

Syphilis In Michigan & Detroit

What's Going on Now



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“The persistence of high rates of syphilis ... is a sentinel event identifying communities in which there is a fundamental failure of basic public health capacity to control infectious diseases and ensure reproductive health.”

- Excerpt from the National Plan to Eliminate Syphilis from the United States issued by the Centers for Disease Control and Prevention

Centers for Disease Control and Prevention Syphilis Elimination Plan

- **Definition of Elimination**
 - **At the National Level**
 - The absence of sustained transmission
 - **At the Local Level**
 - The absence of transmission of new cases within the jurisdiction except within 90 days of report of an imported index case
- **2005 Goals for Nationwide Syphilis Elimination**
 - <1000 incident cases of infectious syphilis nationwide per year
 - 0.4/100,000 population
 - Increase the number of syphilis free counties to 90%

Centers for Disease Control's Five Critical Strategies

- Strengthening community involvement and partnership
- Enhanced surveillance
- Rapid outbreak response
- Expanded clinical and laboratory services
- Enhanced health promotion

Michigan's Strategic Plan for Eliminating Syphilis

- Enhanced Surveillance and Outbreak Response
- Strengthening Community Partnerships
- Improving Biomedical and Behavioral Interventions

Objectives

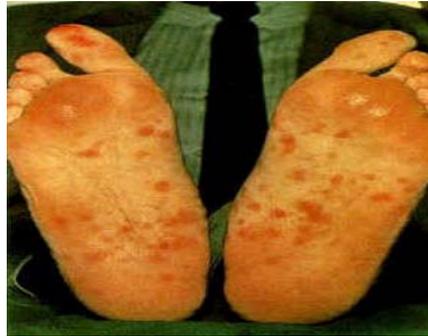
- What is syphilis?
- Syphilis Trends Over Time in Michigan and Detroit
- Syphilis in Detroit
 - Syphilis Stage at Diagnosis
 - Population Demographics
 - Geographic Distribution
 - Core Group Importance and Characteristics
 - Syphilis and HIV Co-infection
- Outstate syphilis
- Detroit vs. Outstate syphilis

Primary Syphilis

- Primary Syphilis is the first stage of *Treponema pallidum* infection.
- It is characterized by lesions (chancres) occurring at the site of entry through either the mucous membrane or epithelial tears.
- Lesions appear 10-90 days after initial infection. The average is 21 days.
- Individuals are infectious once lesions appear.
- Lesions are painless and self-limiting lasting usually 3-8 weeks.



Secondary Syphilis



- Secondary Syphilis occurs about 9-11 weeks after primary lesions heal.
- It is characterized by rashes which may include the soles of the feet and palms of the hands (Palmar Plantar Rash).
- Secondary rashes are also self-limiting and relatively painless.
- Rashes can last up to a year, but usually resolve within a few weeks.
- Other symptoms include Condylomata lata (wet wart like rashes in the genital area), alopecia and mucous patches in the mouth.

Late Syphilis Sequelae

- About 1/3 of untreated cases will develop late syphilis disease manifestations.
- **Gummatous Syphilis**
 - Prior to antibiotics gummatous syphilis occurred in 16% of late cases.
 - Gumma resemble granulomas from tuberculosis infections and most commonly affect the skin and bone but any part of the body can be affected.
- **Cardiovascular Syphilis**
 - Prior to antibiotics 10% of untreated syphilis led to cardiovascular syphilis.
 - This sequelae ultimately leads to aortic insufficiency or thoracic aortic aneurysm.
- **Neurosyphilis**
 - Prior to antibiotics 6.5% of untreated syphilis cases led to neurosyphilis.
 - All forms of neurosyphilis share chronic meningitis leading to lesions in the cerebrum and spinal cord.

Congenital Syphilis

- Congenital syphilis results from transplacental passage of *T. pallidum* into the fetal bloodstream.
- *T. pallidum* can be transmitted at any stage of maternal infection when untreated.
 - 70% of primary cases
 - 90% of secondary cases
 - 30% of latent cases
- Intrauterine death occurs in ~25% of untreated cases and another ~25% result in perinatal death.
- Other sequelae include perforations in the palate; dental malformation (Hutchison's Teeth); cartilage calcification; and vision problems.

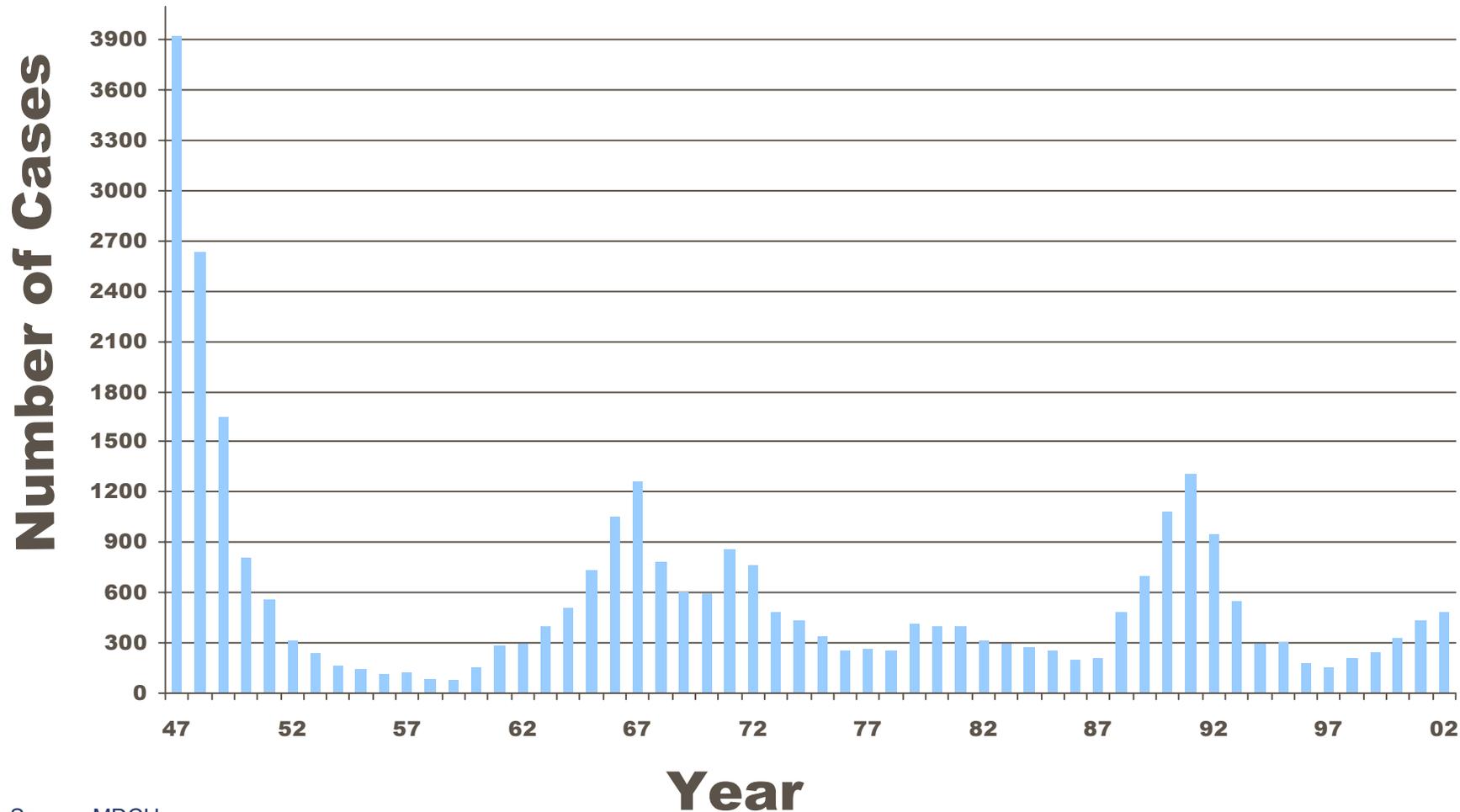


Syphilis is Treatable at Every Stage

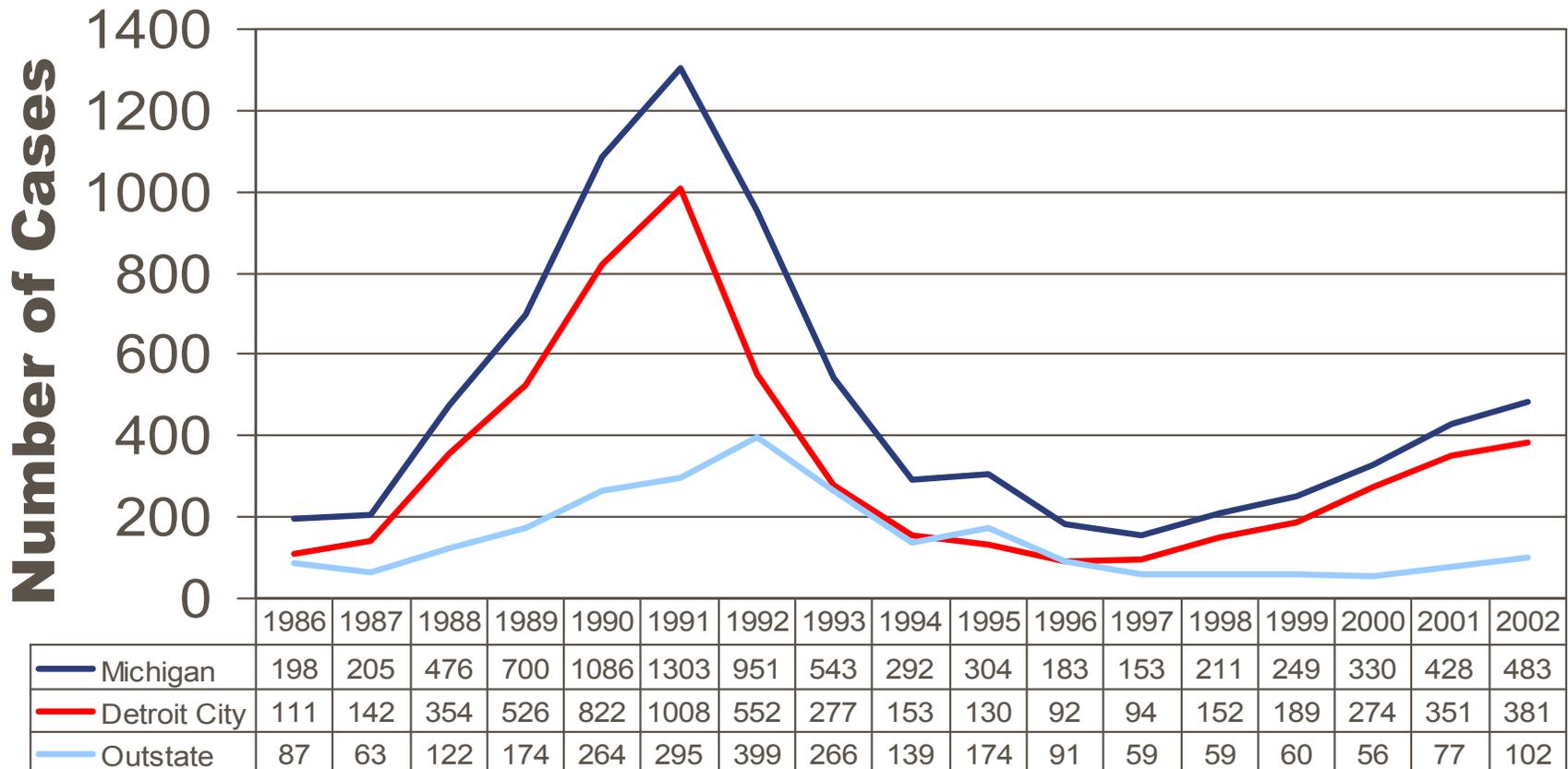
- The preferred treatment for syphilis is benzathine penicillin G
 - For primary, secondary and early syphilis the recommended dose is a one time shot of 2.4 million units administered intramuscularly
 - For latent syphilis the recommendation is 2.4 million units intramuscularly once every week for 3 weeks.
- Oral doxycycline or tetracycline can be substituted if allergy to penicillin exists.
- Treatment administered after late latent symptoms have developed will not lead to their reversal, but will cease any further progression.
- No known resistance to penicillin has developed in *Treponema pallidum* to date.

