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EVIDENCE BRIEF

Public Health Approaches for Women and Pregnant People with Syphilis

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Key Messages

- Public health and health system partners play an essential role in responding to the increasing incidence of infectious syphilis among women of childbearing age and the subsequent increase in congenital syphilis in Ontario. Given available capacity and resources, public health units (PHUs) may consider adapting approaches specifically for the public health follow-up of women of childbearing age and pregnant people who have or have been exposed to syphilis.
- Ascertaining and documenting pregnancy status for all women of childbearing age with or exposed to syphilis so that pregnant individuals can be prioritized for case and contact management is a key intervention for preventing congenital syphilis. PHUs may consider modifying workflows or utilizing surveillance systems, online tools, and/or health care provider forms to improve the completion of this activity.
- Ensuring adequate treatment for pregnant people with syphilis is critical for preventing congenital syphilis. PHUs may consider leveraging existing surveillance systems to efficiently identify

untreated cases to inform public health prioritization and/or identify ways to offer treatment in non-traditional ways (e.g., home visits) to minimize barriers to care.

- Designating PHU staff specifically for the follow-up and/or coordination of care for female and/or pregnant cases and contacts of syphilis is an opportunity to improve public health outcomes and offer more comprehensive support to these clients. The success of this approach depends on well-developed internal and external partnerships.
- Common challenges in implementing syphilis case and contact management approaches for pregnant people in Ontario include system level factors (e.g., limited public health and community resources, gaps in healthcare provider knowledge), client-level factors (e.g., mistrust of health system, perceived stigma, low health literacy), and the social determinants of health (e.g., lack of housing, no access to health care).
- Allocation of additional financial resources to PHUs to provide the necessary capacity to implement interventions that support and enhance public health case and contact management of syphilis in women of childbearing age and pregnant people should be considered by relevant funders.

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Issue and Research Question

Between 2014 and 2023, Ontario observed a continuous increase in the annual incidence of infectious syphilis. The proportion of infectious syphilis cases that are female also increased during this period from 3.8% in 2014 to 18.0% in 2023. The majority of infectious syphilis cases reported among females occurred among those of childbearing age (i.e., aged 15 - 44). Between 2014 and 2023, the incidence of infectious syphilis among women of childbearing age increased from 0.4 to 16.1 cases per 100,000 population. In 2023, 8.5% of infectious syphilis cases among females reported being pregnant. While congenital syphilis was once rare in Ontario with an average of 1.5 cases per year from 2014 to 2019, there has been an increase in recent years, with 23 cases reported in 2022 and 14 cases in 2023.[1]

Public health organizations play a vital role in the management of pregnant people and women of childbearing age with syphilis, including ensuring that they are connected to health care to receive appropriate treatment. Untreated maternal syphilis infection increases the risk of pre-term birth (< 37 weeks gestation). For the developing fetus, syphilis infection can lead to negative fetal development and infant health outcomes including musculoskeletal changes, hematological abnormalities, nerve damage, hearing loss and/or fetal stillbirth.[2] In Ontario, despite extensive efforts of public health units (PHUs) to reach pregnant women with syphilis, 44% of maternal cases associated with congenital syphilis between 2020 and 2022 were lost to follow-up by public health, meaning important case management interventions including ensuring appropriate treatment was received could not be completed.[3] The risks of syphilitic stillbirth and congenital syphilis increases when maternal cases do not receive public health follow-up.[4]

In Ontario there is no dedicated provincial guidance for the public health follow-up of women or pregnant people with or exposed to syphilis. The 2009 Provincial Infectious Diseases Advisory Committee (PIDAC) document *Sexually Transmitted Infections Case Management and Contact Tracing Best Practice Recommendations*, provides limited guidance around public health follow-up of women or pregnant people with or exposed to syphilis. It recommends that pregnant women exposed to syphilis should be prioritized for contact management and that public health follow-up of late latent syphilis be conducted only for pregnant women.[5] Although the Canadian Guidelines on Sexually Transmitted Infections provide guidance on treatment and post-treatment serology for pregnant people diagnosed with syphilis, there is no guidance provided for the public health follow-up of women or pregnant people with or exposed to syphilis.

The objective of this brief is to support public health organizations in developing case and contact management approaches for addressing syphilis in pregnant people and women of childbearing age. It does so by summarizing evidence from the scientific and grey literature, along with findings from a PHO administered survey of PHUs in Ontario, Canada. The brief also highlights opportunities for public health action, including implementation considerations and potential barriers (Appendix 1).

Methods

A search of published scientific and grey literature was completed as well as a survey of Ontario PHUs to identify syphilis case and contact management programs and strategies that focus on women and/or pregnant people.

Outcomes of interest included in this review are:

- Syphilis outcomes (e.g., prevention of congenital syphilis cases);

- Clinical process outcomes (e.g., time to clinical appointment of a maternal case from positive syphilis serology or engagement in prenatal care);
- Public health process outcomes (e.g., engagement with public health follow-up, completion of case/contact management activities).

