Fundamentals of Implementation Science

Using Routine Data Systems to Bridge the Know-Do Gap and Improve Implementation

Week 1 case study

Nancy Puttkammer, MPH, PhD - Assistant Professor, Department of Global Health and International Training and Education Center for Health (I-TECH) – University of Washington

I'll be speaking with you today about a study on implementation and outcomes of the *Test and Start Initiative.* This was an effort to establish universal HIV treatment following HIV diagnosis that was first promoted by the World Health Organization (WHO) in 2015. The setting for our study is Haiti and the study is a result of a collaboration between many different partners including: the Haitian Ministry of Health (MOH), the US Centers for Disease Control and Prevention (CDC), our group at the University of Washington called I-TECH, our local Haiti partner called CHARESS, and another partner organization the National Alliance of State and Territorial AIDS Directors or (NASTAD).

Background

Our study of test and start in Haiti was an observational retrospective cohort study. It used data from the iSanté Electronic Medical Records (EMR) system. This is a large scale EMR implemented in more than 100 health facilities in Haiti and containing longitudinale data for about 70% of all HIV patients in the country. We also used data from National HIV case-based surveillance database called SALVH, which is a National scale system containing records on all patients diagnosed with HIV in Haiti since about 2004. The SALVH data system allowed us to match records for patients who may have moved between health facilities, and so the linkage of the EMR data and the surveillance database really strengthened our study. We were able to find out exactly when each person was diagnosed with HIV and identify when and where they started their treatment. In all, there were more than 147,000 patients in our study diagnosed from 2004 to 2018, across 94 health facilities. Again, this represented about 70% of all people with HIV (in Haiti) in that frame. We studied a couple of outcomes. The first was timeliness of ART initiation and the second was whether patients were actively participating on antiretroviral therapy or ART, six months after their HIV diagnosis.

IS Methods Applied to Haiti Study

We carried out our analyses using a variety of statistical methods. We used Kaplan Meier method to analyze the time to ART initiation. We examined frequency tables and carried out Chi-squared tests, as well as logistic regression.

Primary Findings: Test & Start Implementation

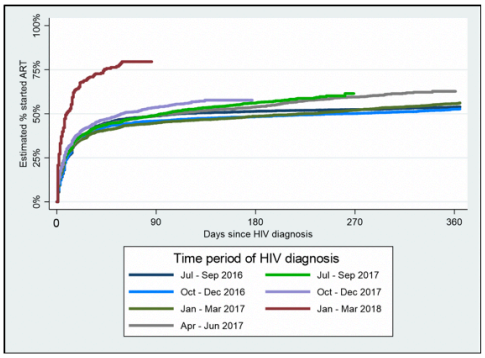


Fig 1: Kaplan Meier curve for estimated time to ART by calendar quarter of diagnosis

