

# STIs in the Indian Country

## Multiple STI's and Risk for HIV

Ryan Kreisberg, MPH

Senior Epidemiologist, PRISM Data Manager



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# Agenda

- STI/HIV Trends across the US and Arizona
- STIs in the Indian Country
- Multiple STIs and Risk for HIV
  - AZ Incidence, Theory, Maricopa Study
- Conclusions/Looking Forward



# Introduction

- STI diagnoses continue to increase across the US
  - Trends for Gonorrhea and Syphilis are shifting disproportionately toward men who have sex with men (MSM)
- Emergent HIV remains relatively stable, while prevalence continues to increase
  - MSM are the most affected by HIV



# STI Trends in AZ

- Reported in 2015:
  - Chlamydia:
    - 32,511 cases
    - Adolescents, young adults, females, AI/AN, and African American continue to be disproportionately affected by CT
  - Gonorrhea:
    - 8,270 cases
    - Young adults and adults (15-29), males, Hispanics, African Americans, and AI/AN are disproportionately affected by GC
  - Syphilis (Primary and Secondary):
    - 590 cases (a five year high)
    - 103% increase from 2013
    - Adults under 30, males, African Americans, and Hispanics are disproportionately affected by Syphilis



# HIV Trends in AZ

- Reported in 2015:
  - Incidence: 730 new cases (10.7 per 100,000)
  - Prevalence: 262 per 100,000
    - AZ has seen an increase of 23% in persons living with HIV/AIDS over the last 5 years
  - MSM account for 59% of emergent HIV/AIDS cases, the highest among all risk categories
  - Non-Hispanic African Americans are disproportionately affected (rate of 41.6 per 100,000)
  - American Indian/Alaskan Natives come in second with a rate of 18.5 per 100,000



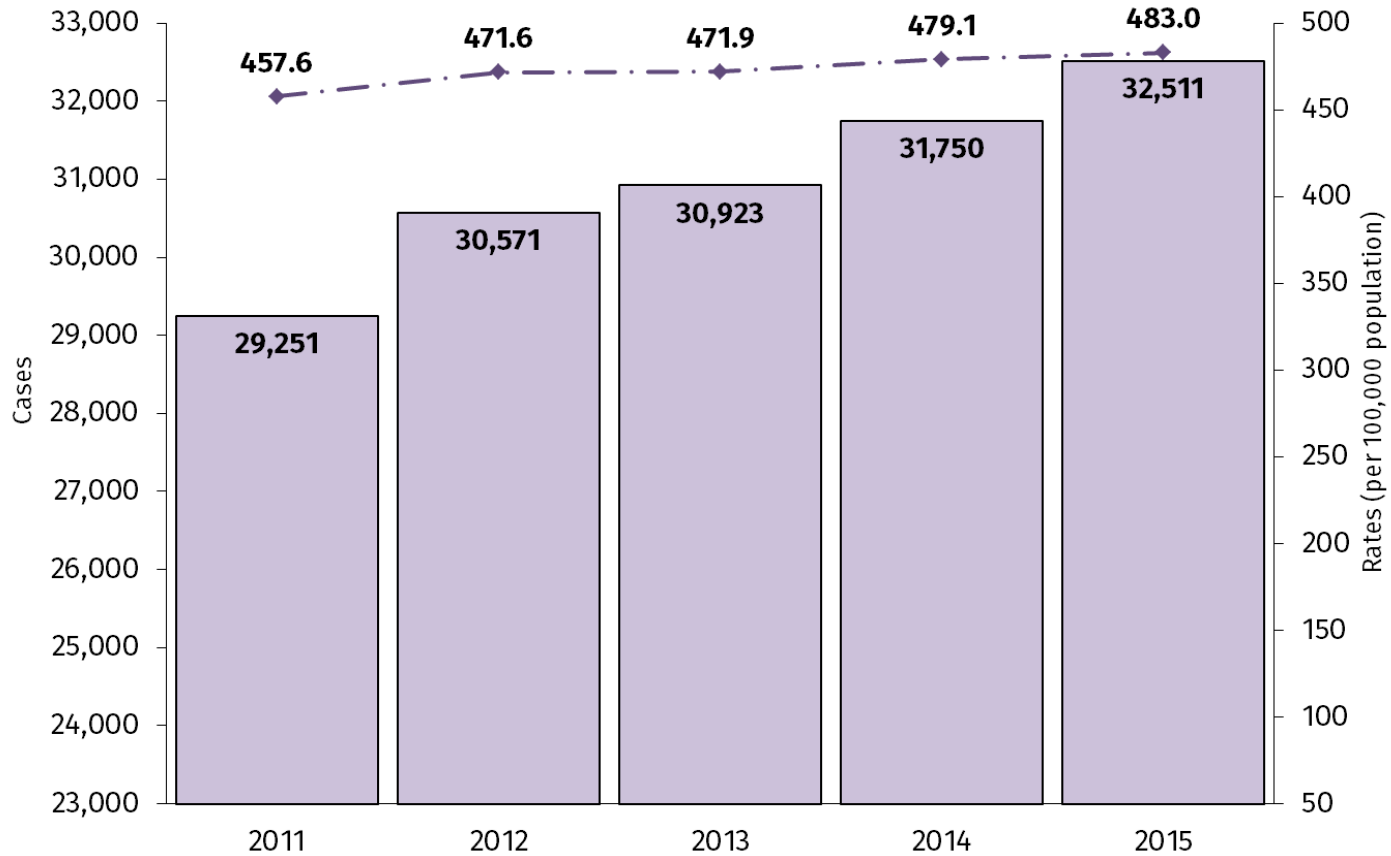
# Chlamydia in Arizona



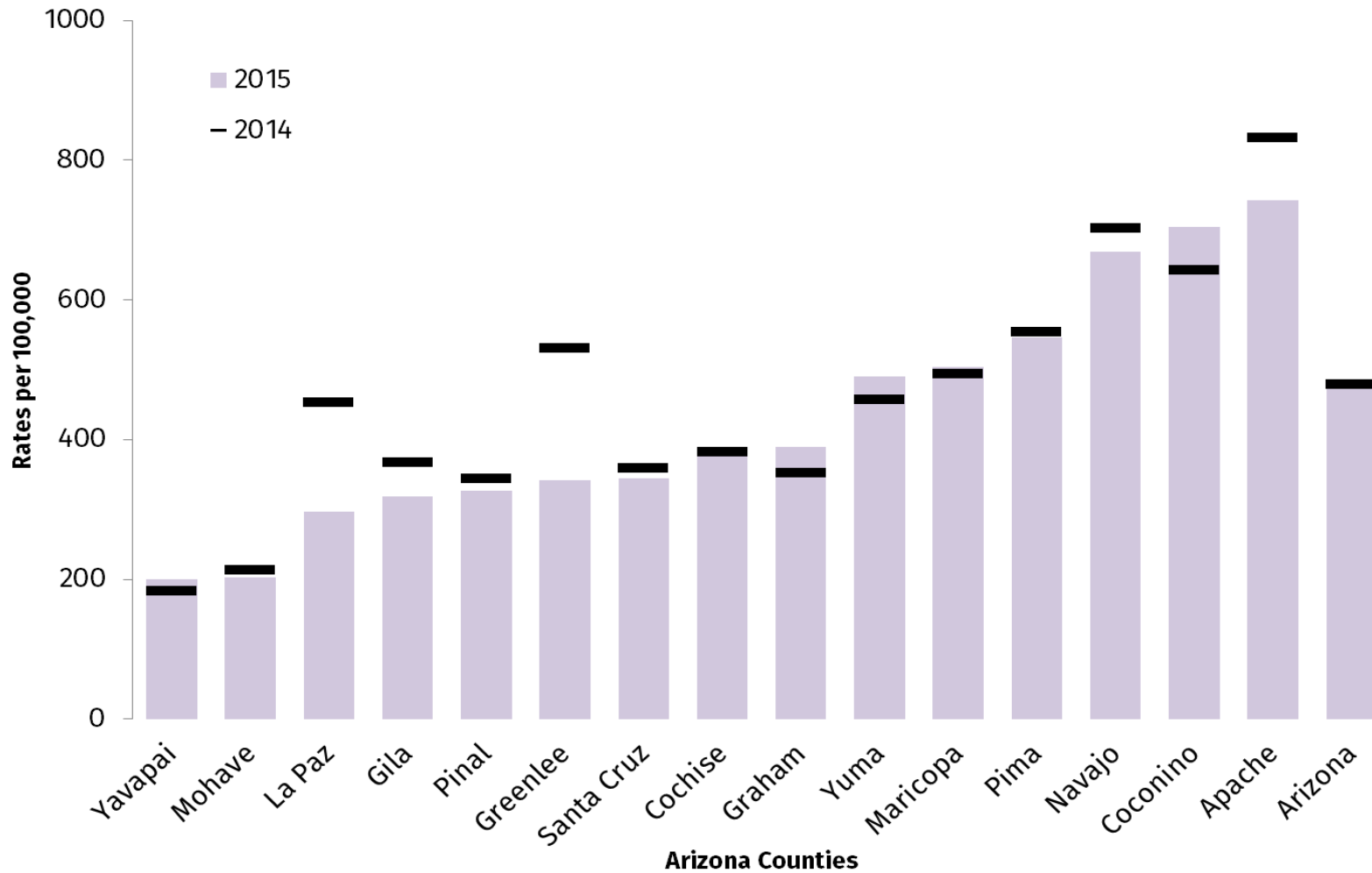
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**Figure CT 1: Reported Chlamydia Cases and Case Rates, Arizona 2011-2015**



