

Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title *(Must match poster title; include key words in the title to improve electronic search capabilities.)*

Congenital Syphilis Predictors Among Pregnant People with Syphilis in Oregon

Student Investigator's Name

Nicole Lund

Date of Submission *(mm/dd/yyyy)*

3/16/2023

Graduation Year

2023

Project Course *(Indicate whether the project was conducted in the Scholarly Projects Curriculum; Physician Scientist Experience; Combined Degree Program [MD/MPH, MD/PhD]; or other course.)*

Scholarly Projects Curriculum

Co-Investigators *(Names, departments; institution if not OHSU)*

Mentor's Name

Timothy Menza, MD, PhD

Mentor's Department

Dept of Infectious Disease, OHSU & Division of STI/HIV/HepC, OHA

Scholarly Project Final Report

Concentration Lead's Name

David Buckley, MD, MPH

Project/Research Question

The purpose of this study is to identify and contextualize the main risk factors of congenital syphilis (CS) among persons diagnosed with any stage of syphilis during pregnancy in the tri-county area (Multnomah, Clackamas, and Washington Counties).

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Public health research study

Key words *(4-10 words describing key aspects of your project)*

risk factors, predictors, congenital syphilis, public health, interview, epidemiology, sexually transmitted infection (STI)

Meeting Presentations

If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

Publications *(Abstract, article, other)*

If your project was published, please provide reference(s) below in JAMA style.

Submission to Archive

Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

Scholarly Project Final Report

Next Steps

What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

Data collection and analysis, followed by presentation of data to community stakeholders with the aim of this being used to influence targeted public health interventions.

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

https://ohsu.ca1.qualtrics.com/jfe/form/SV_3ls2z8V0goKiHZP

Student's Signature/Date *(Electronic signatures on this form are acceptable.)*

This report describes work that I conducted in the Scholarly Projects Curriculum or alternative academic program at the OHSU School of Medicine. By typing my signature below, I attest to its authenticity and originality and agree to submit it to the Archive.

X

Student's full name

Mentor's Approval *(Signature/date)*

X

Mentor Name

Scholarly Project Final Report

Report:

Introduction

Sexually transmitted infections are on the rise in Oregon. Recent studies show a 71% increase in new syphilis diagnoses in the past 5 years, and between 2014 and 2018 there was a 185% increase in CS cases in the United States¹. When looking at the rates of primary and secondary syphilis by region of the country, the West has taken the lead in recent years⁴. Syphilis can have detrimental congenital sequelae, making early and definitive diagnoses in women of childbearing age a priority. Previous research has focused on men who have sex with men due to the disproportionate incidence of syphilis in men compared to women. Changes in disease burden in recent years has sparked the need for new research. In Oregon the number of CS cases rose by 400% between 2014 and 2018². This rise in CS indicates a need to focus research and outreach efforts on women of childbearing age.

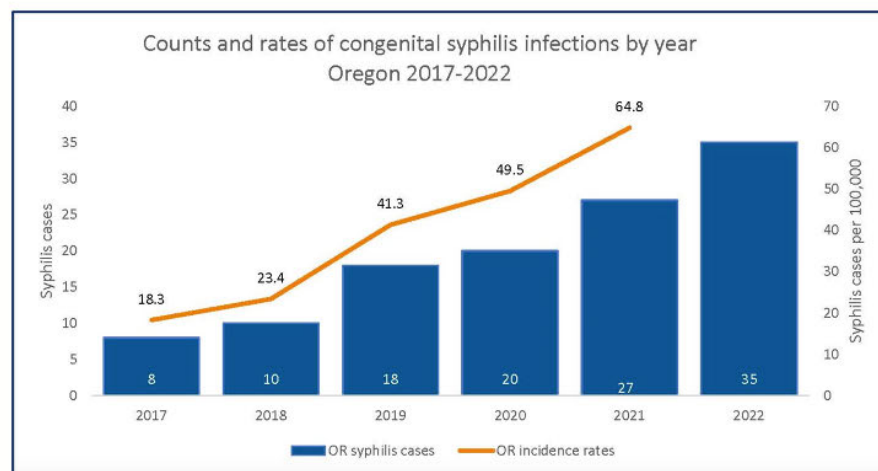


Figure 1. Congenital syphilis counts and incidence rates are confirmed and presumptive surveillance cases. Rates are per 100,000 live births. Preliminary data for 2022 shows a continue increase of congenital syphilis cases. Reported 2022 data are provisional and subject to change. Export date January 9, 2023. ³

Public health data shows that while most Oregon CS cases are born from women who identify as white, a disproportionate number of women identifying as minority racial and ethnic groups are affected⁵. It has also been observed that there is a rising rate of methamphetamine use in women diagnosed with syphilis compared to other drugs, and that these rates are highest in the western states⁴. While the majority of syphilis in pregnant women who become a CS case are diagnosed in their first trimester, there is still a significant number of women who receive no prenatal care and are diagnosed at the birth of their child⁵. Lack of prenatal care and adequate syphilis treatment prior to birth is an area our survey will focus on. We hope to learn more about barriers to receiving prenatal care as well as STI testing and treatment.

