Infectious Syphilis in Detroit, 2002

Where are we now?

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Introduction

In October of 1999 the Centers for Disease Control and Prevention (CDC) outlined and published the *National Plan to Eliminate Syphilis from the United States*. This plan's main goal is the elimination of sustained syphilis transmission within the nation's borders. Upon achievement of this goal, local transmission is expected to occur only when cases are imported, and these outbreaks are to be contained and transmission ceased within 90 days. This limited transmission is projected to result in approximately 0.4 cases per 100,000 people.

Nationwide in 2001, there were 2.2 infectious syphilis cases for every 100,000 people in the population, far from the goal proposed by the elimination plan. Some areas of the country had, however, reached that goal, and 14 of the 50 states had rates of 0.4 cases per 100,000 or less in 2001.

Michigan, however, was not one of these states and ranked 7th in the nation in 2001. The majority of Michigan's syphilis cases reside in Detroit. In 2002, 486 cases of infectious syphilis were reported in Michigan; 380 (78%) of these individuals lived within Detroit City limits. In 2000, Detroit ranked 5th in the nation among cities with over 200,000 residents for reported primary and secondary syphilis cases (21.9 cases per 100,000 population). In 2001, Detroit had risen to 1st (28.6 cases per 100,000 population). For this reason, much recent attention has been directed towards lowering the rate of infectious syphilis in the city and surrounding areas.

The following report outlines what happened with syphilis in the metro Detroit population during the 2002 calendar year.

Methods and Reporting

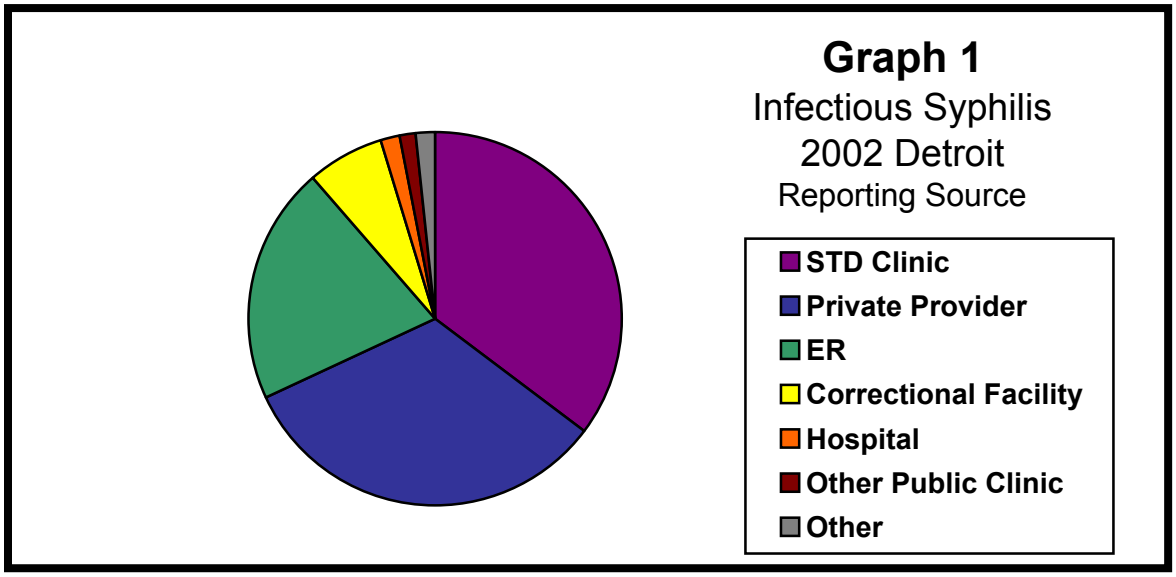
In order to characterize infectious syphilis in Detroit, detailed demographic, behavioral and geographic data were collected on the city's primary and secondary infectious syphilis cases (PSIC) as they were being investigated and their partners notified, tested and treated. This report describes the information gathered through this process on Detroit's detected 2002 PSIC population.

