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Columbus Public Health: A Lean Approach to Syphilis Reduction in Franklin County, Ohio

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A Lean Approach to Syphilis Reduction in Franklin County, Ohio

Columbus Public Health uses process-improvement techniques to tackle outbreak

In 2016, Franklin County, Ohio, was in the midst of a syphilis outbreak: Between 2013 and 2015, early syphilis rates in the county had increased by 65 percent, which was three times the rate for the entire state of Ohio. Syphilis is a sexually transmitted infection (STI), which if left untreated can cause vision loss and irreversible damage to the brain and other organs in as little as one year. And, like many STIs, it can persist and be spread with no noticeable signs or symptoms. The only way to know for sure if an individual has syphilis is to be assessed by a healthcare provider for syphilis. If tested and found early, syphilis can be diagnosed and cured.

In the summer of 2014, Columbus Public Health staff began to see data indicating an increase in syphilis cases. "We noticed a trend also by talking with Sexual Health staff," says Denisse Licon McClure, Epidemiologist at CPH. "They noticed an increase in their workload. There were a lot of people coming into the clinic, and we were just seeing more and more syphilis [cases]." From 2013 to 2014, the rate of syphilis cases had increased by 38 percent.

Columbus Public Health (CPH), in conjunction with the Ohio Department of Health, receives and analyzes STI data, including data specific to syphilis, says Tanisha Pettus, Program Manager for the Prevention Services Program. The information is compared to previous years' trends, national and state data, and data from Ohio's other major metropolitan areas, such as Cleveland and Cincinnati. Disease intervention specialists (DIS) follow up with every syphilis case to assure education and treatment. Management, epidemiologists, and DIS review data and conduct briefings to identify trends, risk factors, disparities, and comorbidities.

Most early syphilis cases were being diagnosed in men who have sex with men. Specifically, data indicated increased rates among African American men who have sex with men less than 30 years of age and among white men who have sex with men greater than 40 years of age. There also was an increase in congenital syphilis cases, meaning infants born to women who had been exposed to syphilis and not treated at least 30 days prior to giving birth. "Having one congenital case is one too many," says Pettus. "The significant increase to seven [congenital syphilis cases] was pretty substantial."

In September 2015, with early syphilis case rates continuing to rise, the CPH issued a public health alert to area medical providers. This alert reinforced recommendations from the

Columbus Public Health

Columbus Public Health (CPH) is a 400-staff department of the City of Columbus. The mission of CPH is to protect health and improve lives in the community. CPH is the leader for identifying public health priorities and mobilizing resources and community partnerships to address them. Within CPH, the Clinical Health Division includes four specialty clinics — Sexual Health, Women's Health, Immunizations, and Tuberculosis — and a Sexual Health Promotion unit, which oversees community-based positive youth development, HIV/STI testing, prevention services, the Housing Opportunities for Persons with AIDS (HOPWA) program, and the Ryan White Part A HIV Care Program.

Centers for Disease Control and Prevention (CDC) related to the screening and treatment of syphilis. It also disseminated a syphilis hotline for medical providers to call with questions or concerns.

It is not uncommon to see changes in the syphilis case rates, says Audrey Regan, Sexual Health Promotion, Director, but an increase of this magnitude indicated an overall infection rate in the community is growing and concerning. CPH staff had become aware of the Academy for Excellence in Healthcare (AEH) at The Ohio State University, and believed the training program could help them develop new ideas to lower syphilis-infection rates.

Lean Learning and Application of Concepts

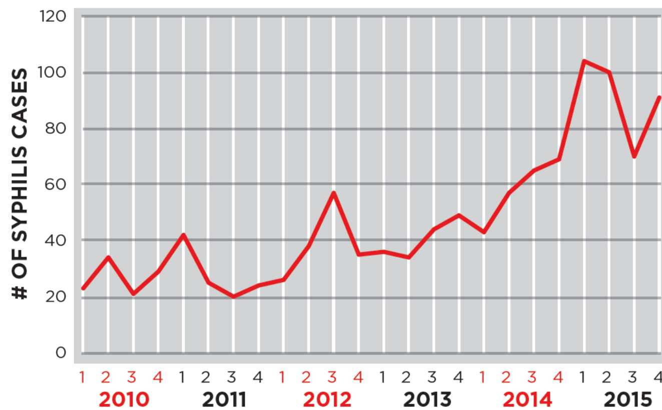
A CPH improvement team received training at AEH in July 2016. Caitlin Kapper, Public Health Quality Assurance Coordinator, says the CPH has worked with OSU's Infectious Diseases clinic and College of Public Health in the past, but this was the first time working with AEH, which is a collaboration between OSU's Fisher College of Business and Cardinal Health. At the initial one-week of training at AEH, the team learned about lean tools and techniques, such as voice of the costumer, process mapping, Five Whys, benefit/effort matrix, root-cause analysis, and other problem-solving techniques. The team reported their progress with their improvement project to AEH in October 2016, at which time they received additional training on lean management systems.