**Figure CT 3: Chlamydia Rates by County, Arizona 2014/2015**

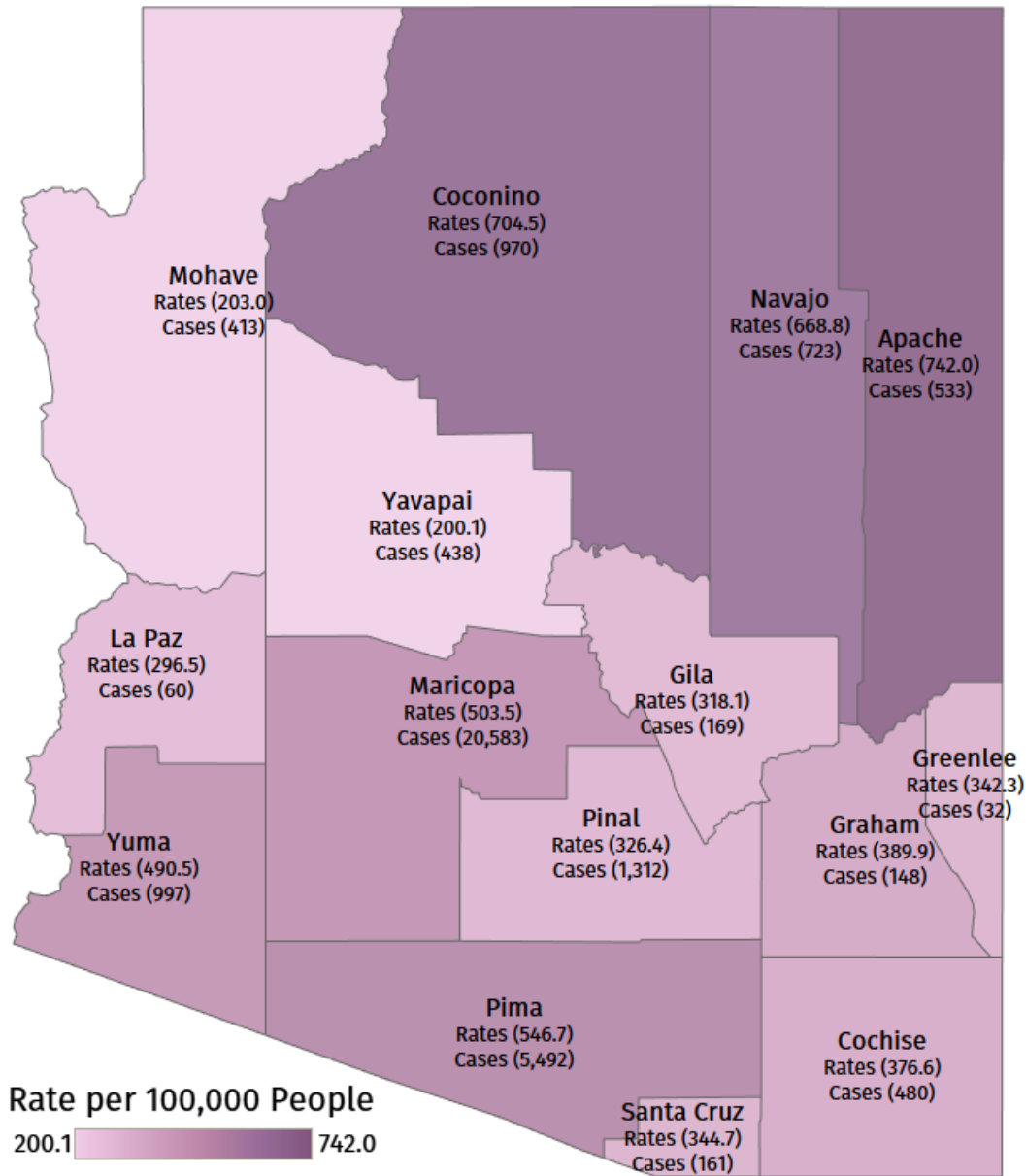


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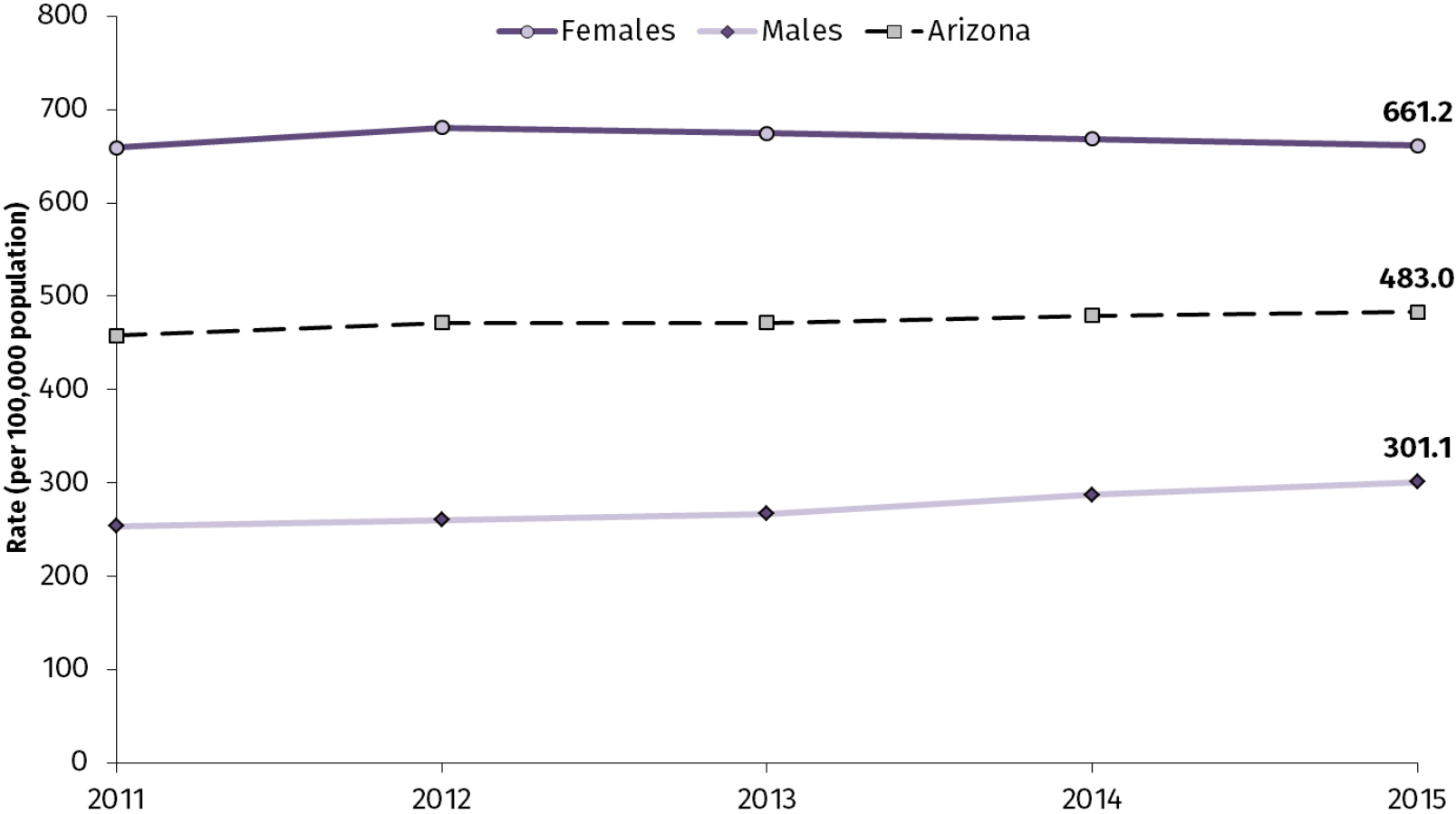
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# Figure CT 4: Chlamydia Rates and Cases by County, Arizona 2015



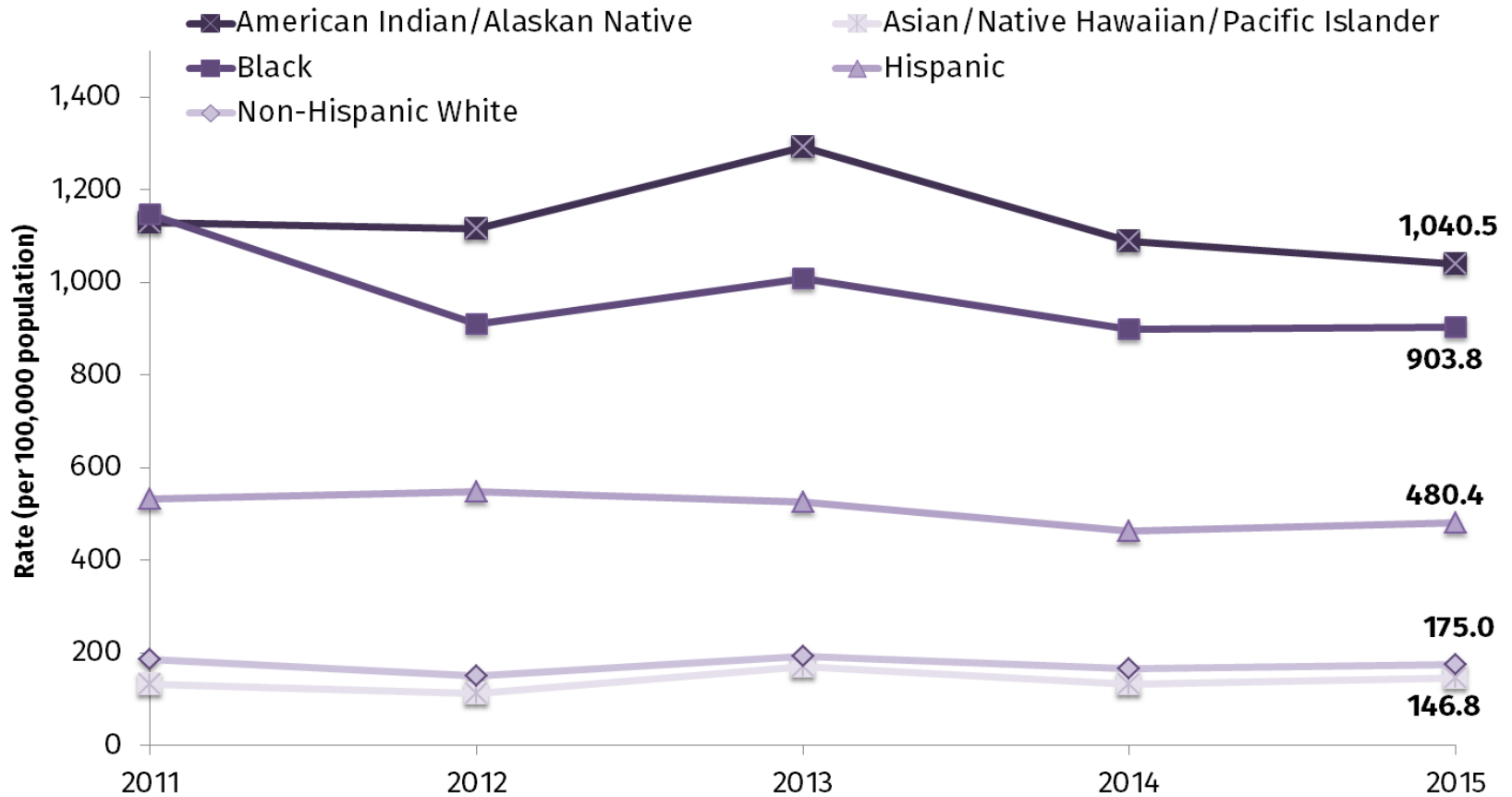
### Figure CT 5: Reported Chlamydia Case Rates by Gender, Arizona 2011-2015



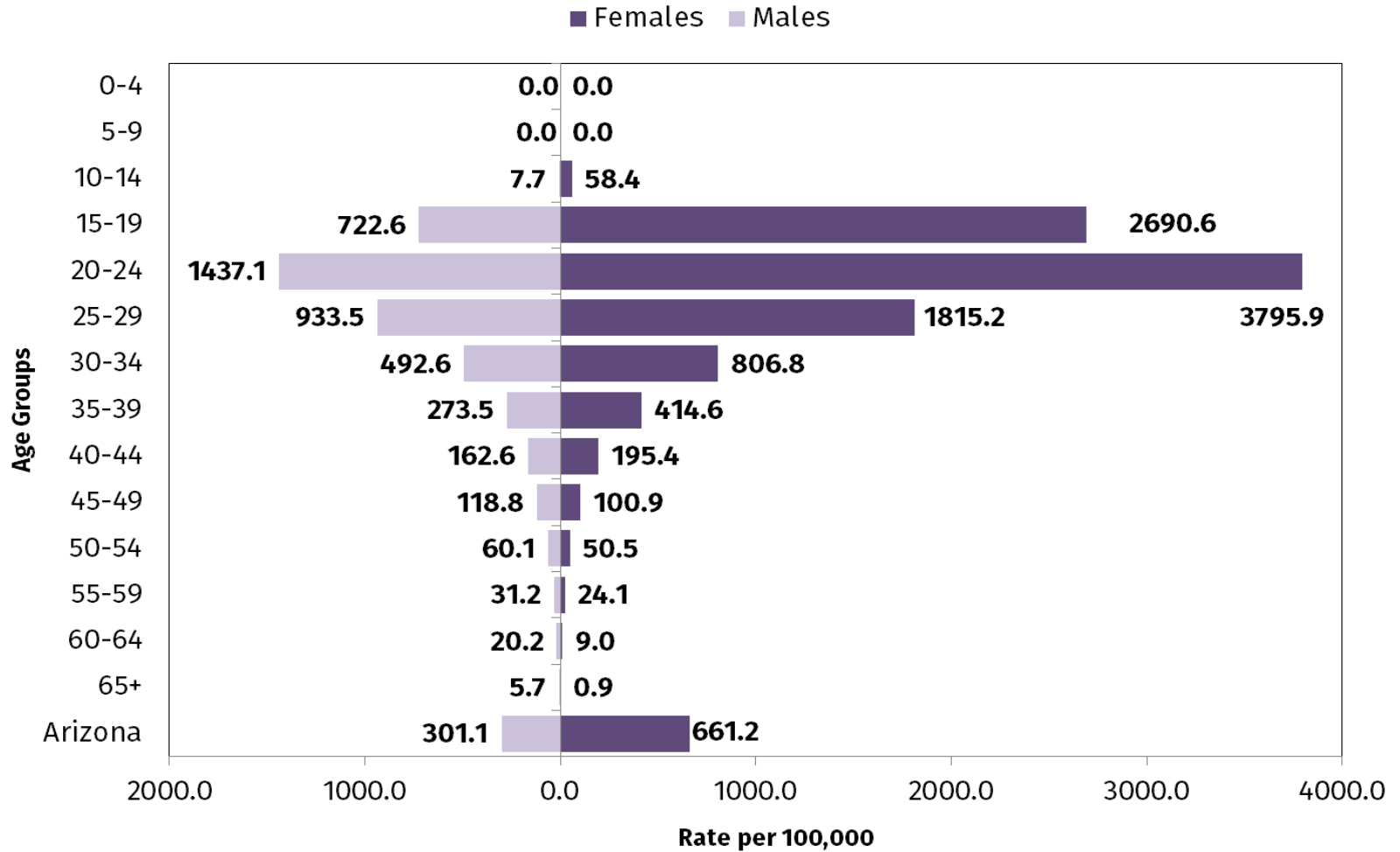
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**Figure CT 6: Reported Chlamydia Case Rates by Race/Ethnicity, Arizona 2011-2015**



