Published in final edited form as:

Sex Transm Dis. 2018 September ; 45(9) : S86–S92. doi:10.1097/OLQ.0000000000000775.

Syphilis Control in the Post-Elimination Era: Implications of a New Syphilis Control Initiative for STD/HIV Programs

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In 1999, the US Centers for Disease Control and Prevention (CDC) announced an ambitious plan to eliminate syphilis from the US¹. Syphilis rates at the time were near historic lows, and the goal of decreasing the number of diagnoses of primary and secondary syphilis occurring nationally to below 1000 cases per year seemed within reach. But by 2001 syphilis rates among men began what has proven to be an unremitting climb, and in 2016 there were over 27,000 cases of primary and secondary syphilis reported in the US². Like high and middle income nations throughout the world, the US now confronts an explosive syphilis epidemic. That epidemic, which was originally highly concentrated among HIV-infected men who have sex with men (MSM), is diffusing into the larger population of HIV-uninfected MSM³. Rates of syphilis among women are also rising. More worrying still, the rate of congenital syphilis in 2016 (15.7 per 100,000 live births) was double the rate in 2012 (7.8 per 100,000), though still a small fraction of the rate in 1991 (107.3 per 100,000 live births), the modern peak in congenital syphilis in the US.

Clearly, syphilis elimination is not imminent and we need a new plan. As we formulate that plan, we should acknowledge that the problem we face is, at least to some extent, a consequence of our success treating and preventing HIV, a sexually transmitted infection (STI) that is vastly more morbid than syphilis. Syphilis rates have risen sharply in the context of widespread HIV testing and treatment, recognition that HIV treatment prevents HIV transmission and, more recently, rapidly increasing use of HIV pre-exposure prophylaxis (PrEP)⁴. The US public health HIV/STI system is succeeding in its biggest challenge, but that success remains incomplete, and our disease control efforts need to evolve in response to the evolving STI landscape.

CDC recently put forward a syphilis “Call to Action” outlining steps affected populations, health departments, medical providers, researchers and others might take in response to the growing epidemic⁵. In this paper, we focus specifically on how US state and local health departments might confront the syphilis epidemic. The steps we propose are not a comprehensive syphilis control plan, and many of the measures we suggest and numeric goals we propose will need to be refined if and when such a plan takes shape. We have no

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illusions that a new syphilis control plan will lead to syphilis elimination, a goal which seems unattainable in the absence of major scientific advances (e.g. a syphilis vaccine and improved diagnostic tests) or a fundamental change in the population's sexual behavior. However, progress is possible, and devising a plan to confront the syphilis epidemic is an opportunity to reconsider and advance our broader public health goals as they relate to HIV/STI and reproductive health.

Principles underlying a renewed syphilis control effort

As we consider a renewed effort to control syphilis, it is useful to define the central principles that might guide our work. First, like contemporary efforts to control HIV, biomedical interventions will play the predominant role in a new effort to control syphilis. Second, a new plan should have clear and measurable objectives. Third, successful syphilis control will require improvements in our public health and clinical infrastructure. That infrastructure includes the professional and medical leadership of health department HIV/STD programs, public health clinics – particularly STD clinics – as well as the wider healthcare system, public health surveillance, and field services. Fourth, as we build new infrastructure, we will need to reconsider how the components of that infrastructure interact. In particular, we need to do more to integrate work across programs (e.g. HIV and STI, HIV/STI and family planning and maternal and child health) and between units within programs (e.g. field services and surveillance). Fifth, a renewed syphilis control plan will require new collaborations with healthcare organizations (HCOs) and with the populations affected by syphilis, particularly MSM. Sixth, a renewed effort to confront syphilis will need to generate political support, engage affected populations and spark enthusiasm in the public health workforce. Finally, efforts to control syphilis should be undertaken with the understanding that the epidemiology of syphilis in the US is substantially shaped by social determinants of health – factors such as poverty, racism, and stigma – which affect sexual mixing patterns and access to medical care^{6,7}. In a new syphilis control plan, health department activities may seek to directly impact broad social determinants of health (e.g. through advocacy of insurance reform). But more typically, work at the HIV/STD program level will be designed to mitigate the effects of social determinants, the alteration of which is beyond the capacity of categorical public health programs.