This project aims to survey and analyze data of pregnant women in Oregon with syphilis, seeking to identify predictors for women at an increased risk of transmitting this infection to their infant. Our findings will be used to guide prevention efforts at the state and county level, and will assist providers as well as DIS with syphilis outreach, testing, education, and prevention.

Methods

Scholarly Project Final Report

Literature review and community input was used to create a novel survey. Multiple rounds of survey revisions were completed based on local Disease Intervention Specialists (DIS) and state health authority feedback.

This study will be conducted using a retrospective survey housed in a secure database called REDCap that can be used over the phone or in person. Based on previous years data we plan to attempt to enroll around 20 participants. In Oregon there were 18 CS cases identified in 2019 and 10 cases in 2018 most of whom were diagnosed in the tri-county area.⁵ Participants will be identified by county DIS in three heavily populated counties in Oregon, Multnomah, Clackamas and Washington counties. Those who are diagnosed with any stage of syphilis during their pregnancy or at the time of the child's birth are eligible to be enrolled in the study. They must reside in the tri-county area (Multnomah, Clackamas, and Washington counties). Syphilis staging and diagnosis will be based on provider and public health data. Syphilis diagnosis can be based on primary symptoms such as visualization of a chancre with positive dark field or reactive RPR, secondary symptoms (rash, condylomata lata), or reactive RPR with evidence of a non-reactive RPR within the past year or an uptick in titer more than 4 fold from prior testing within the past year.⁶ People under the age of 18 or who do not speak English or are incarcerated at time of screening will not be eligible to participate. We hope to include these underrepresented groups in future research.

Data collected in this survey will mostly be qualitative. There will be thematic analysis of the qualitative data, by pulling selected quotes from surveys that correlate to specific themes. For data that is more quantitative in nature we will perform descriptive statistics and compare participants who meet CS criteria to those who had syphilis during their pregnancy but did not meet CS criteria.

The main predictor variables are race and ethnicity, access and utilization of care, relationship status, housing status, domestic partner violence, traumatic history with medical system, insurance status, employment status, drug use, and other pregnancy details. The outcome variable of interest is congenital syphilis (CS).

Results

This project is currently ongoing. Thus far we have created a survey that can be printed and used in a hard copy format or online through the OHSU REDCap database. Prior to building out the survey, meetings took place with local DIS to discuss important topics they would like to have included in the survey. Key risk factors and questions of interest were identified based on their work experience with this population. These meetings were important for the starting point of the survey as well as community buy in and support of the project.

During the literature review phase of this study we looked at other CS surveys. California and Texas have conducted similar expanded surveys for their CS cases. These surveys did not meet the needs of the local population, and thus were used as inspiration. The California survey was too brief and would not have added much to what is already asked routinely by local DIS and the Texas survey was extremely long and thorough. The Texas survey length would deter some participants, as it was upwards of 90 minutes in length. The RAND corporation Social Support Survey inspired some of the emotional support questions in the survey. The goal was to create a survey that was short in length (around 30 minutes) but rich with qualitative data.

The second phase of the project included iterative review of the survey by key stakeholders such as DIS in the tri-county area, county and state STI/HIV Epidemiologists and Oregon Health Authorities HIV/STD

Scholarly Project Final Report

Medical Director.

The interview is semi-structured and includes both quantitative and qualitative elements. Qualitative interviewing allows clients to tell their story in their own words rather than pre-specified answer choices. This type of interviewing captures a client's words, phrases, and sentences verbatim. Taken together, interviews from many clients may reveal themes in the experience of interest (here, having been diagnosed with syphilis in pregnancy). Rather than reading a question and a set of possible responses, interviewers collecting qualitative data ask a question in a more conversational style and provide time and silence for the client to respond in their own words. The interviewer's job is to capture those words with a data collection tool. If the client is having trouble describing their experience, the interviewer can ask probing questions to help the client unpack their experience while always letting the client speak for themselves. This interview is designed to be dynamic and flexible. At the end of each section, there is an open-ended text box for the collection of client comments or reactions to questions and the interviewees comments and concerns about the questions

During the testing phase the survey took around 35 minutes to complete. Questions are written in plain language and will be read to the participants. It includes open-ended questions that allow participants to freely talk about certain subjects, making the interview feel more conversational rather than a list of questions. This format will add to the richness of our data and help create a comfortable atmosphere for the participant and researcher. The full survey is linked below in Appendix A. Below are a few questions from the survey.

- Tell me about your most recent pregnancy.
- Did you receive prenatal care during your most recent pregnancy? (yes/no)
- Did you use any recreational drugs during your most recent pregnancy? (yes/no)

Figure 2 depicts the overall process for this project, with a focus on the iterative review that will continue as this survey is implemented and feedback is received from participants about what does and does not work well. In this figure data collection and results sharing at the bottom, these are the key next steps in this study. Once data is collected and analyzed the goal is to share this information with local health departments throughout the state and beyond. The goal is for interventions and outreach work by DIS and other public health stakeholders to be focused on risk factors identified in this study.