Syphilis Rises & Falls in 7-10 Year Cycles

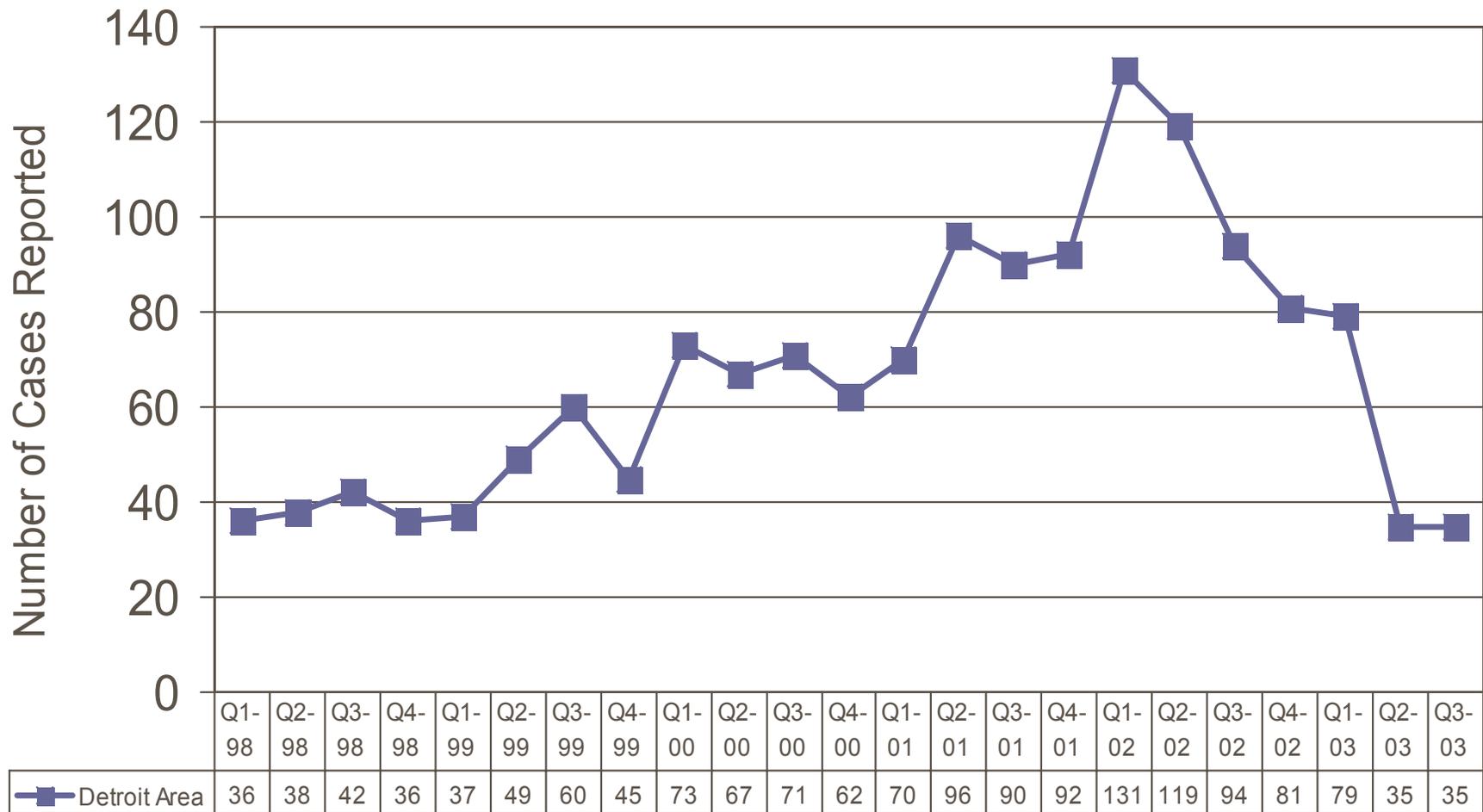
Michigan P&S Syphilis 1947-2002



P&S Syphilis by Region 1986-2002



P&S Syphilis by Quarter of the Year



The Detroit News

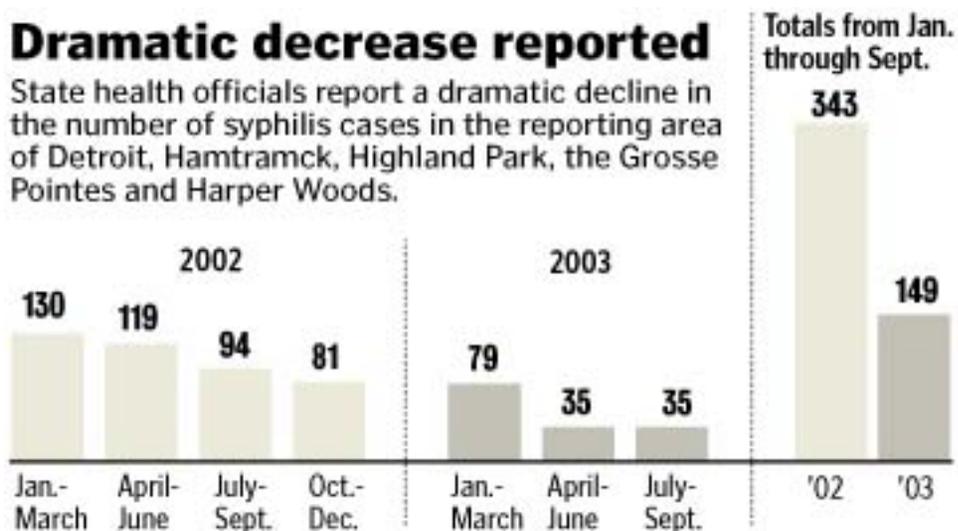
**Metro Section Headline
October 17th, 2003**

Syphilis cases plunge in Detroit

Health Dept. credits decline to intense awareness programs.

Dramatic decrease reported

State health officials report a dramatic decline in the number of syphilis cases in the reporting area of Detroit, Hamtramck, Highland Park, the Grosse Pointes and Harper Woods.