Under Reporting

The symptoms of both the primary and secondary stages of syphilis are painless, may be internal, and disappear regardless of the absence of treatment. Due to this, individuals may fail to seek treatment and therefore never be reported. It would be difficult, if not impossible, to determine the number of cases that go undetected annually in the city of Detroit. Very few studies examine underlying syphilis prevalence because of the difficulty in both acquiring the necessary number of participants and in determining syphilis stage from blood tests alone. One recent study, conducted using 1996 to 1999 data on drug treatment center and jail populations in 5 southern counties, estimated that 2.7% of females and 1.1% of males in drug treatment centers and 4.1% of females and 1.9% of males in jails had high titer-reactive serology for syphilis, suggestive of infectious syphilis. This same study also looked at women who were routinely tested at childbirth. Only 0.4% of this group had high titer-reactive serology for syphilis (Finelli, Lyn. Prevalence Monitoring in Syphilis Surveillance, *Sexually Transmitted Diseases*. 2002; 29(12): 769-774). Thus, syphilis prevalence estimates are heavily dependant on the population in question. Extensive literature review yielded no comparable estimates for the prevalence of undetected infectious syphilis in Detroit. The population discussed below represents only examined and subsequently reported PSIC.

Reporting Sources and Reasons for Exam

Graph 1 describes the detection sources through which Detroit's 2002 PSIC were reported to the health department for investigation and follow-up. The most active reporting venue was the Detroit Health Department's STD Clinic, which detected 35% of all PSIC for the year. Private providers reported another 33%. Twenty-one percent of PSIC were reported through emergency rooms, more than twice the number detected at this venue in 2001. Additionally, 28 PSIC were reported from correctional facilities, as compared to 15 in 2001, an 87% increase. As to be expected, the majority of PSIC sought testing due to syphilis symptoms.



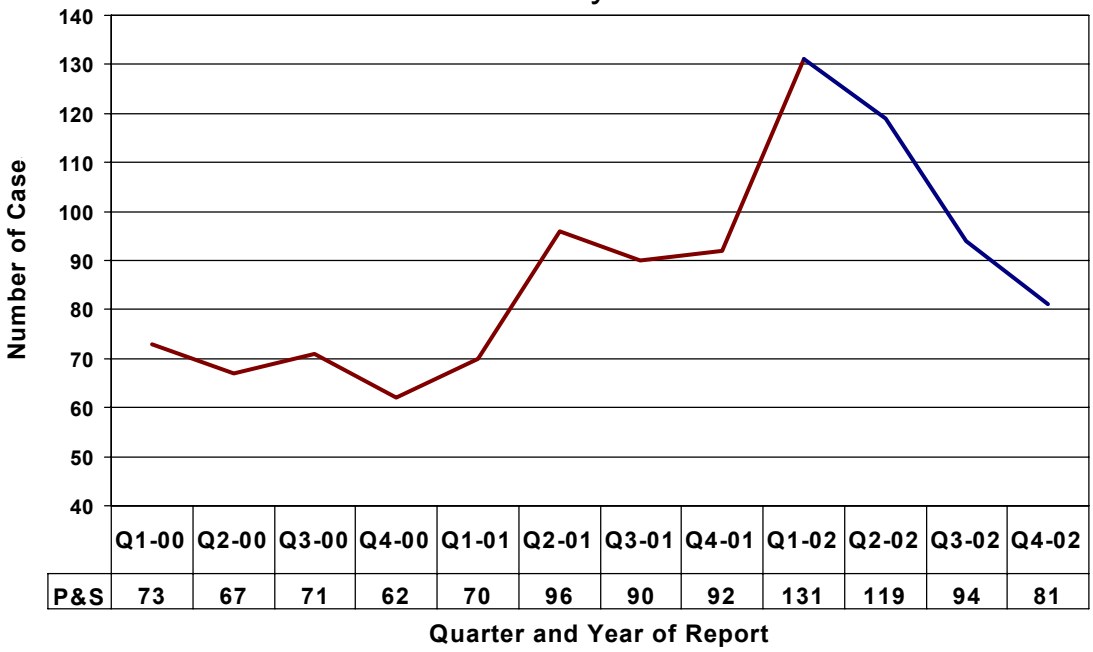
Trends in the 2002 Calendar Year

Rate Decline

2002 was an encouraging year in Detroit, as it moved closer to the CDC's goal of syphilis elimination. In 2002, 425 PSIC were reported from Detroit, Harper Woods, Hamtramck, Highland Park, and the Grosse Pointes. This is up 22% from 2001 when 348 PSIC were reported. Although the total number of PSIC reported in 2002 was higher than 2001, there was a steady and statistically significant downward trend in reported cases during the 2002 calendar year.

