an HIV patient visit

Interpretation

- This busy urban clinic in Durban, South Africa, had several queues for STI management and chronic HIV care, which resulted in long clinic visits.
- POC testing was underutilized at the clinic, and POC TB testing often did not provide same-day results.
- Implementing POC testing can deliver timely information for clinical management and improve patient care, but considerations must include existing clinic workflow, personnel, and capacity.