## Figure CT 7: Chlamydia Rates by Age group and Gender, Arizona 2015



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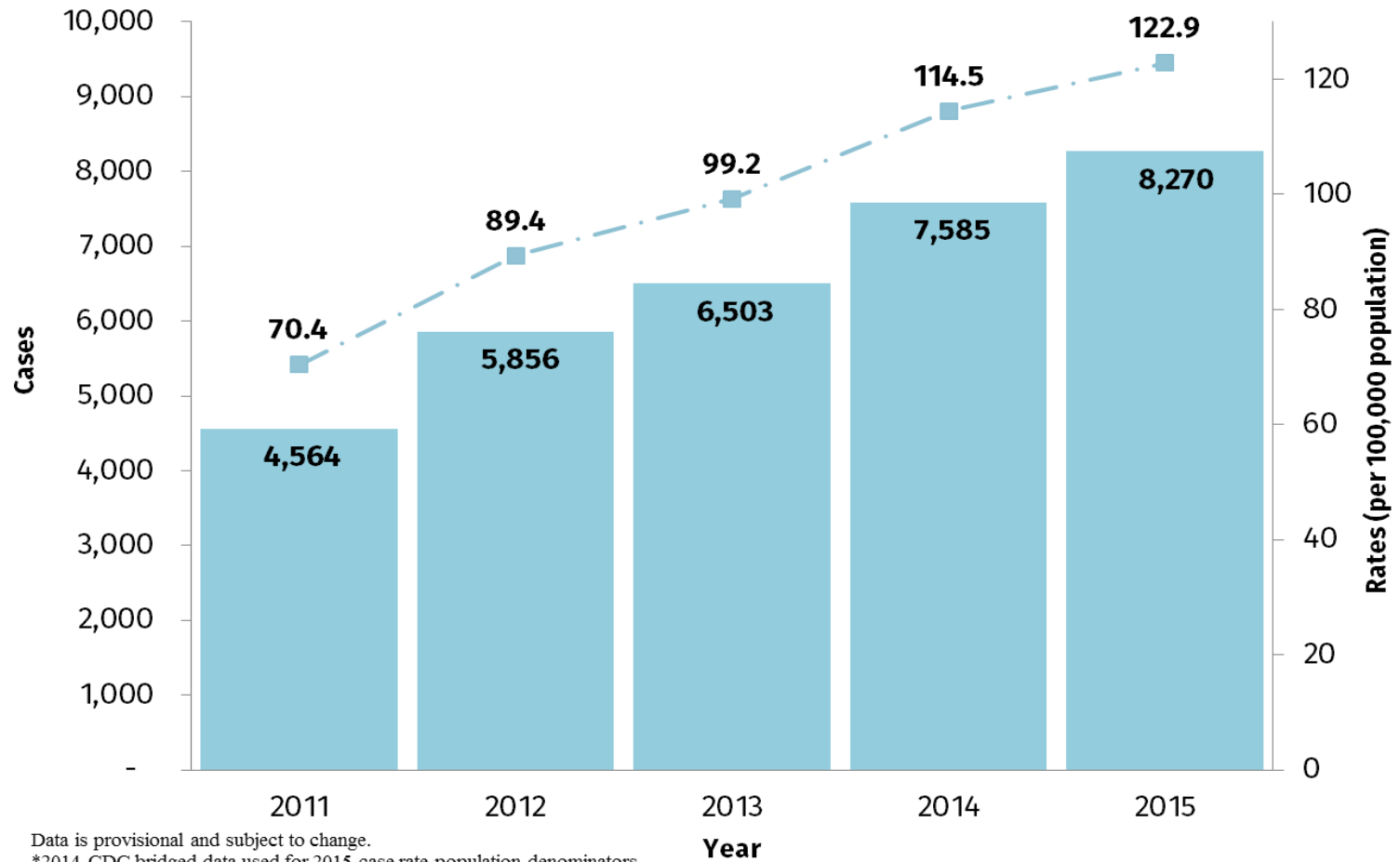
# Gonorrhea in Arizona



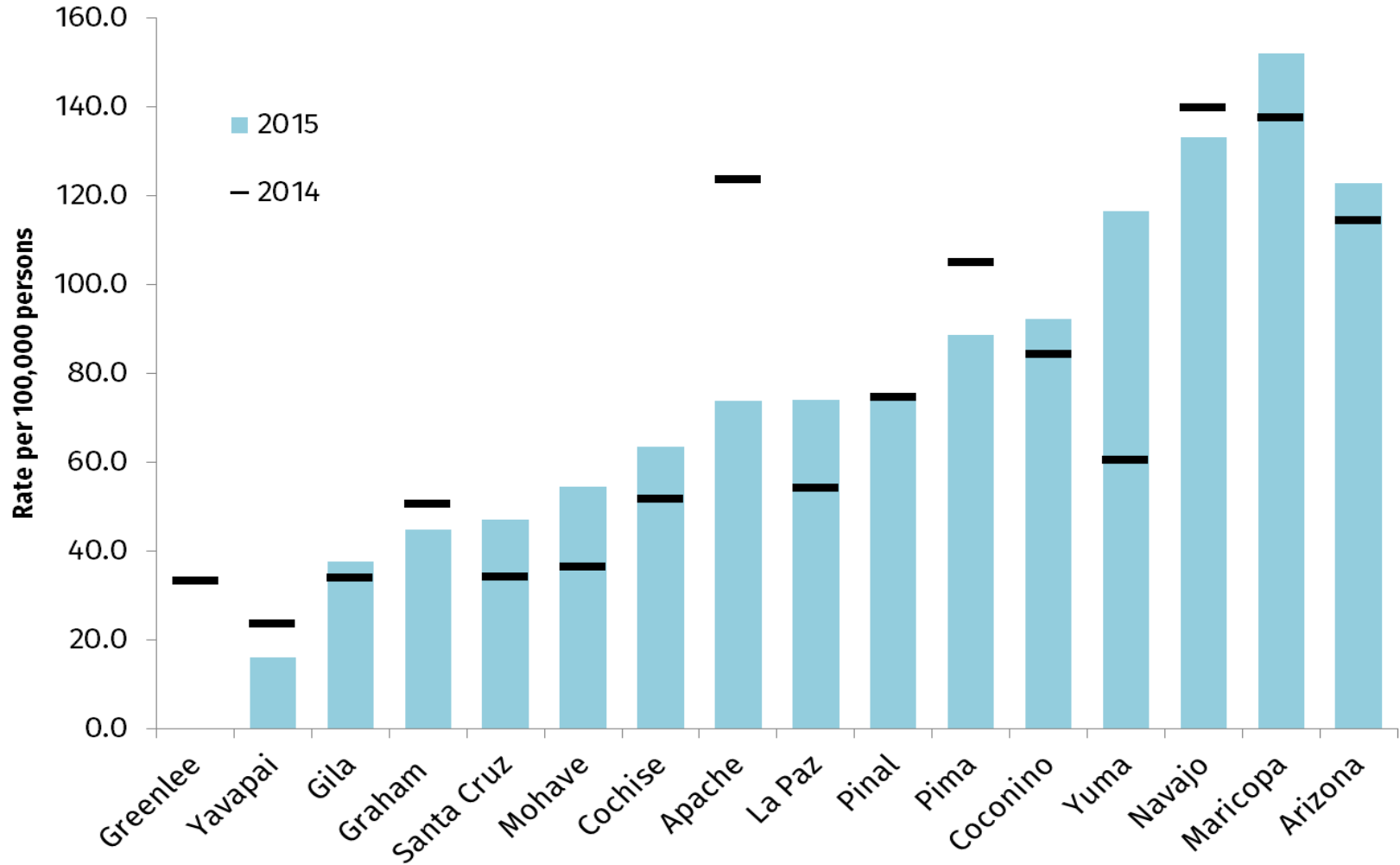
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### Figure GC 1: Reported Gonorrhea Cases and Rates, Arizona 2011-2015



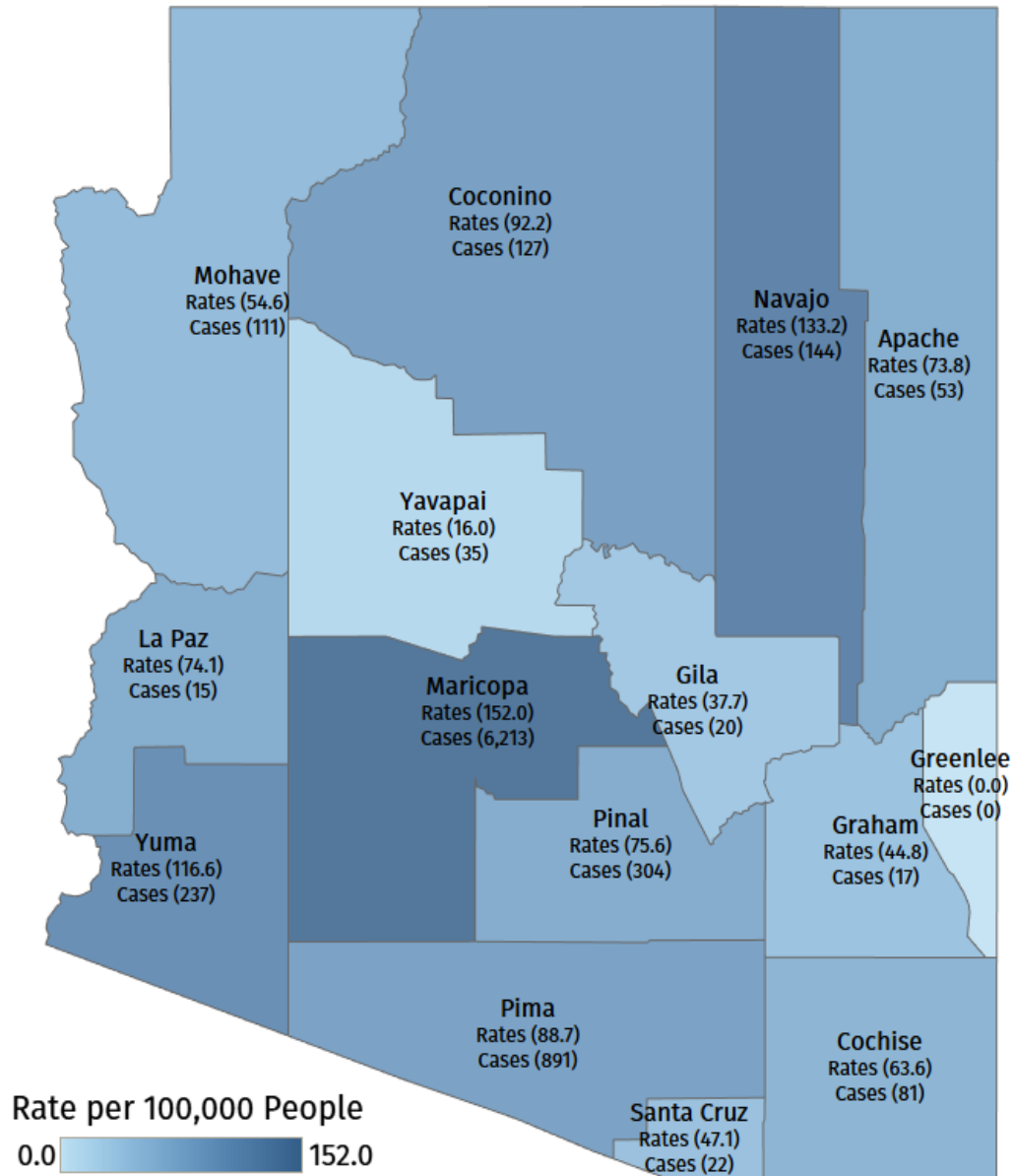
### Figure GC 3: Gonorrhea Rates by County, Arizona 2014/2015