[See Graph 2] That is to say, each quarter during 2002, fewer and fewer PSIC were being reported. No two consecutive quarters saw a significant decline, but the decrease in PSIC from the 1st to the 4th quarter was significant ($p<0.01$). This continuous downward trend has not been seen in recent years and quarterly rates in general were on the rise. Preliminary figures in 2003 offer further encouragement, as PSIC totals continued their decline into the 1st quarter.

Graph 2
Detroit Infectious Syphilis
2000-2002 by Quarter



* Includes Detroit, Highland Park, Hamtramck and the Grosse Pointes
Source: DHD/STD Department

It would be impossible to determine the direct cause for the decline in infectious syphilis; however, a few possibilities are worthy of note. Case management, the procedure used to investigate and treat each and every PSIC and their partners, went through some changes prior to and during 2002. New management was brought in and the Disease Intervention Specialists (DIS) were retrained on procedures and protocols. This may have lead to improved and more expedient case investigation with partner notification and treatment, thus

stopping transmission sooner than would have happened prior to these changes. Also, beginning in early to mid 2001, the Detroit Health Department (DHD) employed a Syphilis Elimination Coordinator to educate city residents and increase overall public awareness of the problem. Some of the initiatives put forth by this position include community level educational presentations and screenings, as well as a citywide advertising campaign that placed informational posters in Detroit buses. Increased community recognition, as a result of the efforts of this position, might explain both the early 2002 PSIC increases and the decreases later in the year. PSIC, who would not otherwise have sought treatment, may have recognized their symptoms, acquired adequate treatment and ended further transmission. Likewise, 2002 was the first full year that the Detroit STD department had a dedicated epidemiologist to aid in determining the best avenues for interventions. This individual, in conjunction with the Elimination Coordinator, was able to help best target community level intervention activities. Additionally, Detroit's surveillance team conducted comprehensive citywide emergency room outreach that included physician education regarding the extent of the area's syphilis problem and information regarding appropriate diagnosis. The proportion of PSIC detected through ERs is continuing to increase, presumably due to these efforts. Finally, at various times during 2002 the CDC sent specialized Rapid Response Teams (RRT) to the DHD to aid in fighting the epidemic. The main contributions of the RRT to the decline in infectious syphilis were the additional staff their presence provided; training, which included case management methods and field investigation techniques; technical support on CDC STD software; and assistance with infrastructure modifications already begun by the STD Department.