The following topics are out of scope of this review:

- Clinical management of pregnant people with syphilis (including treatment and serological monitoring), congenital syphilis cases or infants exposed to syphilis during pregnancy;
- Public health follow-up of congenital syphilis cases or infants exposed to syphilis during pregnancy;
- Prenatal syphilis screening guidance;
- Certain public health activities such as surveillance, awareness campaigns, health care provider education, or activities to increase case detection (e.g., testing campaigns), and public health orders;
- Legislative changes (e.g., laboratory reporting requirements);
- Congenital syphilis morbidity and mortality review boards.

Literature Search

PHO Library Services designed and executed searches on May 15, 2024 in MEDLINE, Embase, and CINAHL Complete databases. Search strategies are available upon request. Searches included English language studies performed in high income (Organization for Economic Co-operation and Development, OECD) countries published since Jan 1, 2012. After removal of duplicate articles, two PHO reviewers independently screened the titles and abstracts of 364 articles for at least one outcome of interest (see Methods). Studies remaining after screening underwent full text review and a third PHO reviewer resolved any discrepancies. The search was repeated on March 14, 2025 and an additional 33 articles were identified and screened with no further relevant articles identified.

Grey Literature

Publicly available communicable disease guidelines, including supplemental resources, for syphilis and congenital syphilis for jurisdictions in Canada, the United States of America (USA), and Australia were reviewed for details specific to case and contact management for women or pregnant people. A detailed list of jurisdictions reviewed is available upon request.

An additional grey literature search of syphilis follow-up strategies was performed on May 17, 2024 using keyword searches in the Google search engine and government websites for content related to syphilis case and contact management of women or pregnant people with syphilis. Since it is not practical to review all the results retrieved by a search engine query, a limit of 100 results per query (ranked by relevance) was manually enforced. Conference abstracts identified in the published literature search were included in the grey literature section if deemed relevant.

Survey of Ontario Public Health Units

In preparation for surveying PHUs, a standard PHO privacy impact assessment for collecting information from respondents in their professional capacity was conducted. Utilizing the Surveys@PHO platform, an electronic survey was sent on August 22, 2024 to representatives from the then 34 Ontario PHUs. The survey included closed and open-ended questions regarding policies and procedures and other

approaches used by PHUs for follow-up with women and pregnant people with or exposed to syphilis. Survey results were downloaded to Microsoft Excel and descriptive analyses of closed-ended questions were completed using Microsoft Excel. A coding framework was developed by the project team to identify key themes for qualitative analyses of the open-ended responses. Coding was completed by a single PHO staff and reviewed by a second PHO team member. Conflicts were resolved through discussion as needed.

Main Findings

Peer-reviewed Literature Search

There is limited published and peer-reviewed literature regarding public health approaches to support case and contact management of syphilis in women and/or pregnant people. Of 397 articles screened, only two had a relevant outcome of interest (see above).

Matthias *et al.* (2019) evaluated whether an electronic notification system to ascertain missing pregnancy status in Florida, USA would improve timely identification of syphilis during pregnancy and ultimately prevent congenital syphilis cases. Between 2013 and 2016 (pre-study period), Florida reported cumulatively 3,455 females between the ages of 15 to 45 years who were diagnosed with syphilis, of which 391 (11.3%) had missing pregnancy status. At the start of the study period (October 2017), 76 women between the ages of 15 to 45 with syphilis and without a documented pregnancy status were identified. Over the 9-month study period using the Department of Health's electronic notification system, which generated reminders to local program staff, pregnancy status was ascertained for 63/76 (82.9%) of these women, of which 3 (4%) were found to be pregnant. One pregnant woman met the case definition for a new syphilis infection, was treated early during pregnancy, and their newborn did not test positive for syphilis. Although the electronic system only sent notifications until June 2018, only 6/559 (1.1%) females between the ages of 15 to 45 in Florida who were diagnosed with syphilis had missing pregnancy status in 2018.[6]

Munro *et al.* (2017) investigated whether an electronic referral pathway and standardized data collection tool could improve follow up for pregnant women with syphilis. In London, United Kingdom, women who attended antenatal visits at North Middlesex Hospital (NMH) and were positive for syphilis showed low attendance and poor partner notification when referred to St. Ann's Contraception and Sexual Health (CASH) Clinic for syphilis management. This study examined the impact of two interventions to improve patient engagement. The first intervention involved staffing a single designated person to manage the electronic referral pathway from the NMH to CASH and inform the NMH of women who did not attend their sexual health appointments. The second intervention used a standard electronic template at CASH that included specific prompts to document treatment, follow-up, and partner notification. The pre-post study design compared an observation period (April 2010- March 2013) of 107 pregnant patients who were referred from the NMH to CASH to an intervention period (April 2014 – October 2014) with 24 similarly referred patients. During the intervention period, initial contact improved (64% pre vs 96% post, $p < 0.001$) and a higher proportion of ongoing male partners attended the clinic for syphilis screening (25% pre vs 61% post, $p = 0.69$). Follow-up of neonates born to syphilis-positive women from the intervention period was low (12.5%). Other relevant outcomes noted by the authors were improvements in documenting partner notification and screening status.[7]

