

Facing the Future of STDs in Arizona: Epidemiology, Anti-Microbial Resistance, and Reporting

Arizona Infectious Disease Training and Exercise
Black Canyon Conference Center – Phoenix

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7/25/13



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Program Targets

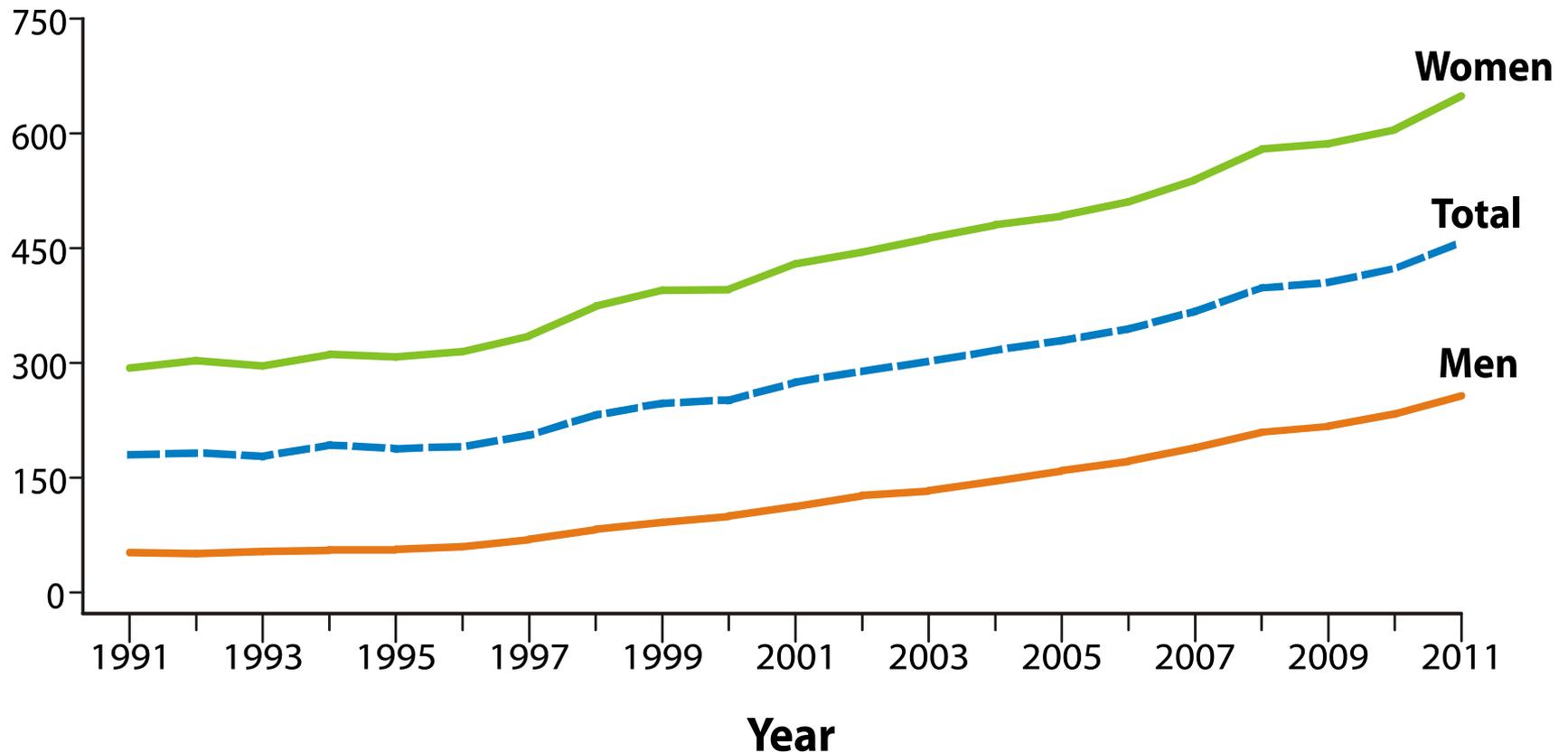
- Adolescents and Young Adults
- Men Who have Sex With Men
- Multi-Drug Resistant Gonorrhea
- Congenital Syphilis

Chlamydia

- The most frequently reported bacterial sexually transmitted disease
- Estimated 3 million infections occur annually
- Many people with chlamydia do not have symptoms and do not seek testing

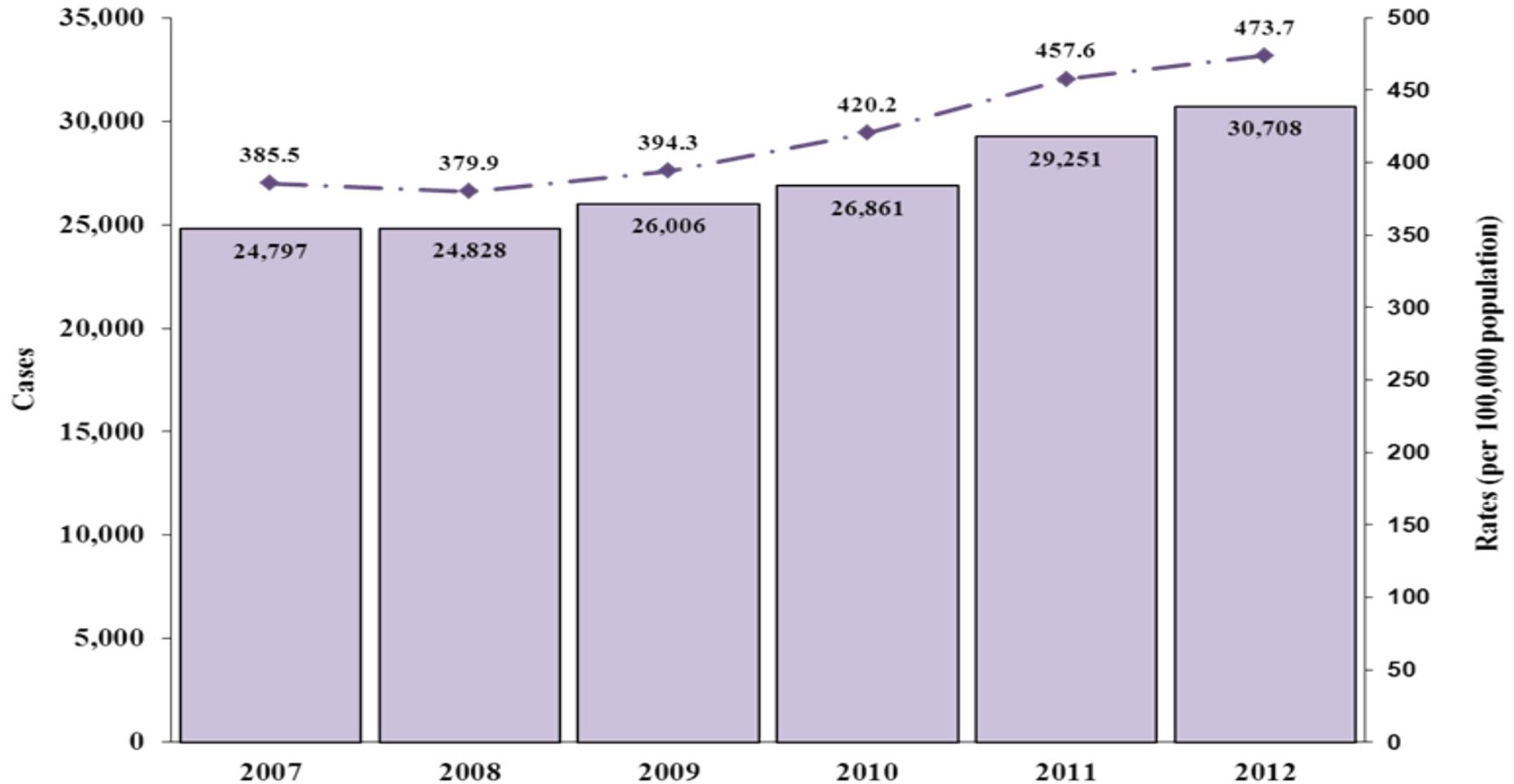
Chlamydia—Rates by Sex, United States, 1991–2011

Rate (per 100,000 population)



NOTE: As of January 2000, all 50 states and the District of Columbia have regulations that require the reporting of chlamydia cases.

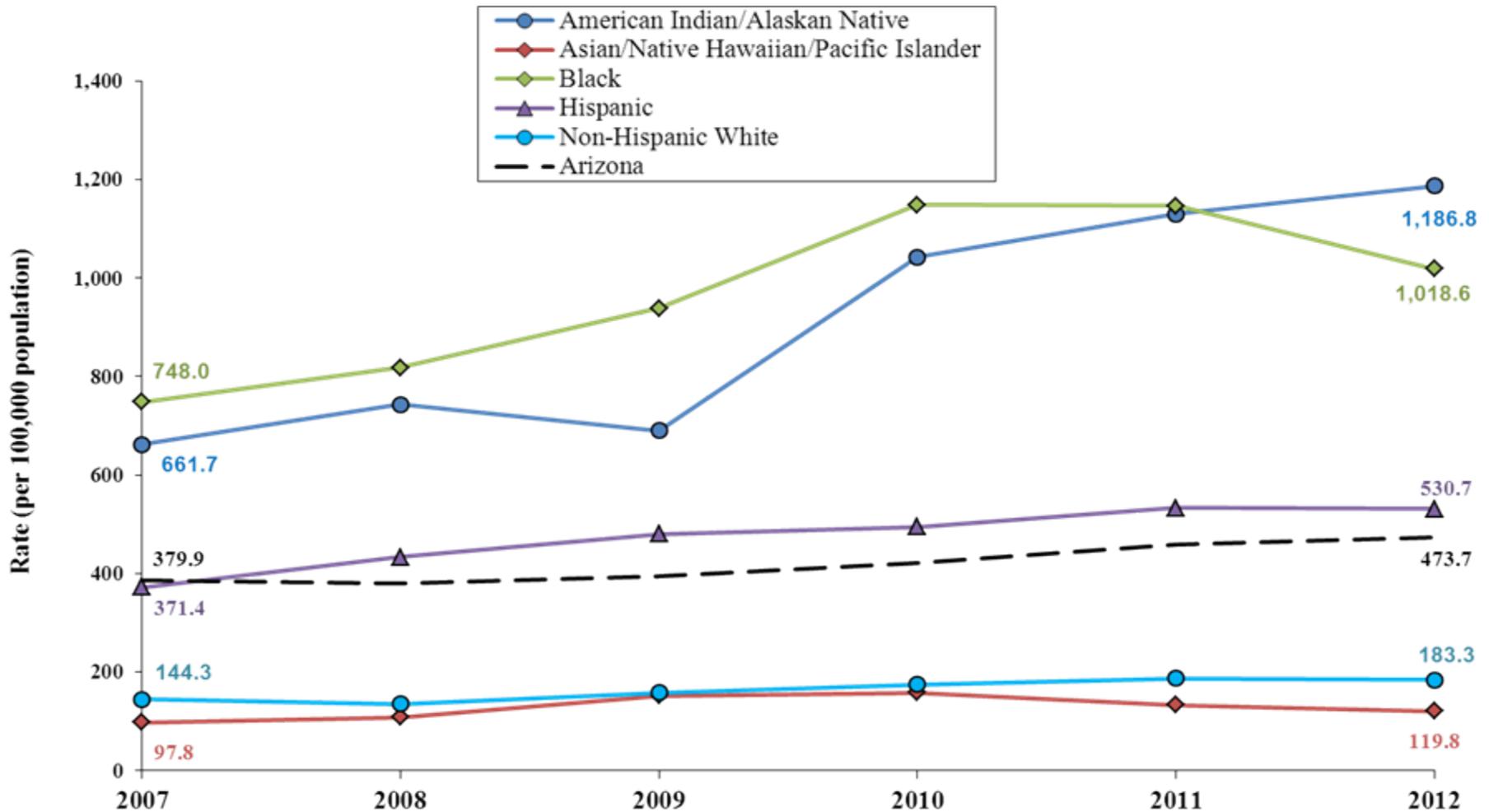
Reported Chlamydia Cases and Case Rates, Arizona 2007-2012



Data is provisional and subject to change.