Defining the objectives of syphilis control

Public health syphilis control efforts have typically sought to decrease the rate of syphilis. That objective is worthwhile, and the US currently has a national goal to decrease syphilis incidence to under <9.1 per 100,000 by 2020. Decreasing syphilis incidence beyond this threshold is an obvious goal for a new plan to control syphilis. It is consistent with the approach taken in the National HIV/AIDS Strategy, which seeks to decrease the incidence of HIV, and with the Australian National Syphilis Action Plan, which has a goal of decreasing syphilis rates in MSM through a combination of increased syphilis testing, partner notification, sustained condom use and perhaps chemoprophylaxis⁸. But is such a goal realistic?

Syphilis control objectives should be specific, measurable, achievable, relevant and realistic, and time-bound (i.e. SMART). In developing local public health goals for outcomes such as HIV incidence or PrEP use, we have often anticipated continued or somewhat accelerated trends. Given the unrelenting rise in syphilis and the absence of clear successes in other areas, it's not clear how we would define a realistic numeric goal for decreasing syphilis. Some argue that such goals can be aspirational, but setting goals without the means to achieve them and falling short of the target can be demoralizing to the public health workforce and undermine public health's credibility with political leaders. The absence of a strong rationale to justify an ambitious goal of decreasing rates of syphilis should prompt us to consider a wider range of objectives (Table 1).

One such objective could be to eliminate congenital syphilis. While recent US trends are discouraging, such a goal would concentrate efforts on the most devastating clinical outcome related to syphilis and is aligned with World Health Organization (WHO) objectives⁹, though the target for elimination in the US should be lower than that proposed by WHO (50 per 100,000 births). Many areas of the US already report no cases of congenital syphilis, suggesting that success is achievable. Seeking to eliminate congenital syphilis would have the additional benefit of reinvigorating our public health commitment to addressing the impact of STIs on women's health, an area that has been underemphasized in recent years with the HIV/STI community's well-justified focus on MSM. A congenital syphilis objective could be aligned with broader goals related to women's reproductive health, including universal human papillomavirus (HPV) immunization of girls and young women, improved access to effective contraception and decreased rates of unintended pregnancy. Even if it is not feasible to launch a broad initiative nationally in the near future, it should be possible at the local, state or regional level in at least some parts of the country.

Another objective could be to minimize the morbidity associated with syphilis. Approximately 3.5-8% of persons with early syphilis have complications (e.g. ocular, otologic or other evidence of neurosyphilis), with approximately 2.5-3% presenting with evidence of ocular disease, a finding that has been remarkably consistent between the preantibiotic era^{10,11} and the present¹². The current syphilis epidemic has been accompanied by increasing reports of ocular syphilis, including cases of blindness¹³⁻¹⁶. Ocular syphilis is readily treated with good clinical outcomes if therapy is initiated quickly following the onset of symptoms, but without directed interventions, the level of morbidity is likely to rise with syphilis rates. More consistent efforts to diagnose complications of syphilis as soon as possible after their onset and assure patients' timely and appropriate evaluation and treatment should be part of a renewed syphilis control effort. Advancing this objective will need to involve healthcare providers, but would ideally involve public health as well. A series of screening questions that can be incorporated into assessments by both clinicians and public health workers providing partner services (i.e. Disease Intervention Specialists) is available online.¹⁷

Among MSM and transgender persons, syphilis control should be integrated with broader HIV/STI control efforts. In particular, the diagnosis of syphilis should be used as an opportunity to link out-of-care HIV-infected patients to HIV treatment, initiate PrEP in HIV-uninfected patients, and promote more frequent follow-up HIV/STI testing in all patients.