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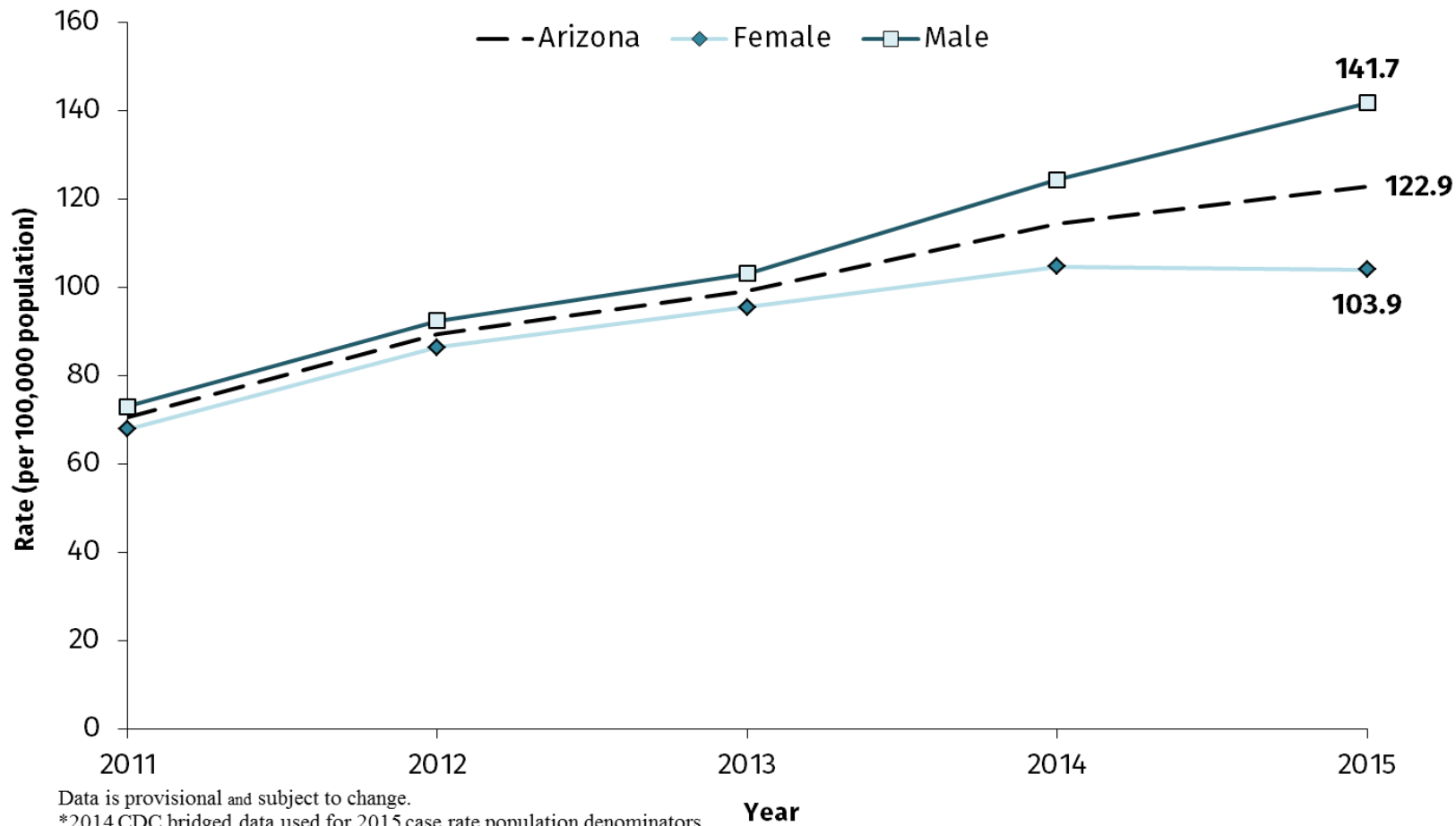
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**Figure GC 4: Gonorrhea Rates and Cases by County, Arizona 2015**

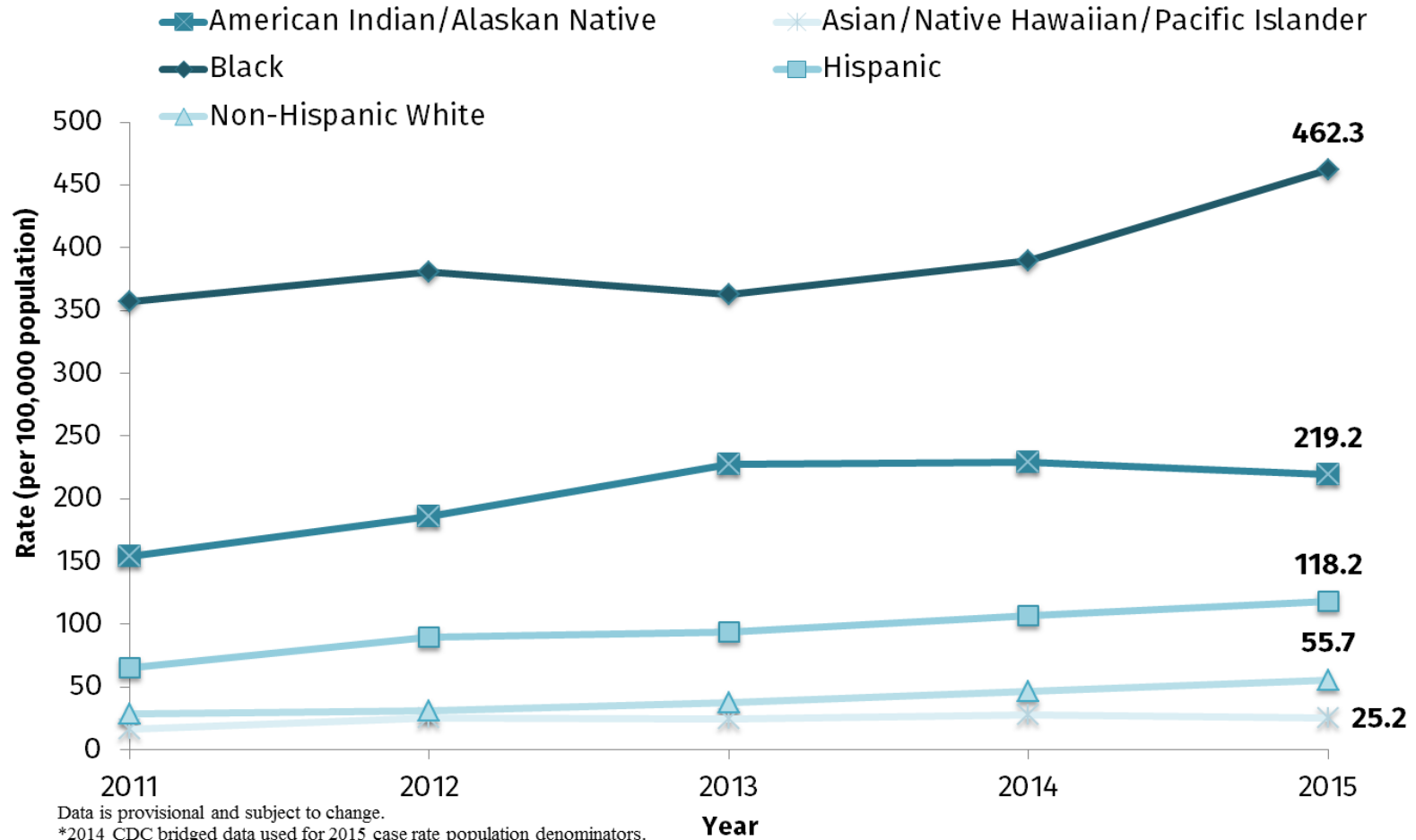




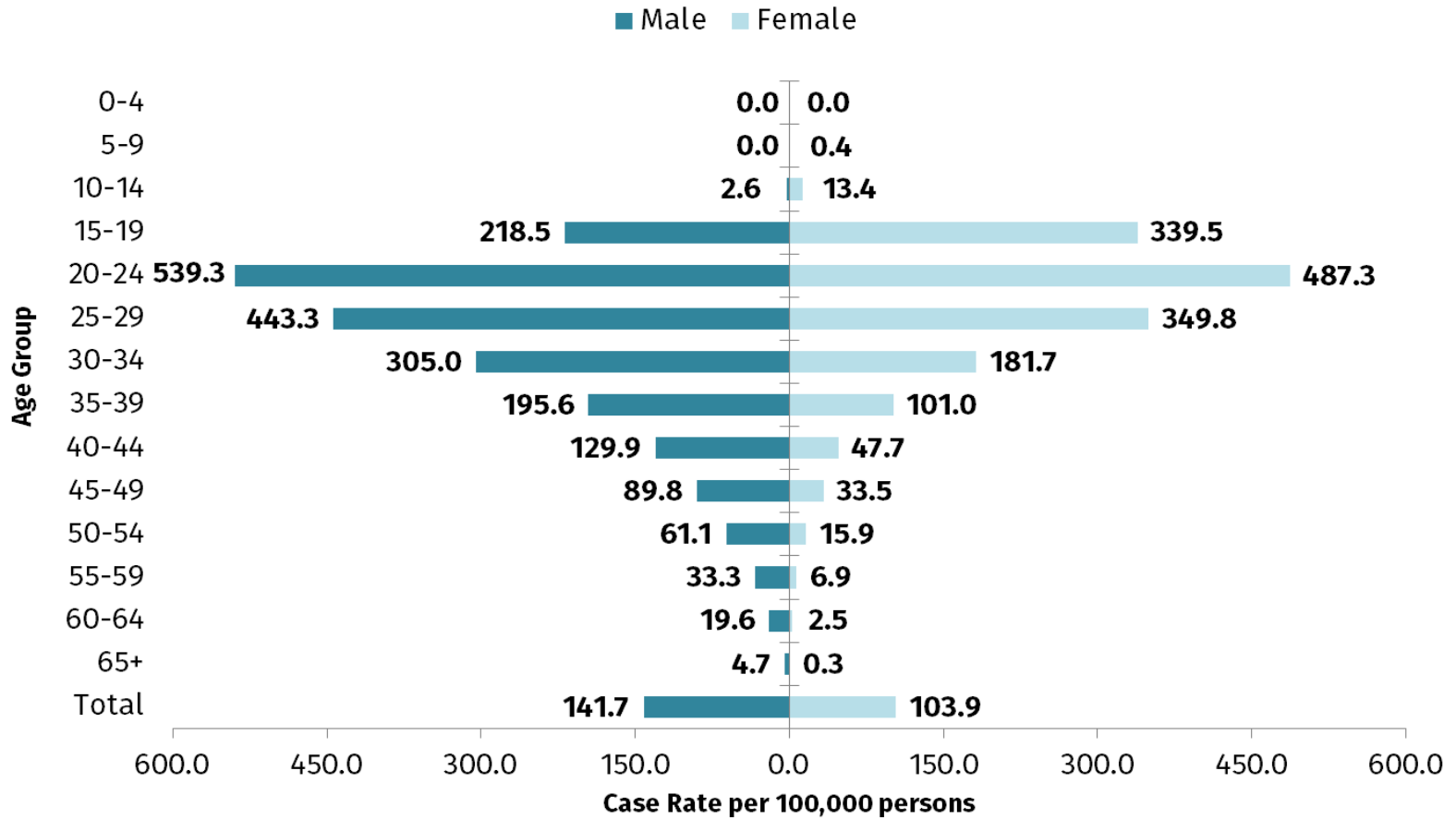
### Figure GC 5: Reported Gonorrhea Case Rates per 100,000 Population by Gender, Arizona 2011-2015