*2011 CDC bridged data used for 2012 case rate population denominators.

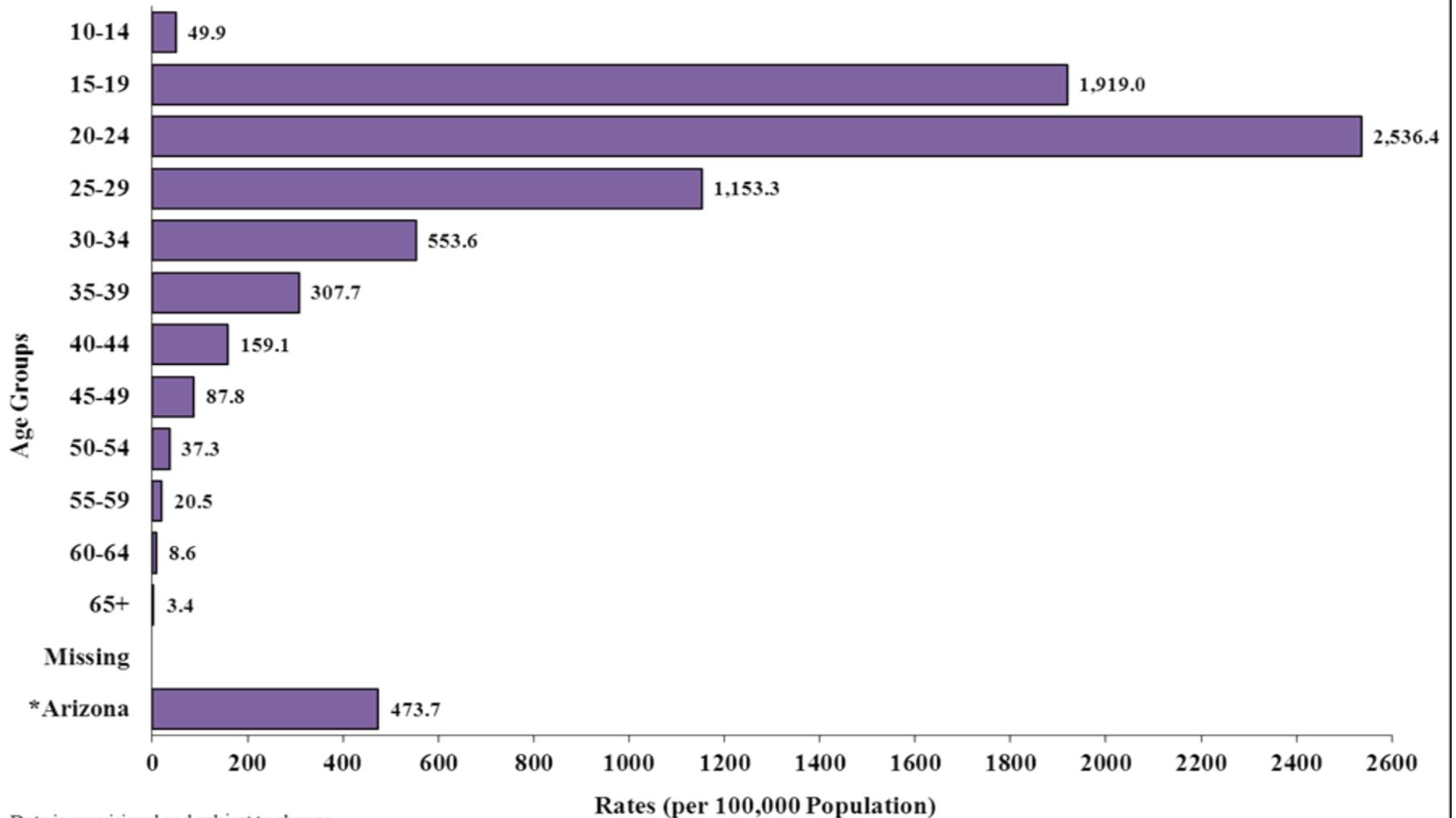
Reported Chlamydia Case Rates by Race/Ethnicity, Arizona 2007-2012



Data is provisional and subject to change.

*2011 CDC bridged data used for 2012 case rate population denominators.

Reported Chlamydia Rates by Age Group, Arizona 2012



Data is provisional and subject to change.

2011 CDC bridged data used for 2012 case rate population denominators. *Ages 0-9 not shown, Arizona rate reflects all ages



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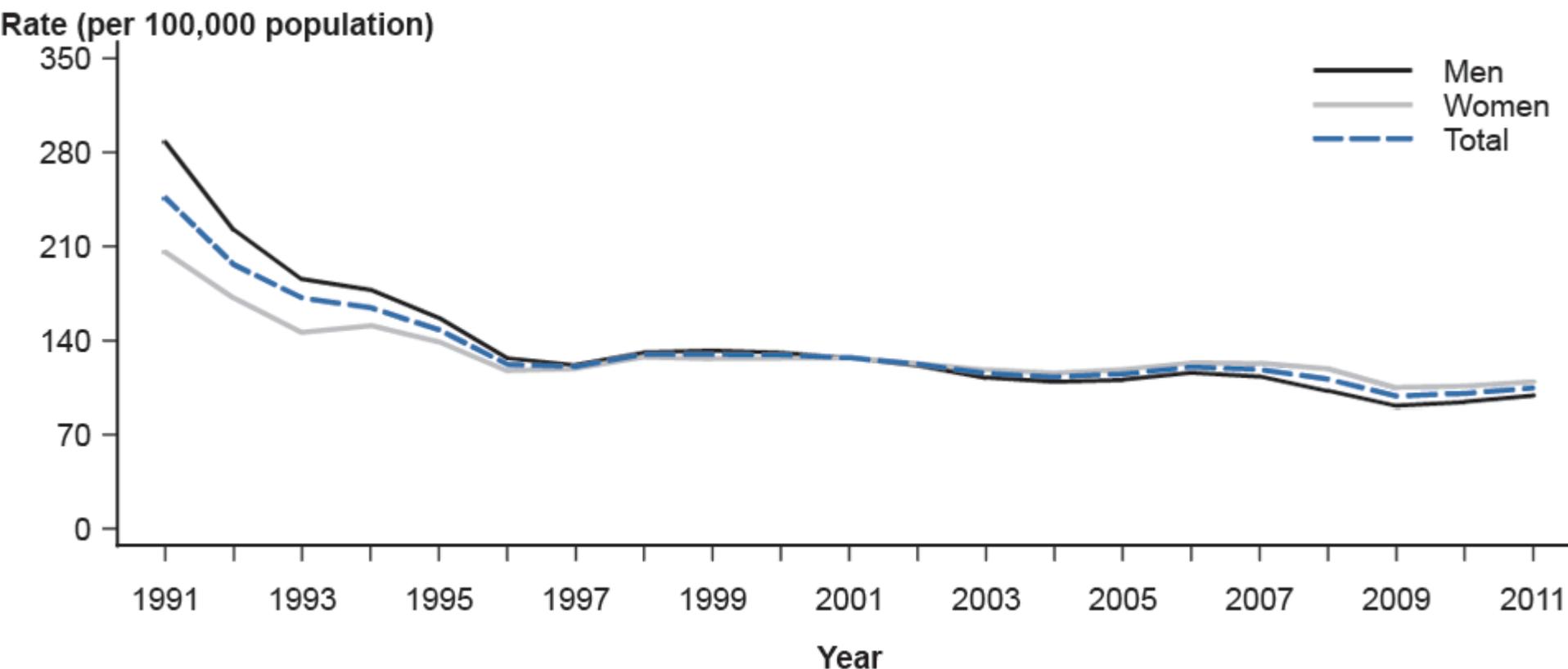
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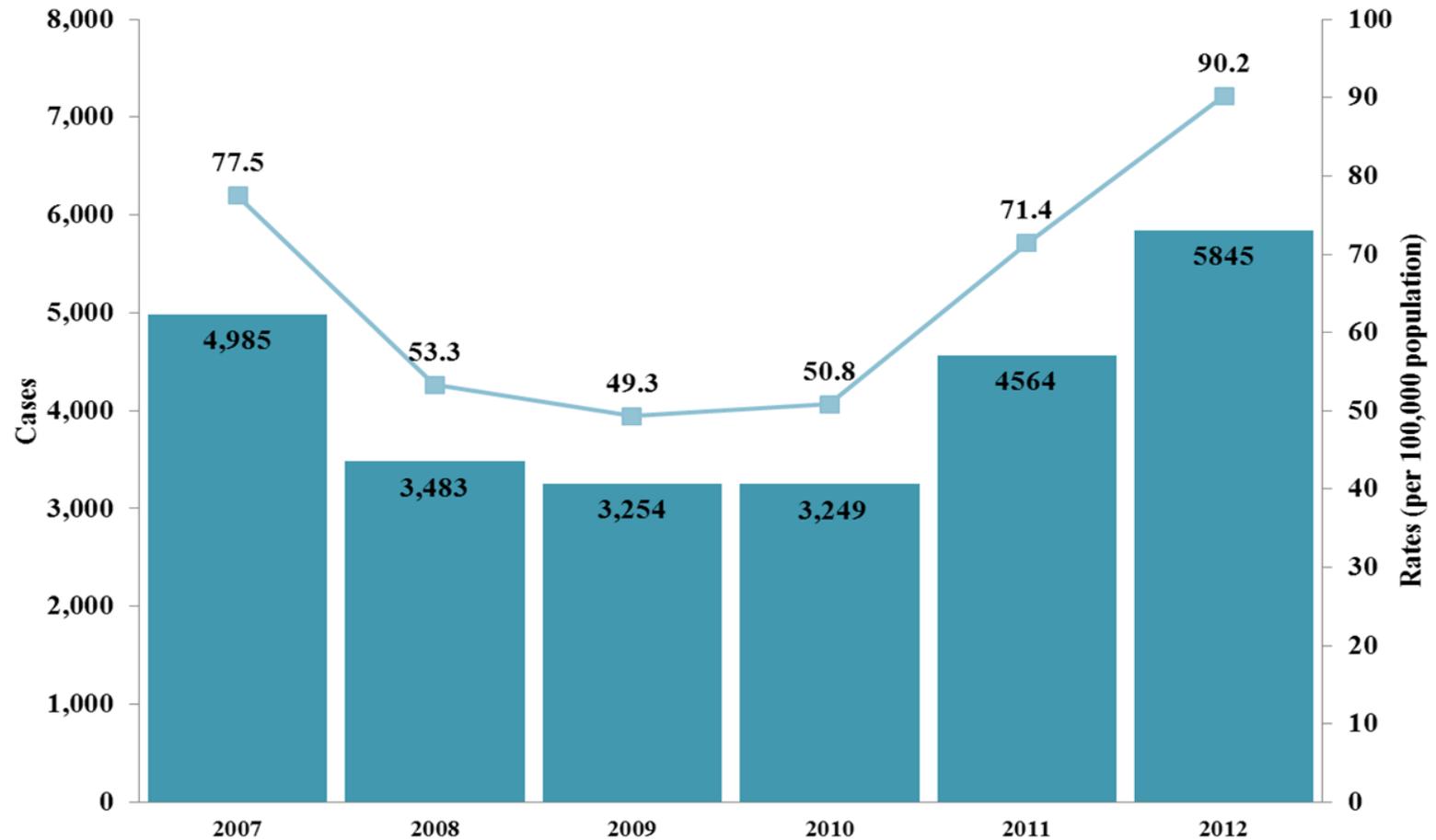
Gonorrhea