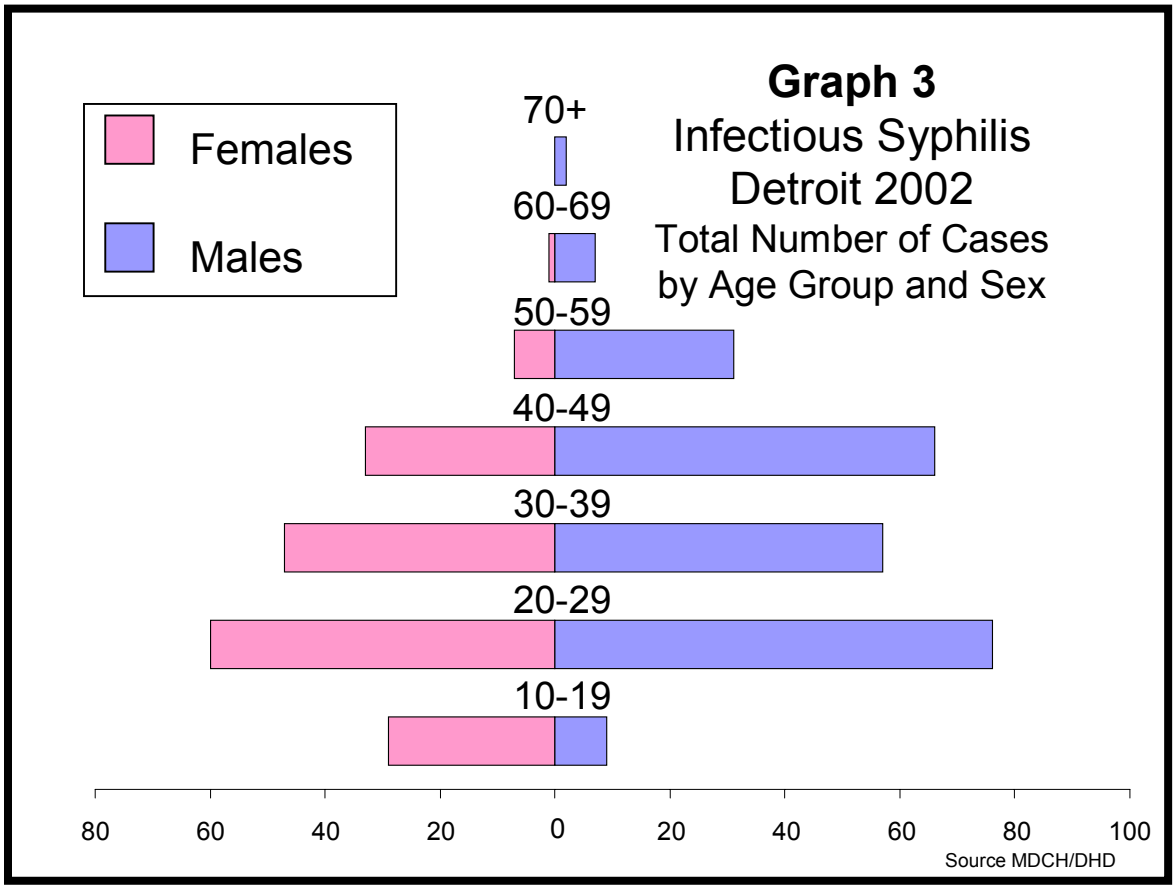
The Population

Demographics

In 2002, 425 PSIC were reported from Detroit, Hamtramck, Harper Woods, Highland Park and the Grosse Pointes, in comparison to 348 in 2001, a 22% increase. Fifty-nine percent of Detroit's PSIC were male, 95% were African

American and 32% were between the ages of 20-29, more than any other age group.

Graph 3 shows the 2002 Detroit PSIC population by age and gender. Males accounted for 59% of the PSIC population and females 42%. Female PSIC tended to be younger than males (31.0 and 37.3 years of age on average, respectively). Half of Detroit's female PSIC were between 10 and 29, while only 34% of males were in this age group. The number of 10-19 year old female



PSIC more than doubled since 2001, going from 12 in 2001 to 29 in 2002. Additionally, the female 50-59 year age group decreased 22%. The opposite was true for male PSIC, where the 10-19 age group decreased 25%, and the 50-59 age group increased 82%. Taking this into account, targeted prevention efforts need to vary by both age and sex.

Only about 75% of Detroit's 2002 PSIC reported their primary means of income. Among those that did, a large percentage (32%) stated they were

unemployed and 19% reported they were employed but did not report their occupation. The figure on unemployment may be an overestimate, as some PSIC may choose not to disclose their means of income out of fear of either being billed for services or contacted at their workplace. The large percentage of low or no income individuals suggests that much of the Detroit PSIC population is likely to be uninsured and thus reliant upon public clinics and less likely to seek treatment for seemingly minor symptoms. Educational outreach and prevention efforts targeting this group and intensive case investigation, management, and follow-up, therefore, remain a high priority for the department.