Grey Literature

Of the 31 communicable disease guidelines and supplemental resources reviewed, 12 jurisdictions/organizations were found to have guidance on syphilis case and contact follow-up specifically for women of childbearing age or pregnant individuals. They included jurisdictions/organizations in Canada (Alberta, Manitoba, Nova Scotia, Saskatchewan and Nunavut), USA (Centers for Disease Control and Prevention [CDC], California and Texas), and Australia (Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine, Western Australia and New South Wales). Using the grey literature search strategy, 25 additional sources describing strategies to support public health follow-up for these populations were identified. The vast majority of grey literature from this search came from the United States, particularly the states of Louisiana, California, Texas, and Illinois.

Summary of findings from the grey literature review were themed into six categories: ascertainment of pregnancy status, prioritized management and follow-up, adequate treatment, designated public health staff, care coordination, and targeted education, support and incentives.

1. ASCERTAINMENT OF PREGNANCY STATUS

Ascertainment of pregnancy status and clear documentation is a key follow-up activity for women of childbearing age who are diagnosed with syphilis or are contacts of a syphilis case.[8-13] Although jurisdictions acknowledged the need for timely documentation, only New South Wales specified that documentation of pregnancy status should be done within one working day of notification of the syphilis case to public health.[9]

A few jurisdictions described strategies that leverage existing case management or surveillance tools to ensure pregnant cases and women of childbearing age have documented pregnancy status. In addition to the approach used in Florida (described by Matthias *et al.,* 2019), some suggested approaches to ascertaining pregnancy status included[13,14]:

- Automated identification of reported laboratory results that are suspected to be pregnancy-related (e.g., prenatal screening selected as reason for testing) for follow-up;
- System-mandatory entry of pregnancy status prior to case closure;
- Routine reporting of the proportion of female cases with undocumented pregnancy status to program staff.

Several jurisdictions have developed case reporting forms or templates to improve health care provider reporting particularly for the identification of pregnant cases. For example, the state of Louisiana has designed a reporting form for individuals diagnosed with syphilis during pregnancy to allow for more timely identification, assessment and referral for follow-up.[15] In New South Wales, the health department uses a syphilis reporting form that prompts providers to indicate the individual's pregnancy status and treatment information (e.g., medication and date(s) administered), and if pregnancy status is unknown, providers are urged to obtain this information as soon as possible due to the risk of congenital syphilis.[16] The Illinois Department of Public Health has developed an online reporting tool for physicians to report cases of syphilis identified in pregnant people and/or infants to facilitate prioritization and mobilization of public health resources for these individuals.[17]

2. PRIORITIZED MANAGEMENT AND FOLLOW-UP

Once pregnancy status is ascertained, most jurisdictions prioritize management for pregnant cases and contacts. High priority case management status includes having a short interval timeline for initiating action (e.g., within one business day) and in some cases, an extended follow-up period. [8-14, 18-12] For,

example, in Manitoba, pregnant cases with syphilis receive follow-up (i.e., are kept 'open' in their electronic surveillance/case management system) until at least time of delivery and pregnant contacts are pursued for one year before being discharged as lost to follow-up.[19]

Other individuals prioritized for public health case and contact follow-up include women of childbearing age and all sexual partners of pregnant people with syphilis (of any stage). In most jurisdictions reviewed, public health organizations follow-up with sexual partners of pregnant people with syphilis to confirm that treatment was received and that follow-up serology was obtained outside of the window period.[8,10,13,20-22] In Alberta, testing is recommended for children born to women with late latent syphilis, based on the potential duration of infection.[23]

As part of a multi-pronged approach to address rising congenital syphilis cases, the San Francisco Department of Public Health created new workflows in 2019 in which pregnant women with syphilis and their sexual partners were identified as highest priority for public health follow-up. The evaluation of this workflow found that the proportion of cases in women aged 15-49 in which pregnancy status was determined increased from 73% in 2017 to 92% in 2019. There were also non-significant increases in the proportion of female cases with early syphilis who received an interview, identified sexual partners to public health, notified sexual partners, and had partners who received treatment. It was determined that six congenital syphilis cases were prevented in 2019.[24]

3. ENSURE ADEQUATE TREATMENT

Ensuring pregnant people with syphilis are appropriately treated per guidelines is critical for preventing congenital syphilis. For public health, this may include providing treatment or ascertaining treatment information from health care providers (e.g., medication, dose, administration date). Some jurisdictions require documentation of past or current treatment for pregnant persons with positive syphilis serology, and if this cannot be obtained, re-treatment is recommended.[9,13,19] In Texas, pregnant people within one month of their due date are prioritized for enhanced case follow-up if treatment status remains unknown.[13] Manitoba gives specific direction to conduct active follow-up of pregnant cases with suspected treatment failure.[19]