- CDC estimates 820,000 gonorrhea infections annually
- Most women with gonorrhea do not have symptoms
- Untreated gonorrhea can increase a person's risk of acquiring or transmitting HIV
- Gonorrhea has progressively developed resistance to antibiotic drugs used for treatment

Gonorrhea—Rates by Sex, United States, 1991–2011

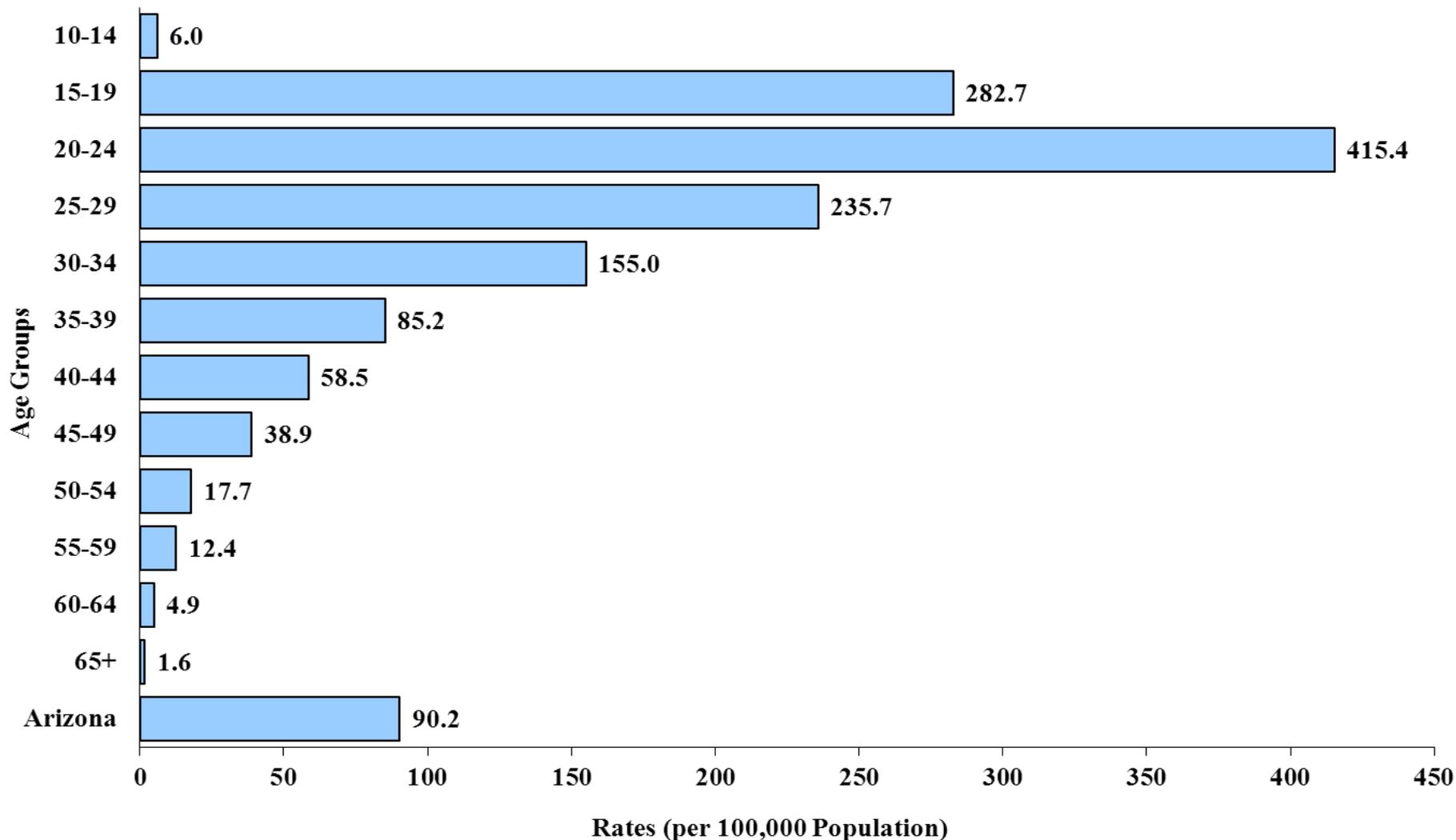


Reported Gonorrhea Cases and Case Rates per 100,000 Population, Arizona 2007-2012

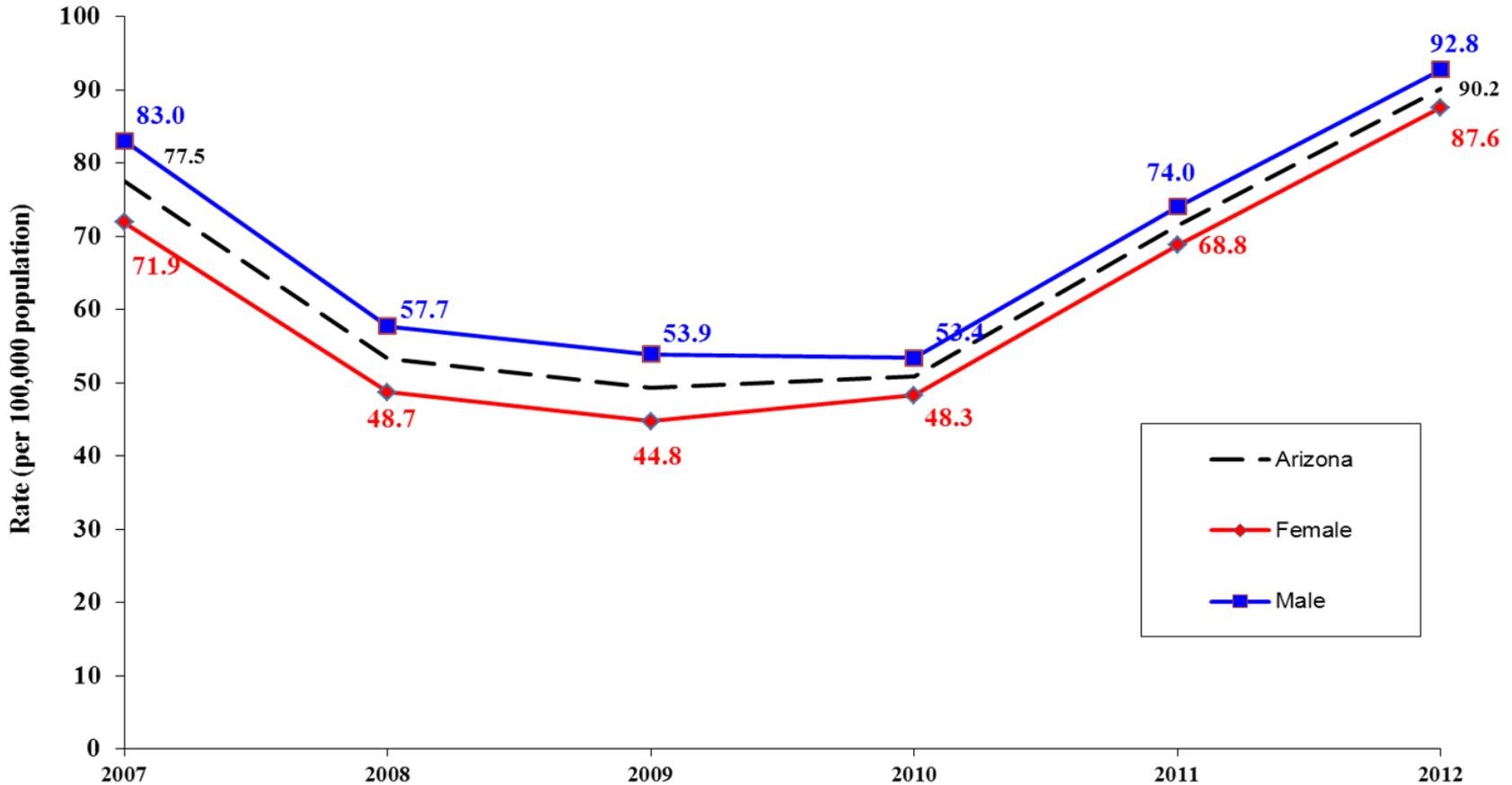


Data is provisional and subject to changes,
*2011 CDC bridged data used for 2012 case rate population denominators.