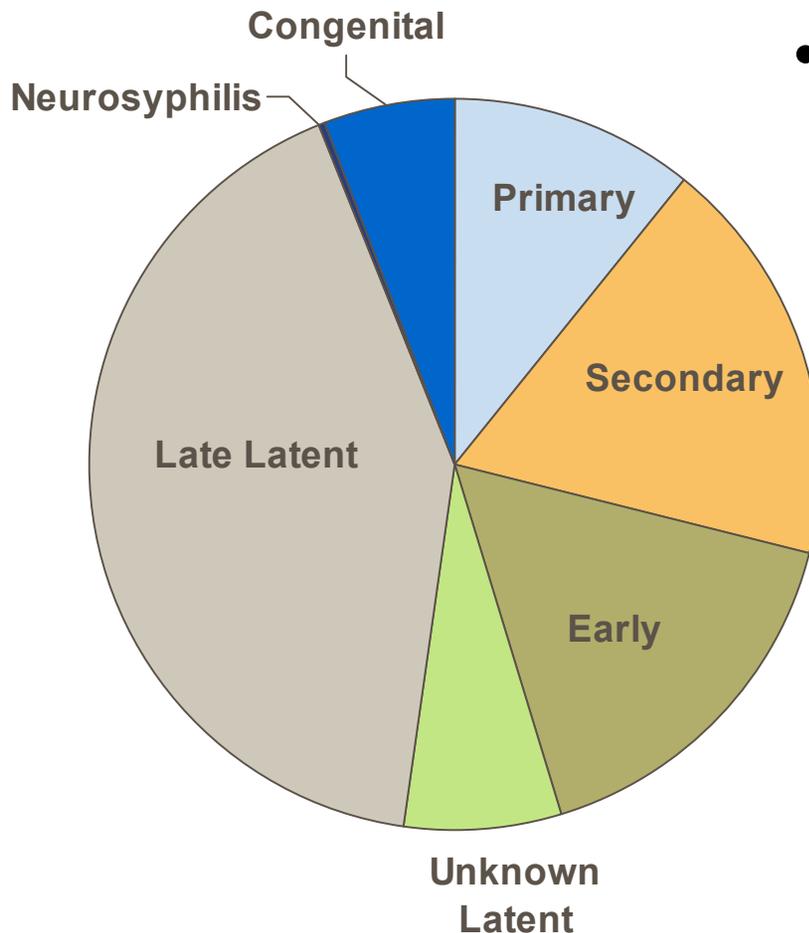


Source: Michigan Department of Community Health

The Detroit News

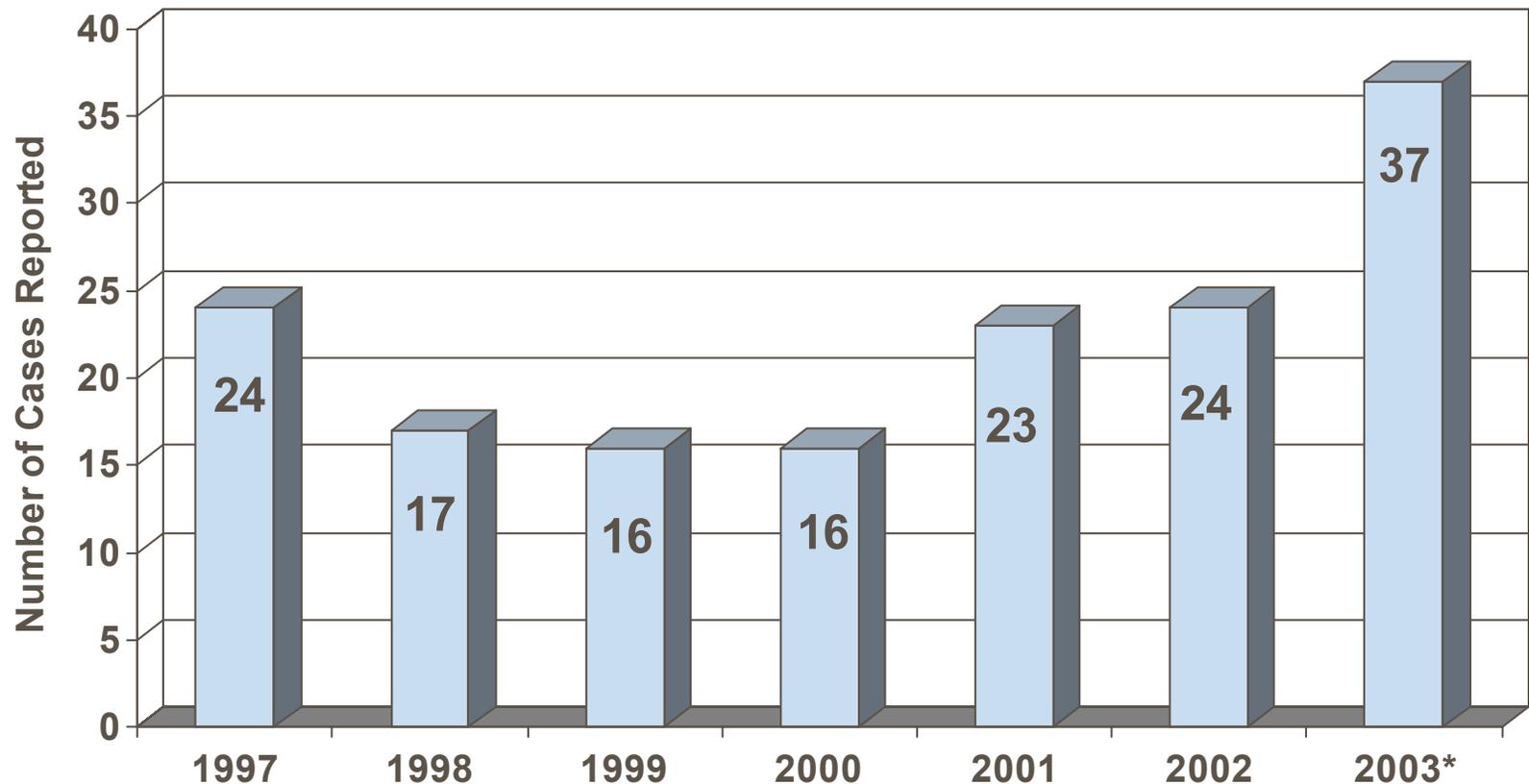
Diagnosed Syphilis in Detroit

January - October 2003



- 569 Cases of Syphilis
 - 60 Primary (11%)
 - 110 Secondary (19%)
 - 93 Early Latent (16%)
 - 38 Unknown Latent (7%)
 - 233 Latent (41%)
 - 3 Neurosyphilis (1%)
 - 32 Congenital (6%)

Number of Congenital Syphilis Cases Reported by Year



Data Includes Detroit, Harper Woods, Hamtramck, Highland Park and the Grosse Pointes

Data provided by MDCH/DHD

Note: These totals will not match CDC totals as this data is calculated by year of report rather than DOB as done by the CDC

*Projected Total (November 14, 2003)

Why the Increases in Congenital Syphilis?

- The increase is most likely an artifact due to surveillance and reporting changes
- Case Definition Modifications
 - Algorithm was modified to conform with CDC recommendations
 - Sensitivity of diagnosis was greatly increased
- Congenital Syphilis Coordinator position created
 - Surveillance was improved and increased

The Demographics of Detroit P&S Syphilis January - October 2003

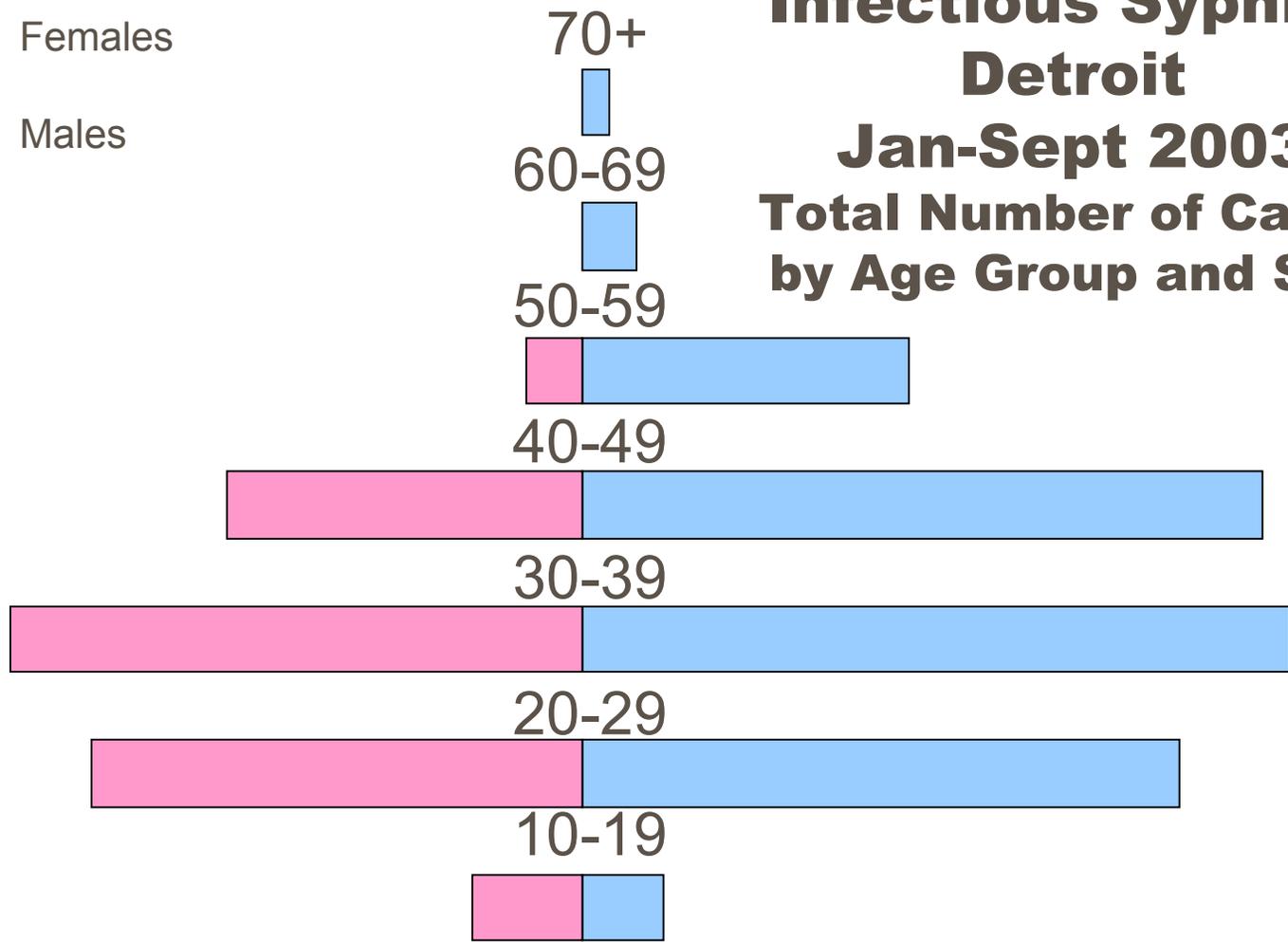
- The majority of Detroit's 170 P&S cases occurred in African Americans
 - 92% African American
 - 7% White/Caucasian
 - 2% Hispanic
- The majority of cases occurred in males
 - 60% of cases were male
 - Male-to-Female Ratio 1.5:1
- Ages ranged from 15-74 ($\mu=36.6$)
 - Males ranged from 15-74 ($\mu=38.4$)
 - Females ranged from 15-59 ($\mu=33.9$)

Who gets Syphilis in Detroit?