Among HIV-uninfected MSM, the diagnosis of syphilis is strongly associated with future HIV acquisition^{18,19}, and data from our HIV/STD program in Seattle suggests that approximately one in four MSM who are offered PrEP referral through syphilis partner services will initiate prophylactic therapy²⁰. Among HIV-infected persons receiving syphilis partner services in King County, WA in 2016, only 5% were out of care or not virally suppressed. However, the level of viral suppression among all HIV-diagnosed persons in King County is quite high (82%), and it seems likely that the proportion of HIV-infected persons with syphilis who are unsuppressed is higher in at least some areas of the US. Our experience highlights the feasibility of using syphilis partner services to identify persons who are inadequately treated for HIV and the need to integrate linkage to HIV care into a coordinated clinical and public health approach to syphilis care. Just as syphilis partner services should be broadened to focus on health beyond the direct effects of syphilis, integrating syphilis control into a comprehensive effort to improve the health of sexual and gender minorities has a number of advantages. It capitalizes on large investments in HIV control to achieve new synergies, and it marries syphilis control to a national effort that enjoys substantial public and political support and has a vocal and powerful constituency.

Elements of a renewed syphilis control effort

A new national effort to control syphilis will require a concerted, coordinated effort to improve clinical care and public health outreach (i.e. field services) and surveillance, broader efforts to change the healthcare system and improve the health and well-being of sexual and gender minorities (Table 2), and new approaches to confront the growing syphilis epidemic among heterosexuals.

Clinical infrastructure: HIV clinics, STD clinics, and the wider healthcare system

Increasing syphilis testing coverage and frequency are key components of any effort to control syphilis. Mathematical models suggest that such testing can diminish syphilis rates⁸, and data from Australia are consistent with the idea that increased syphilis testing has resulted in a shift toward more persons being diagnosed in the absence of symptoms, presumably before they developed secondary syphilis²¹, a trend also observed in King County, WA and Baltimore, MD.^{3,22} As in Australia, syphilis testing among MSM in the US is increasing, with an estimated 49% tested in 2014, up from 38% in 2011²³, though this level of testing is still well below the estimated 91% testing coverage reported among HIV-uninfected MSM in Australia²¹. Improving testing coverage and increasing testing frequency will require a number of steps.

First, we need better guidelines. Current CDC guidelines recommend at least annual syphilis testing in MSM, with testing every 3-6 months in higher risk men, including those with multiple partners or who use substances⁵; testing every 6 months in persons on PrEP; and one-time testing early in pregnancy with more frequent testing among pregnant women in populations “in which the prevalence of syphilis is high and for women at high risk for infection.”²⁴ CDC recommends that MSM test for HIV annually, and that higher risk MSM test more often, though national guidelines do not specifically define high risk²⁵. Our guidelines need to be more explicit, more coordinated and inclusive (i.e. include HIV and

STIs) and better aligned with our public health, population-level objectives. Creating such guidelines may require moving away from a strict reliance on data derived from individual-level randomized trials and case-control studies, and the associated clinical focus on testing as a means to avert complications in infected persons. For HIV/STI testing, much of the benefit of screening occurs at the population-level and cannot be measured in individual-level studies. In some instances, making this shift will require relying on expert opinion as medical guidelines often require. If CDC is prohibited from moving in that direction, state and local health departments and professional organizations will need to do so.

Developing screening guidelines for pregnant women and non-pregnant heterosexual populations is particularly difficult. Syphilis rates among heterosexuals in the US, like rates of heterosexual HIV infection, are typically low, making annual screening of all adults or young adults relatively cost ineffective. These rates also vary dramatically across the US and between different demographic subpopulations. As a result, guidelines will often have to be developed locally, perhaps with national recommendations defining epidemiologic contexts which might trigger adoption of different screening recommendations. In some areas, heterosexual syphilis is concentrated among substance users, homeless persons, and other vulnerable and socially marginalized populations who are potentially identifiable for screening. But in other areas, particularly in the southern US, the dominant identifiable risk marker is African-American race. We believe that state and local health departments should consider establishing age and race specific testing recommendations based on local epidemiology. We acknowledge that such recommendations have the potential to be stigmatizing, and that issuing such recommendations will require a process of community engagement to explain their rationale and how they will benefit the population. Such a discussion might emphasize that HIV and STI testing is a health service that directly benefits the person tested, that reducing disparities will require improving services for the persons who are most affected by the infections, and that the failure to concentrate resources on communities disproportionately affected by infections like syphilis and HIV ultimately victimizes the very populations control efforts seek to help. It should be noted that New York City Department of Health uses African American and Hispanic race/ethnicity in their PrEP recommendations for women²⁶; and that the California Department of Health suggests that clinicians offer African American women up to age 30 screening for gonorrhea and chlamydia²⁷. (California guidelines recommend gonorrhea and chlamydial screening for all women under the age of 25.) Thus, there is precedent of using race/ethnicity in HIV/STI related prevention guidelines. Table 3 presents draft guidelines for HIV/STI screening, with explicit definitions of high risk and testing frequency.