## Figure GC 6: Reported Gonorrhea Case Rates by Race/Ethnicity, Arizona 2011-2015



## Figure GC 7: Gonorrhea Rates by Age Group and Gender, Arizona 2015



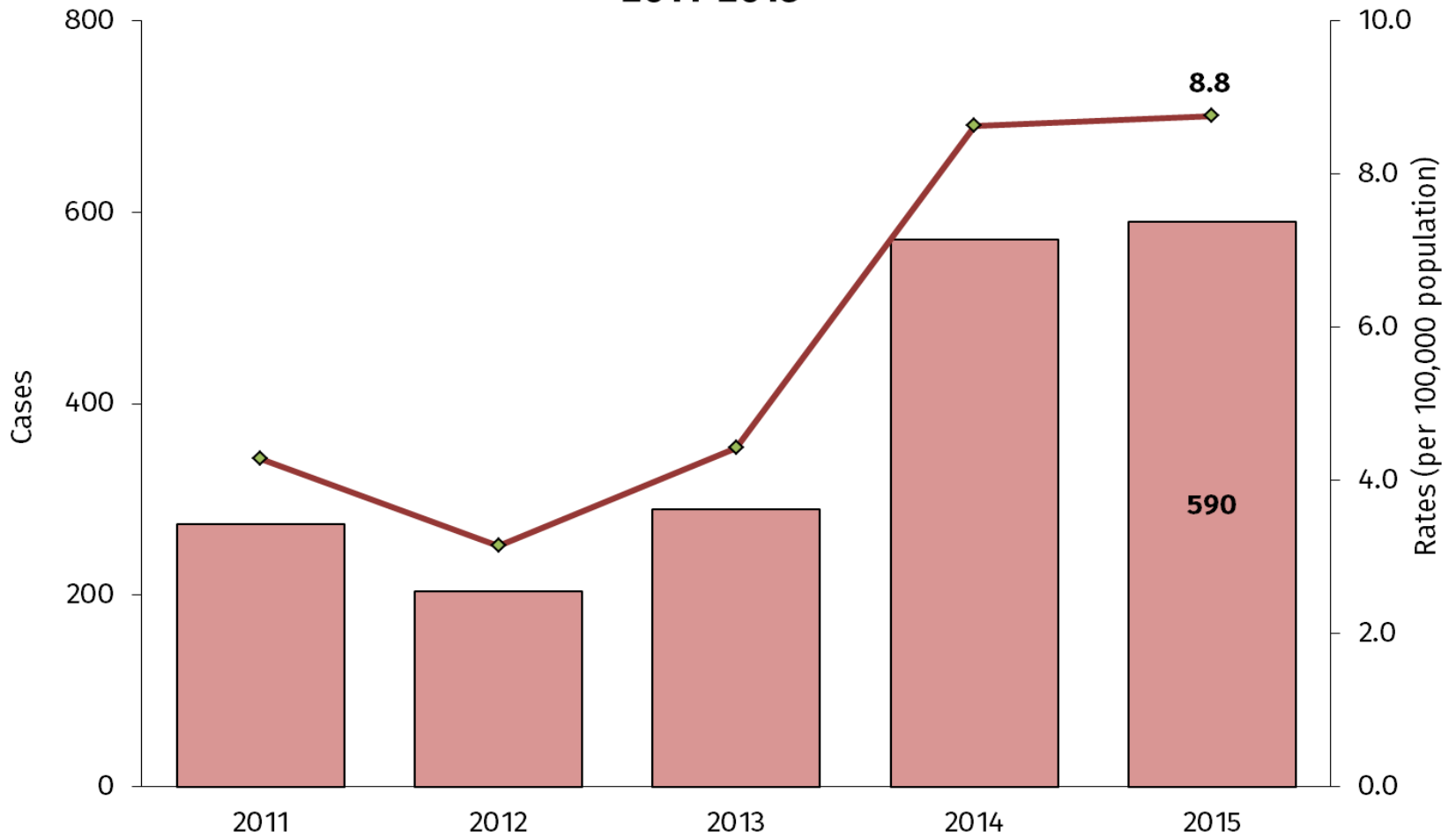
# Primary/Secondary Syphilis in Arizona



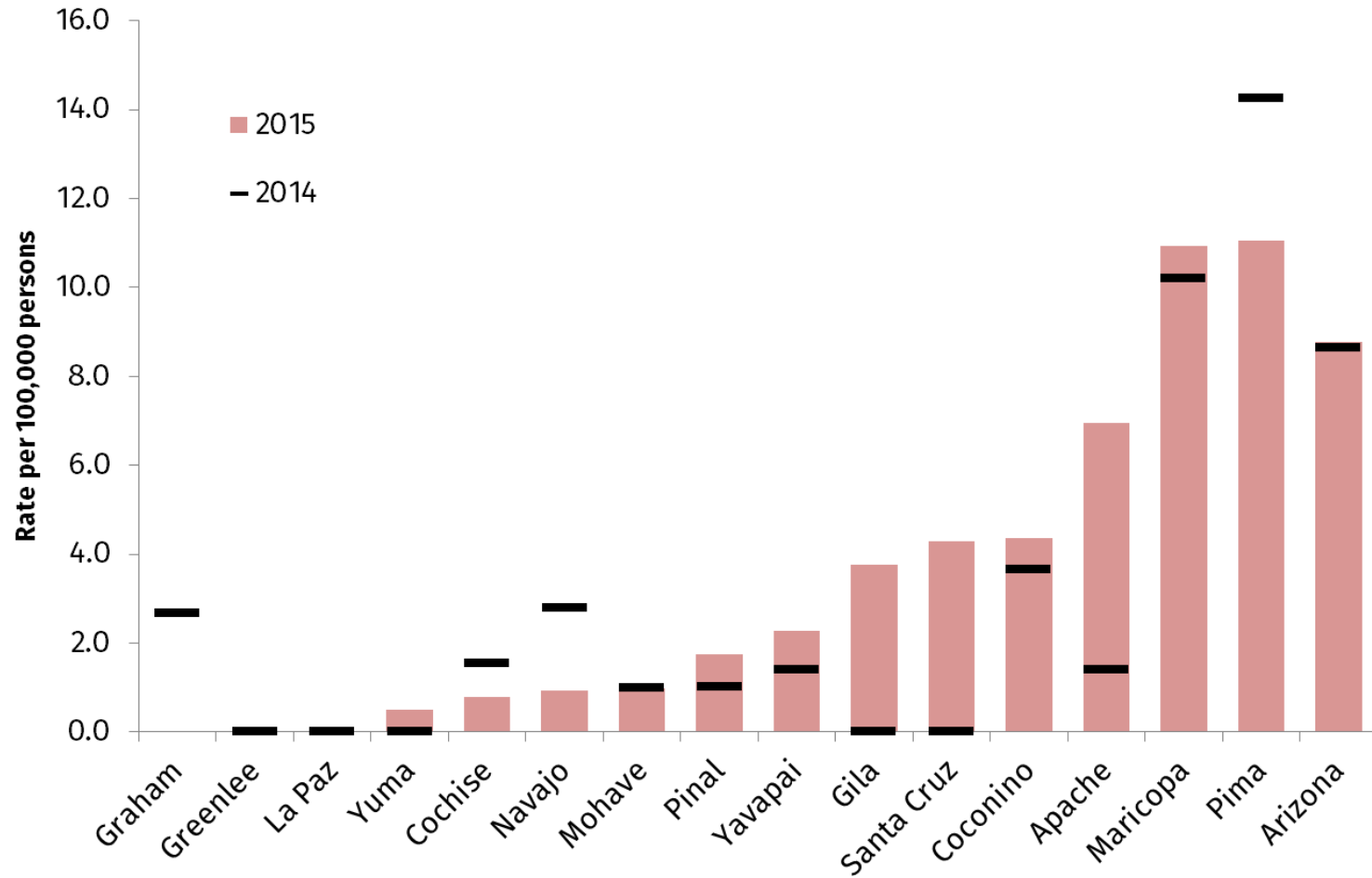
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**Figure S1. Reported Primary and Secondary Syphilis, Arizona  
2011-2015**



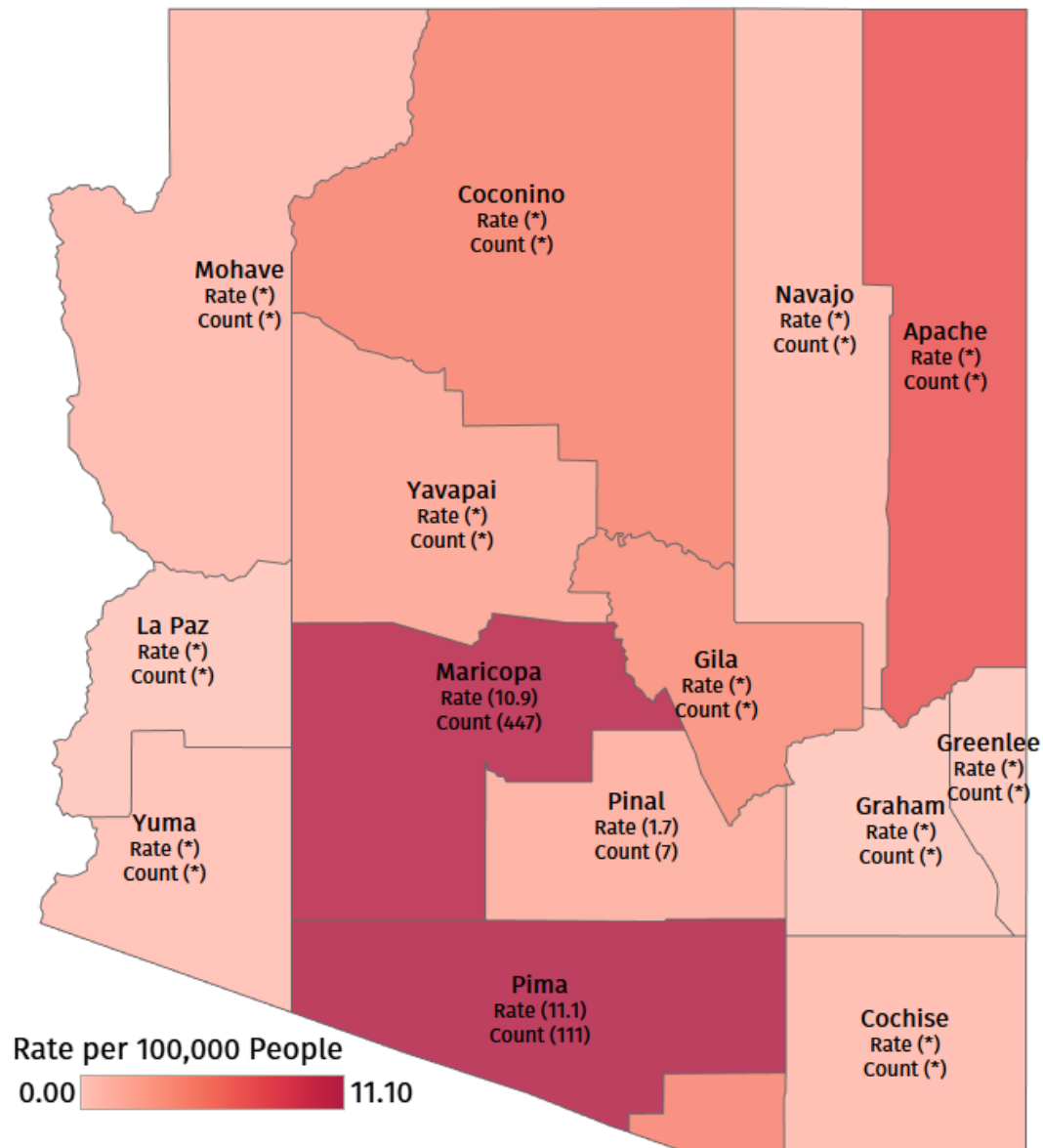
**Figure S3: Syphilis Rates by County, Arizona 2014/2015**



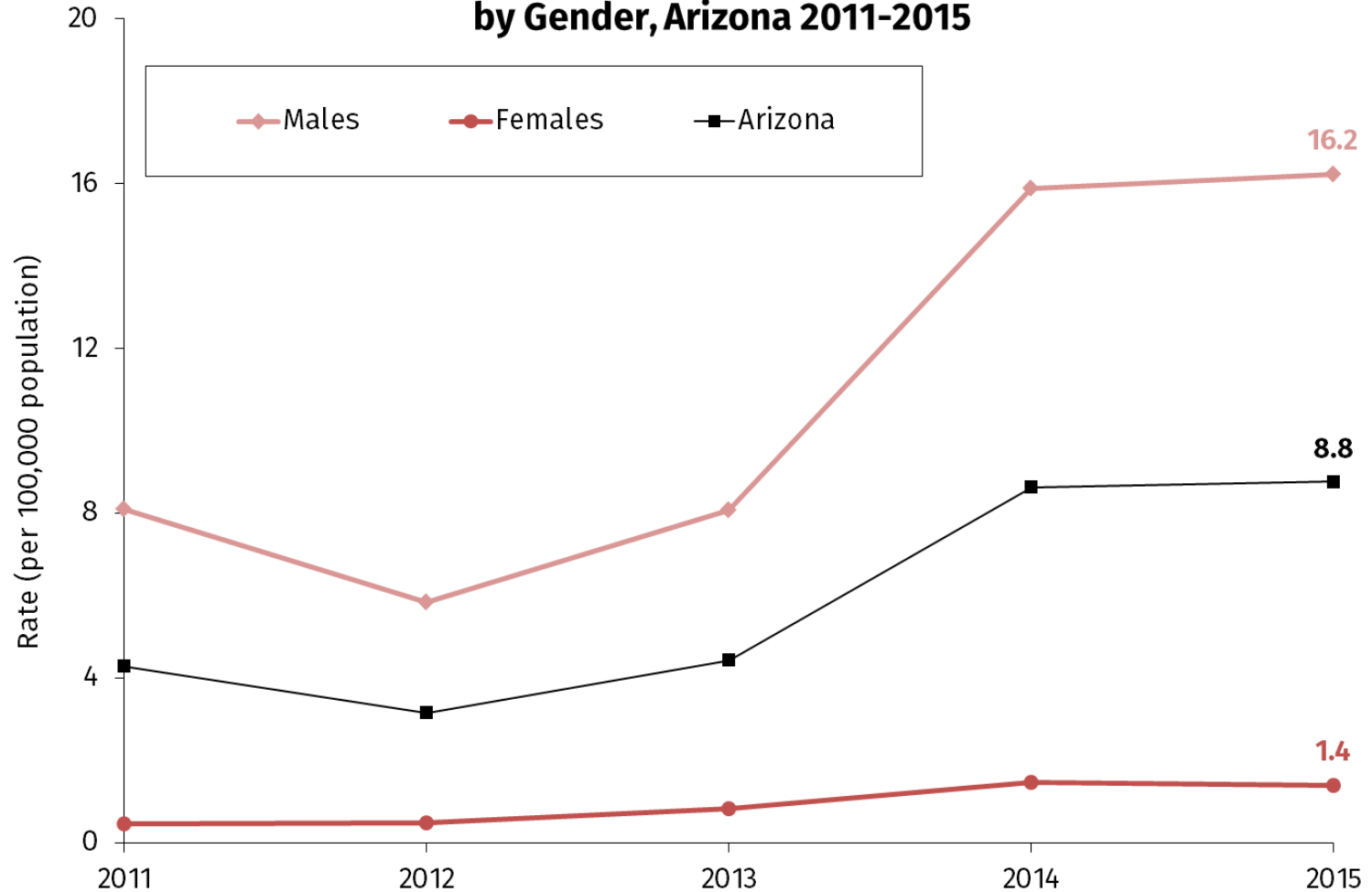
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**Figure S4: Primary/Secondary Syphilis Rates and Cases by County, Arizona 2015**