- **Detroit's Overall Population**
 - 76% Black
 - 0.89:1 Male:Female Ratio
 - 21% between the ages of 15 and 29
 - 52% between the ages of 20 and 59
 - Average Age
 - Males 31.7
 - Females 34.7
- **Detroit's Syphilis Population**
 - Disproportionately Black
 - Disproportionately Male
 - Heavily affect the middle ages between 20 and 59
 - When people are most sexually active
 - Older on Average

 Females
 Males

**Infectious Syphilis
Detroit
Jan-Sept 2003
Total Number of Cases
by Age Group and Sex**



30

20

10

0

10

20

30

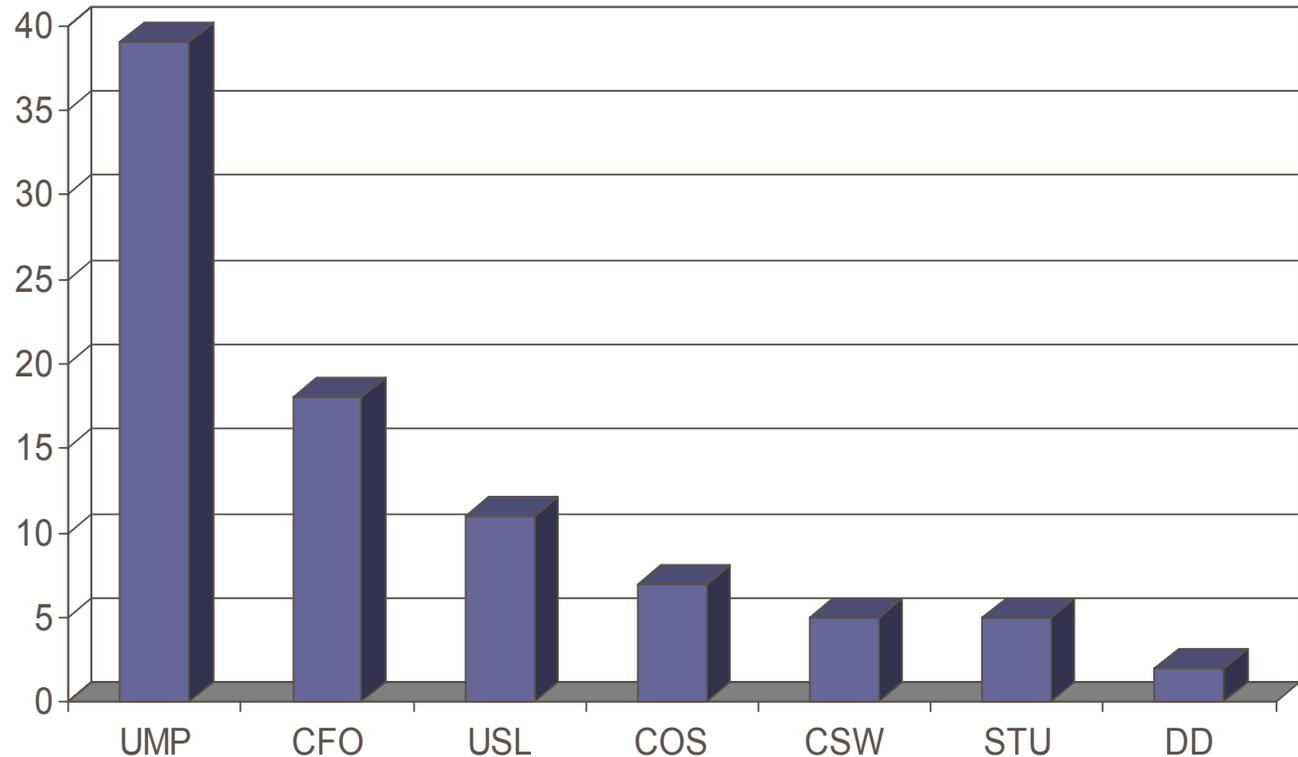
UMP = Unemployed
CFO = Craftsmen, Foremen or Operative
USL = Unskilled Laborer
CSW = Commercial Sex Worker
STU = Student
COS = Clerical, Office or Sales
DD = Drug Dealer

Detroit P&S Syphilis

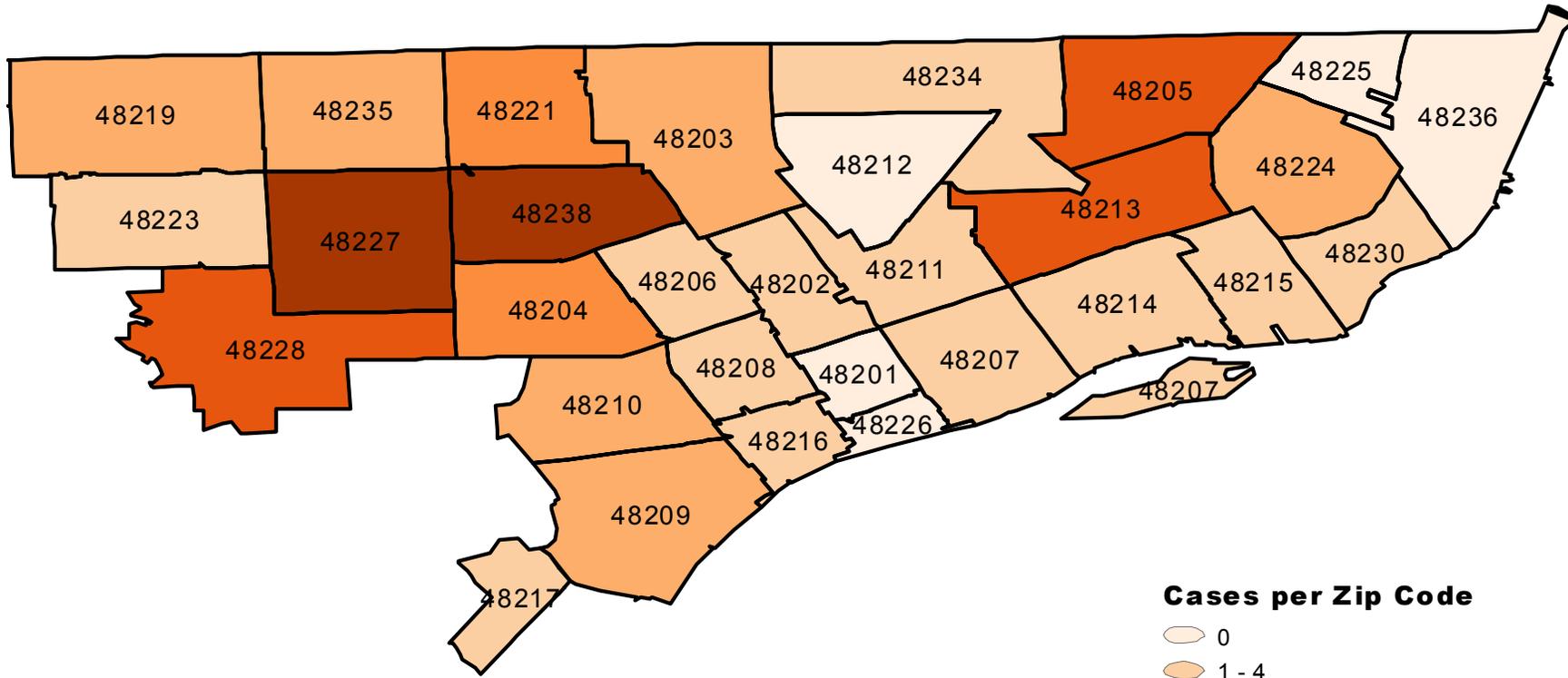
January – October 2003

Employment Types

Number of Cases Reporting Each Type of Employment



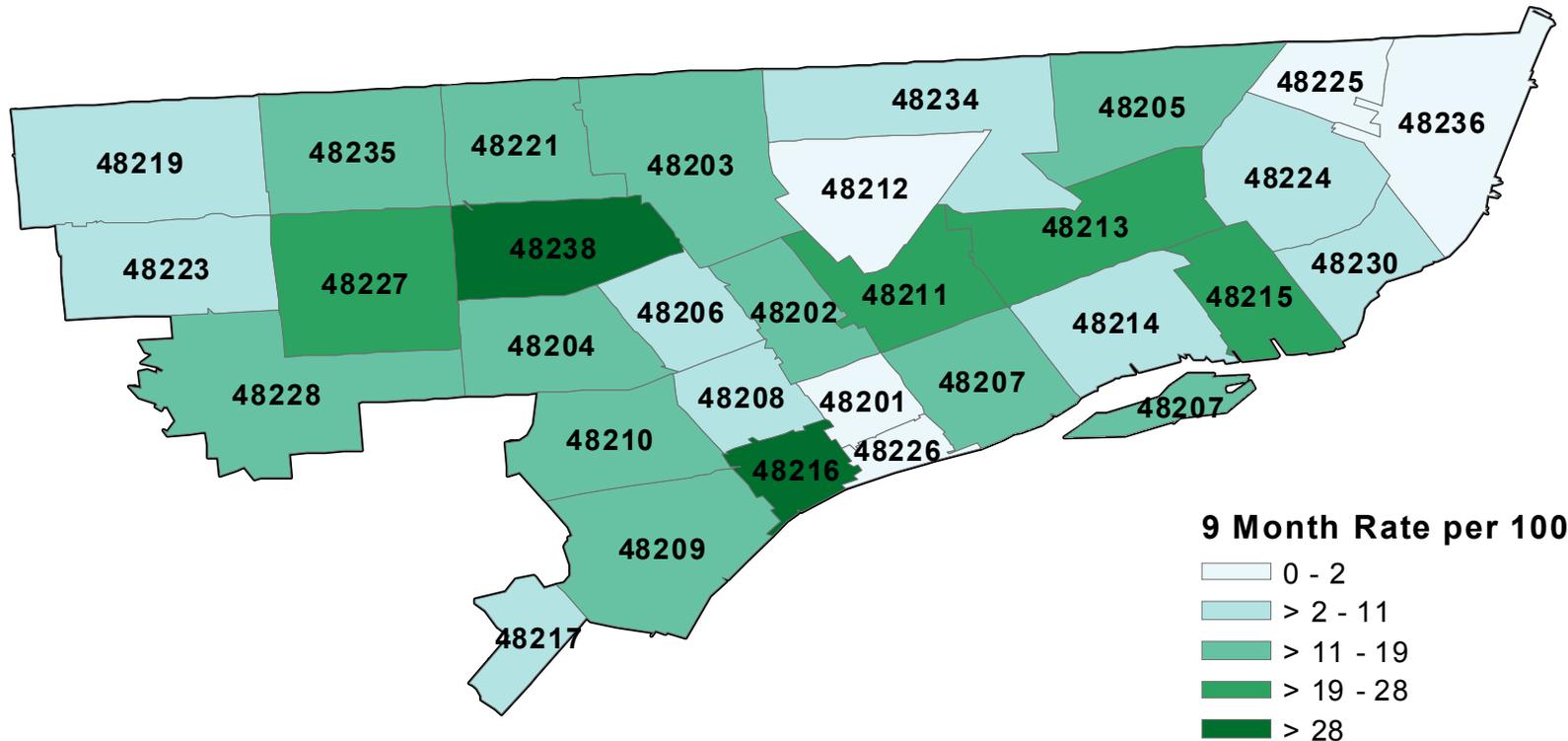
**Geographic Distribution P&S Syphilis
by Zip Code
Year To Date September 2003**