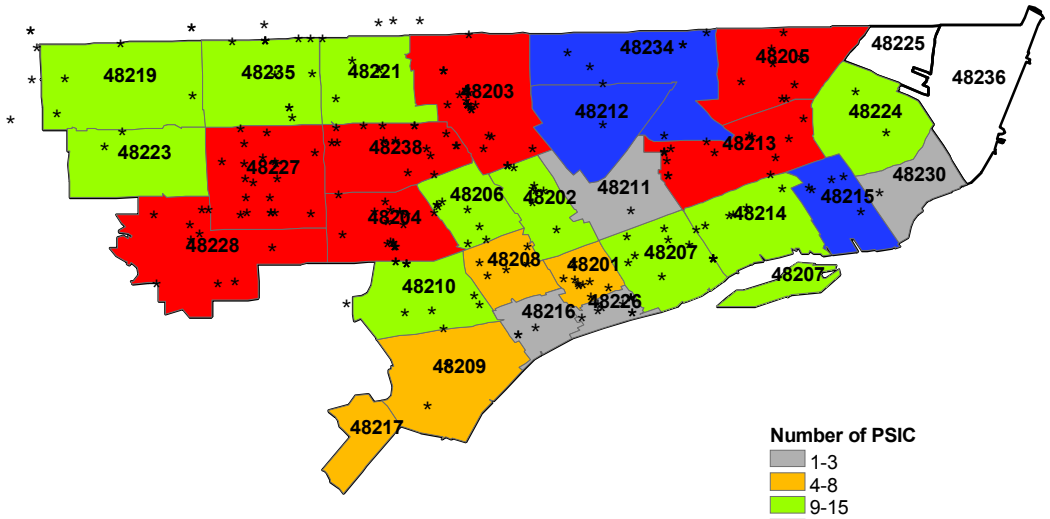
Geographic Distribution

The map found in graph 4 details the geographic distribution of 2002 syphilis morbidity by residential zip code in Detroit and the surrounding areas. 48204 (10% of PSIC), 48227 (8%) and 48203 (8%) were 2002's highest morbidity residential zip codes.

Graph 4

Geographic Distribution
P&S Syphilis
2002

Detroit, Highland Park, Hamtramck and the Grosse Pointes
All Locations of Partner Meeting or Sex
Primary and Secondary Cases
2002



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The map also shows the locations where PSIC met new partners or had sex. Each dot represents a location mentioned by one or more of the 2002 PSIC. Among PSIC reporting new partners, the street was the most commonly mentioned meeting place (31%). Bars or clubs were the next most common (15%) and a small number reported meeting at parks or work (7% and 6%, respectively). No individuals reported meeting partners through escort services, the Internet, jail or shelters.