In some areas, successfully implementing guidelines will require policy changes that affect the entire healthcare system. Healthcare policy-related work is often spearheaded by health department leadership teams or by agencies only peripherally linked to HIV/STD programs. However, HIV/STD programs can, at times, advocate for broad policy changes. High priority objectives in this area include ensuring that insurance companies pay for recommended HIV/STI screening without co-pays and without patients first paying their annual deductible; expanding the availability of screening through non-traditional sources of care, like pharmacies; and ensuring adequate clinic remuneration for testing-only visits during which patients do not see a physician, mid-level provider or nurse.

We also need better STI-related clinical infrastructure. Syphilis remains a concentrated epidemic that requires knowledgeable providers to recognize and treat it appropriately. HIV clinics are a key part of that infrastructure. Ideally, all HIV clinics would institute opt-out syphilis screening for MSM (or all men if gender of sex partner data are not readily available) with every blood draw, up to four times per year. This has been shown to increase syphilis testing and case-finding in Australia²⁸, and can be integrated with extragenital specimen self-collection for gonorrhea and chlamydial infection²⁹. Because many patients with HIV now attend HIV clinics only once or twice per year, STI screening may need to be uncoupled from routine HIV care visits. One option is to implement testing-only visits without a provider evaluation, perhaps prompted by text message reminders, which have been found to increase STD testing in other settings³⁰.

STD clinics are a critical component of the nation's STI control infrastructure and should play an important role in a new syphilis control plan. These clinics are commonly the largest single source of new HIV and syphilis diagnoses in an area³¹, and many do an excellent job caring for large numbers of MSM patients, usually with very limited resources. At the same time, fewer than 10% of patients in many STD clinics are known to be MSM, despite the fact that almost 70% of all new HIV diagnoses and over 70% of all early syphilis diagnoses occur in MSM^{2,32}. In such instances, clinics should ideally shift the populations they serve to better align their work with public health priorities. Doing so will be difficult and may be resource-intensive. Particularly in parts of the country that have not expanded Medicaid under the Affordable Care Act, the clinics need to balance their role as safety net providers for a primarily heterosexual population with their disease control mission, which necessitates greater focus on MSM. A renewed syphilis control effort should include assistance to help STD clinics improve the care they provide, upgrade their infrastructure, and broaden their appeal to priority populations – especially MSM and transgender persons. These efforts could be at least partially supported with HIV prevention funding as they are all well aligned with HIV control priorities.

Finally, a renewed syphilis control effort needs to engage diverse medical providers and the broader healthcare system. Health departments, professional organizations and CDC will all need to invest more in educating providers to recognize and appropriately manage syphilis. But success will also require structural changes in the organization of healthcare to better meet the needs of gender and sexual minorities. These changes should include efforts to build specialized clinical infrastructure as well as improvements in medical care for lesbian, gay, bisexual, transgender and queer/questioning (LGBTQ) patients throughout the healthcare system. In a 2014-15 Internet survey of 1413 MSM in 7 US states, we found that 82% of respondents were interested in receiving care from a specialty MSM provider, and that 46% would change their source of primary care to such a provider if such a provider were available to them (Khosropour C, personal communication). Some US cities have healthcare systems and centers that specifically focus on the care of LGBTQ patients (e.g. Fenway Health in Boston, Howard Brown in Chicago, the Los Angeles LGBT Center, and the Open Arms Clinic in Jackson, Mississippi). But building clinical infrastructure need not depend on such focused centers. It should be possible to train or identify specialty providers within large HCOs and give patients the option to select them. At present, however, a key barrier to improving healthcare for LGBTQ patients is the lack of systematic ascertainment

of patients' gender identity and gender of sex partners in the medical record. To be useful, this information needs to be recorded in fields that can be used to generate prompts to clinicians, reminders to patients, and monitoring reports to assess progress in improving care. Washington State recently committed to a statewide effort to improve the care of sexual and gender minorities, and our hope is that this effort can help facilitate efforts to control syphilis.