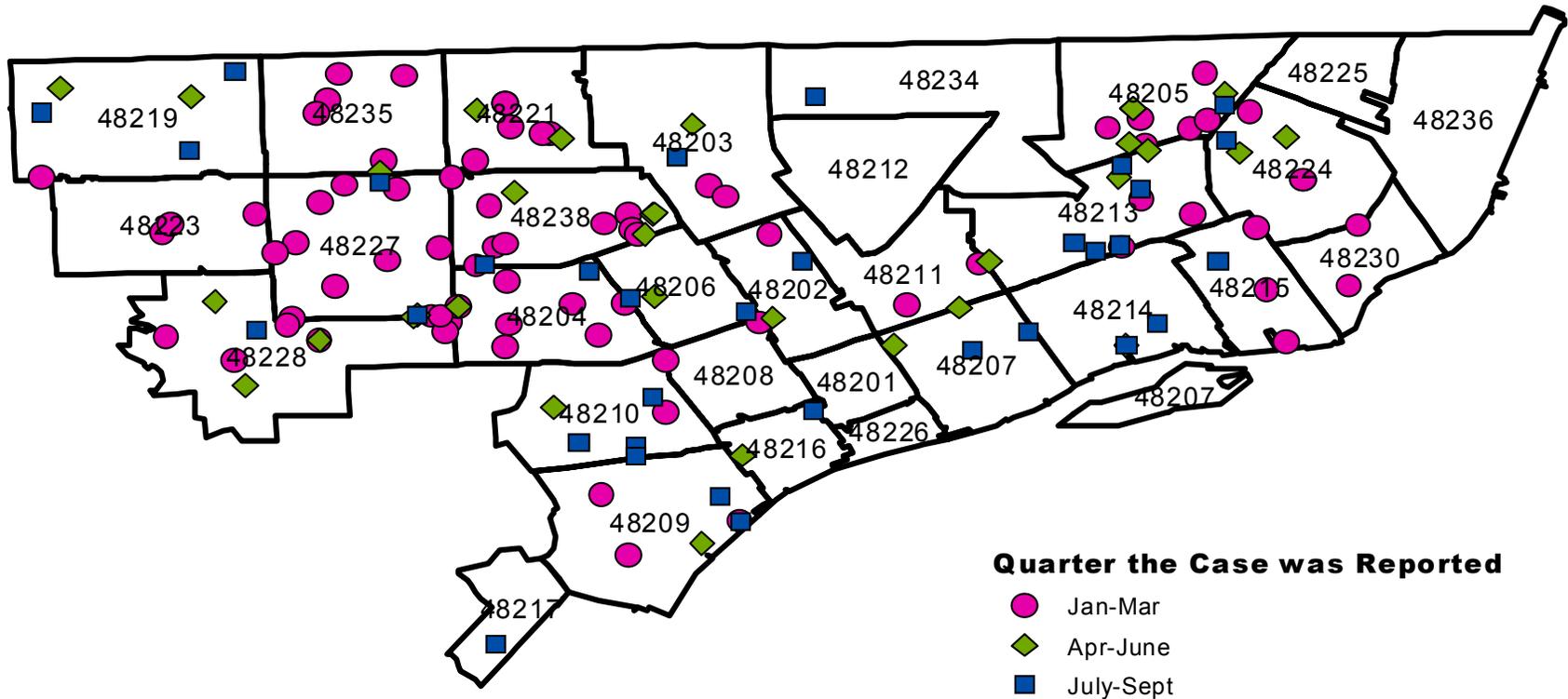
Cases per Zip Code

- 0
- 1 - 4
- 5 - 7
- 8 - 9
- 10 - 11
- 12 - 15

Geographic Distribution
P&S Syphilis
9 Month Zip Code Rates per 100,000 Population
Year to Date September 2003

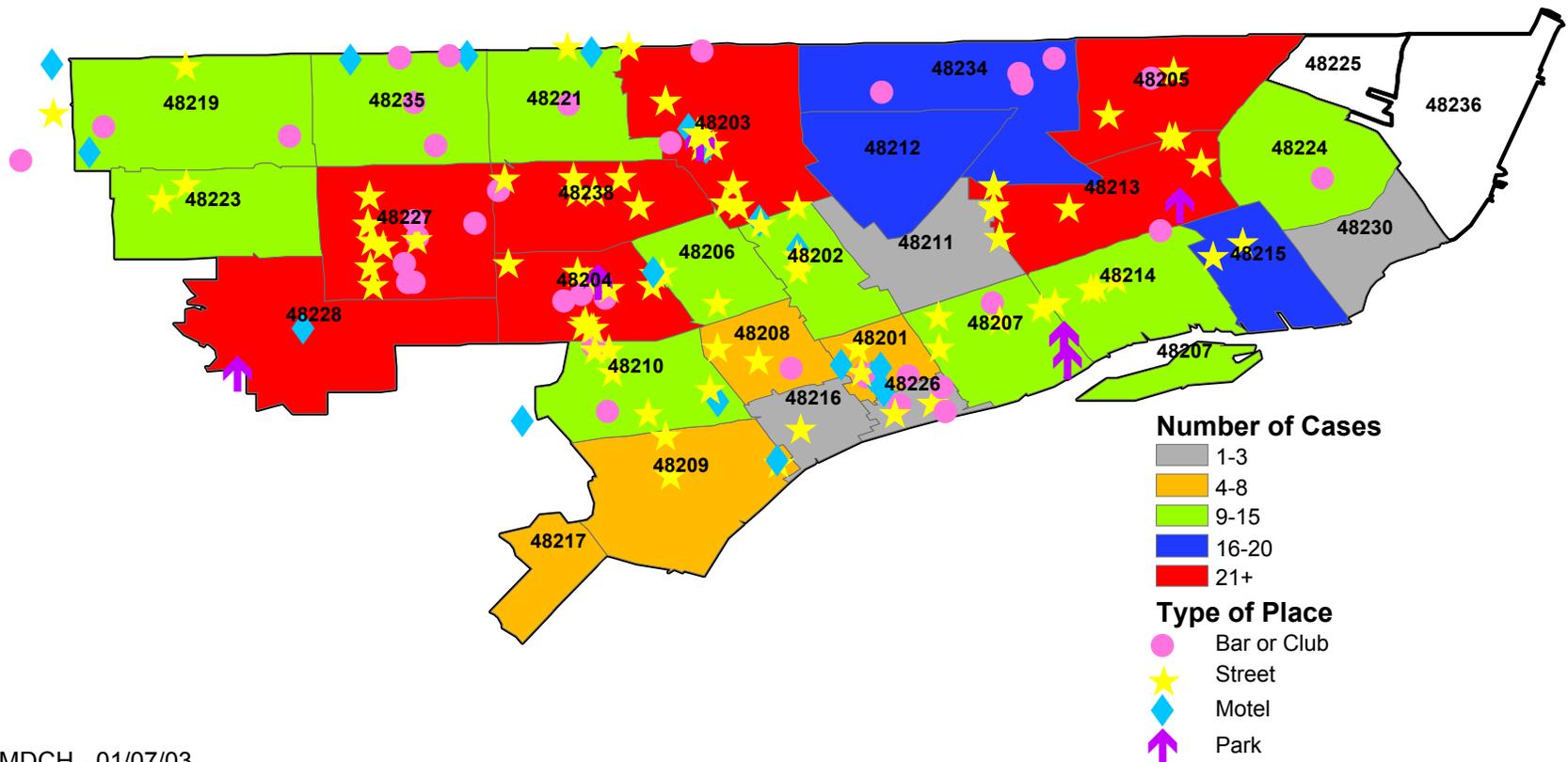


**Geographic Distribution P&S Syphilis
Migration of the Disease Throughout the Year
Year To Date September 2003**



Geographic Distribution P&S Syphilis 2002

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



What is the *Core Group* and why are they important?

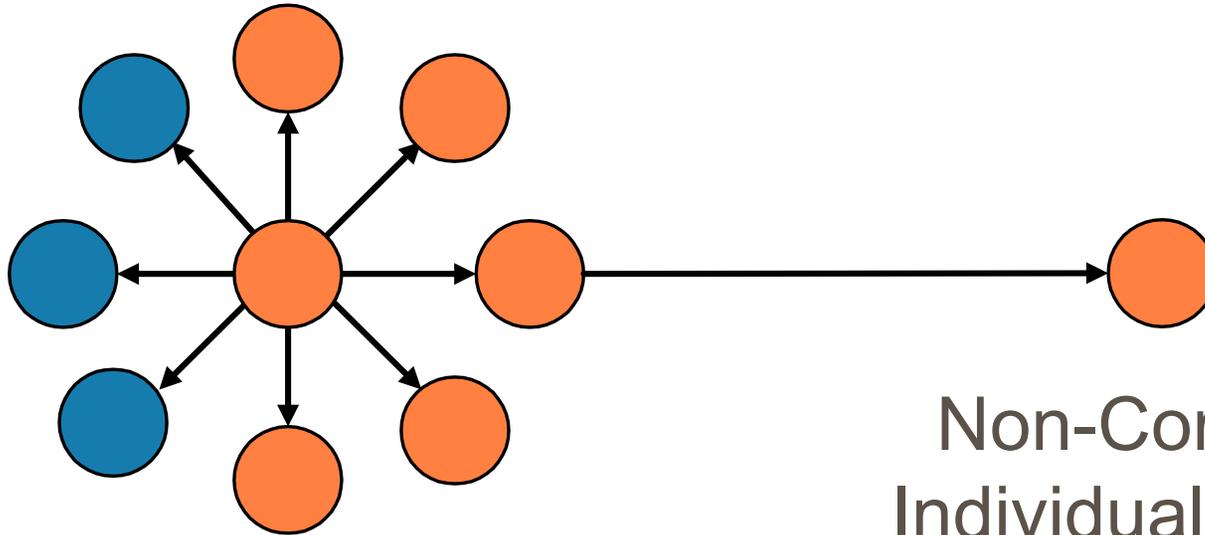
- The Core Group is a *theoretical* group of individuals responsible for maintaining syphilis transmission at times of overall low prevalence.
- Infectious cases in the Core Group are considered to be disproportionately responsible for syphilis transmission through the community.
- Syphilis infections in “low-risk” individuals may be attributable to individuals who practice “high-risk” Core Group behaviors.

The Core Group Profile for Syphilis Transmitters

Any infectious case reporting the following behaviors in the 12 months prior to being investigated for infectious syphilis.