Some jurisdictions leverage existing tools to ascertain treatment status to inform public health management. In Texas, an electronic surveillance system is used to identify pregnant cases with no record of treatment or who have been inadequately treated. This mechanism helps prioritize these cases for enhanced case follow-up, including field visits and coordination with their health care provider to initiate treatment or retreatment.[13] Similarly, the Western Australia Department of Health employs a syphilis-specific public health management system that generates automatic alerts for public health staff to confirm receipt of treatment and/or repeat testing and case summaries for case management meetings.[25]

In response to syphilis cases facing challenges in accessing appropriate treatment, the State of Louisiana Office of Public Health created a program called the Syphilis Home Observed Therapy (SHOT). This program offers at-home administration of penicillin G benzathine to treat syphilis in areas of the state with high syphilis morbidity. Individuals with uncomplicated pregnancy are referred to SHOT if they face barriers to accessing treatment and have no documented penicillin allergy. Once registered, the case and their contacts are offered penicillin G benzathine therapy at home by a registered nurse accompanied by a perinatal case manager or disease intervention specialist (DIS). Staff capacity, buy-in and self-efficacy are noted as challenges to implementation.[26,27]

4. DESIGNATED PUBLIC HEALTH STAFF

The Department of Public Health in New York City designed a model of care called the Congenital Syphilis Prevention Investigator (CPI) model. In this approach, all syphilis investigations among females in a defined region were assigned to a single case manager. Outcomes of interest were compared for cases reported between the pilot period (June to December 2020) and the pre-CPI model period (January to December 2019). The CPI approach improved data completion by 13-25%, timeliness of syphilis follow-up by 15.8%, timeliness of partner services by 19.5%, receipt of mandated third trimester syphilis screening by 37.6%, and timeliness of syphilis treatment by 4.6%. Factors contributing to positive outcomes were staff buy-in, comprehensive staff training that included general prenatal health, prioritization of client relationship-building, and development of internal and external partnerships (e.g., social work).[28]

5. CARE COORDINATION

Several jurisdictions highlighted approaches that aimed to improve health care engagement and mitigate the impact of social determinants of health on syphilis outcomes. This was achieved by designating complementary staff within the health department or by forming multidisciplinary and multisectoral care coordination committees.

In public health departments in the USA, the public health investigations for STIs are often conducted by a DIS. DIS are public health professionals trained to conduct case and contact management of communicable diseases of public health significance.[29] Three jurisdictions described models where additional staff (e.g., social worker, public health) were used to offer care coordination or follow-up that complements the case and contact management activities of the DIS.

In Louisiana, a Perinatal Case Manager develops individual care coordination plans for women or pregnant people with syphilis that focuses on improving access to primary and prenatal care and addressing social determinants of health (e.g., securing stable housing, food security). For pregnant people, this consisted of monthly contact until the date of delivery. During the pilot period, this program enlisted 51 women with syphilis and had successful outcomes including: facilitating treatment for cases and their partners, securing stable housing, and engagement in primary care and/or obstetrical care. It was found that program engagement was higher for pregnant women compared to non-pregnant women.[14-15, 30]

Similarly, in a 2017 pilot program in New York City, pregnant people with syphilis were assigned a social worker. In this model, the social worker provided client support and case management that connected the client to syphilis treatment, prenatal care, reminders for retesting, and other syphilis education. Of the 28 clients who enrolled, 19 (67.8%) were retested for syphilis in their third trimester. Of the 15 confirmed deliveries, there were no confirmed cases of congenital syphilis. [31]

The Chicago Department of Public Health developed an enhanced care coordination program to refer pregnant people with syphilis to public health nurses in the Maternal, Infant Child and Adolescent Health Bureau for additional follow-up. These public health nurses focused on prenatal care access, re-testing for syphilis in the third trimester, and addressing relevant social determinants of health (e.g., housing, employment, health insurance etc.). Of 24 pregnant people with syphilis who consented to participate in this program, 13 (54%) were linked to prenatal care by the public health nurses while seven (29%) were already engaged. Of the 13 individuals linked to prenatal care, 10 (77%) completed

prenatal health counselling, five (38%) were referred to a national food security program, and five (38%) were further engaged with services such as housing, social work, and employment resources.[32]
Two jurisdictions described care coordination committees focused on the care and management of pregnant people with or at risk of a syphilis infection.