CPH Improvement Team

- Caitlin Kapper, MPH, Public Health Quality Assurance Coordinator
- Tiffany Krauss, RN, MSN, Clinical Health Division, Director
- Denisse Licon McClure, PhD, Epidemiologist
- Tanisha Pettus, MSA, Disease Intervention Specialist
- Audrey S. Regan, PhD, Sexual Health Promotion, Director

Infection rates had clearly risen (see *Syphilis Cases in Franklin County*), but the team needed to look deeper into the data — determining who was being infected could help to guide their reactions. The CPH improvement team found that 155 individuals had more than one syphilis diagnosis from 2010 to 2015, and these individuals contributed to about 25 percent of all syphilis cases. Furthermore, most of these people (82 percent) had an HIV co-infection.

Syphilis Cases in Franklin County



Source: Columbus Public Health

Of those individuals co-infected with HIV, 70 percent had received Ryan White Part A service. "The Ryan White program is essentially a health insurance program," explains Regan. "It pays for primary medical

care for individuals who are low income and HIV-positive, and then it also provides a lot of the social supports that are necessary to keep people engaged in care. One of the key pieces of that is social work support, which we call medical case management." Case management consists of social workers in clinics and in community settings, who address the medical and social needs of individuals that may have barriers to care, such as housing, food, transportation, and financing. The group helps clients overcome those barriers when navigating the system.

"We even took a deeper look and saw, of those clients that were enrolled in the Ryan White program, most of those clients were actively engaged and virally suppressed, which is the ideal state and means they are taking their HIV medication as prescribed by a healthcare provider," says Kapper. Most of the clients also were being screened for syphilis annually. Client compliance with HIV medication, however, does not equate to safer sex practices. This data brought awareness to the team that syphilis-specific information needed to be communicated throughout the Ryan White network, including to specific infectious disease providers and the medical case managers.

The improvement team also examined internal practices when dealing with clients and local medical staff. They met with frontline staff, educated them on lean principles, listened to their insights about persons with syphilis, and used the Five Whys technique to better understand how they worked with the client community (see *Defining the Client Path with Five Whys*). Because of difficulty in recruiting clients, the improvement team conducted targeted, voice-of-the-customer interviews with frontline staff from CPH. "They could speak on behalf of their clients and their peers, in some instances," adds Kapper.

Defining the Client Path with Five Whys

Source: Columbus Public Health

The team mapped the syphilis-treatment process, asking frontline staff to define what a client goes through — notification, testing, and treatment — as well as what the client goes through in the Ryan White process. "They were having Ryan White services or HIV treatment, and they were also having syphilis testing and treatment, so we wanted to look at both of those," says Kapper. "We utilized both the process map and the Five Whys to show areas of need."

The team saw that HIV was a parallel treatment process, but not necessarily one that involved access to the same information or interaction with the same staff. For example, different medical staff may treat the same patient for syphilis and for HIV, unaware of the others' actions.

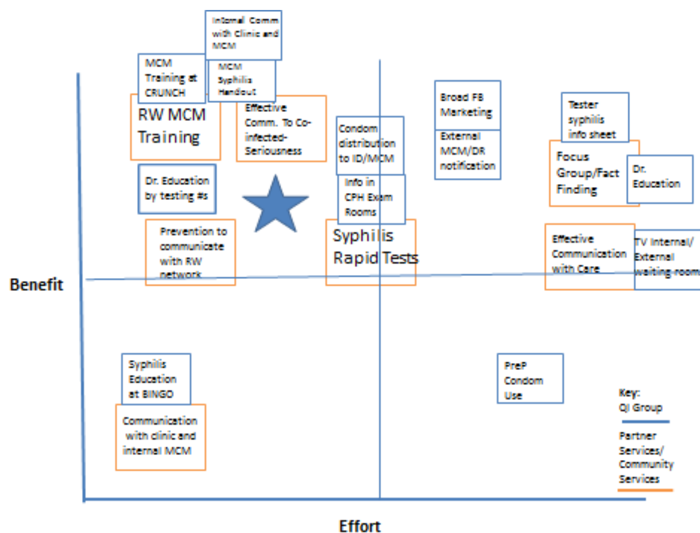
"Narrowing down the scope, using the Five Whys to identify our problem statement and contributing factors to the syphilis outbreak, and process mapping were critical and useful tools, particularly as we came back and started educating frontline staff," adds Pettus.