1. Exchange of money/drugs for sex
 - Being a Commercial Sex Worker
 - Having Sex with a CSW
2. Anonymous sexual partners
3. Four or more partners in the past year
4. The use of heroin, crack or cocaine

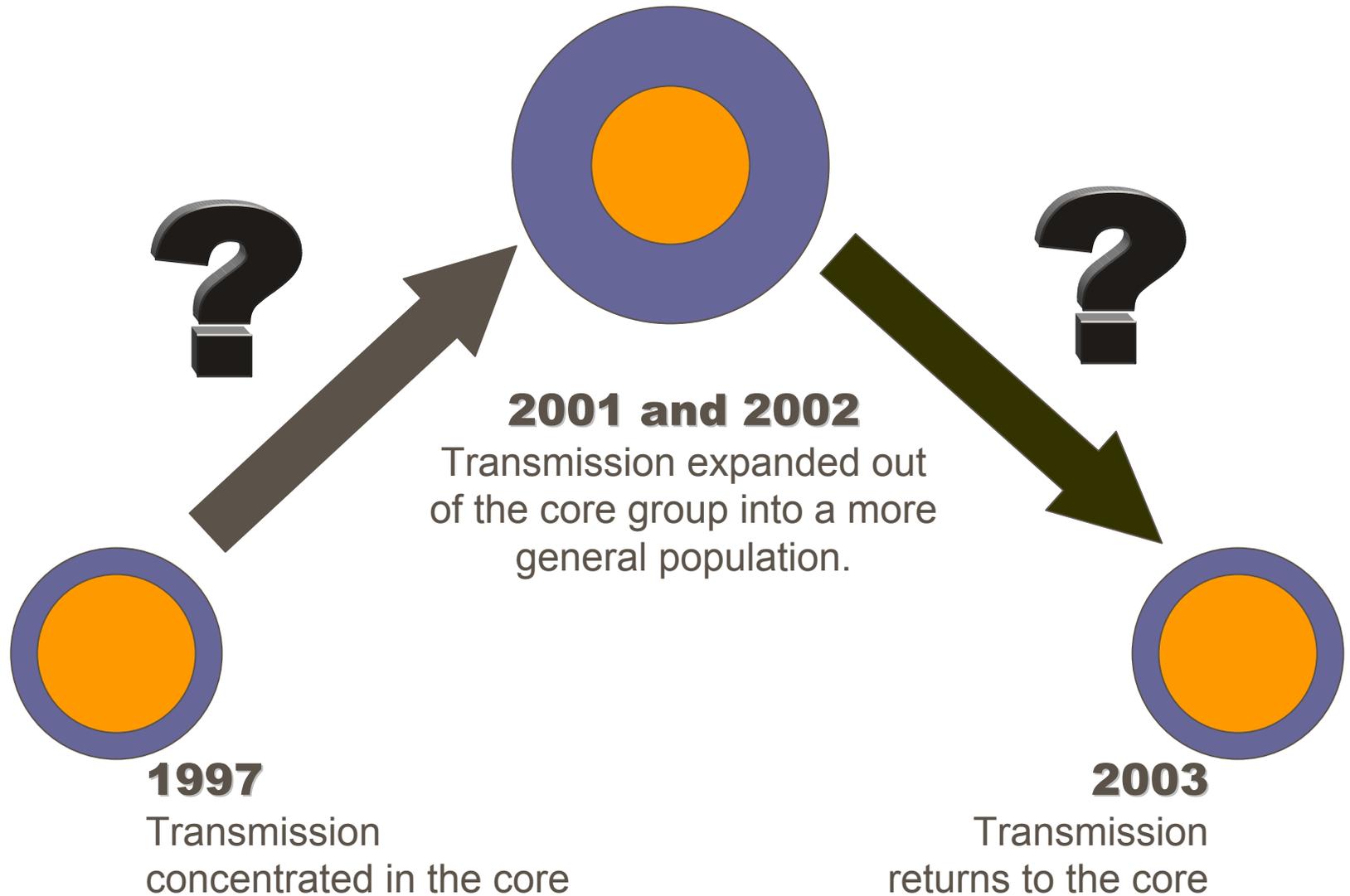
A Core Group P&S
Syphilis Case has Eight
Partners During the
Infectious Period



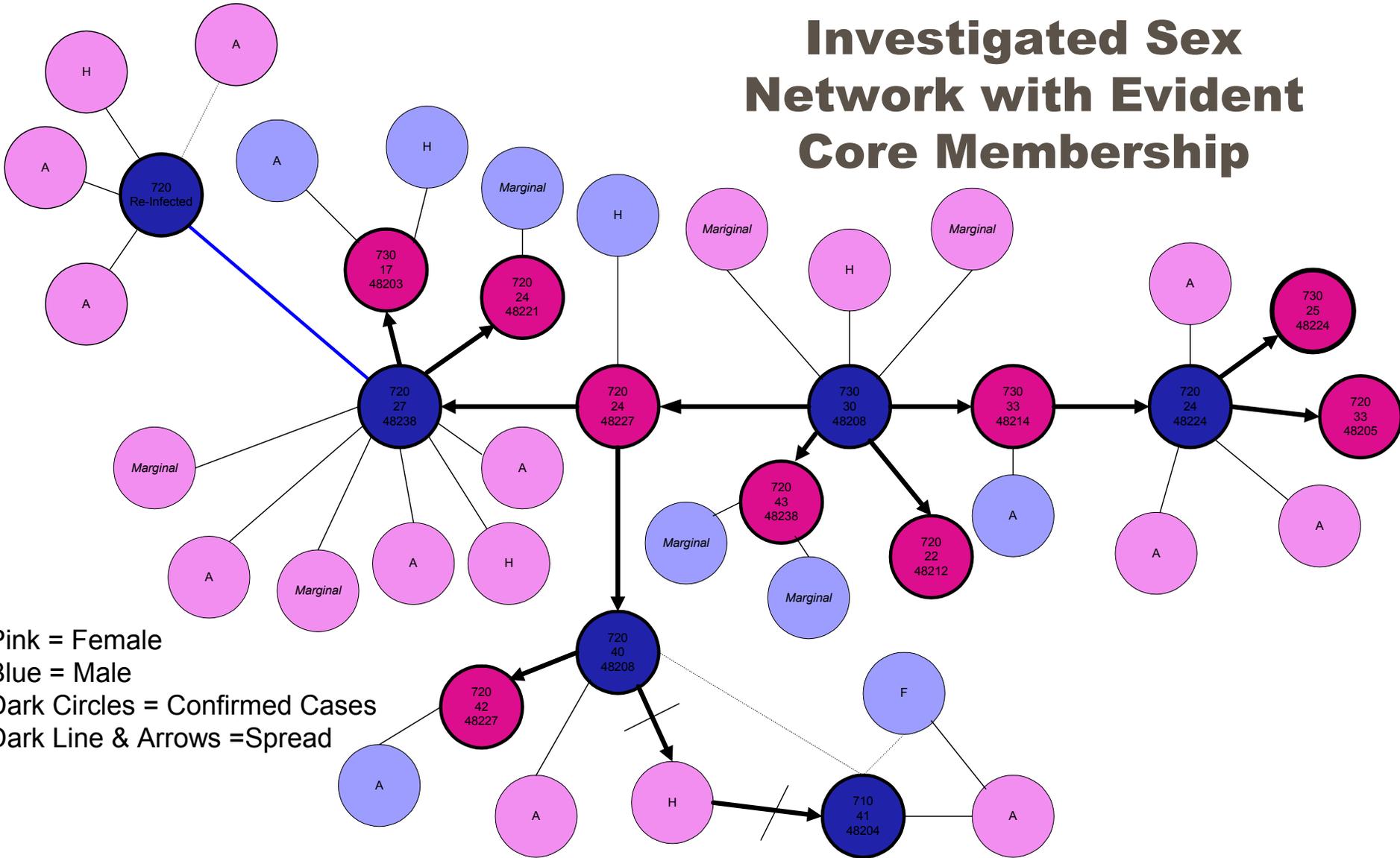
60% of their Partners
Become Infected

**Why focus
efforts on
the core
group?**

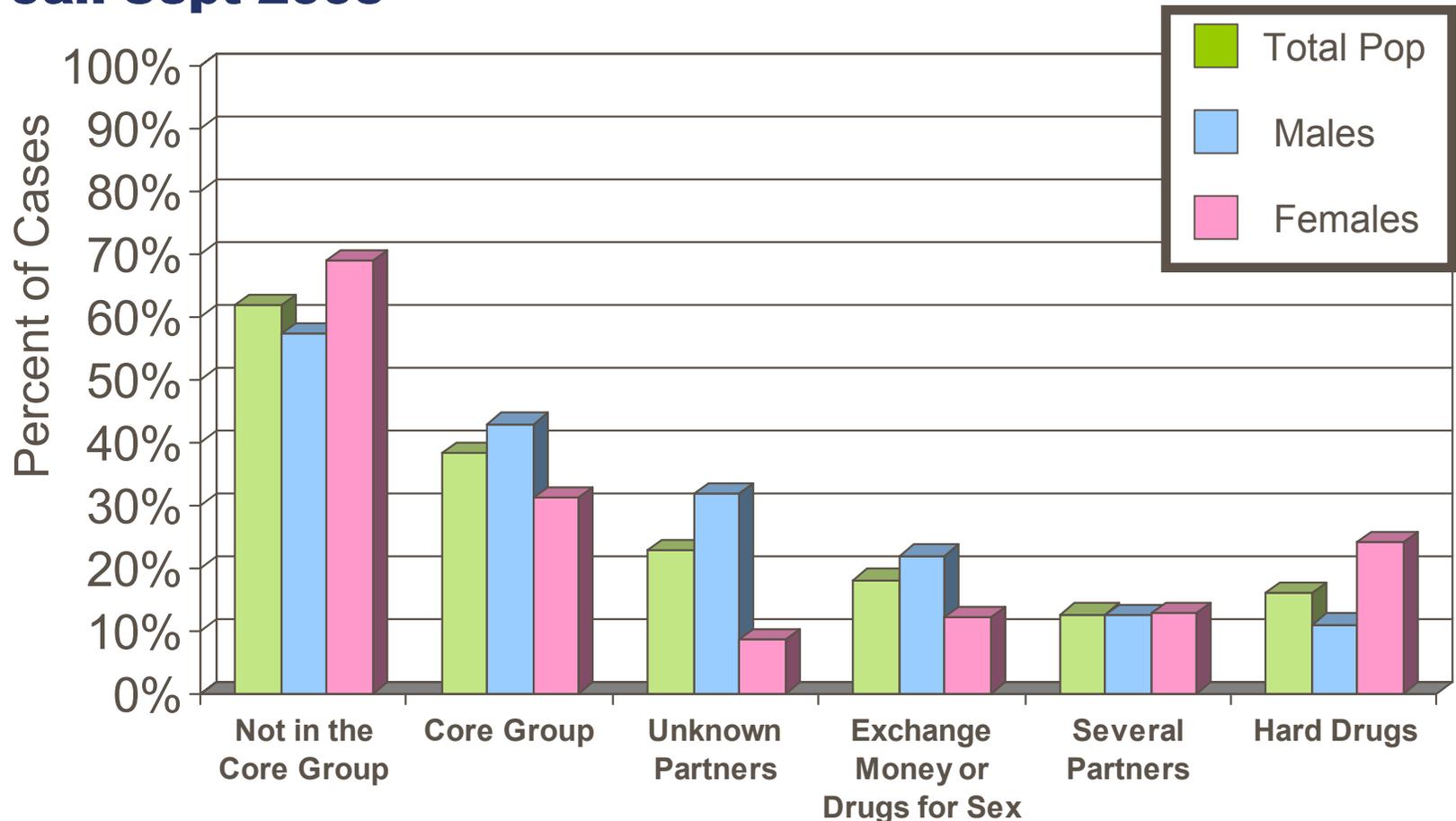
Non-Core Group
Individual with Only
One Partner Becomes
Infected