Reported Gonorrhea Rates per 100,000 Population by Age Group, Arizona 2012

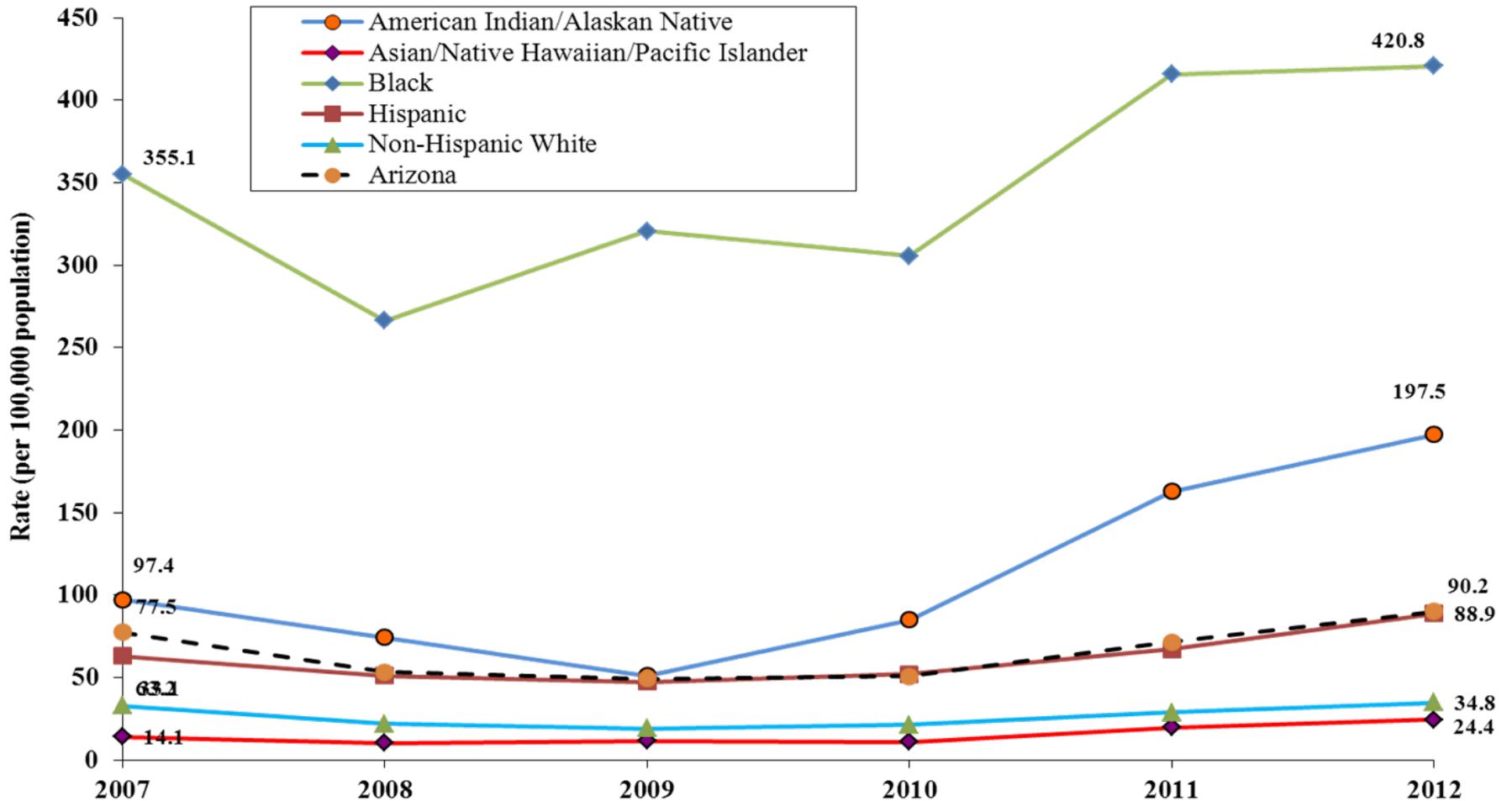


Reported Gonorrhea Case Rates per 100,000 Population by Gender, Arizona 2007-2012



Data is provisional and subject to changes,
 *2011 CDC bridged data used for 2012 case rate population denominators.

Reported Gonorrhea Case Rates per 100,000 Population by Race/Ethnicity, Arizona 2007-2012



Data is provisional and subject to changes.
 *2011 CDC bridged data used for 2012 case rate population denominators.

Chlamydia and Gonorrhea Summary

- Possible reasons for continued increase
 - Increased testing and physician education at Infertility Prevention Program participating sites
 - Improvement in Chlamydia HEDIS measure by commercial health plans in Arizona
 - Television and radio media campaign implemented by Maricopa County

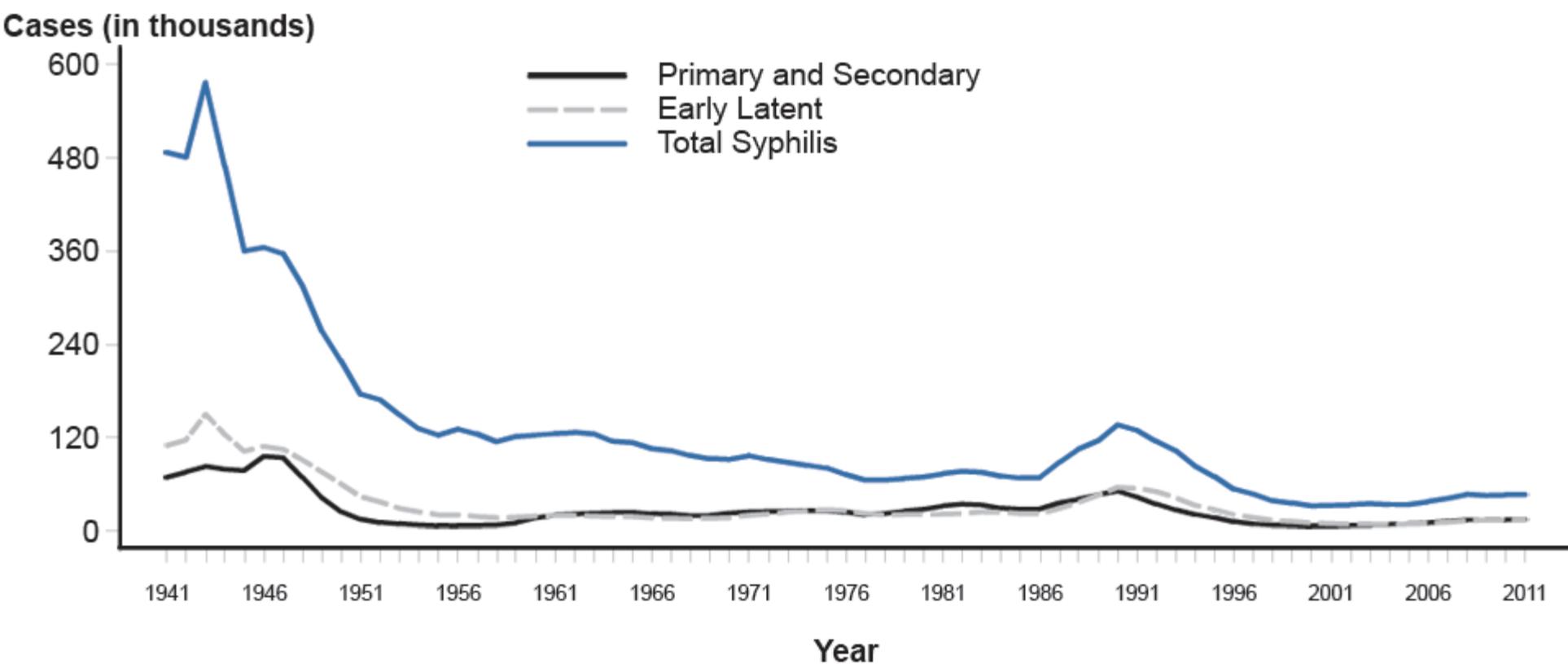
Summary continued

- Current public health response
 - Maricopa County has increased clinic hours, and increased the use of social media
 - Some Tribal governments have initiated school testing and Native Stand curriculum
 - State Health Department has upgraded data management system (PRISM) and is implementing electronic lab reporting

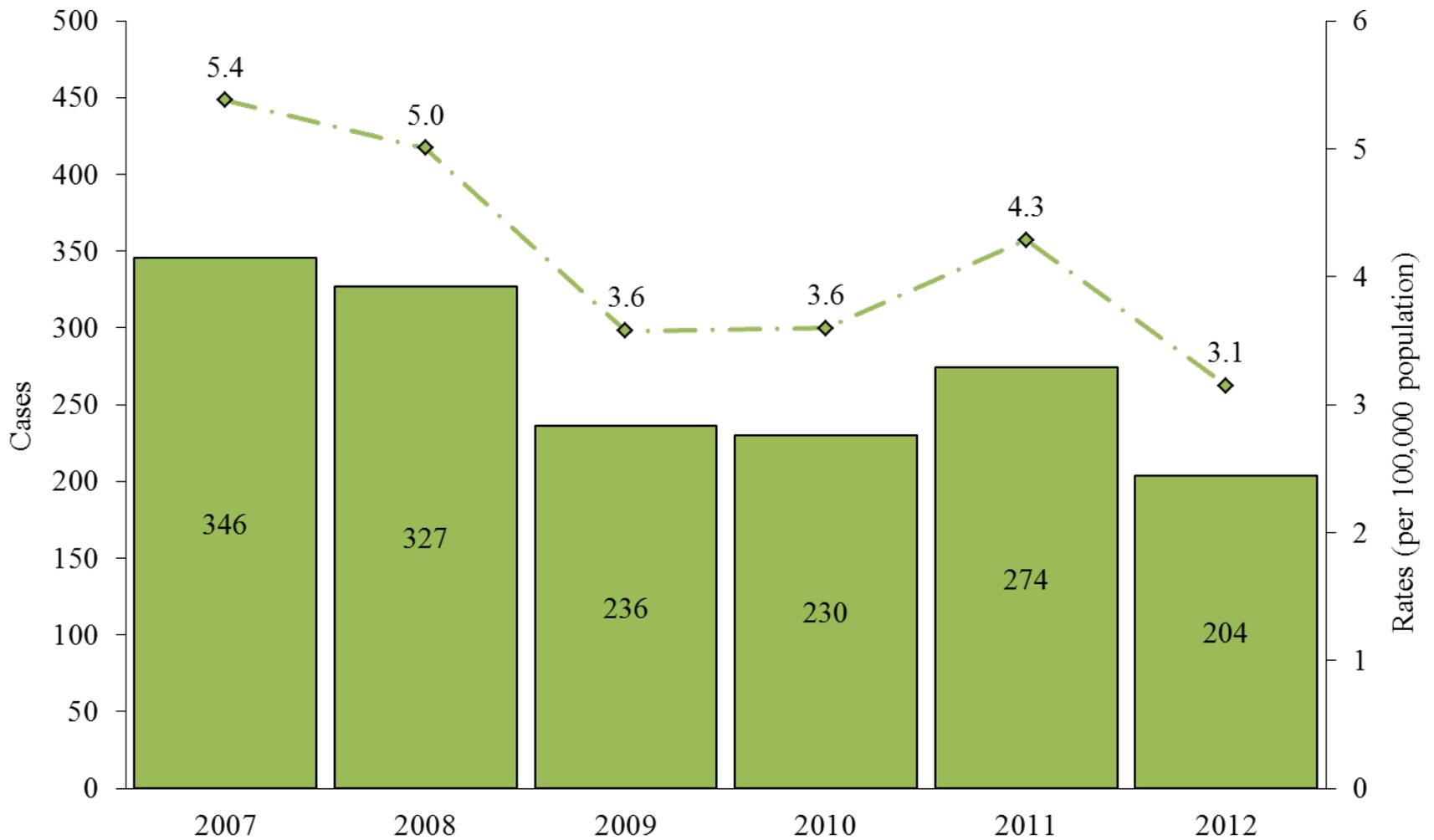
Syphilis

- Can cause long term complications and/or death if not adequately treated
- In 2011, 72% of P&S syphilis occurred among men who have sex with men
- Pregnant women with the disease can pass it to unborn child