Selecting and Applying Countermeasures

The root cause of syphilis infection is unprotected sex with someone who has untreated syphilis. Always using a condom or other barrier method correctly is effective in preventing the spread of syphilis. "Increasing correct and consistent condom use is a challenging and intense approach," says Regan. "That is where the benefit/effort matrix came in to help us out (see *Benefit/Effort Matrix*). Instead we looked at the next layer: if you screen people more often and get them treated faster, then they'll spread the disease to fewer individuals."

Using the lean techniques they had learned at AEH and their continued evaluation of the problem, the team brainstormed recommendations, many of which they had not previously considered. They plotted their countermeasures on the benefit/effort matrix, scoping their project to where they believed they could make the most impact in helping them to achieve their goal. (In early 2016 at a quality-improvement leadership retreat, a goal was established to stabilize the syphilis rates from 2015 to 2016.)

Benefit/Effort Matrix



Source: Columbus Public Health

The team's coach at AEH, Ken Robinette, a VP at Cardinal Health, helped to steer the team toward countermeasures for which they could generate some movement, says Kapper. "We were being overwhelmed with the root cause. Behavioral change is difficult and something we continue to attempt to move the needle on, but there needed to be more, and we knew that from our increasing syphilis rates over the years." Three countermeasures were identified as priorities by the team. At the time of the October AEH report-out, implementation was underway on two of the three:

Education and Competency Building of Ryan White Medical Case Managers

The team wanted to develop more syphilis and sexual health information, especially for Ryan White medical case managers. Ryan White clients are seen by medical case managers in-person

for an in-depth biannual psychosocial assessment. The team quickly learned that the assessment was not specific to syphilis testing, treatment, or risks. Furthermore, many case managers were unaware of educational materials, community screening sites, or how to make an appointment for treatment. "We have added multiple questions to this assessment that discuss syphilis, specifically, and also discuss syphilis risk factors — e.g., skin contact that may expose a client as well as if a client has tested in the past for syphilis and what the results of those tests were," notes Kapper. "Those changes by the team have been made, and that is actually a statewide document. All of our Ryan White clients throughout the state are now asked additional syphilis questions."

The team also began building competency of the Ryan White medical case managers and increasing their knowledge, not only around syphilis transmission, treatment, and testing, but also on all sexually transmitted infections. "If a client does indicate that they have been tested for syphilis or if they indicate to the case manager that they may have had a partner who has tested for syphilis, case managers are now educated on places that treat and that test, and are able to have a more educated conversation with the client on the risk factors," says Kapper. The CPH team also is looking at how case managers would like to consume and use information, such as providing them with talking points that can guide a conversation, and developing material at the right health literacy level — not too clinical and covered in a way that clients will understand.

Communication Strategy with Medical Staff

During the team's data analysis, they identified five community physicians that were diagnosing the vast majority of syphilis cases, particularly among the county's clients with more than one syphilis diagnoses. This information indicates that Central Ohio's infectious disease providers are following CDC guidelines related to screening for syphilis. However, because of the high morbidity in Franklin County, especially among HIV-positive gay and bisexual men, that cadence of screening is insufficient. "We've had casual conversations with four out of those five providers, and one provider changed their practice already to doing more routine syphilis screening," says Regan. "We're going to meet with the others and encourage them to encourage their clients to be screened quarterly rather than annually."

Regan notes that the physicians were generally following CDC recommendations on syphilis treatment — screened once per year — but the CDC recommendations can be interpreted in different ways. For example, providers in high morbidity areas should be screening clients more frequently, but "high morbidity" is not defined. CPH staff believe Columbus would qualify.

"There is no resistance to it [among physicians]," adds Regan. "I just don't think that the providers were aware that we probably fall into that high morbidity area. And I don't think providers necessarily were picking up the patterns that their clients were being diagnosed with syphilis repeatedly. They would have no reason to analyze their data to track the number of syphilis cases among their clients… However, these clients are generally virally suppressed, which means they are managing their HIV very well. They might only see their infectious disease

> provider once a year — that's what the current recommendation is. That's why the messaging with providers is really around, 'You can bring your client in and re-screen them once a year, or refer them to other community resources.'"