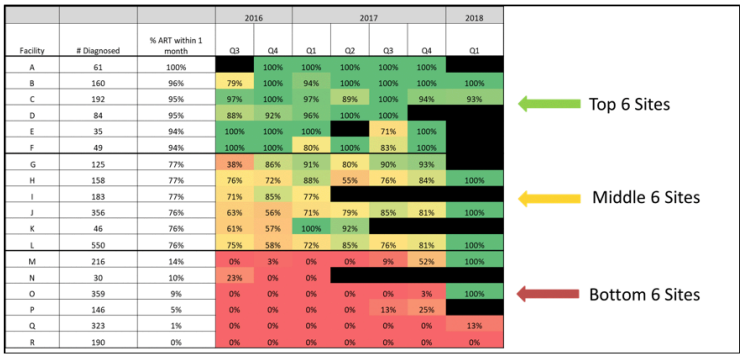
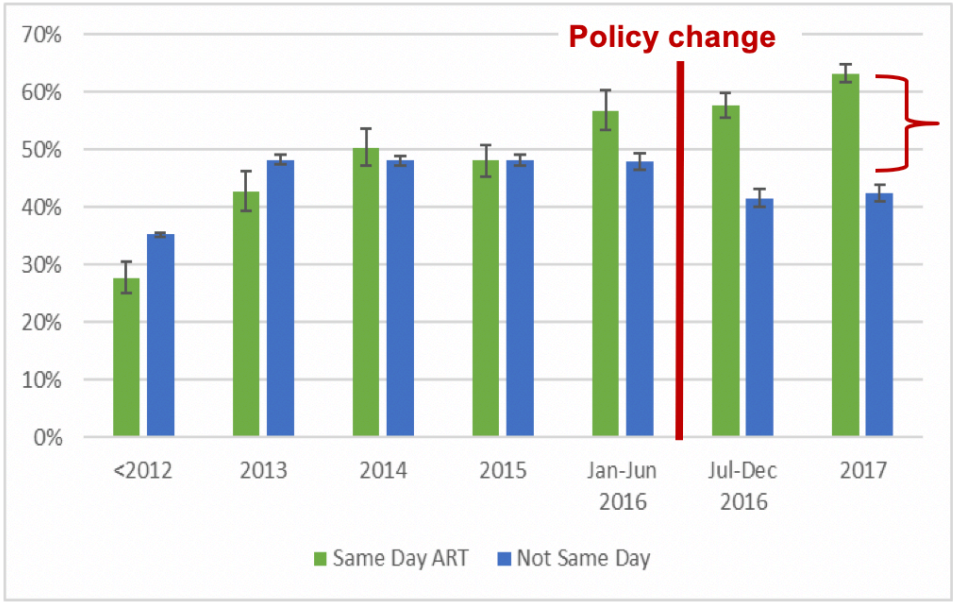


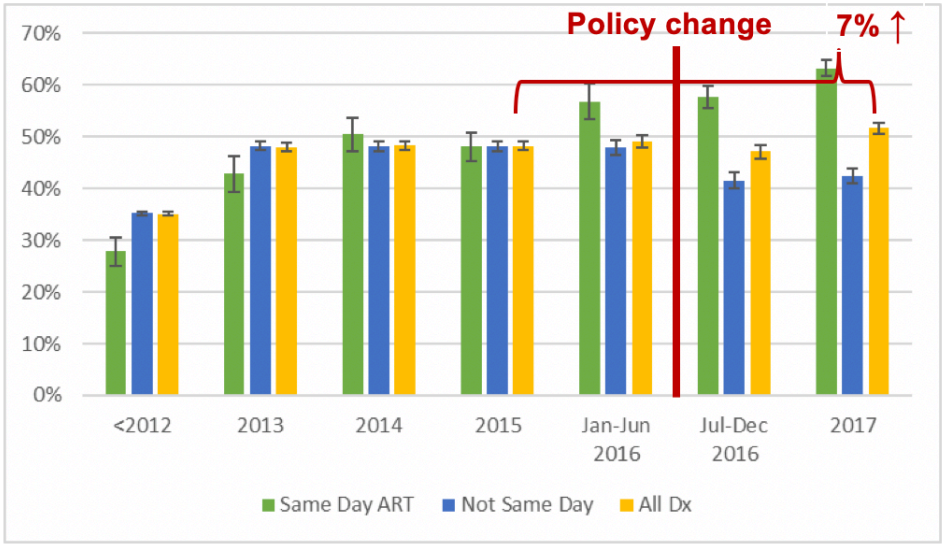
Fig 2: Heat map by facility, for proportion of patients diagnosed and started on ART within 1 month of diagnosis