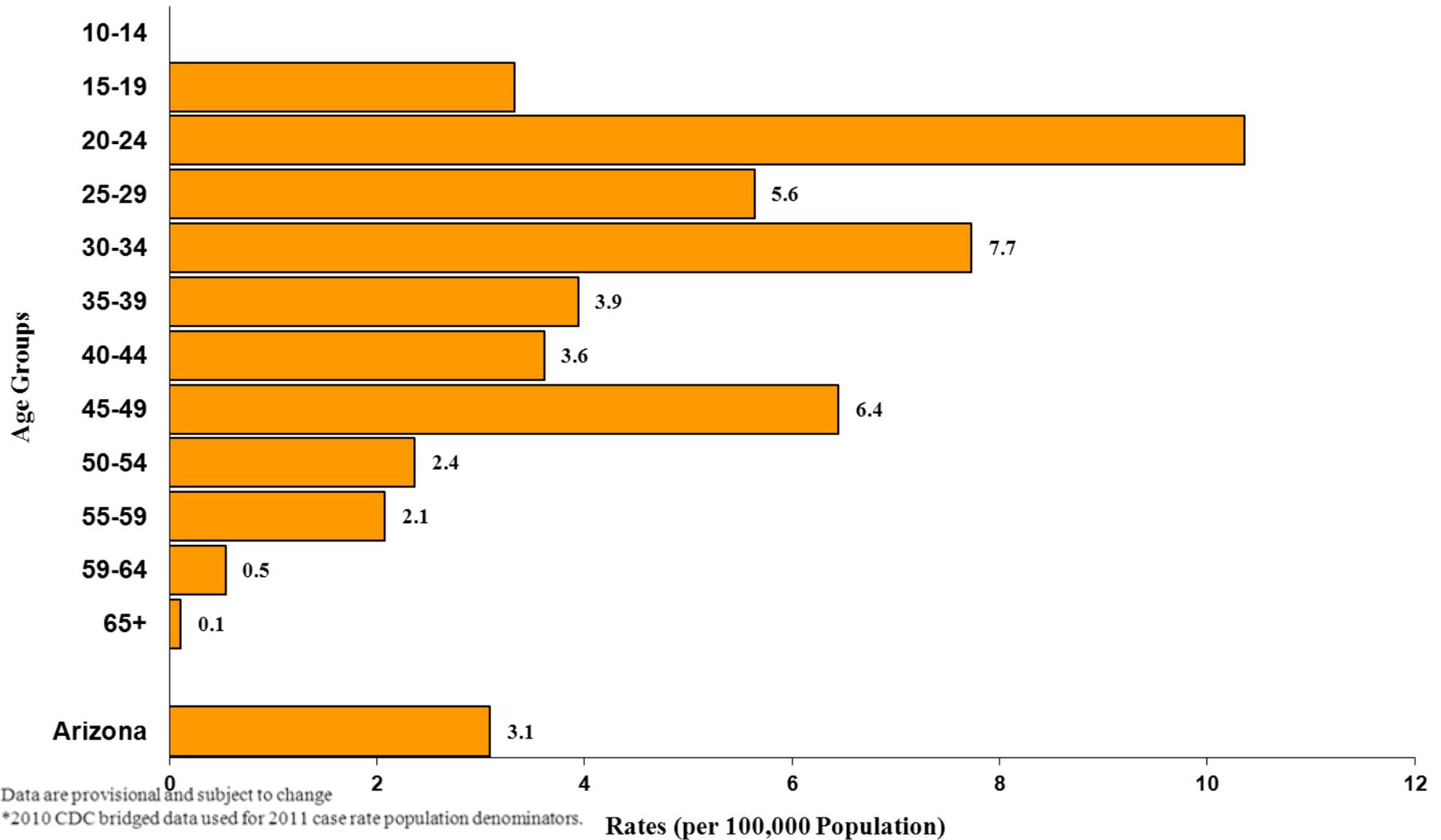
Syphilis—Reported Cases by Stage of Infection, United States, 1941–2011



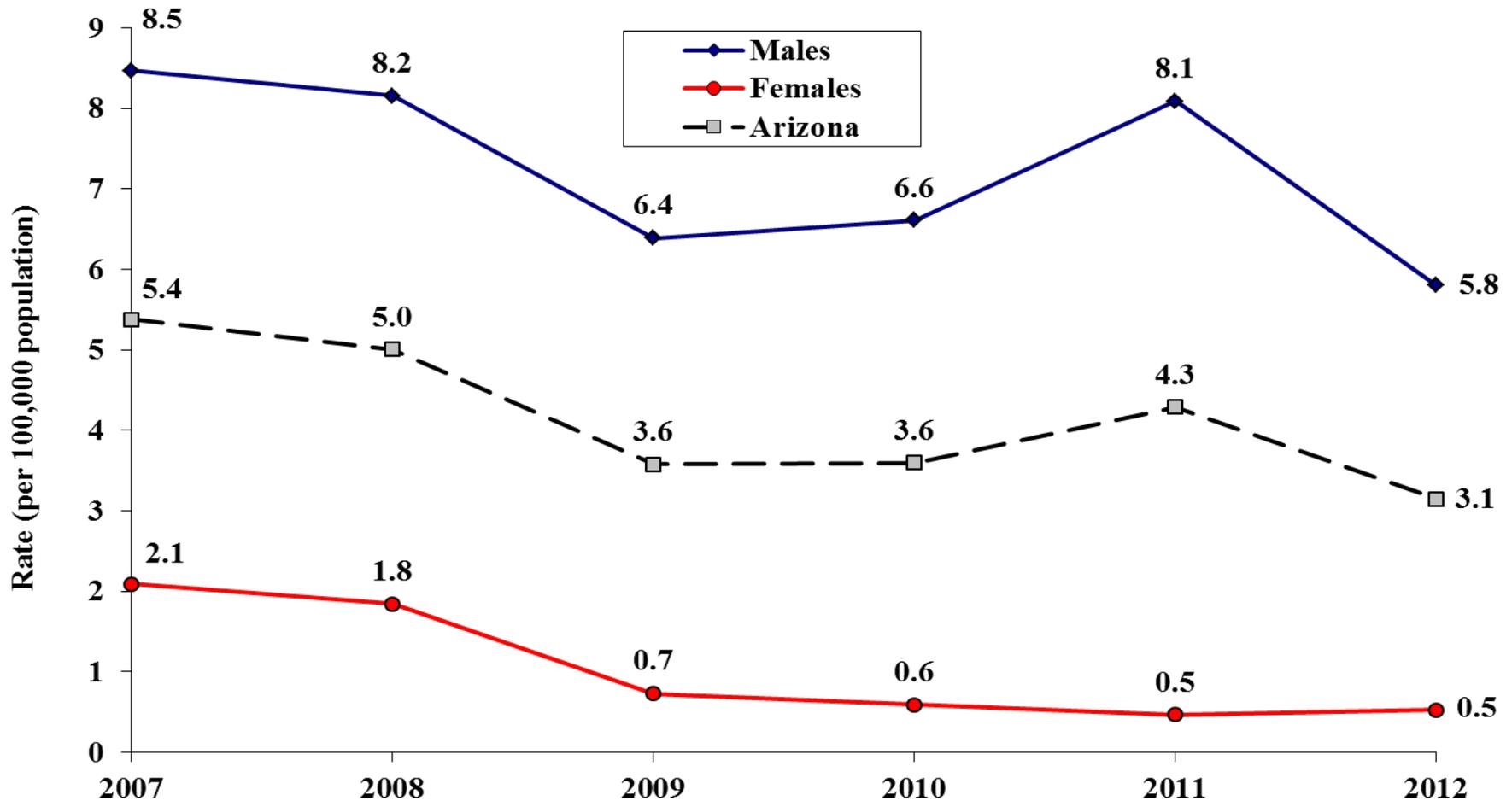
Reported Primary and Secondary Syphilis Cases and Case Rate, Arizona 2007-2012



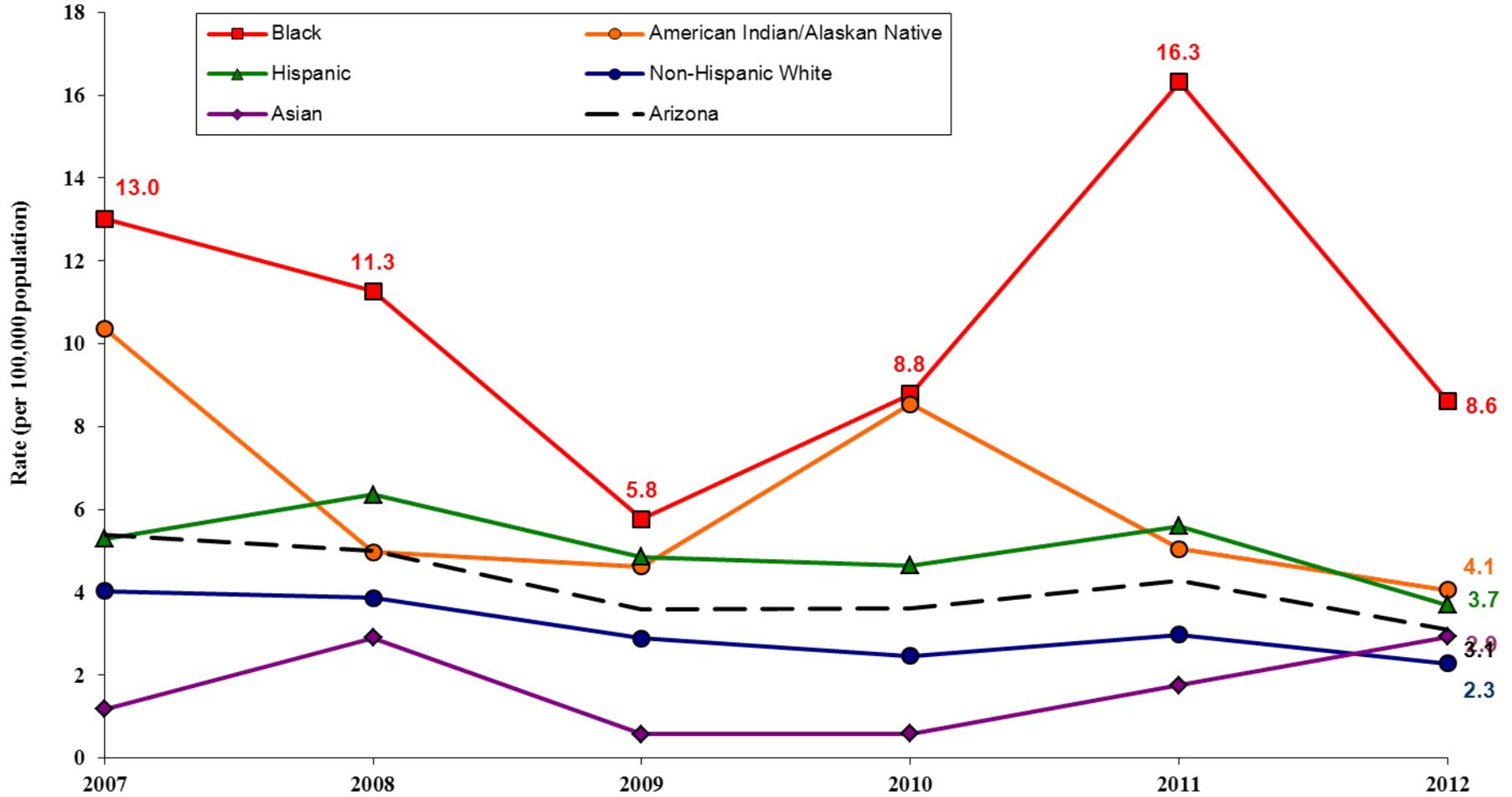
Reported Primary and Secondary Syphilis Rates by Age Group, Arizona 2012



Reported Primary and Secondary Syphilis Case Rates by Gender, Arizona 2007-2012



Reported Primary and Secondary Syphilis Case Rates by Race/ Ethnicity, Arizona 2007-2012



Disease Reporting

PRISM Implementation

PRISM

- In 2012 the AZDHS STD Control program upgraded to a new data management system
- New system
 - Web based, can be implemented by all counties
 - Provides case management functionality
 - Allows counties to access data via pre-programmed reports

PRISM

- Set to begin importing electronic lab information from 3 laboratories
- Currently 2 counties participating
- Will allow counties to immediately see lab reports that are submitted electronically to the state STD program
- Will allow for faster initiation of investigations

Gonorrhea - Emerging Antibiotic Resistance

Neisseria gonorrhoeae Antibiotic Resistance

- *Neisseria gonorrhoeae* (NG) has demonstrated an ability to progressively develop antibiotic resistance which
 - Undermines treatment success
 - Heightens risk of complications
 - Facilitates transmission
- Antibiotic Resistance is decreasing our treatment options