2002 Detroit Investigated Sex Network with Evident Core Membership

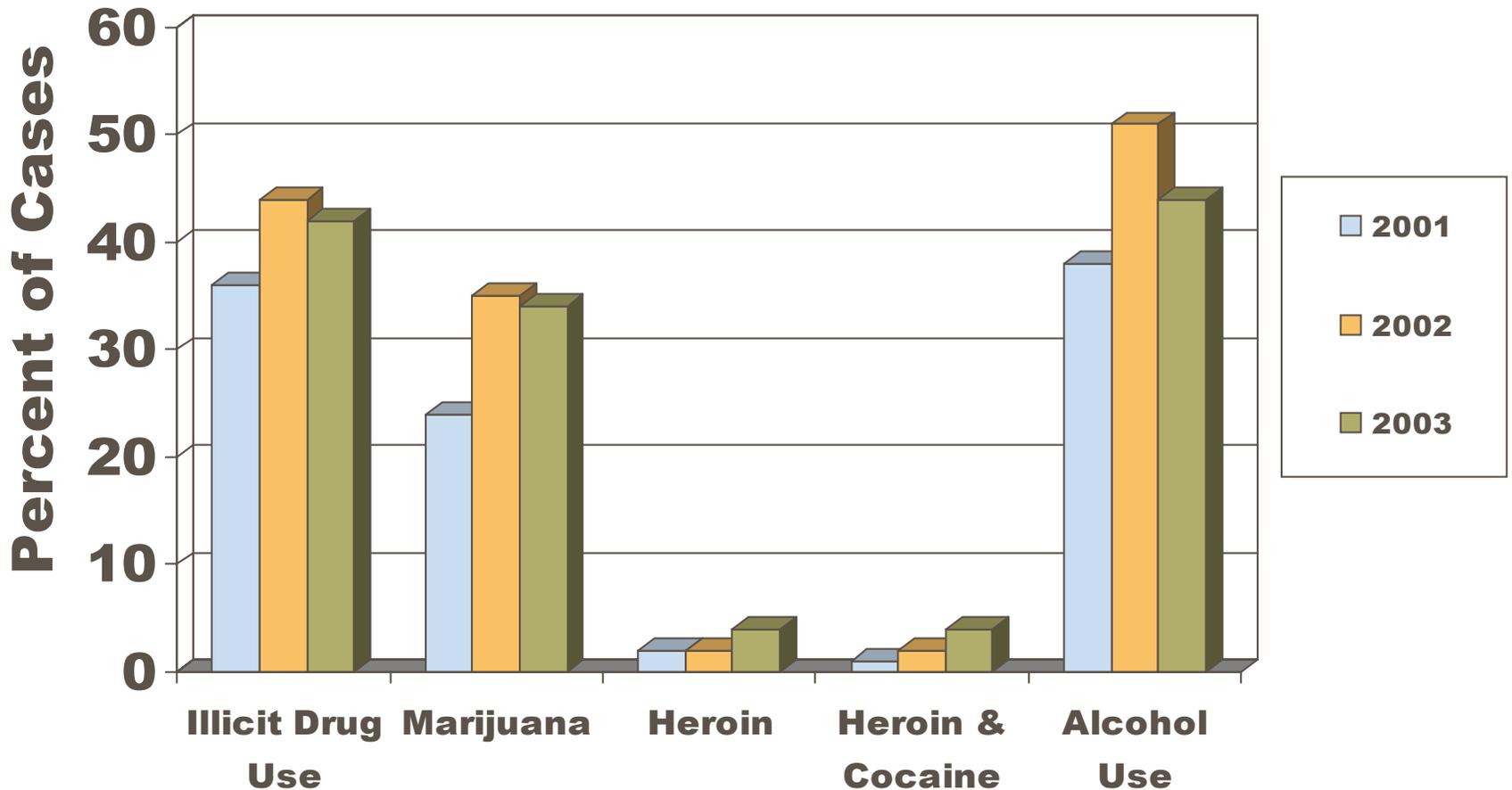


Core Group Characteristics of the Detroit P&S Population by Gender Jan-Sept 2003



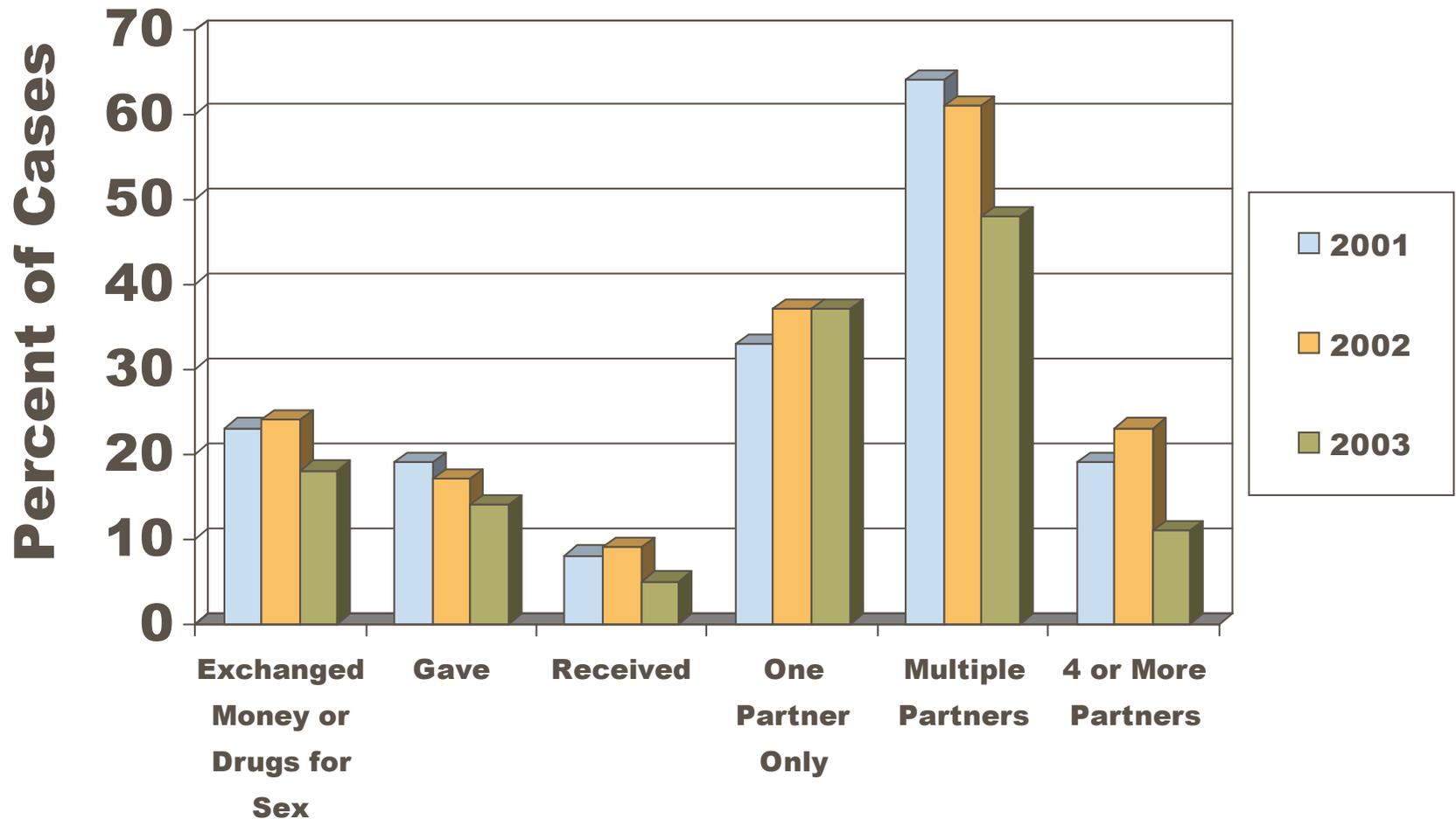
Core Group Characteristics

Drug Use Trends (Jan-Oct By Year)



Core Group Characteristics

Sexual Behavior Trends (Jan-Oct by Year)



Syphilis and HIV in Detroit

- Syphilis infection increases the transmissibility of the HIV virus by those already infected
 - Increases viral load by inducing HIV 1 gene expression¹ and promoting the expression of the monocyte co-receptor CCR5 which is required for transmission²
- Syphilis cases have a 2- to 5-fold increased risk of acquiring HIV infection due to genital lesions which provide a portal of entry

1: Thues et al. JID 1998; 177:941-950

2: Sellati TJ et al. JID 2000; 181:283-293

Detroit's Co-Infected Population Early Syphilis 1997-2003

- 129 co-infected cases
 - 3.6% of all syphilis cases examined
- Demographics
 - 95% African American
 - 76% Male
- Stage of Syphilis Infection
 - 62% P&S
 - 38% Early

Significant Trends

- 60% of examined cases were diagnosed with HIV prior to acquiring syphilis
- 73% of early co-morbid cases reported MSM activity while less than 4% of syphilis only cases do
- Among all early syphilis cases (Jan-Aug 2003) the odds of co-infection is 96 times higher for those self-reporting MSM than those self-reporting only heterosexual sex (OR: 96.0, 95% CI: {10.11, 911.28})