Risk Factors

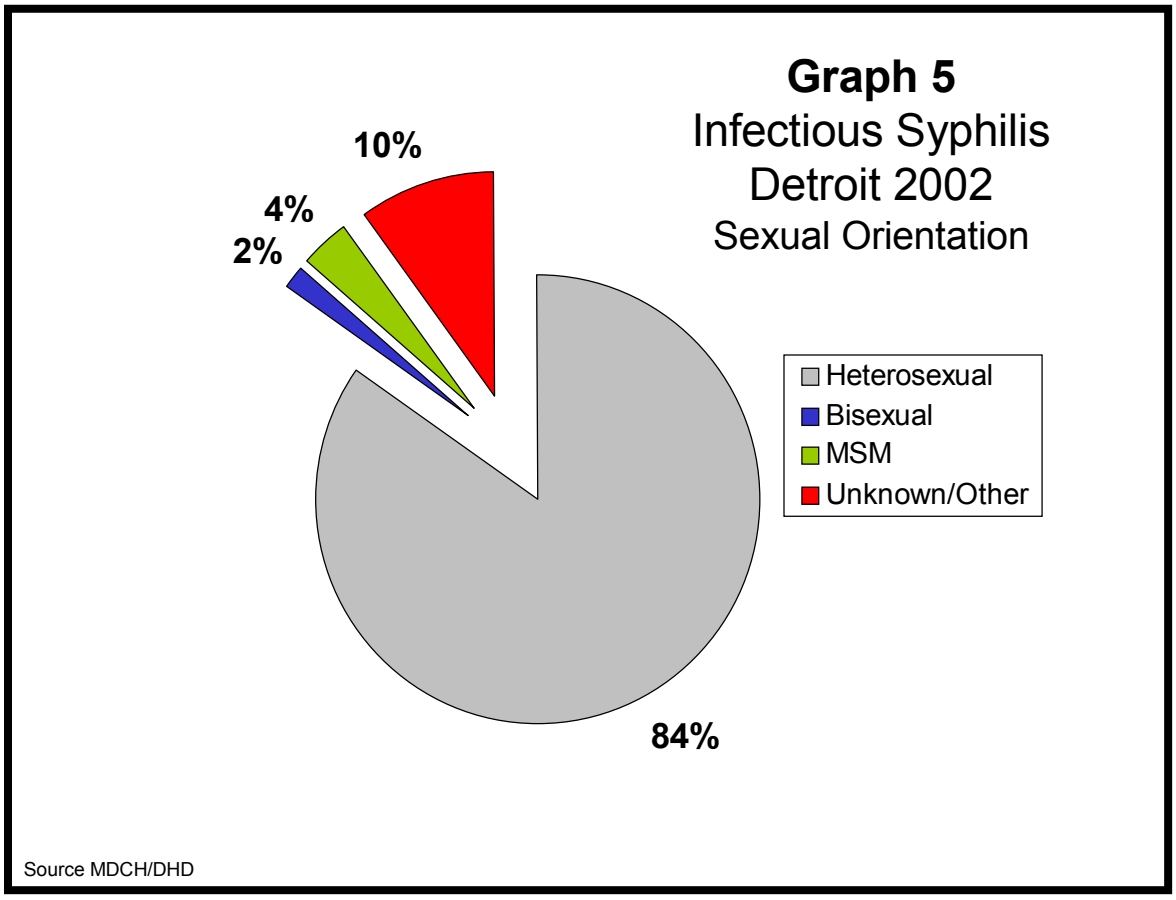
In 2002, 44% of PSIC reported illicit drug use compared to 36% in 2001. The proportion of PSIC reporting marijuana use also increased from 24% to 35%. Drug use behavior differed by gender and age group. Men were more likely than women to report marijuana use (38% vs. 30%, respectively [OR: 1.51, p=0.06]), and women were more likely than men to report crack use (14% vs. 11 %, respectively, although this value did not approach significance). In general, younger PSIC more often reported marijuana use and older PSIC crack. Fifty-five percent of PSIC reporting marijuana use were below the age of 29. More pointedly, 39% of 10-19 year old and 49% of 20-29 year old PSIC reported the use of this drug. No 10-19 year old PSIC reported crack use, but 19% of 40-49 year old and 21% of 50-59 year old PSIC reported the behavior.

Twenty-five percent of the 2002 PSIC population reported exchange of money and/or drugs for sex. As expected, women were more likely to receive money or drugs for sex (18% of female cases) and men were more likely to give money or drugs for sex (29% of male cases). The number of female PSIC reporting receipt of money or drugs for sex almost doubled in comparison to 2001, going from 11% to 18%. There was little change in the approximately 28% of males who reported giving money or drugs for sex between this and last year. Interestingly, among those who reported their means of income, only about 5% of all PSIC, and 9% of female PSIC, reported being commercial sex workers (CSW). Thus, individual women who support themselves in this manner may not

self-identify or report themselves as CSWs, making this especially important group even harder to reach.