This slide shows some of our findings about test and start implementation in Haiti. The policy itself was adopted in July of 2016 and we can see from the figure at left (the Kaplan Meier plot) that the time from HIV diagnosis to ART initiation did not really change for the first 18 months, after the policy was adopted. We see a lot of those lines for patients diagnosed each quarter really overlapping, but then we can see that the timing of ART initiation really took off in the first quarter of 2018, when many (more a much higher percentage) of patients were enrolled on ART within three months of diagnosis. The figure at the right shows a heat map for results by each different facility and we see here the top 6 sites, the middle 6, and the bottom 6 in terms of the overall proportion of patients who started on ART within one month of diagnosis. This is broken down by each quarter following the policy adoption. We can see that in the top six sites, most of them were in green, they were achieving very high levels of starting patients on AR T within a month. Excellent results kind of right out of the gate. The middle 6 sites, it was a bit of a more mixed picture where they were having intermediate performance early on but then steadily improving over time. In the second figure, here we see a heat map by health facility for the proportion of patients who were diagnosed and started on ART within a month of diagnosis. Each column, with each color represents a calendar quarter following adoption of the test and start policy. We can see at that top 6 sites (in the country) that they had very strong performance in terms of initiating patients on ART within one month, really from the get-go. Lots of green there. In the middle 6 sites, we see that their performance was mixed but improved steadily over time. In the bottom 6 sites, these were sites that really struggled to start patients on ART, within a month; with many of them starting fewer than 25% of their patients in a timely way, even well into the policy change period. These findings showing the heterogeneity of implementation of the tested start policy have been used by policy makers at the national-level, to highlight the importance of standardized implementation and to hone in on specific sites to support them to improve the quality of their programs.

Active ART Participation 6 months after diagnosis, by time frame of diagnosis
Among patients diagnosed in 2017, we can see that those who started ART on the same day (with the green bar) were 49% more likely to be active on ART six months later, compared to those who did not start ART on the same day (shown in the blue bar). This shows that rapid ART initiation seemed to be very favorable in terms of reducing loss to follow-up, after diagnosis.



In this slide, we see the same results but with an added bar (the yellow bar). That shows all patients diagnosed with HIV and combines the results for those who started ART on the same day and those who did not start ART on the same day. And when we look at this we can see that the policy change seems to have produced an improvement, but a rather incremental improvement. A 7% increase in the overall level of patients who are active on ART six months after diagnosis, when comparing 2015 (before the policy change) to patients diagnosed in 2017 after the policy change. So, it seems that things are headed in the right direction, but rather incrementally.



Conclusions

The conclusions we took away from our study were that Test and Start is a very complex initiative, which was widely implemented over time, in Haiti. It did take some time for it to scale-up fully. After scale-up, there were still about one third of all HIV diagnosed patients in Haiti who were not starting ART within a month; so, this points to further work needed to reach all patients. We could also see that same-day ART was favourable, but again that more work is still needed to reach the targets of truly universal treatment.

Reflections

Our study is one example of an observational study using routine data sources to assess strengths and gaps in policy implementation. The advantages of this type of study are that really shows real-world conditions and achieves wide coverage of the population through the routine data sources. Implementation science (using this type of data source and carrying out this type of observational study) does rely on high quality routine information. So, it is very important to have a good understanding of the completeness and the accuracy of the data source or sources. In this case, we had done several prior data quality assessment studies to understand the strengths and limitations of the EMR data. In this example, we focused ART participation because we knew that there was very good data in the data systems about ART dispensing; we could tell when patients had come to the clinic to pick-up their ART medications. We would have liked to study the biologic outcome of viral load suppression, but we knew that in our data source HIV viral load results were only available for fewer than 40% of ART patients. That's based on the fact that viral load testing is still in the process of being scaled-up in Haiti. It's important (in this context) to very carefully select the suitable analytic methods. To study viral load testing, where results are only available on a portion of patients, it's very important to think through carefully the methods one uses, considering methods such as imputation for missing data or propensity score weighting methods to account for selection bias in the availability of the viral load results data, for example. Overall, with this case study, we can see that investing in data quality and strong data access can help to get critical information to decision makers, which they can then use to improve the health system.

Acknowledgements
I'd like to close by acknowledging the many co-authors and collaborators who worked with me on this study they're shown here on this slide as our funding sources.

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