Sulfonamides

Fluoroquinolones

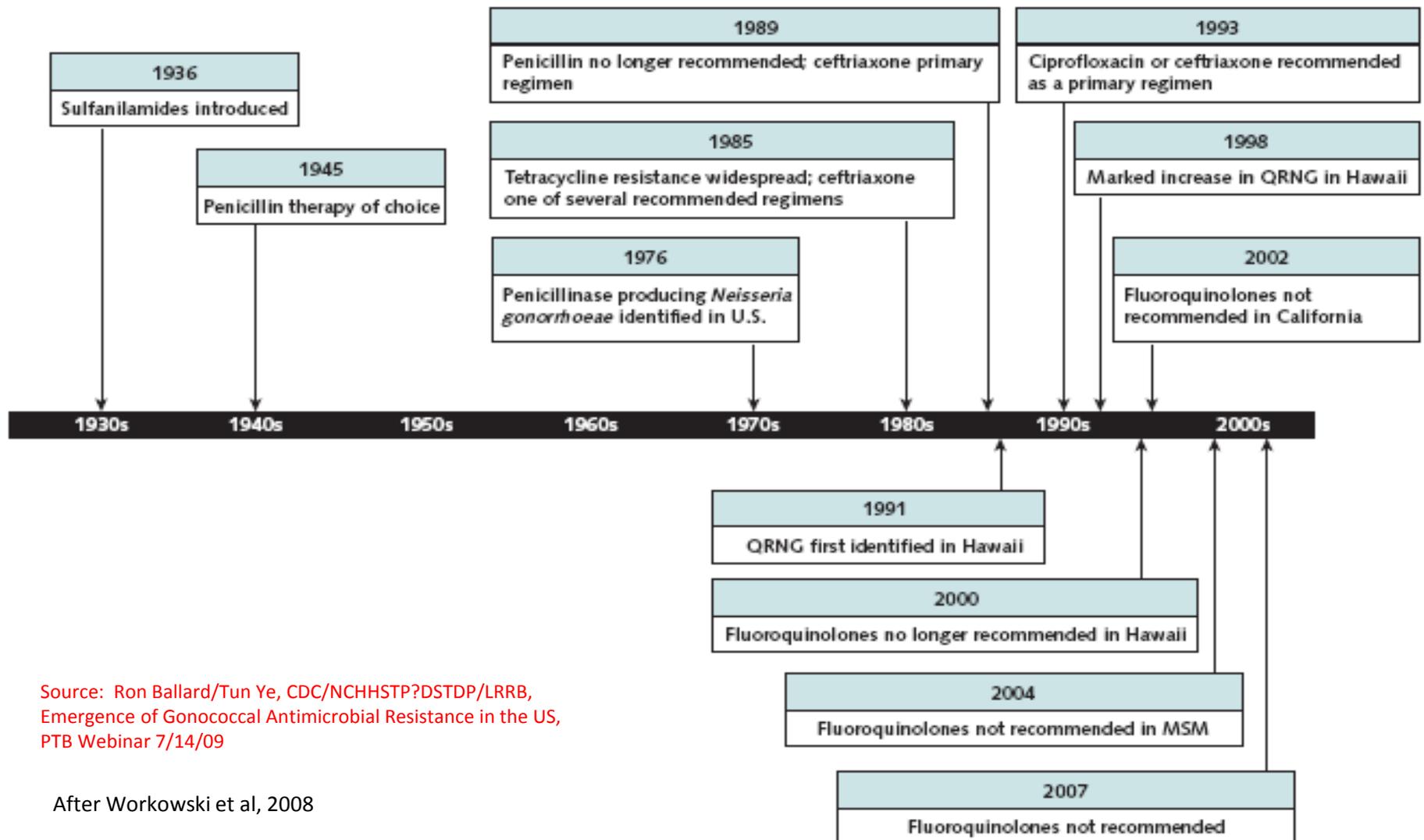
Penicillin

? Cephalosporins

Tetracycline

? Macrolides

Emergence of Gonococcal Antimicrobial Resistance in the U.S.



Source: Ron Ballard/Tun Ye, CDC/NCHHSTP/DSTDP/LRRB, Emergence of Gonococcal Antimicrobial Resistance in the US, PTB Webinar 7/14/09

After Workowski et al, 2008

Gonococcal Isolate Surveillance Project (GISP)

- US sentinel surveillance
- Monitors trends in NG antibiotic susceptibility
- 26–29 STD clinic sites
- Urethral NG isolates obtained from first 25 men per site each month
- Susceptibility testing by 4–5 regional labs
- Confirmatory testing by CDC
- Minimum inhibitory concentrations (MICs) by agar dilution

GISP sites and regional laboratories — United States, 2000–2010



* Did not participate for entire time period

Source: Robert Kirkcaldy, MD, MPH - CDC/NCHHSTP/ Division of STD Prevention
 NCSD Annual Meeting – November 2, 2011

Cephalosporin Susceptibility MICs

- MICs of cephalosporin-resistance not defined
 - Don't know what MIC is predictive of clinical treatment failure
 - Surveillance of cephalosporin MIC trends, rather than “resistance”
- Cefixime and ceftriaxone susceptibility: $\leq 0.25 \mu\text{g/ml}^*$
- “Decreased susceptibility”: $\geq 0.50 \mu\text{g/ml}$

* Clinical and Laboratory Standards Institute (CLSI), 2010

Source: Robert Kirkcaldy, MD, MPH - CDC/NCHHSTP/ Division of STD Prevention
NCSA Annual Meeting – November 2, 2011

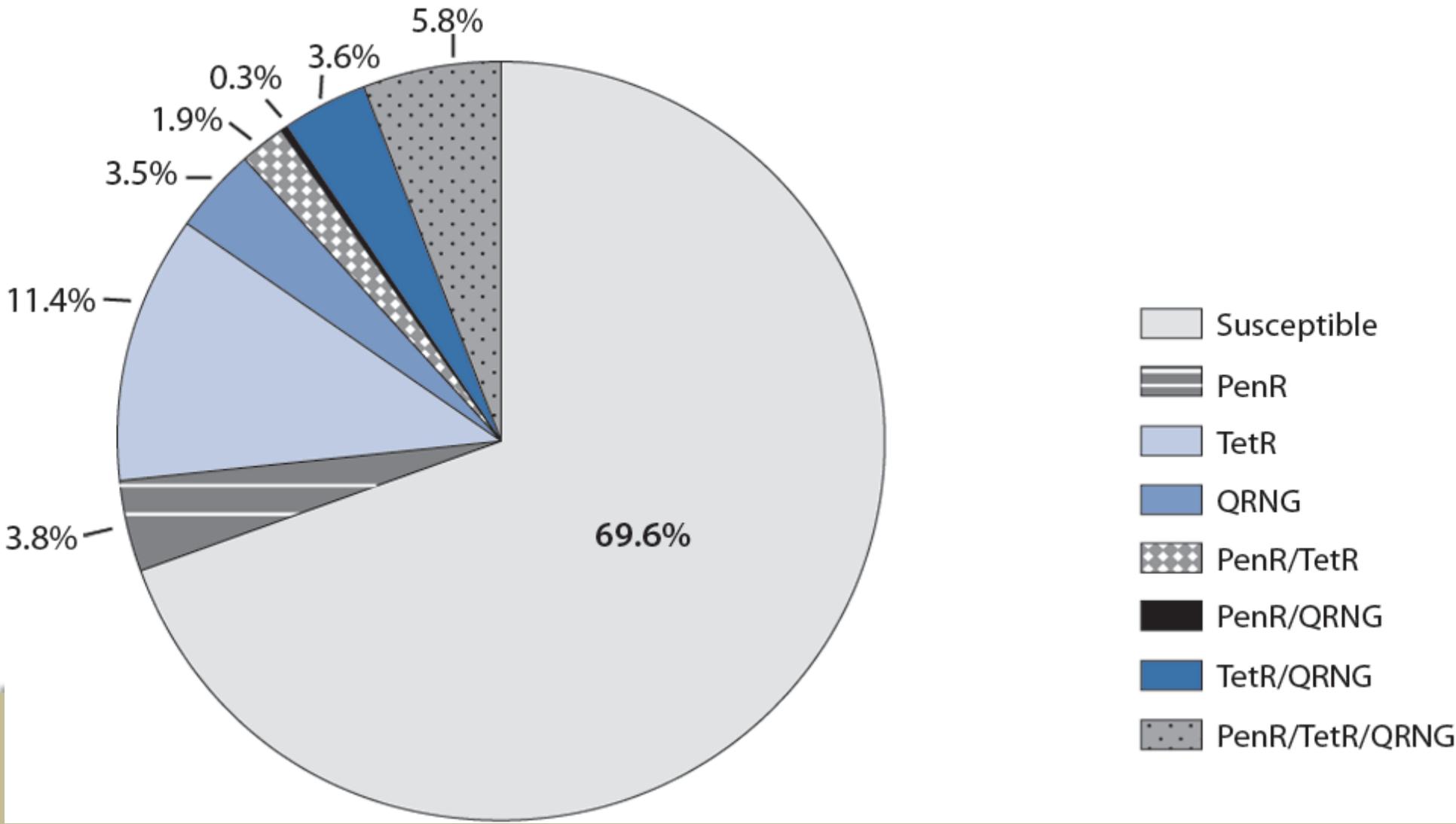


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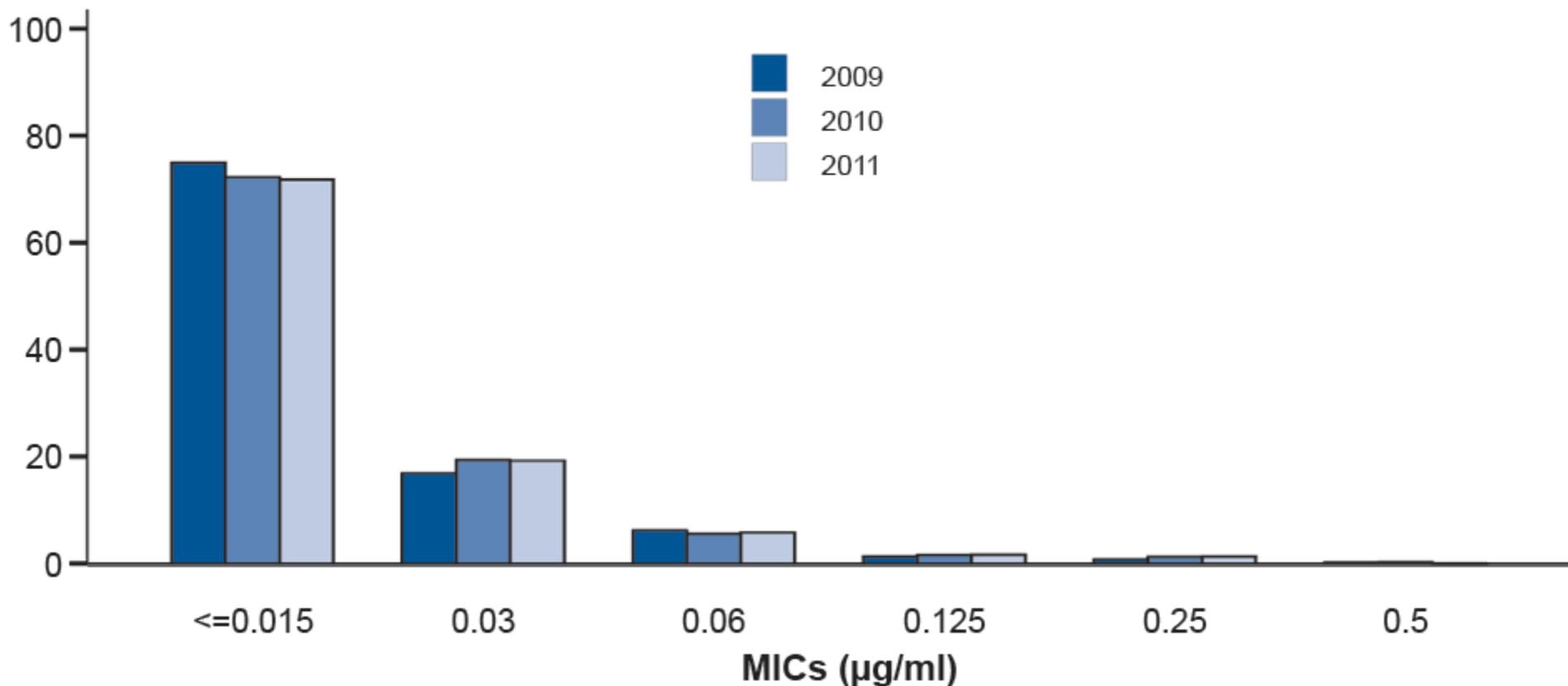