Recent reports of syphilis increases and high prevalence levels in urban areas such as New York, NY and Palm Springs, CA center on activity in the men who have sex with men (MSM) population. Some speculate that the advent of life-prolonging HIV drugs has decreased the use of safe sex methods in this population. MSM activity is considered a risk factor for syphilis and in other areas of the nation this population plays a significant role in epidemics. In Detroit's syphilis epidemic, however, MSM do not appear to be a major factor. Of the 384 2002 PSIC who self-reported sexual behavior, the vast majority (94%) reported only heterosexual sex. Only a small percentage, about 4%, reported MSM behavior and another 2% reported bisexual activity; however, 2 of these 7 PSIC were female (see graph 5). Of males, about 9% (16 PSIC), reported MSM activity and of these, 5 PSIC were bisexual. Recent reports have suggested that under-reporting of MSM behavior commonly occurs, especially among African American males. Such underreporting may be occurring in the Detroit population; however, 42% of PSIC are female. This low male-to-female ratio (1.38:1) supports the assertion that the most prominent form of transmission is heterosexual in nature.

Syphilis increases the risk of acquiring and/or transmitting HIV and other STDs. For this reason, concurrency of infections is tracked in the population. Twenty-seven PSIC (6.35%) in 2002 and 15 in 2001 (4.31%) were known to be HIV positive. Additionally, in 2002, 7% of PSIC were known to be concurrently infected with chlamydia and about 4% with gonorrhea. These figures are most likely underestimates of proportion of the PSIC population co-infected with these STDs, as concurrent infections that are reported to the health department are not readily matched with the PSIC, and the individual PSIC often does not report them to investigators. Educational outreach on syphilis and safer sexual practices, at the time of treatment, to patients testing positive for any STD continues to be a mainstay of prevention.



Core Group Characteristics

A core group of individuals infected with STDs and engaging in high-risk behaviors are considered important in sustaining transmission. In the Detroit PSIC population, a member of the core group responsible for syphilis transmission is defined as an individual who in the 12 months prior to detection reported one or more of the following behaviors: [1)] sex with anonymous partners, [2)] 4 or more partners [3)] exchanging money or drugs for sex, and/or [4)] using crack, cocaine or heroin. According to this definition, 42% of Detroit's 2002 PSIC were members of the core. Twenty-seven percent of PSIC reported unknown partners, 22% reported 4 or more partners, 25% had exchanged money or drugs for sex and 16% used crack, cocaine, or heroin. From 2001 to 2002 the proportion of PSIC that were members of the core group of syphilis transmission did not change. In 2002, as syphilis spread into a larger population, it spread not

only to the general population lacking core-group behaviors, but also to more individuals who partake of high-risk, core group behaviors. This spread was proportionate to the ratio of core to non-core that was seen in 2001.

It is important to consider that individuals who do not engage in high-risk behaviors are also at risk of syphilis if their sex partners have multiple partners or use drugs. In fact, the majority (58%) of PSIC do not report high-risk behaviors. Reduction in disease among the core group should also decrease syphilis transmission to the general population who lack these risk behaviors. PSIC clustering in the high morbidity zip codes may be an indication of core group clustering as well; hence, focusing on these areas may aid in the reduction of cases in the city. Finally, overall syphilis public awareness, emphasizing the characteristics of primary lesions, rashes and other symptoms, should be raised to decrease syphilis incidence in both the hard to reach core population and their at-risk partners.

Conclusion

In summary, it is important to note that efforts blanketing the population, as a whole, will not appropriately reach those most at risk; however, targeting only those who exhibit high-risk behaviors may not protect the majority of PSIC who do not. Continued interventions heavily targeting the core group of syphilis transmitters, especially focusing efforts around high morbidity zip codes by utilizing tailored and population-based interventions, while at the same time heightening overall public awareness of the problem, may be the best avenue for furthering the decline of syphilis incidence in this city.

The continued use of demographic and behavioral data, to best target intervention activities at those with the greatest risk for acquiring and furthering transmission, should remain a mainstay. Assuring the acquisition of complete and accurate data will allow for ongoing and effective intervention planning and tracking of the epidemic. Finally, case management with partner notification and testing must be maintained at a high quality.

The diverse and collaborative team working at the Detroit Health Department's STD program is a partnership between local, state and national entities. They intend to ensure that the appropriate strategies continue to be followed and updated as needed. Together they are attempting to bring Detroit's epidemic under control. The main goal of the DHD STD program is to bring this epidemic to an end, by locating and effectively treating each and every case of syphilis in the city, thus halting the damaging effects of this disease.