A third countermeasure was to establish a notification process for when a positive test result occurred and develop the technological ability to alert other clinical staff (e.g., medical case managers, infectious disease doctors). For example, Disease Intervention Specialists should ideally be able to electronically share information about their client with Ryan White medical case managers staff so risk-reduction education occurs in that program with the client. This is not feasible short-term. There is no interface of data among computer programs, and this countermeasure would have required overhauling of several data systems operated by different agencies to get them to speak to each other, notes Regan.

Progress and Next Steps

The CPH team is continuing to implement the two countermeasures. In early February 2017, data for full-year 2016 was not yet available. However, preliminary data indicates that while there was still an increase it was substantially smaller than the percentage increase CPH had seen in prior years, according to Regan. Considering that the team's intervention did not start until the last quarter of 2016, the finding is encouraging.

Pettus believes the project is successfully moving in the right direction, and that there have been qualitative benefits to CPH: "Staff has responded in a positive manner. We have been able to establish a better relationship with frontline staff that we may not have necessarily had in the past. Their voices are being heard. We're taking a look at what their needs are in terms of how they can better reach clients in the community, since they are the ones who are interacting with them the most."

"We have made headway, with frontline staff being a real large part of this process," adds Kapper. "I do feel like that is at the center of our success. We've learned so many great things from the people actually doing the work. It seems simple, but the successes and the lessons learned from our frontline have been so valuable — we really want to continue that as we look at other problems within Sexual Health Promotion, allowing frontline staff to tell the stories themselves and speak on behalf of their client because they know best."

CPH also has had unsolicited requests for presentations about their work out in the community to a statewide group of Ryan White medical case management agencies. "That is a real positive," notes Regan. "It shows not only that we are a trusted entity but that these other organizations feel syphilis and co-infection rates are important enough to train their staff."

In January 2017, the improvement team reported out on the project to Columbus' health commissioner and CPH upper leadership. Other quality improvement projects taking place in other divisions and other programs also made presentations. The CPH improvement team saw how what they had learned at AEH could be applied elsewhere in the department. "I think some of the tools that we've learned certainly

could be applicable to some of the other quality improvement projects, [such as application of] lean principles and utilizing process flow mapping," says Krauss. For example, groups working on the spread of hepatitis C have begun process mapping in order to streamline their processes in their program, with assistance of some CPH team members.

CPH team members also have had conversations with the Ohio Department of Health on ways to work together with other large municipalities in the state where syphilis co-infection rates are similarly high. They have also made the department thoroughly aware of their approach for syphilis prevention so it can promote the countermeasures to other disease intervention specialists in the state.

Throughout the process, the CPH team has had access to the agency's leadership as well as its support. "We had been working on the syphilis issue for a while," says Krauss. "I think they were very supportive and excited that we would take this issue and try to look at it from a different perspective to try to make some headway. [They gave us] a week to go and work on this project. I think they saw great value in us doing that. It also supports our culture of quality here at Columbus Public Health, that all of us were trained on lean principles and can train the trainer, if you will, and be resources for other projects. They saw great value in us doing that."

AEH Commentary

The CPH improvement project illustrates the far-reaching applicability of many lean concepts in all corners of the healthcare industry. Fundamental to lean is a thorough understanding of the problem, based on data and from perspectives of those who work amid the problem and from the patient/client. For the latter, AEH introduced team members to techniques to engage frontline staff in a meaningful way, one in which their experiences and ideas helped to shape solutions. Having CPH leadership also support and apply resources to this unique problem-solving approach emphasized the significance of the outbreak and the improvement project, and helped to rally staff in addressing the problem.

This public-health project to stabilize the rate of syphilis infections in Franklin County also shows the importance of scoping projects to an area that has potential to yield impactful results while still being one that is feasible and efficient. Lean tools, such as the benefit/effort matrix, helped CPH team members identify countermeasures to deliver the best results for the resources invested. The lessons learned when examining and *solving* even a tightly scoped project eventually can be expanded and applied to broader facets of the problem and other problems that CPH confronts daily.

About AEH

The Academy for Excellence in Healthcare blends in-person class time with hands-on project work, interactive simulations, and recurrent coaching, all aimed at helping healthcare teams spark actionable change at their organization. At the heart of this program is a real-world workplace problem each participant team selects and commits to solving through five intensive days on campus, followed several weeks later by two days of project report-outs and lean leadership training. This project-based approach pays immediate dividends and lays the groundwork for transformational change.

In collaboration with

A Lean Approach to Syphilis Reduction in Central Ohio

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