The San Francisco Department of Public Health chairs weekly care coordination meetings with a multidisciplinary group. The objective of these meetings is to identify and develop care plans (including linkage to treatment, testing and prenatal care) for pregnant people in the community who are at high risk of syphilis, diagnosed with syphilis and not yet treated or are treated and would benefit from ongoing support. These weekly meetings include public health nurses, prenatal care providers, perinatal navigators, social workers, street medicine workers, homelessness outreach workers, members of a congenital syphilis prevention taskforce, and a DIS supervisor. In 2021, 45 pregnant people in San Francisco were followed by this committee and 17 (38%) were ultimately diagnosed with syphilis. Of these, 12 (71%) completed treatment greater than 30 days prior to delivery. Four pregnancies resulted in a congenital syphilis diagnosis. Staff involved in these care coordination meetings described this as an efficient model for providing care to these individuals and improved the ability of staff to offer patient-centred and trauma-informed care.[33]

In 2020, Metropolitan Communicable Disease Control (MCDC) in Perth, Australia created the Syphilis in Pregnancy (SIP) committee. This committee is a multi-agency and multidisciplinary group consisting of public health staff, sexual health physicians, midwives, health service staff working in Indigenous and homeless service agencies and the Department of Justice, and specialists in areas of pediatric infectious diseases, neonatology, and obstetrics. The SIP meets monthly and design and monitor care plans (including treatment decisions, infant/fetal risk assessment and management decisions, contact tracing, care access issues, and linkage to social supports, including housing) for all pregnant women who have a new syphilis diagnosis, a history of inadequately treated syphilis, or completed treatment for syphilis within the 12 months prior to their current pregnancy. From January 1, 2021 to September 30, 2022 the SIP committee monitored 63 pregnant women with no congenital syphilis cases identified among women who were monitored.[25]

6. SUPPORT, EDUCATE AND INCENTIVES

In Nunavut, a Prenatal Syphilis Plan of Care Letter is developed for each case and distributed to all providers involved in the care of the pregnant person and to the pediatrician anticipated to be involved in the infant's care. This action is completed for all pregnant people with reactive syphilis serology, including those with a prior history of syphilis, late latent, or infectious syphilis to ensure awareness and continuity of care.[34]

A few guidance documents emphasize education and support specific for pregnant people or women with syphilis. These resources include linkage to prenatal care or family planning services, counselling regarding risks and recommended follow-up should the pregnant person experience a Jarish-Herxheimer reaction to penicillin, and counselling on syphilis screening for any previous children by their primary care provider.[13,19, 20, 23. 35]

In Oregon, the HIV/Syphilis Care Incentive Program was developed to improve engagement in syphilis follow-up. Pregnant individuals identified to be at risk of incomplete syphilis follow-up are offered $25 gift cards to local retailers for attending each appointment for treatment and/or post-treatment serology. On a case-by-case basis, these incentives may be expanded to other activities such as partner treatment. [36]

Survey of Ontario Public Health Units

A total of 31 completed surveys were received from 34 (91.2%) Ontario PHUs with representation from all seven health regions. Responses were submitted from a variety of public health roles including public health nurses, program managers, and medical officers of health.

PHUs were asked whether their public health management policies and procedures differed for cases and/or contacts of syphilis who were women of childbearing age or were known to be pregnant compared to males or non-pregnant individuals.

POLICIES AND PROCEDURES: SYPHILIS CASES

The majority of PHUs reported conditions in their policies and procedures specific to the follow-up of pregnant individuals with syphilis (29/31; 93.5%) while fewer reported this for women of childbearing age with syphilis (13/31; 41.9%). Of those who had direction in their follow-up procedures for these populations, common themes included:

- **Ascertain pregnancy status:** Several PHUs specified that ascertaining pregnancy status is a part of their assessment for all women of childbearing age with syphilis. In some PHUs, referrals for a pregnancy test are made if pregnancy status can not be confirmed.
- **Prioritize management and follow-up:** Cases of syphilis (infectious and non-infectious) among pregnant people and women of childbearing age are categorized as 'high priority' by several PHUs. Some PHUs specified that pregnant cases would not be discharged from follow-up or closed as lost-to-follow-up until after delivery or the estimated date of delivery.
- **Enhanced case management activities:** It was commonly reported that pregnant cases were followed more judiciously than non-pregnant cases to ensure completion of follow-up serology, ascertainment of treatment status and/or to obtain a plan of care from the responsible physician. PHUs reported that they make additional attempts and employ more exhaustive methods (e.g., home visits, searching databases for additional contact information, engaging police services or the Children's Aid Society) to reach pregnant cases compared to non-pregnant cases. Some PHUs specified that non-infectious syphilis cases do not routinely receive follow-up unless they are known to be pregnant. In a few PHUs, syphilis follow-up differed for women of childbearing age compared to males or women of non-childbearing age. In some cases, women of childbearing age received public health follow-up for late latent syphilis and are contacted for serological monitoring and to ensure adequate treatment.
- **Internal case communication:** Some PHUs indicated that every syphilis case in pregnant persons is reported to senior members of their communicable disease team (e.g., medical officer(s) of health, managers, and/or directors).
- **Linkage to health care:** Several PHUs identified that they facilitate referrals to an infectious diseases specialist for treatment and follow-up on an as needed basis for pregnant people with syphilis. A few PHUs noted that they routinely facilitate referrals to prenatal care for those not already attached to a provider or to a pediatric infectious diseases specialist when the infant is born.
- **Education:** Several PHUs indicated that they offer additional counselling to pregnant people with syphilis, specifically on the topic of congenital syphilis risks and prevention, ongoing monitoring of infection, and the importance of preventing re-infection.