Penicillin, Tetracycline, and Ciprofloxacin Resistance Among *Neisseria gonorrhoeae* Isolates, Gonococcal Isolate Surveillance Project (GISP), 2011



Distribution of Minimum Inhibitory Concentrations (MICs) of Cefixime Among *Neisseria gonorrhoeae* Isolates, Gonococcal Isolate Surveillance Project (GISP) 2009–2011

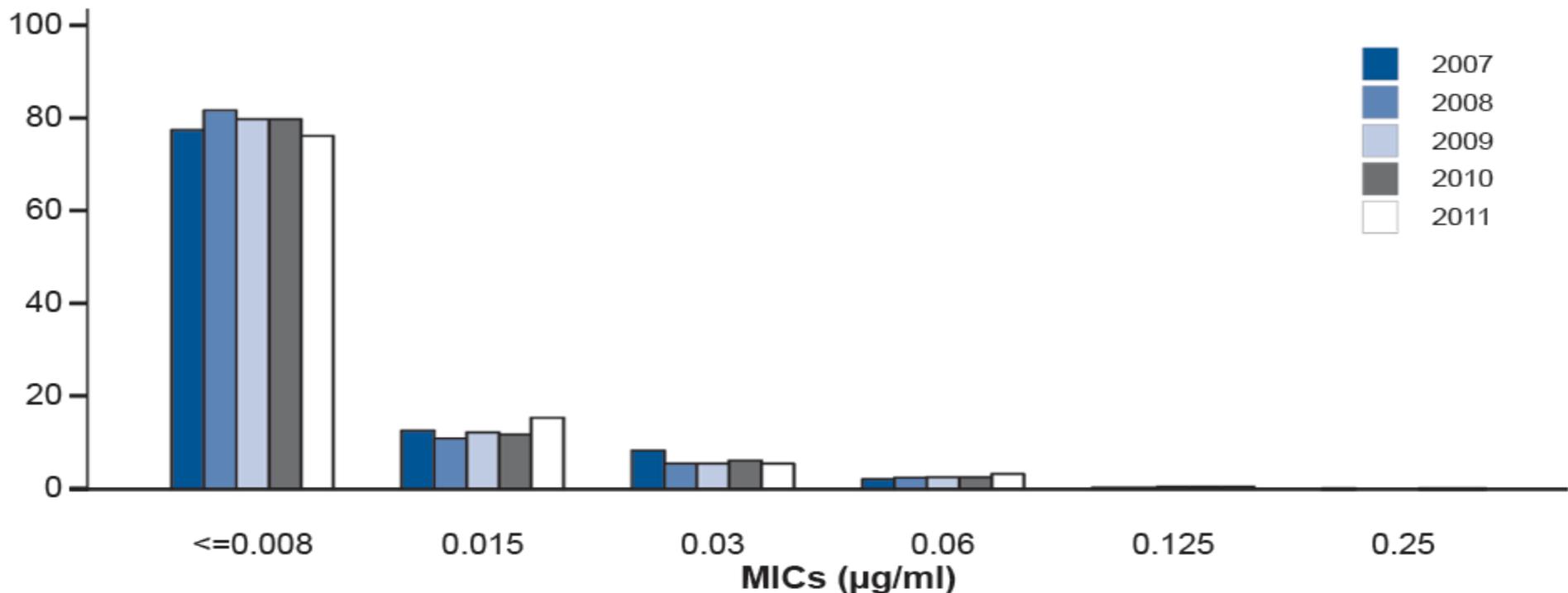
Percentage



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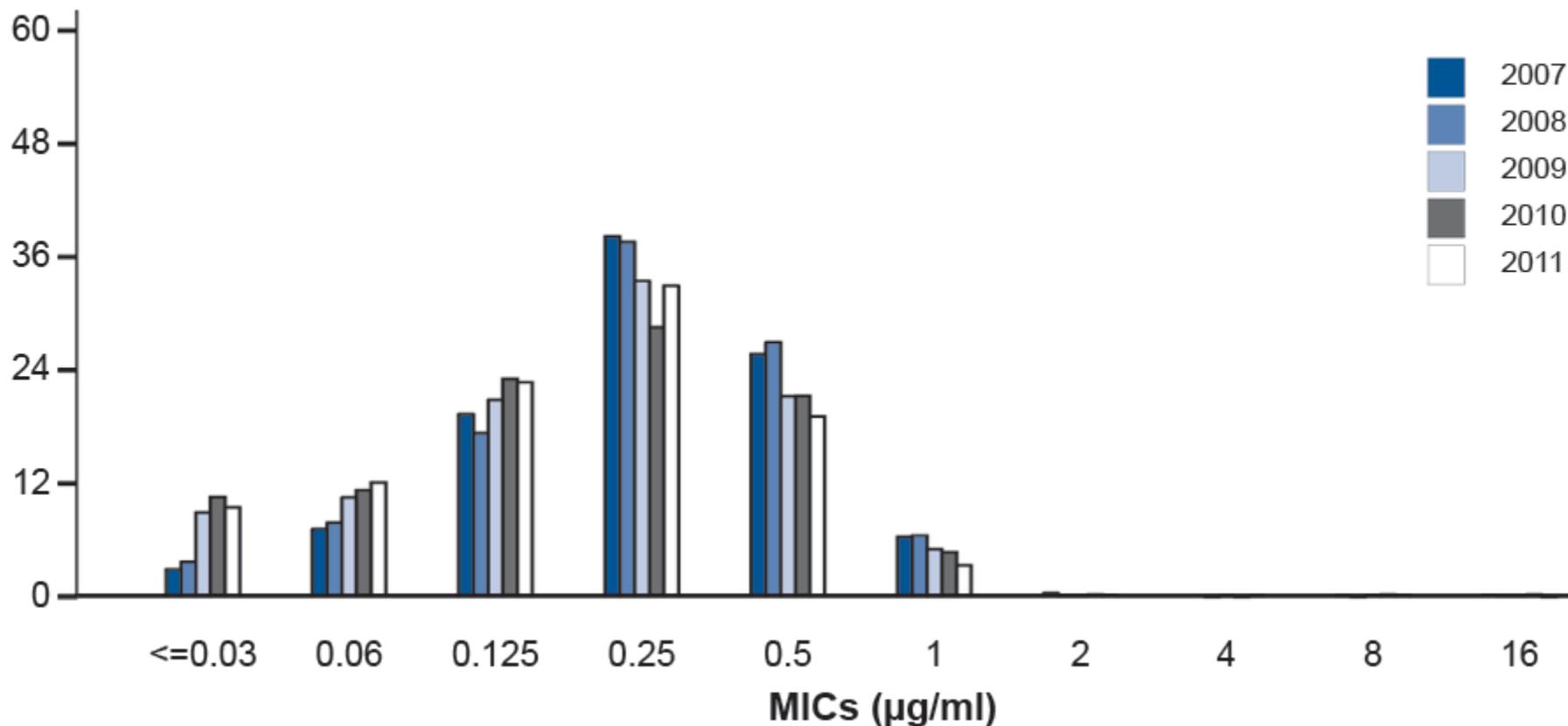
Distribution of Minimum Inhibitory Concentrations (MICs) of Ceftriaxone Among *Neisseria gonorrhoeae* Isolates, Gonococcal Isolate Surveillance Project (GISP), 2007–2011

Percentage



Distribution of Minimum Inhibitory Concentrations (MICs) of Azithromycin Among *Neisseria gonorrhoeae* Isolates, Gonococcal Isolate Surveillance Project (GISP) 2007–2011

Percentage



Emergence of Cephalosporin Antimicrobial Resistance

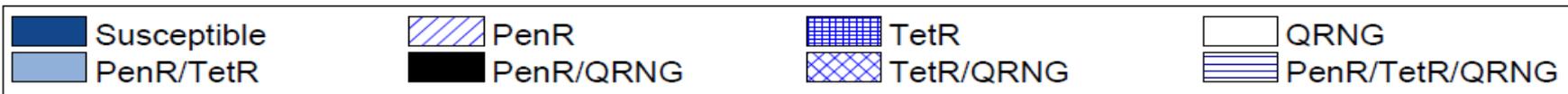
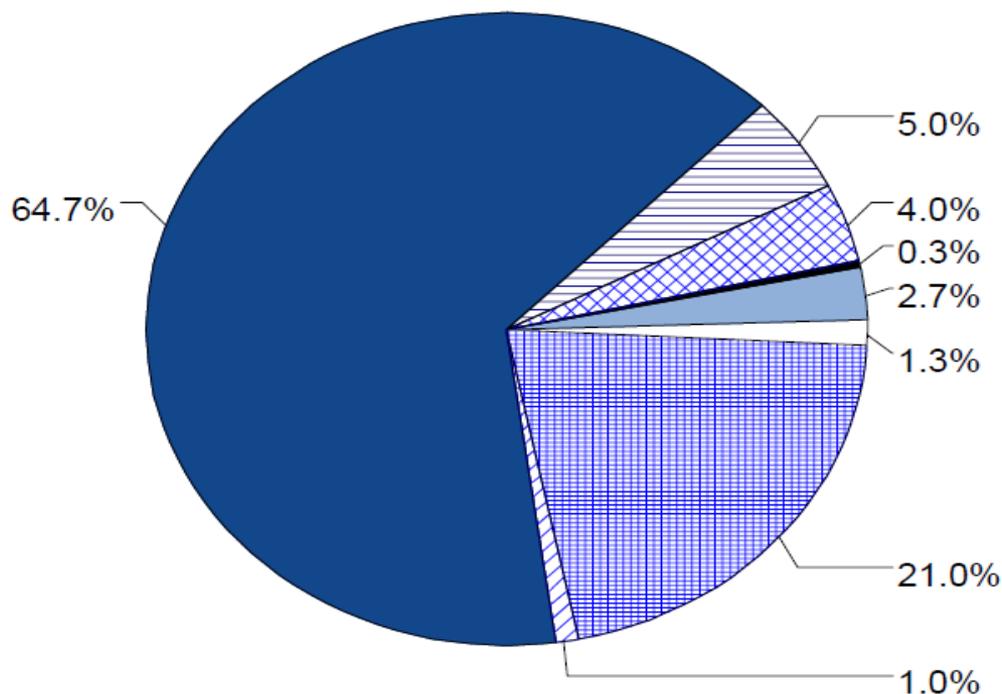
- 2000 – Decreased susceptibility to cefixime was first reported in Japan
- 2001 – 2 cases of decreased susceptibility to cefixime in Hawaii
- 2002 – Japan reports 30% of isolates with decreased cefixime susceptibility (MIC \geq 0.5)(0% in 1999)
- 2003 – Japan reports possible failure of treatment of 4 MSW with cefixime was noted in Japan in 2003
- 2006-2008 – 2% of isolates with ceftriaxone MICs > 0.6 in Australia
- In 2009, a CSW patient in Japan diagnosed with pharyngeal gonorrhea that was highly resistant to ceftriaxone (subject of recent “superbug” media coverage)
- 2010-2011 – documented cefixime treatment failures reported in Norway and the United Kingdom.