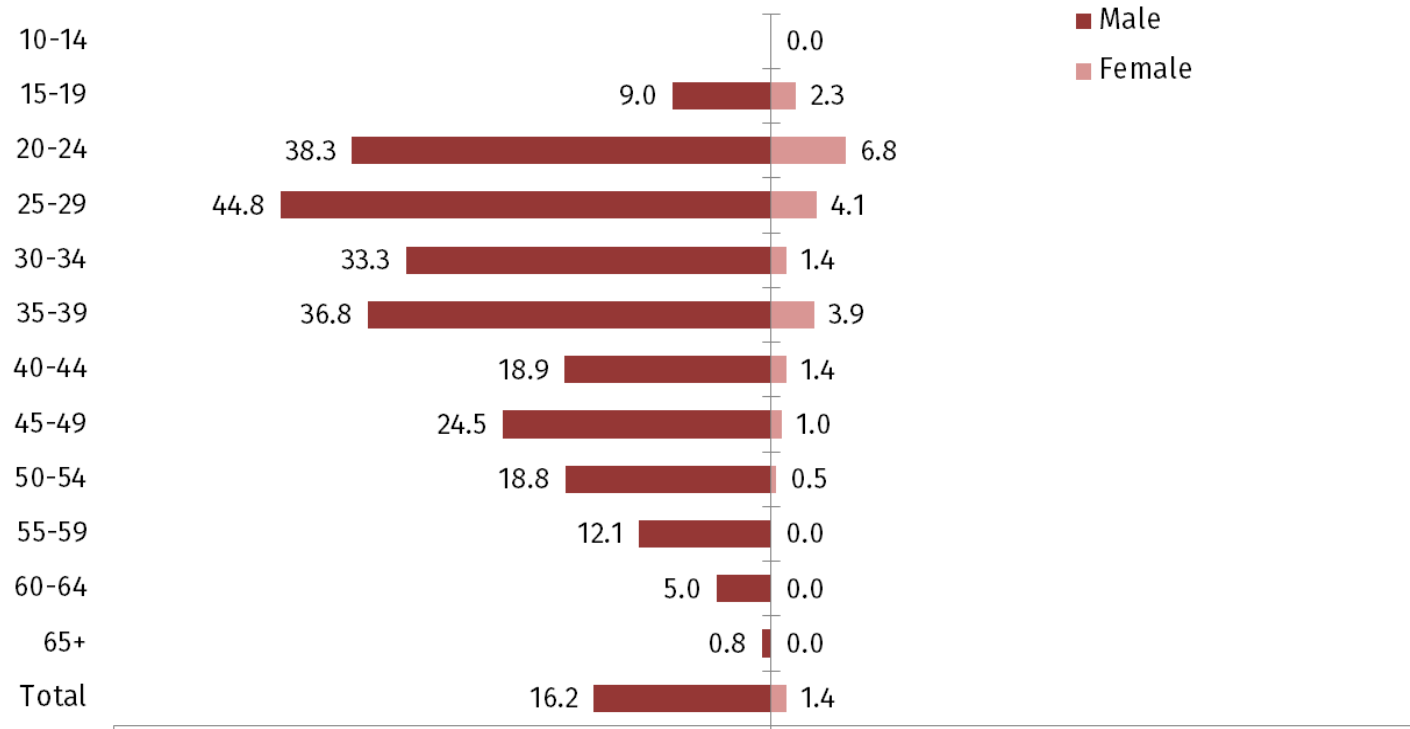


**Figure S5: Reported Primary and Secondary Syphilis Case Rates by Gender, Arizona 2011-2015**





## Figure S6: Rates of Primary and Secondary Syphilis by Age Group and Gender, Arizona 2015



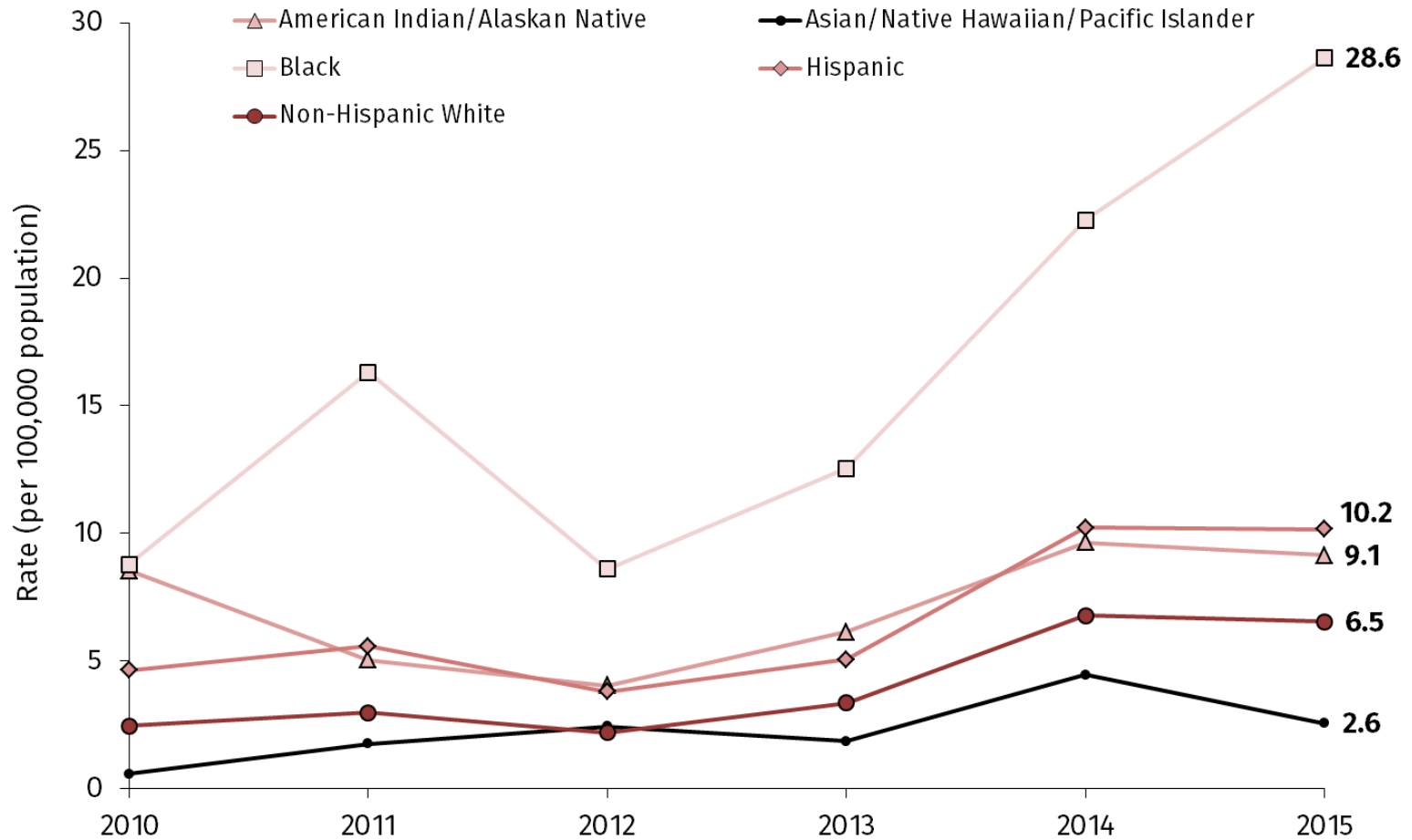
\*Ages 0-9 not shown, Arizona rate reflects all ages.



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**Figure S7: Reported Primary and Secondary Syphilis Case Rates by Race/ Ethnicity, Arizona 2010 - 2015**



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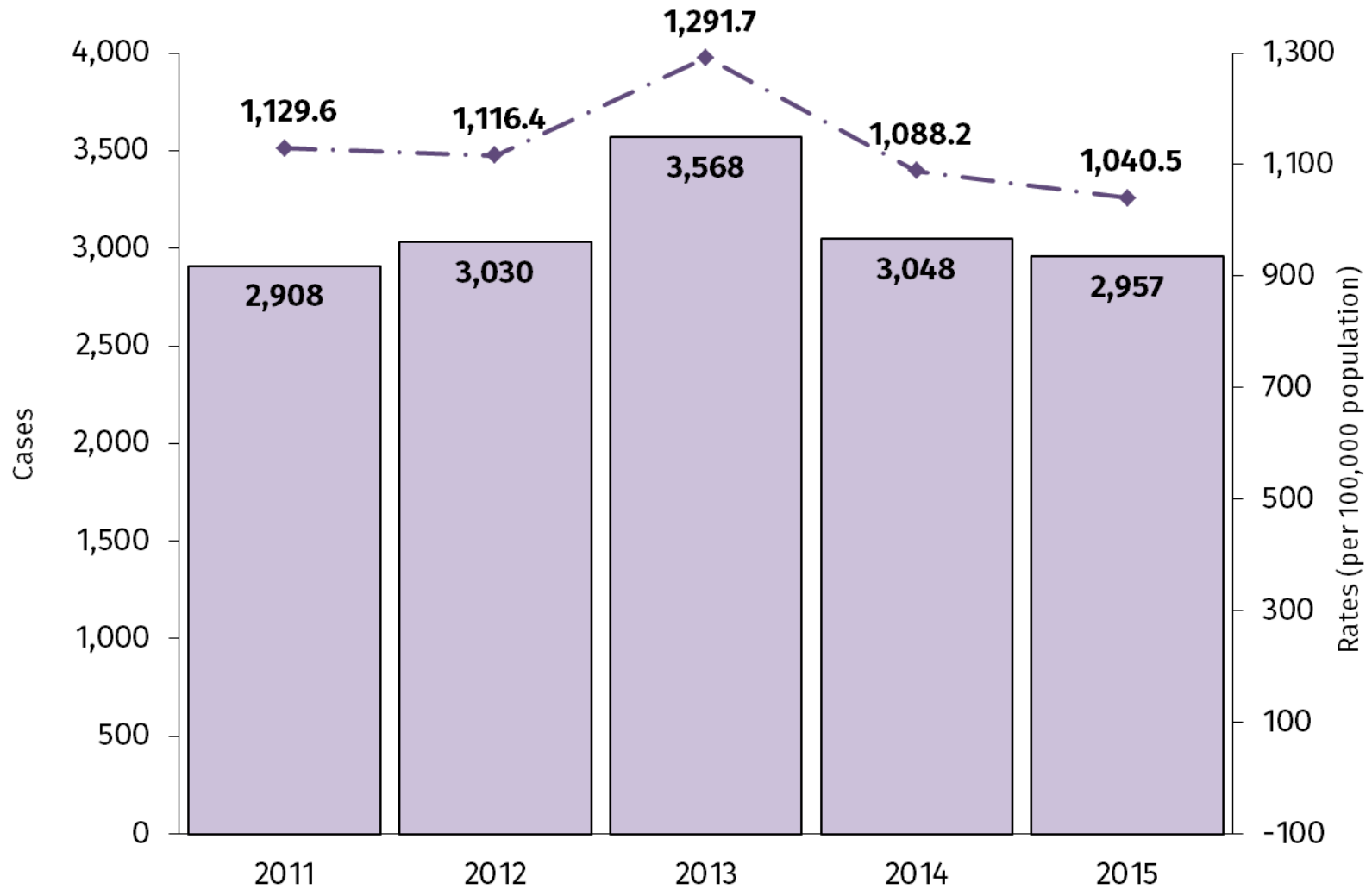
# Chlamydia