POLICIES AND PROCEDURES: CONTACTS

While several PHUs reported modifications to their policies and procedures for pregnant contacts of individuals with syphilis (22/31; 71.0%), fewer PHUs altered follow-up for contacts of pregnant people with syphilis (14/31; 45.2%) or female contacts of people with syphilis (10/31; 32.3%).

Of those who had direction in their follow-up procedures for pregnant contacts and/or contacts of pregnant cases, common themes included ascertaining pregnancy status, prioritization of pregnant people and women of childbearing age for contact follow-up, enhanced contact management activities (as per above), referrals where appropriate, and education). PHUs frequently indicated completing follow-up that included the verification of notification and treatment and/or testing for pregnant contacts and contacts of pregnant people with syphilis. Fewer PHUs indicated that they routinely completed this action for female contacts of people with syphilis. A few PHUs reported that they follow-up with female contacts to ascertain pregnancy status if the index case is unable to confirm or if they have reason to believe the index will not complete notification.

STRATEGIES TO SUPPORT PUBLIC HEALTH FOLLOW-UP

Approximately half of PHUs (16/31) reported that they have used additional strategies to support syphilis follow-up for women and/or pregnant people. Some of the strategies described may be used for all cases or contacts while others are used as needed depending on the circumstances.

Specific strategies PHUs employ to support case management of these populations include:

- **Ensure adequate treatment**: if a syphilis case has challenges accessing care, some PHUs offer home visits for administration of syphilis treatment and specimen collection (i.e., venipuncture) to monitor serological response to treatment.
- **Designate staff:** PHUs described two approaches for assigning staff for the follow-up of women and/or pregnant people. One is a 'single interviewer model' whereby one nurse is responsible for the follow-up of each case for the duration of the syphilis investigation. This approach is used to facilitate continuity of care and helps build rapport with the client. An alternative approach is designating a single public health nurse to oversee and monitor the follow-up of all pregnant cases. This individual provides support to their colleagues conducting case management.
- **Use of templates:** Some PHUs created tailored case management templates for pregnant cases, including health care provider reporting forms or letters that are distributed to care providers known to be involved in the care of the client.
- **Incentives:** A few PHUs described offering financial support such as compensation for transportation and/or incentives (i.e., gift cards) for attending appointments on an as needed basis.
- **Support:** A few PHUs described the strategies of "warm transfers" or supportive referrals to health care providers (i.e., prenatal care).
- **Leveraging existing resources:** PHUs noted the use of translation services and collaborating with internal teams (e.g., outreach team, Family Health resources) or community partners, including prenatal care providers and women's shelters.

PHUs that utilize strategies or approaches to complement case management for women and/or pregnant people with syphilis reported positive outcomes such as improved client relationships, treatment uptake, and engagement in public health follow-up. PHUs highlighted success particularly with assigning a single nurse for case follow-up and collaboration with community partners and health

care providers. Commonly identified facilitators of positive outcomes at the system or staff level included support from leadership, availability of guidelines and best practice recommendations, adequate staff buy-in, staff willingness to modify practices, public health staff expertise, and having well-established relationships with community partners. The most commonly reported barriers to positive case management outcomes at the client level were STI-related stigma, lack of syphilis knowledge, poor access to health care services (e.g., prenatal, STI), and inequities related to social determinants of health such as lack of financial or family supports. The most commonly reported barriers to positive case management outcomes at the PHU level included staff shortages and turnover, high workload, health care provider knowledge gaps, and a lack of technological infrastructure.

Discussion

In order to prevent congenital syphilis, pregnant people diagnosed with or exposed to syphilis must be considered high priority for public health follow-up. Where appropriate and capacity permits, PHUs may consider updating their syphilis case management policies and procedures to include guidance specific to pregnant people and women of childbearing age who have been diagnosed with or exposed to syphilis. Ascertainment and documentation of pregnancy status are foundational activities to inform prioritization and appropriate public health follow-up. PHUs may consider assessing the proportion of cases among women of childbearing age without documented pregnancy status to better identify gaps and opportunities for improving syphilis outcomes.

Many jurisdictions utilized technological tools and infrastructure as part of their multi-pronged approach to the follow-up of syphilis in females and pregnant people. Technology can be used to send electronic reminders for public health staff to ascertain and document pregnancy and treatment status or for clinicians to seamlessly submit online reporting forms or referrals for appropriate syphilis treatment and follow-up. Tailored templates for syphilis among these populations can be used to aid public health departments in identifying pregnant syphilis cases for more timely prioritization and follow-up, enable clear and consistent communication of case details, and assist with care planning with community providers.

Some public health organizations assign a single staff member who is dedicated to the follow-up of female and/or pregnant cases and contacts. This approach allows a staff with specific expertise to offer comprehensive and consistent care to cases and contacts in these populations. This may improve engagement with public health and uptake of appropriate syphilis treatment. As few PHUs in Ontario reported using this strategy to-date, it presents an opportunity for consideration (where funding and capacity permit) to improve syphilis case and contact follow-up.