Implications

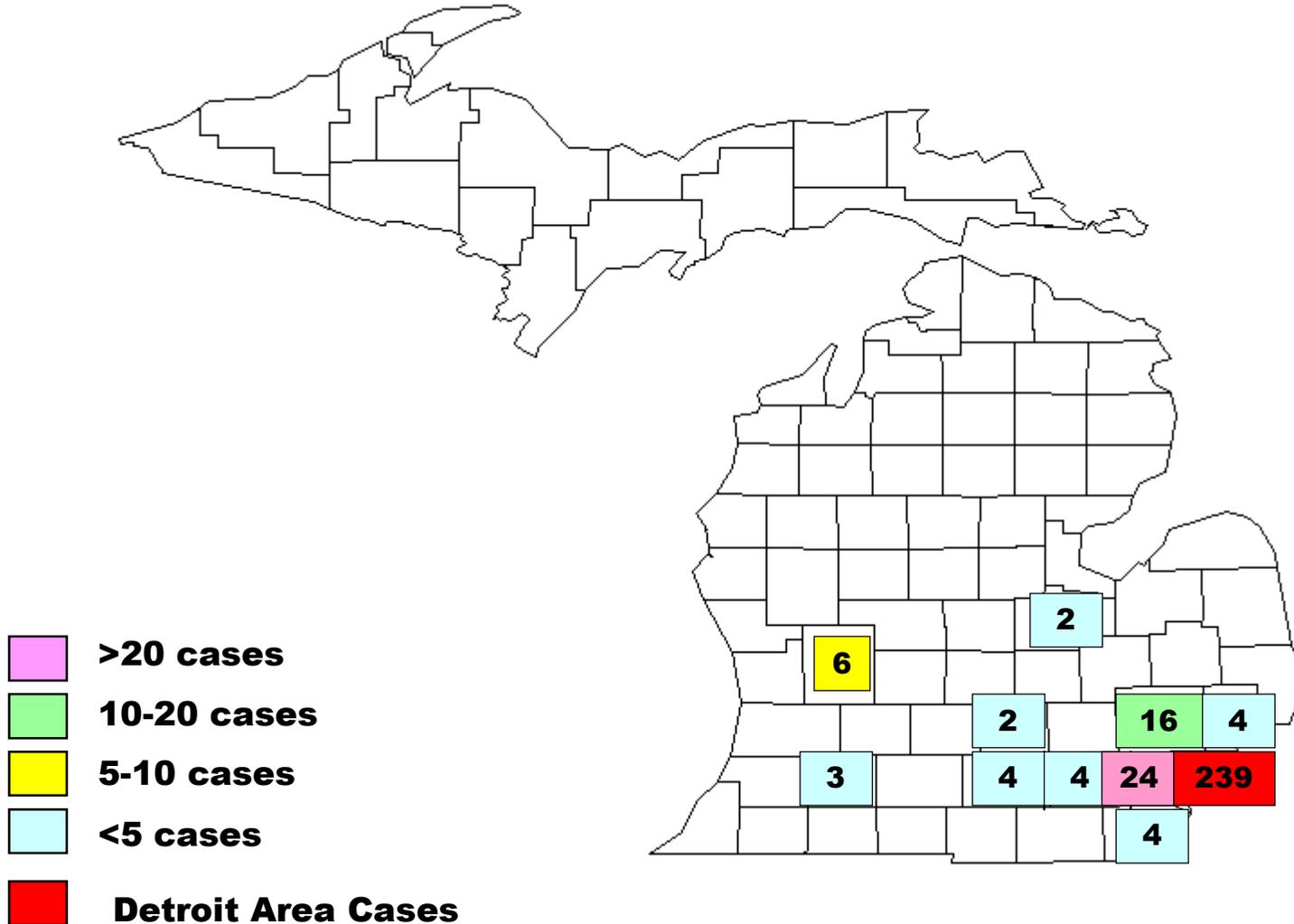
- Some HIV infected individuals continue high-risk sexual behavior regardless of HIV status
 - Health care professional promotion of safer sex practices remains important as HAART extends and improves quality of life
- HIV testing should be encouraged for all syphilis cases but especially those self-reporting MSM behavior
- Education should be provided to clinicians treating HIV positive patients on the recognition of and screening for syphilis

Early Syphilis

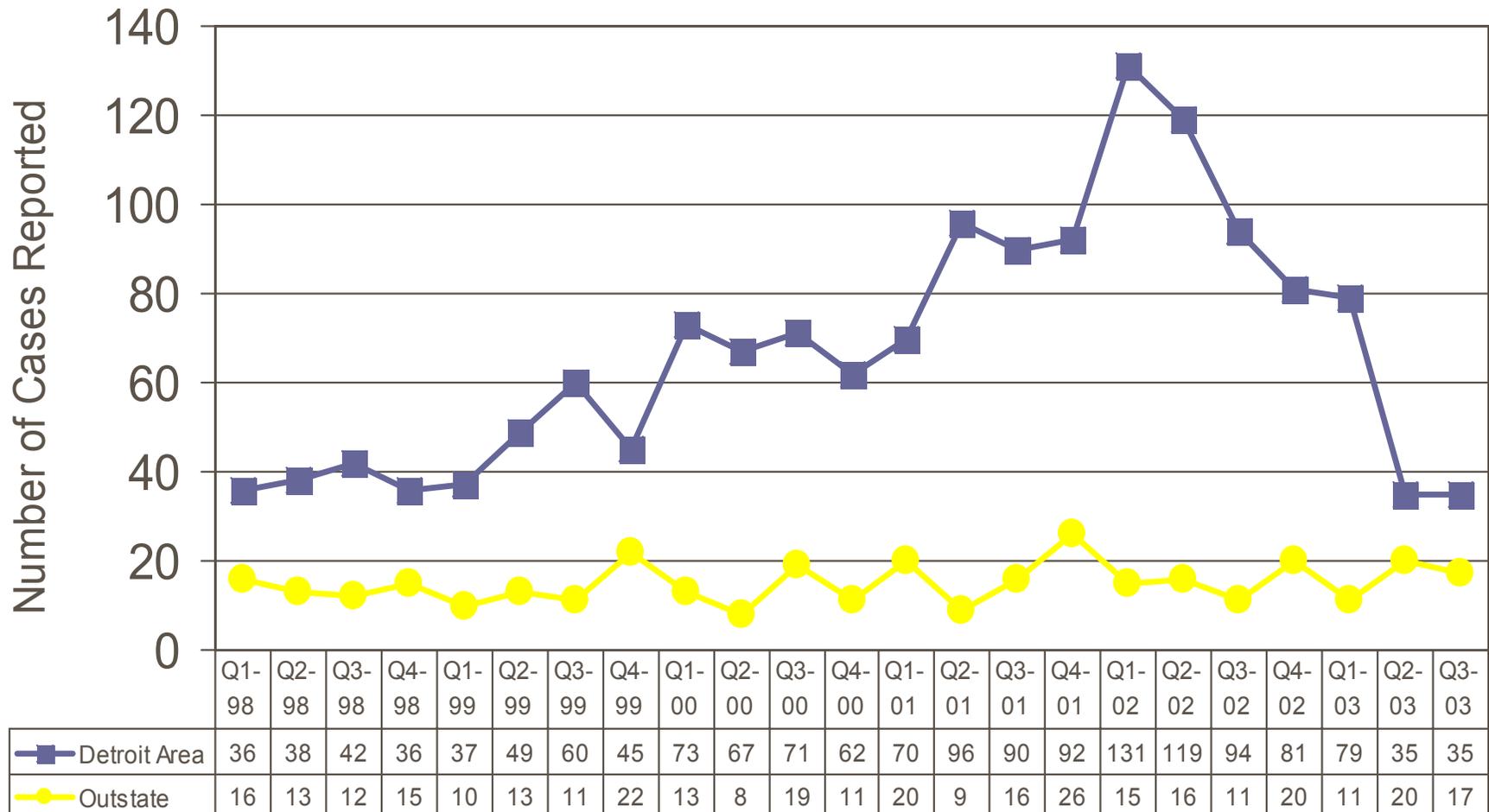
Out-State and Detroit Michigan

January - September 2003

N=69 Outstate
N=239 in the Detroit Area



P&S Syphilis by Quarter of the Year



Outstate Early Syphilis Demographic Characteristics (Jan-Sept)

- 77% of cases are male (n=53 vs. n=16)
 - YTD Male-to-Female Ratio 3.21
- Racial Breakdown
 - 51% African American (n=35)
 - 45% Caucasian (n=31)
 - 5% Other (n=1 AI/AN, O, Hisp)
- Ages Ranged from 15-58 ($\mu = 35.7$)
 - Males ranged from 18-58 ($\mu = 37.2$)
 - Females ranged from 15-47 ($\mu = 30.6$)

Outstate Early Syphilis Core Group Characteristics (Jan-Sept)

- 53% Of early cases are members of the core group of syphilis transmitters
 - Unknown or anonymous partners
 - 42%
 - Four or more sexual partners
 - 26%
 - Exchange of money or drugs for sex
 - 18%
 - Hard drug use (Crack, Cocaine or Heroin)
 - 6%

Detroit Area vs. Outstate Differences in the Populations (Jan-Sept)

- Outstate cases more likely to be white
 - Detroit Population more likely to be African American or Hispanic
- Outstate cases more likely to be members of the core group of syphilis transmitters
 - 53% vs. 38% (P&S cases)
- Outstate cases more likely to be male
 - 77% vs. 55% (early cases)
- Outstate cases more frequently self-reported MSM activity
 - Detroit: 6% of all P&S and 10% of male P&S
 - Outstate: 25% of all P&S and 32% of male P&S

Conclusions

- Syphilis is curable and resistance has not been detected
- Michigan rates are mainly a result of syphilis in Detroit
- Detroit's syphilis has been on the decline in recent years while syphilis around the nation has risen
- Detroit's syphilis population is highly African American, slightly more male than female and has a low SES
- A large proportion of syphilis cases have high-risk behaviors

Conclusions

- Syphilis migrates throughout the city over time
- Syphilis and HIV co-infection increases the risk of transmission and acquisition of both diseases
- Outstate syphilis has remained stable over time
- The outstate syphilis population is demographically more diverse, has a higher male-to-female ratio, is slightly younger and more MSM in nature than the Detroit population

Special Thanks To:

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