Scholarly Project Final Report

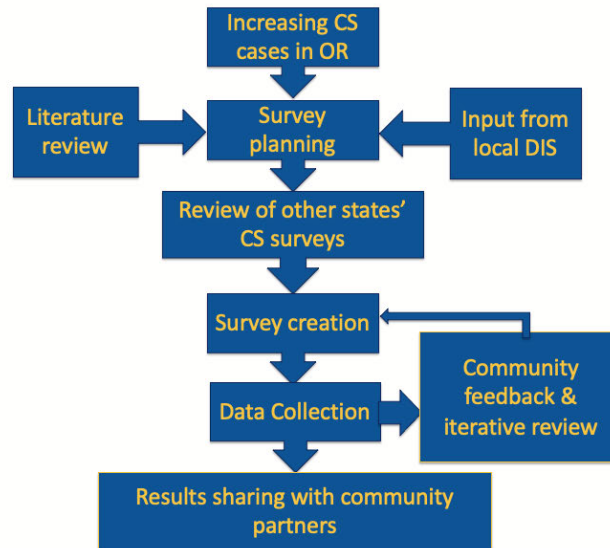


Figure 2. Process map of survey planning, creation, and implementation
DIS (Disease Intervention Specialists)
CS (Congenital syphilis)

Discussion

It was important to be thoughtful about the survey creation process. There were multiple brainstorming and feedback sessions with State DIS prior to and during the creation of this survey. Some challenges we faced when working with various health departments was pushback based on the additional workload of going through the survey, and concerns about not getting enough feedback from the community we are interested in studying. Based on the concerns brought forward about the amount of time burden this would put on DIS we created guidance in the instructions about how to prioritize certain questions in the survey that we felt would be most important to collect as well as which clients would be most important to offer the survey to. We prioritized people who had an infant with congenital syphilis by maternal or infant criteria followed by people diagnosed with any stage of syphilis in pregnancy who did not have an infant with CS and were affected by discrimination based on race or ethnicity and/or challenges related to healthcare access, substance use, mental health, housing, incarceration, or other social determinants of health. Additionally, if they were able to interview people diagnosed with early syphilis in pregnancy who did not have an infant with CS and were not affected by the challenges listed above. Lastly, we ask DIS to prioritize people diagnosed with late/unknown duration syphilis in pregnancy who did not have an infant with CS and were not affected by the challenges listed previously.

As is inherent to most surveys there is potential for recall bias. Our plan is to limit this by speaking with participants either during their pregnancy or shortly after their child is born. This will allow participants to be able to easily recall their pregnancy experience.

Currently, local public health departments are doing a lot of important downstream work by identifying STI cases and doing follow up including education, partner services, treatment verification, and connection to care. We hope to add to this important work and gather information that can help inform future upstream changes, such as alterations in screening and testing procedures or new target populations for outreach work.

Scholarly Project Final Report

The information obtained in this survey will be used to guide public health intervention. Understanding key risk factors within this population will help local public health departments target their testing efforts and outreach. This information can be woven into patient education, by making patients aware of things that can increase their risk of contracting syphilis. It is important to understand what these people feel are key barriers to seeking timely testing and treatment for syphilis. The goal is to use this information and work with the health care community to implement changes that will decrease these barriers. If we are able to have a positive interaction during the survey and establish some trust between the researcher and the participant this can also be one small way to reduce barriers to seeking care. This survey has the potential to collect novel data about this vulnerable population and impact future prevention efforts and changes in the way care is provided.

Conclusions

Congenital syphilis cases are rapidly rising in Oregon and across the county. The need for data driven interventions is great. We hope that this novel survey can be used to help create targeted interventions that will reduce congenital syphilis in our community and beyond.

References

1. Stanford, Kimberly A., et al. "Routine Opt-out Syphilis Screening in the Emergency Department: A Public Health Imperative." *Academic Emergency Medicine*, 2019, doi:10.1111/acem.13897.
2. Congenital Syphilis. (n.d.). Retrieved May 31, 2020, from <https://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/HIVSTDVIRALHEPATITIS/SEXUALLYTRANSMITTEDDISEASE/Pages/Congenital-Syphilis.aspx#:~:text=Over the last several years,syphilis infections has increased 400%>.
3. Congenital Syphilis Algorithm. (n.d.). Retrieved May 31, 2020, from https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Congenital_Syphilis_Algorithm.pdf.
4. Sexually Transmitted Disease Surveillance 2018. Retrieved October 23rd, 2020, from <https://www.cdc.gov/std/stats18/default.htm>.
5. OHA STD Program, 2020
6. Sexually Transmitted Diseases Treatment Guidelines, 2015 (*MMWR Recomm Rep* 2015;64 (No. RR-3):[34-50])
7. CS case reviews encouraged for CDC grant funding <https://www.cdc.gov/std/funding/docs/STD-PCHD-TA-Notes-4-Congenital-Syphilis.pdf>

Appendix A

You can access the live survey at this link: <https://redcap.link/cs>