HIV Testing in Jails: Comparing Strategies to Maximize Engagement in HIV Treatment and Prevention

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Study Aims & Objectives

The goal of this study was to evaluate the impact of third generation, rapid point-of-care (rPOC) vs. fourth generation, laboratory-based antigen/antibody (lbAg/Ab) testing on the HIV care cascade in a large urban jail during a planned transition between these testing strategies.

We hypothesized that rPOC testing would result in more HIV individuals leaving the jail with their HIV test results than after the transition, when the jail switched to the lbAg/Ab testing strategy.

> **What would be the best way to test for HIV in a jail setting, where the population is constantly changing?**

Materials & Methods

Study Design:

- Retrospective cohort study

Study Population:

- >90% African American, 5% Latinx, and 3% White. Nearly all entrants live at or below the 200% poverty level
- Approximately 92% of intakes are persons born male
- Male median age of 33 years and a female median age of 37 years
- About 55% of patients have a history of substance abuse, mental illness, or both
- Median length of stay in the D.C. DOC is 24 days for men and 13 days for women
- HIV prevalence in the jail ranges from 1-2%, with an average estimated population of approximately 30 PLWH at any given time before the COVID-19 pandemic

Data Collection:

- We utilized aggregate historical data from two testing periods:
  - January 2019 – August 2019 for rPOC testing
  - October 2019 – January 2020 for lbAg/Ab testing
- Calculated analysis variables included: monthly rates of HIV test acceptance, HIV test results received, antiretroviral therapy (ART) initiation, and proportion of PLWH receiving discharge planning prior to release

Intervention:

- In September 2019, the D.C. Department of Health (DOH) recommended a transition to lbAg/Ab testing, which would be done in conjunction with a battery of other blood tests drawn at intake.
- At intake, Unity Health Care notifies entrants that they routinely test nearly all patients, but persons can decline or defer testing
- Entrants known to be living with HIV, either through self-identification or a previous stay, are usually not re-offered HIV testing.
- Those tested within the last 6 months at the D.C. DOC are also not routinely retested.
- After transitioning to the laboratory-based strategy, the HIV test was added to a larger infectious disease screening panel and may have been conducted perfunctorily, regardless of the previously identified status of an entrant.

Statistical Analysis:

- From the aggregate data, we tabulated the count data for our outcomes of interest and compared the averages for each time period using two independent sample t-tests with with a 5% critical level of significance.
- We then conducted an interrupted time series (ITS) analysis to assess the significance of the difference in outcome variables between each testing phase using negative binomial models.
- The primary independent variable in the ITS analysis was an indicator variable of lbAg/Ab testing, which had a value of 0 prior to October 2019 and a value of 1 after October 2019.
- We calculated incidence rate ratio (IRR), which was expressed as a rate change in percentage between the two testing phases.
- September 2019 was considered a transition period and excluded from the ITS analysis
- We additionally included two-time variables to assess the time trends of rate changes during the two testing periods respectively.

Background

Despite 15% of individuals entering jails with undiagnosed HIV infection[1], routine HIV testing is not standard in U.S. jails.

Maximizing the yield and speed of HIV testing in detention facilities could promote rapid entry/re-entry into care for those who newly test positive or have fallen out of care.

A previous study in the Fulton County jail in Georgia[2], showed that rapid, opt-out testing was cost-SAVING compared to a laboratory-based testing strategy at intake.

The Washington D.C. Department of Corrections (D.C. DOC) system consists of a single large urban jail, which ranks among the top 75 largest jails in the country.[3]

The D.C. DOC offers opt-out HIV testing at entry and transitioned from rPOC testing to lbAg/Ab testing in September 2019, providing a critical opportunity to study optimal HIV testing strategies in the jail setting.

Detailed Results

Table 1. Descriptive Statistics of HIV Care and Treatment Outcomes in the D.C. DOC Per Month

Variable	Rapid Point-of-Care Period (January 2019-August 2019)	Laboratory-Based Antigen/Antibody Period (October 2019-January 2020)	Statistical Test
	Mean [Standard Deviation]		t-value (p value)
Total Jail Entrants	759.4 [22.2]	735.3 [10.8]	-2.0 (0.07)
Rate of HIV Tests Accepted + Performed	66.0 [4.9]	88.4 [1.8]	8.6 (<0.0001)
HIV+ Test Result	0.8[0.9]	4.0 [2.4]	2.6 (0.07)
Rate of HIV Test Result Positivity per month	0.2 [0.2]	0.6 [0.4]	2.9 (0.02)
Rate HIV Test Results Received per month	~100%	87.6 [0.9]	--
PLWH Treated with ART on the 1st of the Month	51.3[5.8]	62.8 [4.8]	3.4 (0.007)
Rate of PLWH Treated with ART at any point during the month while jailed	88.7 [9.0]	91.2 [2.5]	0.5 (0.6)
PLWH Received Discharge Planning Visit	35.5 [5.7]	29.8 [5.0]	-1.7 (0.1)
PLWH Released per month	20.5 [3.7]	18.8 [3.6]	-0.8 (0.5)
Ratio of Discharge Planning Visits per PLWH Released	1.8 [0.3]	1.7 [0.5]	-0.5 (0.7)