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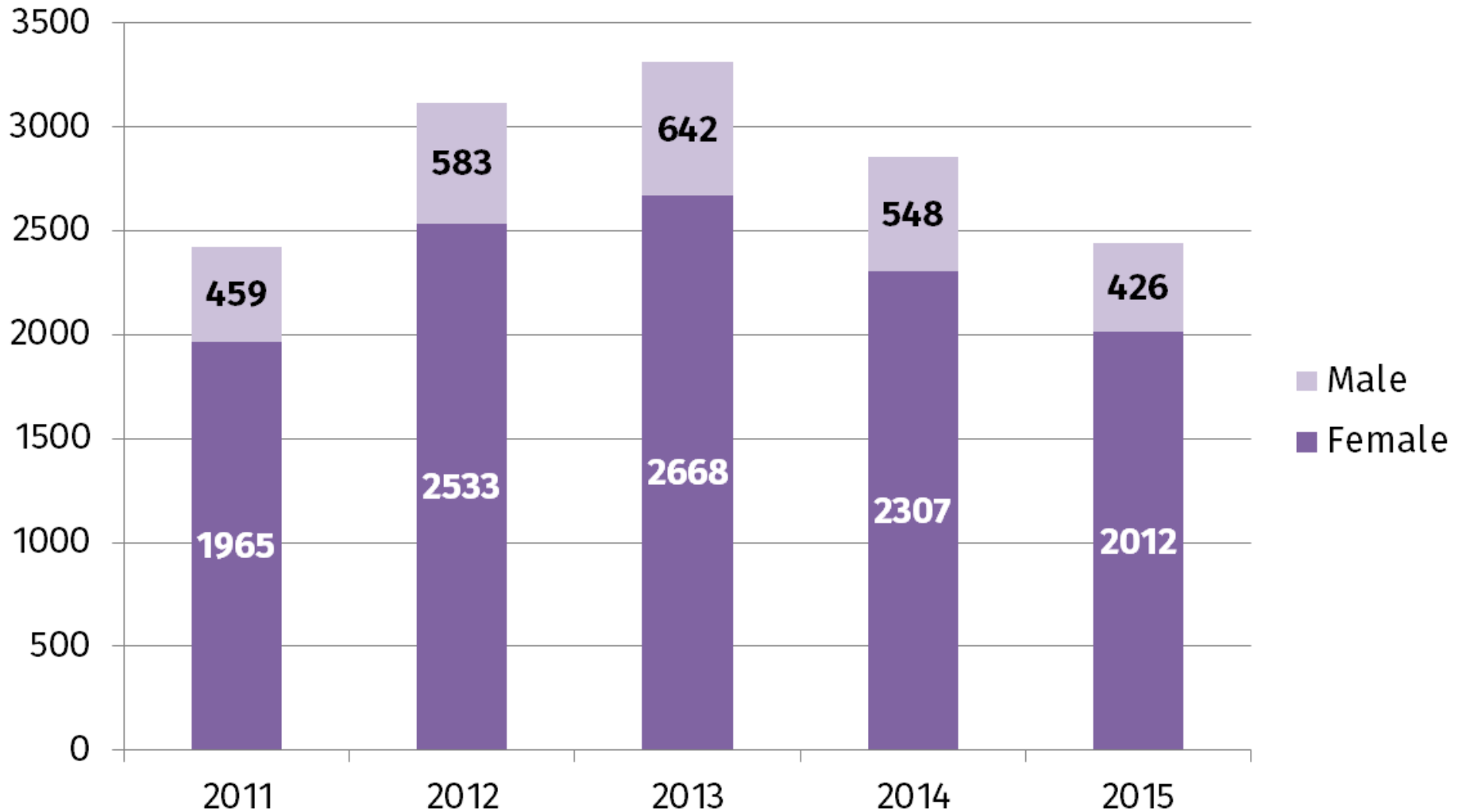
### Figure CT 1: Reported Chlamydia Cases and Case Rates Among American Indians/Alaskan Natives, Arizona 2011-2015



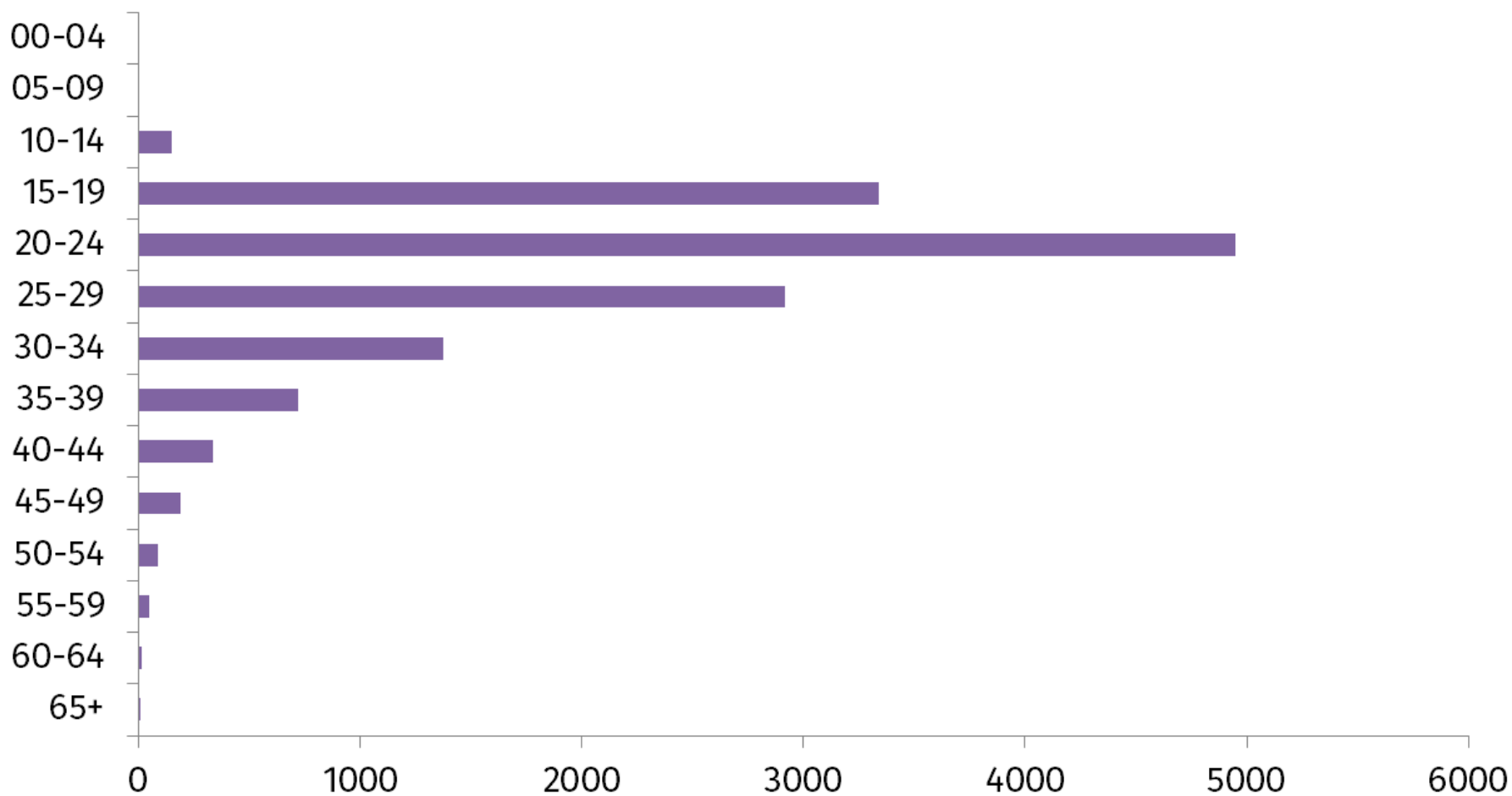
Data is provisional and subject to change.

\* 2014 CDC bridged data used for 2015 case rate population denominators.

# Primary/Secondary Syphilis Cases by Gender Among American Indians/Alaskan Natives, 2011-2015



## Chlamydia Cases by Age Group Among American Indians/Alaskan Natives, 2015



# Gonorrhea

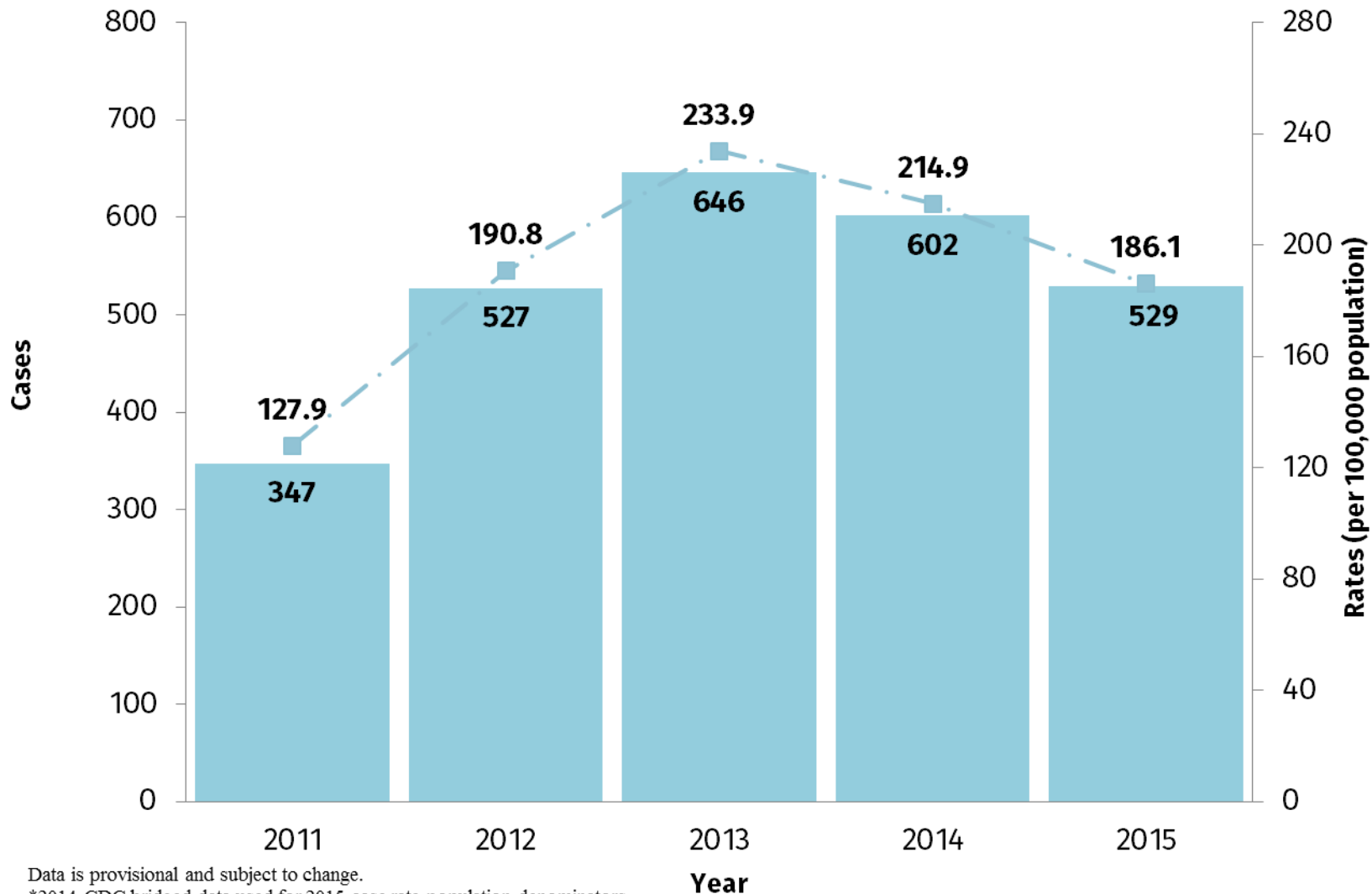


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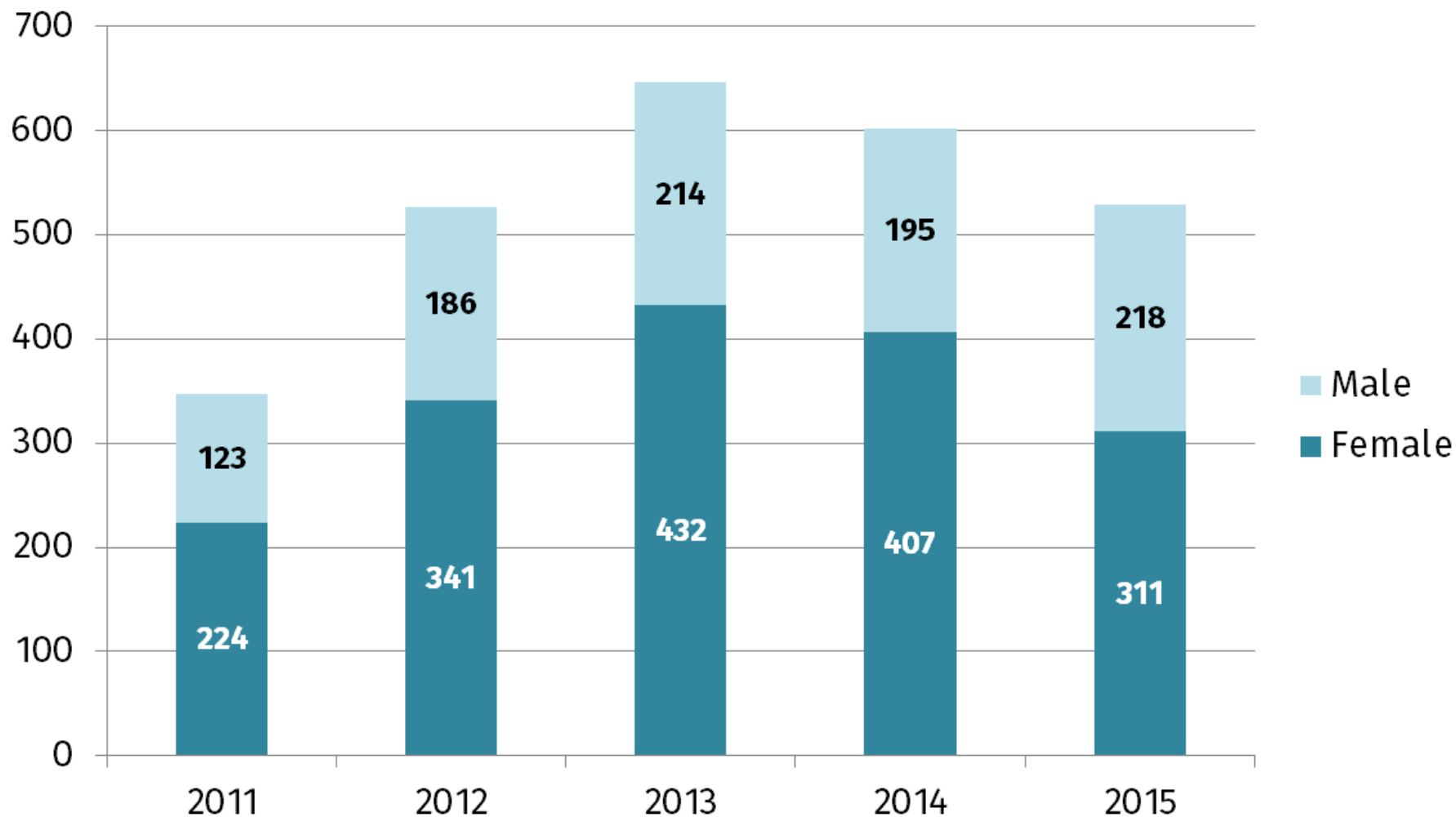
### Figure GC 4: Reported Gonorrhea Cases and Rates Among American Indians/Alaskan Natives, Arizona 2011-2015