Field Services

Virtually all health departments in the US currently provide partner services (PS) to persons with early syphilis³³, and these services have been a core component of US public health efforts to control syphilis since the 1940s. The traditional goal of PS for syphilis is to find and treat infected sex partners. PS success is often measured using the brought-to-treatment index, the number of infected partners treated divided by the number of index cases receiving partner services. Among studies evaluating PS for syphilis published 1975-2003, the median brought-to-treatment index was 0.22 (range 0.05-0.53)³⁴. More recent studies from North Carolina and King County, WA have reported indices in this same range (0.15 and 0.26, respectively)^{35,36}, though a report from New York City, Philadelphia, Texas and Virginia found that only 9% of cases had at least one infected partner brought to treatment (range 5-14%), suggesting a substantially lower level of success³⁷. These metrics give one a sense of what is currently being accomplished through field services without clearly defining the impact of the intervention on syphilis transmission. That uncertainty, as well as concern that the effectiveness of syphilis PS is eroding in the setting of increased use of geospatial social networking applications (GSN Apps), should lead to a broader consideration of the objectives of syphilis PS.

The role of PS in a new syphilis control initiative should be aligned with the initiative's goals. To achieve that, we will need to enhance our surveillance with changes to syphilis case reports and partner services interview procedures and records (Table 4). DIS will need programmatic support, resources, and updated policies and training to make better use of technologies such as GSN Apps, cellphones, and social media. Insofar as minimizing the major morbidity associated with syphilis is a goal, DIS should routinely screen patients for symptoms of syphilis complications and have systems in place to assist patients requiring further medical evaluation. To help avert congenital syphilis, DIS might work with women who do not desire pregnancy and who are diagnosed with syphilis or at high risk for syphilis to link them to long acting contraception. Finally, to better align syphilis control with HIV-related objectives, syphilis investigations should seek to refer patients for PrEP and, as needed, for HIV care.

Modernizing our approach to PS should also include a willingness to reconsider the value of some longstanding activities, such as face-to-face interviews and field investigations, defining when these labor-intensive procedures are worthwhile and when they can be abandoned. Our approach to PS may need to be more flexible. For example, public health programs might elect to conduct very intensive investigations of syphilis cases among heterosexuals – where numbers of cases are often low and the risk of congenital syphilis

may be high – but less intensive investigations among HIV-infected MSM who are virally suppressed. We recently addressed issues related to field services modernization in detail³⁸.

Conclusions

The US, like middle and high-income nations around the world, now confronts an explosive epidemic of syphilis, an epidemic that remains concentrated among MSM, but which appears to be spreading to the wider population. In developing a response to this epidemic, we face a fundamental dilemma. We feel compelled to do something, but are skeptical that available public health tools can really bring syphilis rates down. That dilemma should not be an excuse for inaction. Rather, it highlights the need to invest in scientific innovation while developing a plan that focuses on preventing the most devastating consequences of syphilis (e.g. congenital syphilis, blindness) and uses the opportunities created by the epidemic to advance our broader objectives related to HIV and reproductive health.

Acknowledgments

Research reported in this [publication/press release] was supported by NIAID, NCI, NIMH, NIDA, NICHD, NHLBI, NIA, NIGMS, NIDDK of the National Institutes of Health under award number AI027757.