A key takeaway from the evidence is the importance of public health organizations in establishing and leveraging both internal and external partnerships to ensure comprehensive syphilis management and care coordination. Partnerships with community agencies, health care providers (e.g., infectious diseases specialists, pediatricians, obstetricians, general practitioners and midwives), and other teams within public health (e.g., outreach, family health programs, sexual health clinics) were relied on for facilitating public health contact with clients. These relationships alongside defined communication and referral pathways were instrumental in ensuring adequate treatment, serological monitoring and contact follow-up. Case management models that integrate staff from maternal and family teams as well as with complementary disciplines such as social work can benefit cases beyond syphilis management (e.g., assistance with housing, accessing care, and food security), offering an opportunity to address complex social issues that public health organizations may not have the capacity or resources to support. Interdisciplinary care coordination committees were also described as resource efficient models for supporting client engagement in syphilis follow-up and prenatal care.

PHUs in Ontario have identified common challenges in implementing case management approaches for pregnant people. In particular, PHUs cite limited public health and community resources—both human and financial—gaps in healthcare provider knowledge about syphilis, and client-level barriers such as lack of trust, stigma, health literacy, and inequities in social determinants of health (e.g., lack of access to stable housing and challenges in accessing health services). Additional financial support for public health should be considered by funders in order to adequately manage syphilis cases, educate local health care providers, and support initiatives that address the social determinants of health.

Strengths and Limitations

This review summarizes available peer-reviewed and grey literature obtained through a robust search strategy and input from a majority of PHUs in all seven health regions of Ontario. Although peer-reviewed literature on effective case and contact management interventions for syphilis in women and/or pregnant people is limited, approaches utilized in Ontario and in other jurisdictions are summarized and themed to assist public health organizations in implementing strategies applicable in their jurisdiction. We did not appraise the quality of included peer-reviewed studies. We provide a qualitative summary of survey results of PHU strategies in Ontario and we were unable to provide proportions of uptake by PHU to demonstrate which strategies were more commonly employed. As the structure, funding, and program delivery model of public health organizations in other jurisdictions reviewed in this brief may differ from PHUs in Ontario, the approaches utilized in these jurisdictions may not be applicable to the Ontario context.

Implications for Practice in Ontario

In order to address rising rates of infectious syphilis in pregnant individuals and women of childbearing age PHUs should consider reviewing the approaches discussed in this brief and adapting or implementing where appropriate and feasible based on capacity and available resources within their organization and/or community. Specific considerations for employing the strategies described in this brief and potential barriers to implementation are outlined in Appendix 1. In surveying PHUs, it was identified that implementing additional strategies would require both financial and human resources.

Although not discussed in detail in this brief, PHUs should consider modifying their approach for individuals known or at risk of having barriers accessing care in their community (e.g., people who are precariously housed or who use substances). Evidence shows that women and pregnant people may avoid seeking primary care or engaging in public health follow-up due to stigma, mistrust, intergenerational trauma, past negative experiences with the health care or child welfare systems and/or fear of ramifications related to disclosure of drug or alcohol use, particularly as a pregnant person.[38,39] To address this, PHUs may consider integrating trauma- and violence-informed care principles into the planning and delivery of their strategies and as a part of staff training to ensure safe and competent care.

Conclusion

Increasing rates of infectious syphilis in females and women of childbearing age combined with challenges in accessing appropriate treatment and follow-up is contributing to an increase in congenital syphilis in Ontario and other jurisdictions. Public health organizations may consider (where appropriate and where funding and capacity permit) adapting or implementing strategies that focus on prioritizing the ascertainment of pregnancy status, coordination of supports to reduce barriers to care, and

provision of enhanced support to women/pregnant people with or at risk for syphilis. Furthermore, integrating strategies that remove barriers to care into the public health management of pregnant people and women with or exposed to syphilis may improve syphilis outcomes, including prevention of congenital syphilis.

Appendix 1: Implementation Considerations and Potential Barriers for Syphilis Case and Contact Management Interventions for Women and/or Pregnant People

Intervention	Implementation Considerations	Potential Barriers
Prioritize pregnant cases, pregnant contacts and partners of pregnant cases.	• Assign high priority level for follow-up of cases who are pregnant or are women of childbearing age, pregnant contacts and sexual partners of pregnant cases and expected timeframe for initiating follow-up. • Define length of follow-up time for pregnant people/women of childbearing age and indicators for closing the encounter. • Hold routine and frequent meetings (e.g. daily) between public health staff managing cases, program managers, medical officers of health and surveillance staff. • Develop a standardized template for briefing leadership and other relevant staff.	• Limited staff capacity to ensure timely follow-up of cases • High syphilis case counts in women of childbearing age may make timely follow-up challenging • Limited human and financial resources for intensive follow-up. • Difficulty in locating and engaging contacts including sexual contacts and anonymous contacts. • Case reluctance to notify partners or provide contact information to health unit.
Ascertain and document pregnancy status of female syphilis cases and contacts	• Set a timeframe (e.g. within one business day) for documentation of pregnancy status after PHU becomes aware of syphilis case or contact who is a woman of childbearing age • Document the estimated delivery date, where possible. • Assess baseline completion/documentation rate for pregnancy status to identify areas for future improvement • Assign PHU staff to review and identify cases with missing pregnancy status on a routine basis.	• Pregnancy stats not reported by health care provider during time of initial report. • Lack of access to an electronic medical record (EMR) • Lack of staff capacity (e.g., to complete data entry, create and maintain forms) • Limitations of existing infrastructure or data systems (e.g., inability to automate some functions or enter pregnancy status and details like estimated date of delivery).