Emergence of Azithromycin Antimicrobial Resistance

- 2006-2008 European sentinel surveillance study in 17 countries showed 2%-7% azithromycin resistance in study isolates
- 2011 – MMWR on San Diego County STD Program report of 5 isolates with high azithromycin MICs (8-16)
- 2011 – CDC Dear Colleague letter regarding Hawaii report of one isolate with azithromycin MIC of $\geq 1,024$

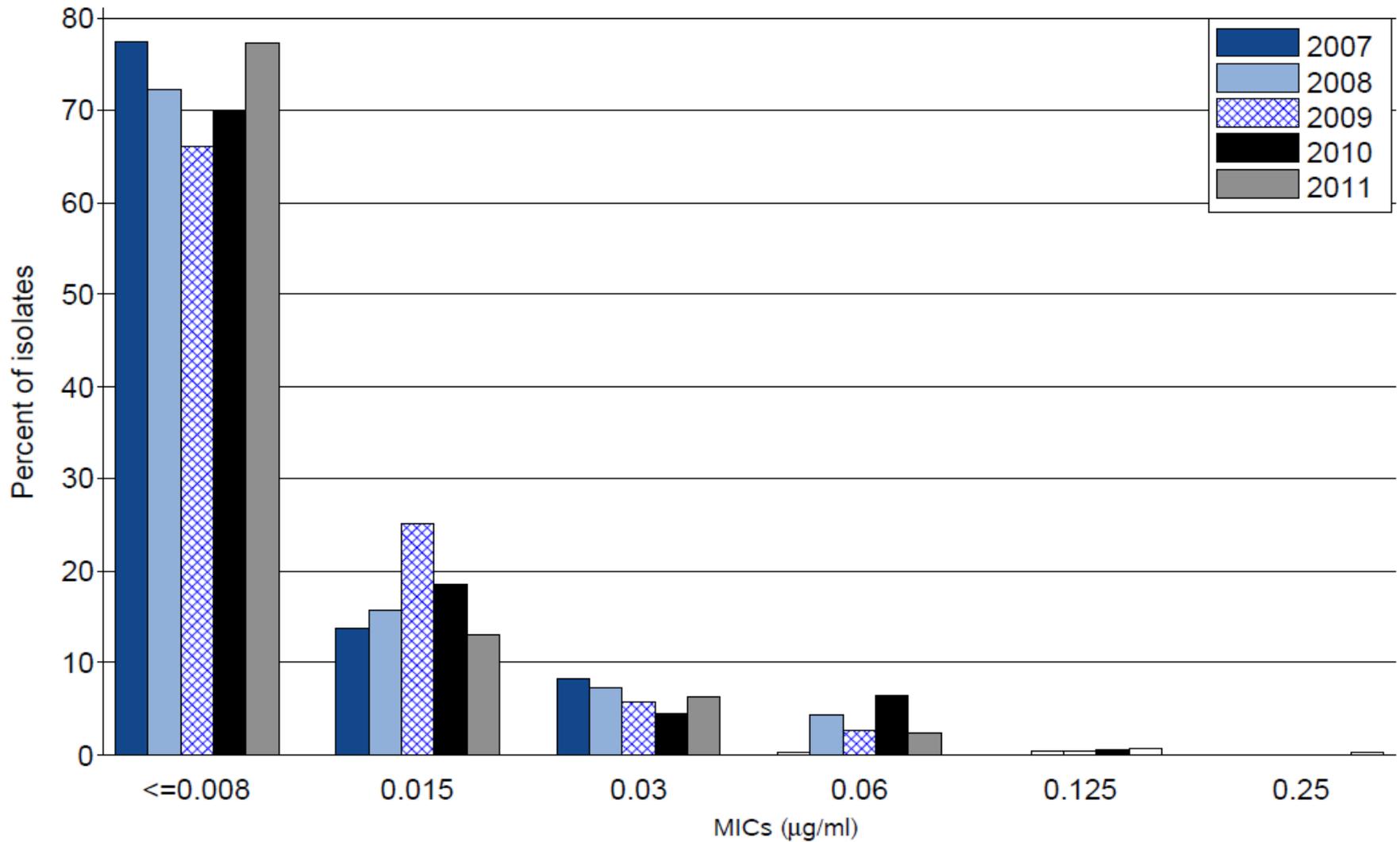
Phoenix, Arizona (N=300)

Figure F. Resistance to penicillin, tetracycline, and ciprofloxacin among GISP isolates, 2011



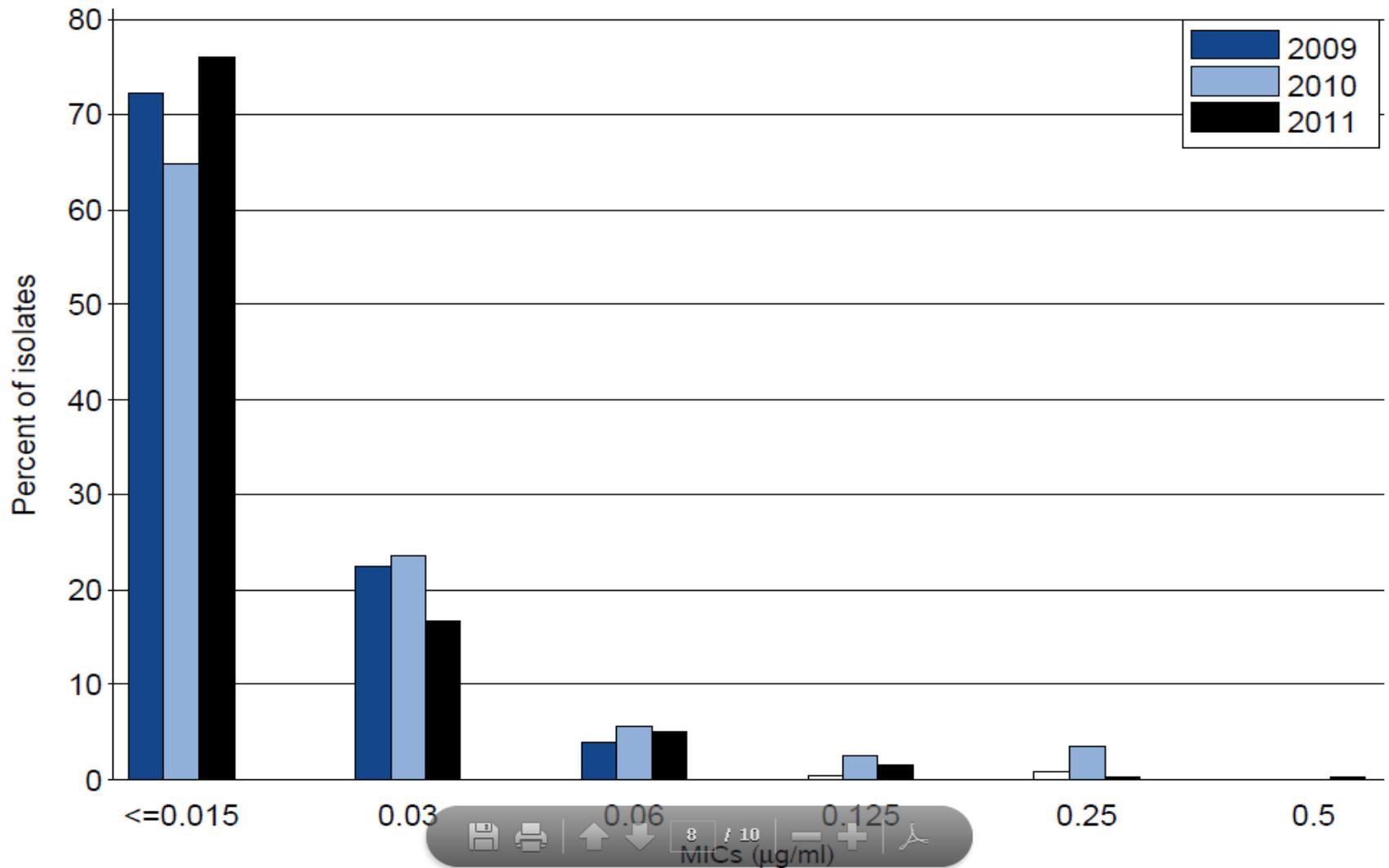
Phoenix, Arizona

Figure G. Distribution of Minimum Inhibitory Concentrations (MICs) of ceftriaxone among GISP isolates, 2007-2011



Phoenix, Arizona

Figure H. Distribution of Minimum Inhibitory Concentrations (MICs) of cefixime among GISP isolates, 2009-2011



Arizona Cephalosporin-Resistant Gonorrhea Response Planning

- Surveillance
 - Monthly outbreak detection surveillance
 - Planned surveillance for individuals retesting positive within 30 and 60 days
 - County and provider reporting
- Laboratory survey to determine capacity to perform antibiotic susceptibility testing (AST)
- Provider alerts
- Arizona STD Outbreak Response Plan

Cephalosporin-Resistance Planning Recommendations for County, Tribal and IHS Health Departments

- Consider enhanced surveillance
- Raise community awareness
- Increase clinic and community screening for gonorrhea
 - Increase screening at non-genital sites
- Assure local providers treat with recommended regimen
- Maintain vigilance for treatment failures and report rapidly
- Maintain gonorrhea culture capacity
- Develop knowledge of where to obtain culture & AST
- Enhance patient counseling and partner services activities for gonorrhea

Public Health Investigation & Case Follow-up

- Interview case
 - Demographics
 - Sexual behavior
 - HIV status
 - Travel history
- Conduct Partner Services
 - Find partners
 - Educate and ensure partners are treated
 - Interview partners (ideally)
- Interview extended sociosexual network
- Notify State STD Control Program

Treatment of Suspected Resistant Cases

- The Centers for Disease Control and Prevention (CDC) and the Arizona STD Control Program recommend the following in cases of suspected cephalosporin treatment
 - If the patient has not already been treated with ceftriaxone 250 mg, then treat with ceftriaxone 250 mg IM x 1 AND azithromycin 1 gram orally in a single dose.
 - Perform a test of cure with culture and antibiotic susceptibility testing (before re-treating).
 - Inform your local health department.
 - For clinical consultation call the STD Program's Medical Epidemiologist at (602) 372-2544
 - In patients who have already been treated with the recommended ceftriaxone regimen whose symptoms do not resolve after treatment, please call (602) 372-2544 for clinical consultation.
- Emphasize that patients should abstain from oral, vaginal, or anal sex until one week after the patient and all of his/her partners are treated.