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Table 1

Possible goals for a new national effort to control syphilis

Goals	Example Measurable Objective
Eliminate congenital syphilis	<ul style="list-style-type: none"> • Congenital syphilis rate 2.5 per 100,000 live births (approximately 100 cases/year nationally), with all jurisdictions below WHO congenital syphilis goal (<0.5 per 1000)
Minimize the morbidity associated with syphilis	<ul style="list-style-type: none"> • No episodes of permanent vision loss, major neurologic sequelae or death attributable to syphilis
Improve partner services for early syphilis	<ul style="list-style-type: none"> • Initiate 100% of cases of early syphilis • Interview 80% of persons with early syphilis • Verified epidemiologic index of 0.6[*] • Verified brought to treatment index of 0.3[*]
Increase PrEP use among MSM and transgender persons with syphilis and their sex partners	<ul style="list-style-type: none"> • Increase PrEP use among HIV-uninfected MSM and transgender persons with syphilis and their sex partners by 50–100% over 3 years (goal >50% use among all MSM with syphilis)⁺
Increase HIV testing among persons diagnosed with syphilis and their sex partners	<ul style="list-style-type: none"> • 95% HIV testing in persons reported with syphilis • 80% HIV testing among the notified partners of persons report with syphilis
Increase linkage to care and viral suppression among persons living with diagnosed HIV treated for syphilis or contacted for partner services	<ul style="list-style-type: none"> • >90% of persons with syphilis (and HIV-infected sex partners) engaged with HIV care or linked to HIV care within 1 month of syphilis treatment • >80% viral suppression among persons with syphilis and their HIV-infected sex partners within 3 months of syphilis treatment

^{*} Epidemiologic index = number of partners treated for syphilis divided by index cases receiving partner services. Brought to treatment index = partners diagnosed and treated for syphilis divided by index cases receiving partner services.

⁺ Baseline based on local data.

Table 2

Proposed public health and clinical infrastructure changes as part of a renewed effort to control syphilis

Infrastructure goals	Objectives & Activities
Improve medical leadership of HIV/STD programs	<ul style="list-style-type: none"> • All large urban and statewide programs include a medical provider with specific expertise in HIV/STD
Create interdisciplinary, problem-focused teams that integrate surveillance/program evaluation, field services and clinical staff	<ul style="list-style-type: none"> • Teams focus on specific priority activities with monitored outcomes (e.g. congenital syphilis elimination [possibly linked to perinatal HIV infection], syphilis investigations, data-to-care)
Increase program evaluation capacity	<ul style="list-style-type: none"> • All jurisdictions have designated epidemiologic support for both routine surveillance and program evaluation • Develop more flexible data management systems controlled at the program level.
Improve STD-related clinical infrastructure	<ul style="list-style-type: none"> • STD clinics - Improve quality of care to include provision of PrEP; syphilis treatment; evaluation for complicated syphilis with on-site or referral system for specialty evaluation and treatment; on-site or referral system for long-acting contraception • Align STD clinic work with public health goals (e.g. increase services for MSM and transgender persons) • Work with large healthcare organizations to systematically identify gender and sexual minorities in electronic records, and improve clinical care, including adherence to STD testing and PrEP guidelines • Develop specialized sources of care for MSM and transgender persons

Table 3

HIV/STD screening guidelines

Men Who Have Sex with Men & Transgender Persons who Have Sex with Men *	
Screening frequency & criteria	All MSM and transgender persons who have sex with men: at least annually
	<p>Every 3 months if any of the following risk occurred in the prior year:</p> <ul style="list-style-type: none"> • Condomless anal sex with an HIV serodiscordant or unknown status partner • 10 sex partners • Diagnosis of a bacterial STI • Methamphetamine or popper use • Currently using HIV PrEP <p>Areas with estimated HIV incidence among African American MSM (or young MSM) exceeding 4% should consider promoting testing every 3 months in these populations regardless of other risks.⁺</p> <p>HIV-infected patients should be tested for syphilis at every blood draw done as part of routine HIV care up to 4 times per year[*]</p>
Recommended STI testing	<p>Nucleic acid amplification testing (NAAT) for rectal, pharyngeal and urethral gonorrhea and chlamydia⁺⁺</p> <p>Syphilis serology</p> <p>HIV testing (4th generation HIV test or HIV RNA)</p> <p>Hepatitis A and B serologies (if unvaccinated or not known to be immune)</p> <p>Hepatitis C (annually if HIV-infected or any injection drug use)</p>
Pregnant women	
Screening frequency	<p>All women: First trimester testing for HIV, hepatitis B (if not immune), urogenital gonorrhea and chlamydial infection and syphilis</p> <p>Repeat third trimester test if any of the following^{**}:</p> <ul style="list-style-type: none"> • Methamphetamine, cocaine or opiate use (not prescribed by a medical provider) • Positive tests for gonorrhea in the prior year • Any history of syphilis • Current sex partner has a history of syphilis • Sex workers • Residence in an area with a rate of primary and secondary syphilis >10/100,000 in women
Other populations (including heterosexuals)	
	<p>Criteria and frequency based on local epidemiology.</p> <p>Populations to consider for annual testing</p> <ul style="list-style-type: none"> • Injection drug users • Non-injection methamphetamine, cocaine and opiate users • Homeless adults age <45 • Incarcerated persons and persons with a history of incarceration in the prior 5 years • Sex workers • Persons with a history of syphilis in the prior 5 years <p>Age and race/ethnicity specific recommendations in areas where syphilis disproportionately affects specific groups. Such testing might link HIV and syphilis testing and focus on populations where the estimated risk of HIV and/or syphilis exceeds 1 person 5000 per year.</p>