Intervention	Implementation Considerations	Potential Barriers
	• If using a technological platform to facilitate documentation of pregnancy status, define frequency of report generation and assign designated staff to review data. • Define and set minimum standards for data completion of specific fields for pregnant cases and their contacts and pregnant contacts of syphilis. • Design health care provider forms and/or resources with tailored fields to identify when syphilis is identified in a pregnant person (e.g., reason for testing identified as prenatal screening on laboratory result).	• Inadequate staff training to adopt new technologies
Ensure adequate treatment	• Assign PHU staff to review and identify cases with missing treatment status, prioritizing those approaching their estimated delivery dates where possible (e.g., known to be in the third trimester). • Review and update existing medical directives to permit syphilis treatment outside the clinical setting (e.g., at client's home), where feasible. • Develop referral pathways to health care providers if the health unit is unable to administer syphilis treatment • Include safety protocols for staff and clients in home-based treatment procedures	• Limitations of existing data systems (e.g., inability to enter information on treatment status or automate functions to identify cases with missing treatment status). • Incomplete or delayed reporting by health care providers. • Lack of health care provider knowledge on how to appropriately treat syphilis in pregnancy • Barriers for cases to access treatment (e.g., via sexual health clinics, primary care or infectious diseases specialists). • Reluctance from patients to accept home treatment (if available)

Intervention	Implementation Considerations	Potential Barriers
Designate staff specifically for managing syphilis cases and contacts in these patient populations	• Set case limits for individual case managers. Consider a rotating roster of staff, where feasible. • Provide comprehensive staff training that include topics such as: syphilis in pregnancy and congenital syphilis, prenatal care, trauma-informed care, culturally competent care, motivational interviewing and relationship building. • Hold routine and frequent meetings (e.g. daily) between public health staff managing cases, program managers, medical officers of health and surveillance staff.	• Additional staff training requirements (e.g., information specific to pregnancy) • Potential staff burnout or turnover due to intensive or challenging caseloads.
Care coordination	• Form a coordination committee made up of but not limited to public health nurses, public health leadership (e.g., medical officers of health, program manager/directors), prenatal care providers, perinatal navigators, social workers, midwives, outreach workers, harm reduction workers, staff who work in Indigenous health, sexual health physicians, infectious disease physicians, and obstetricians. • Define objectives, scope, and terms of reference for the committee, including roles and responsibilities (e.g., chair, minutes, carrying out action items), meeting frequency, and target population. • Identify opportunities for defined roles and/or formal intra- or interagency partnerships to address social determinants of health to avoid potential duplication of efforts.	• Coordination challenges across agencies and disciplines. • Risk of role duplication if clear definitions and responsibilities are not articulated. • Lack of remuneration to attend meeting for non-salaried staff, where applicable (e.g., fee for service physicians, midwives) • Financial resource limitations

Intervention	Implementation Considerations	Potential Barriers
Support, educate, and incentivize pregnant people	• Identify and integrate priority messaging into counselling of pregnant individuals with or exposed to syphilis (e.g., importance of routine prenatal care including syphilis screening, benefit of treatment at preventing syphilis transmission to fetus). • Develop incentive-based programs (e.g., gift cards for attending treatment and/or follow-up appointments) for high-risk populations. • Define protocols to offer financial support for transportation to appointments for clients experiencing barriers to care. This may include establishing a relationship with a local taxi company or pre-purchasing transit tickets/pre-paid transit cards and having them available to distribute as needed. • Design health care provider communication templates to notify all providers involved in the care of the pregnant person of their syphilis test results and treatment status.	• Stigma and mistrust in health care providers may reduce client engagement. • Challenges in effectively reaching high-risk and marginalized populations (e.g., no cellphone/telephone, individuals with no fixed address). • Lack of staff capacity to integrate additional counselling content with clients • Inability of health unit to offer financial support or incentives (e.g., restrictions on use of funding, lack of funding available).

Additional Resources

- Canadian Public Health Association (CPHA), Centre for Sexuality. Trauma and violence-informed care toolkit for reducing stigma related to sexually transmitted and blood-borne infections. Ottawa, ON: CPHA; 2020. Available from: https://www.cpha.ca/sites/default/files/uploads/resources/stbbi/STBBI-TVIC-toolkit_e.pdf

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