Table 2. Level and Trend Changes in Predicted Rates[a] in HIV Care and Treatment

	Rapid Point-of-Care Period (January 2019-August 2019)		Laboratory-Based Antigen/Antibody Period (October 2019-January 2020)	
	Baseline[b] (%) (95% CI)	Pre-Transition Trend[c] (Δ%) (95% CI)	Transition Change[d] (%) (95% CI)	Post-Transition Trend[e] (Δ%) (95% CI)
Rate of HIV Tests Accepted by Patient	64.7 (55.8, 75.0)	-0.4 (-2.8, 2.1)	38.5 (14.0, 68.3)	-0.9 (-7.3, 6.1)
Rate of HIV Results Received by Patient	100 (99.2, 100.8)	0.0 (-0.1, 0.1)	-13.1 (-14.0, -12.1)	0.6 (0.3, 1.0)
Rate of PLWH Treated with ART on the 1st of the Month	83.2 (70.3, 98.1)	-1.1 (-3.8, 1.6)	12.8 (-9.1, 39.9)	-1.9 (-9.0, 5.7)
Ratio of Discharge Planning Visits per PLWH Released	1.6 (1.1, 2.7)	-1.8 (-7.8, 7.2)	11.4 (-45.9, 90.1)	-5.6 (-23.2, 22.6)

[a] Probabilities modelled using segmented linear regression models;
[b] Refers to the predicted probability of outcome in August 2019, the end of the first testing phase;
[c] Refers to the modelled change (%) per month during the pre-transition period;
[d] Refers to the modelled change (%) immediately after the transition to lbAg/Ab testing compared to immediately before the transition;
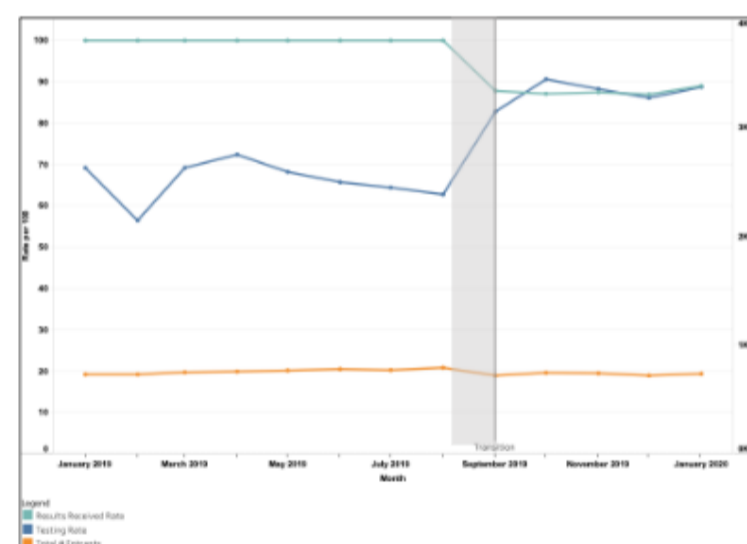[e] Refers to the modelled change (%) per month during the post-transition period.

Figure 1. Total number of entrants and rate of HIV testing, and results received, Washington D.C. Department of Corrections Jail, 2019-2020.

Main Findings & Conclusions

The transition from point of care to laboratory-based testing contributed to:
- A significant increase in the rate of HIV testing and decrease in the rate of HIV results received
- A non-significant increase in the rate of PLWH receiving ART and in the number of PLWH receiving discharge planning
- A statistically significant positive trend in the receipt of HIV results during the lab-based testing period, with the rate increasing by 0.6% each month following the transition.

In a jail offering phlebotomy-based laboratory testing on all entrants, we observed an increase in HIV testing rate following a transition from point of care to lab-based testing, however, point of care testing averted the delays in receiving test results associated with lab-based testing in a jail.

Our study in the D.C. DOC of moving from point of care to lab-based 4th generation testing demonstrated the importance of testing volume with the volume of tests performed with the new testing strategy, in addition to receiving HIV test results at the point of care to ensure that all persons living with HIV and circulating through the correctional system are aware of their HIV status. In contrast, a rapidly churning jail like the Fulton County jail[2], the speed of test result return was more important. This shows that in choosing the best testing strategy, local context is important. Moving forward with this presented research, we are currently doing a prospective study comparing lab-based 4th gen testing to a combination of 4th gen & point of care testing strategies, to examine both testing volume and speed of return of results. With this new study we will evaluate if the combination of these testing strategies results in more persons being tested, and in turn, more being treated sooner.

Literature Cited

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Acknowledgments

> In the DC jail, all persons tested received their result with point-of-care testing, yet the strategy of offering all entrants laboratory-based tests so successfully raised the testing rate that in the end, the percentage of persons going home with a test result in hand increased. In a jail with slow turnover, the speed of returning results had less influence on people learning their status than in a jail with shorter lengths of stay. MORAL: tailor choice of test to local conditions.