⁺ Recommendations could be further limited based on age if supported by local data

^{*} Persons who have not had any sex since last HIV/STI testing and those in long-term (>1 year) mutually monogamous, HIV-concordant relationships do not require HIV/STI screening.

⁺⁺ Testing should occur at sites of sexual exposure. Self-obtained specimen collection should be available. Some jurisdictions may not test all asymptomatic men for urethral infections.

^{**} Third trimester screening recommendations should ideally be developed based on local data.

Table 4

Surveillance monitoring for a renewed syphilis control effort

Goal	Additional surveillance activities designed to measure progress toward goal
Eliminate congenital syphilis	<ul style="list-style-type: none"> • In addition to pregnancy status, partner services investigations of female index cases and exposed partners document contraception use, whether partner services (PS) staff offered long-acting reversible contraception (LARC), and whether patient accepted LARC referral, (optional follow-up: whether patient received LARC) • Add pregnancy status to STD case reports and, as possible, laboratory orders • Develop local guidelines to focus third trimester screening of pregnant women and screening among heterosexuals • Evaluate the completeness of testing and reporting of maternal syphilis testing in cases of stillbirth or early infant death • In-depth investigations of all cases of congenital syphilis to define actionable steps to improve prevention • Improve communication between health departments and obstetrics and midwifery providers, including involvement of public health in fetal/infant mortality reviews
Avert complications of syphilis (neurosyphilis, ocular syphilis, otosyphilis)	<ul style="list-style-type: none"> • Case reports include: vision & hearing symptoms, results of cerebrospinal fluid analysis and clinician diagnosis of complicated syphilis • Partner services investigations include: vision & hearing symptoms, whether further evaluation was performed (if symptomatic), results of cerebrospinal fluid analysis and ophthalmologic assessment • Sentinel events of permanent vision loss, major neurologic sequelae, and death reviewed with team including medical director, field services, and medical providers involved in the case
Increase HIV testing	<ul style="list-style-type: none"> • Case reports include: HIV status of index case • PS interviews document index patient and exposed partners' * self-reported HIV status, date of last HIV test, linkage to HIV testing (if HIV test >2 weeks prior to syphilis diagnosis), result of HIV test
Increase PrEP use	<ul style="list-style-type: none"> • PS interviews document for index patient and exposed partners * whether patient was on PrEP at time of syphilis diagnosis, and if not, whether PS staff offered PrEP, whether patient accepted PrEP, where patient was referred for PrEP, (Optional follow-up: whether patient started PrEP.)
Increase engagement in HIV care and viral suppression	<ul style="list-style-type: none"> • Syphilis case and partner services database linked to HIV surveillance database so that previous HIV diagnosis reported to surveillance and most recent viral load report known to PS staff prior to interview • PS interviews document for index case and exposed partners * with previous HIV diagnosis: whether patient is taking antiretroviral therapy (ART), date and result of most recent viral load • For index case and partners who are off ART, not virally suppressed or last viral load test >1 year prior: whether PS staff offered patient assistance making a medical appointment or referred to HIV care relinkage assistance, plan for next appointment, date of completed medical appointment

* Exposed partners of index cases with or without previous HIV diagnosis