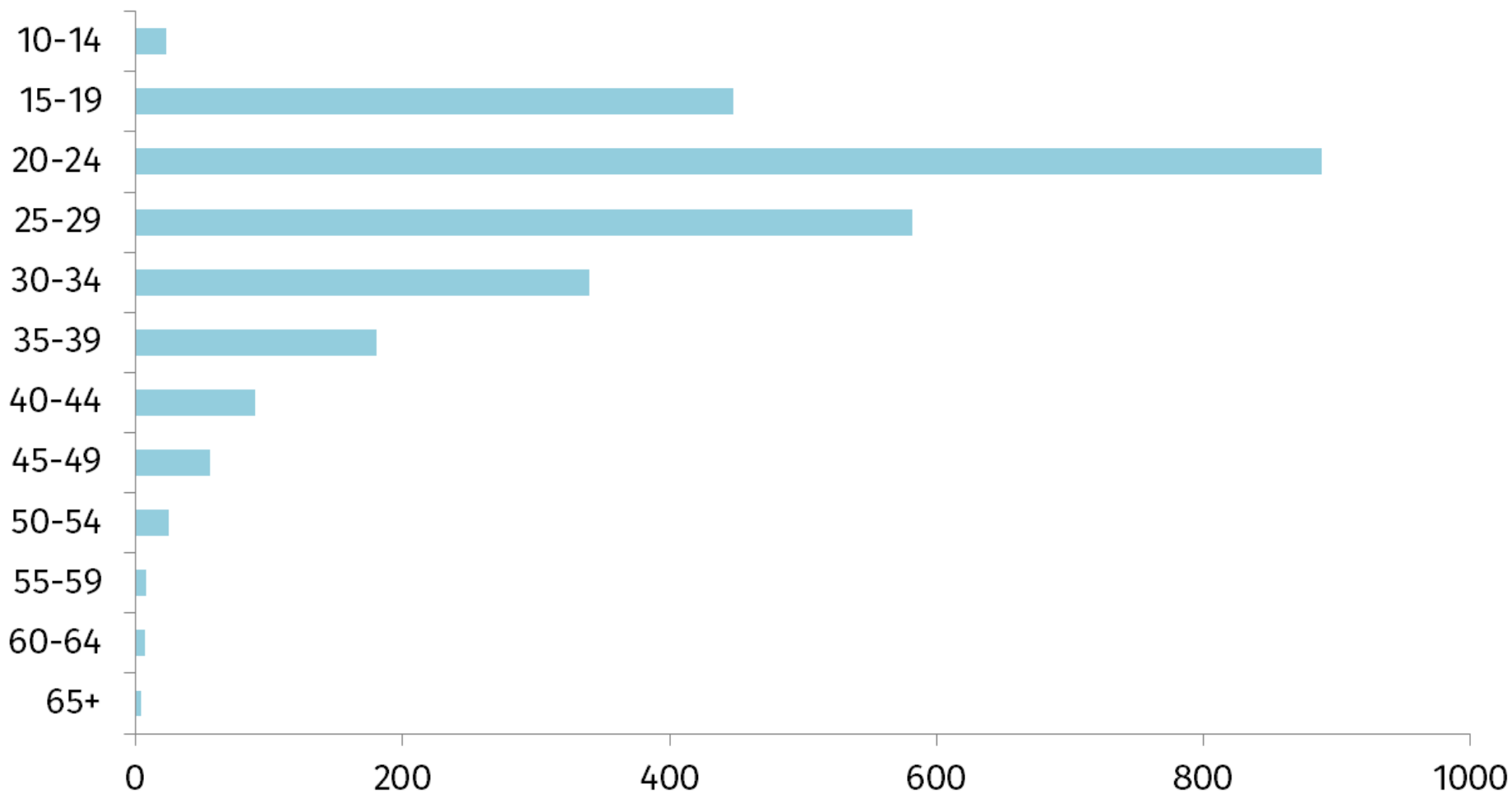
Data is provisional and subject to change.

\*2014 CDC bridged data used for 2015 case rate population denominators.

## Gonorrhea Cases by Gender Among American Indians/Alaskan Natives, 2011-2015



## Gonorrhea Cases by Age Group Among American Indians/Alaskan Natives, 2015



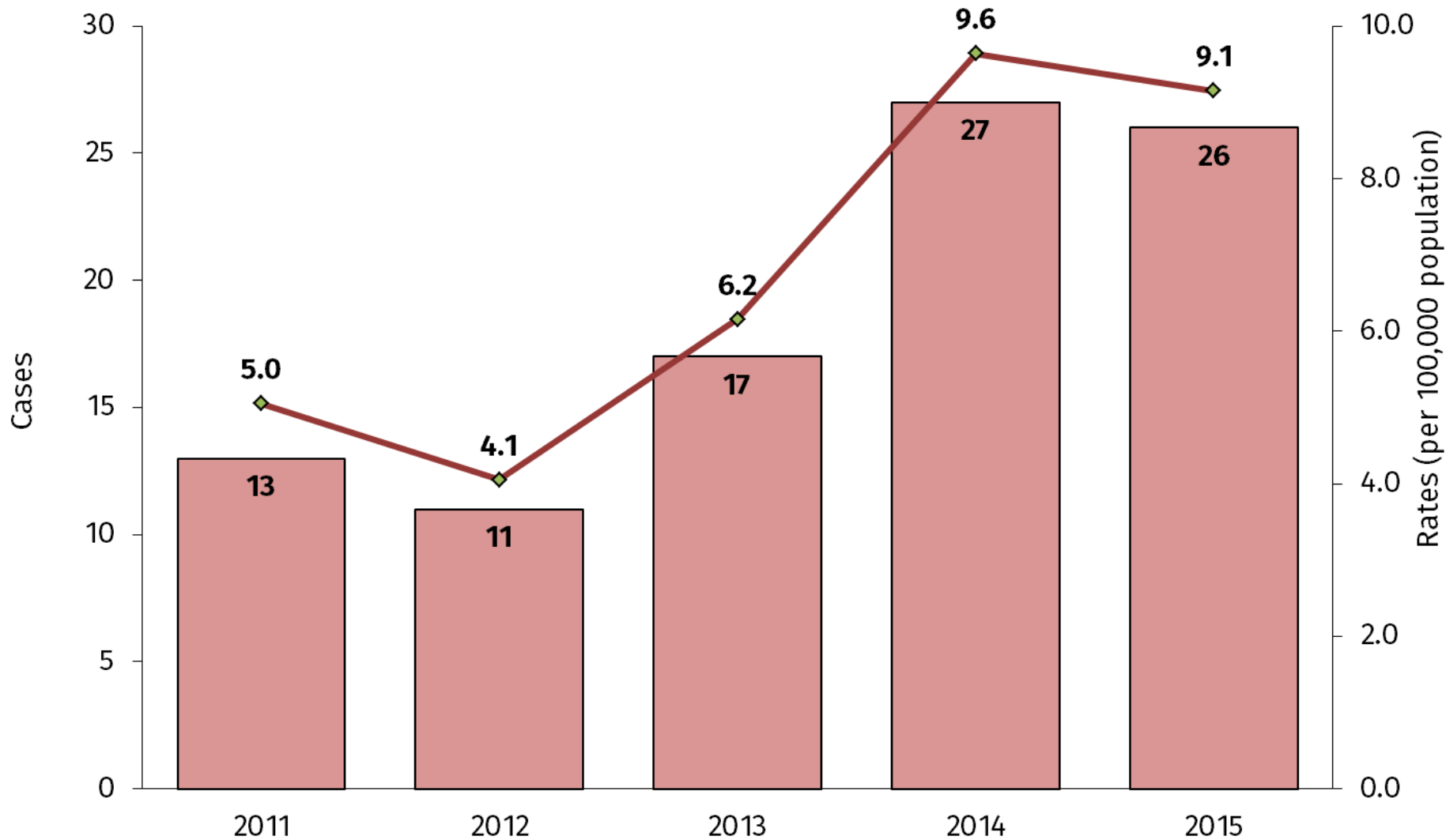
# Primary/Secondary Syphilis



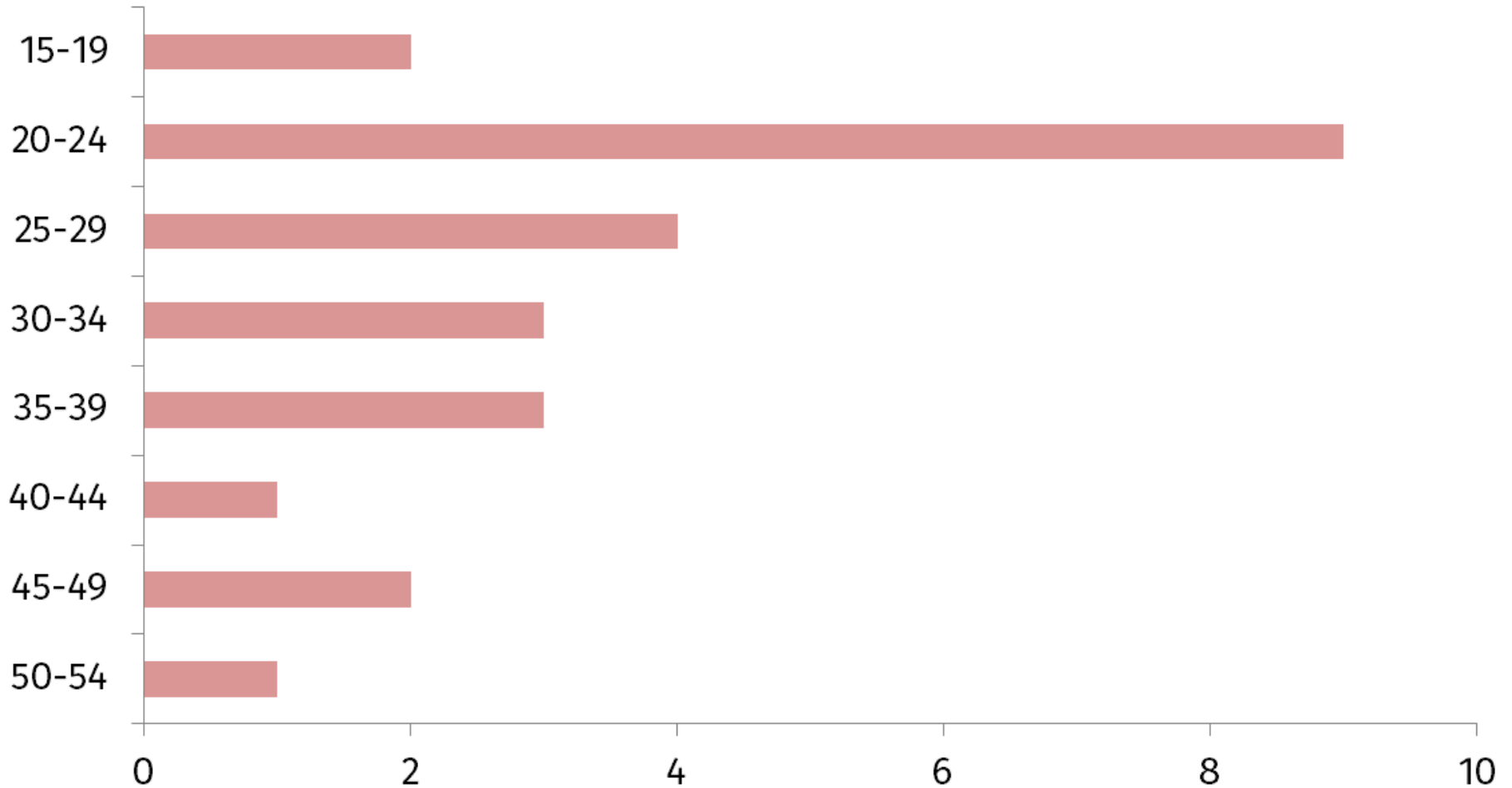
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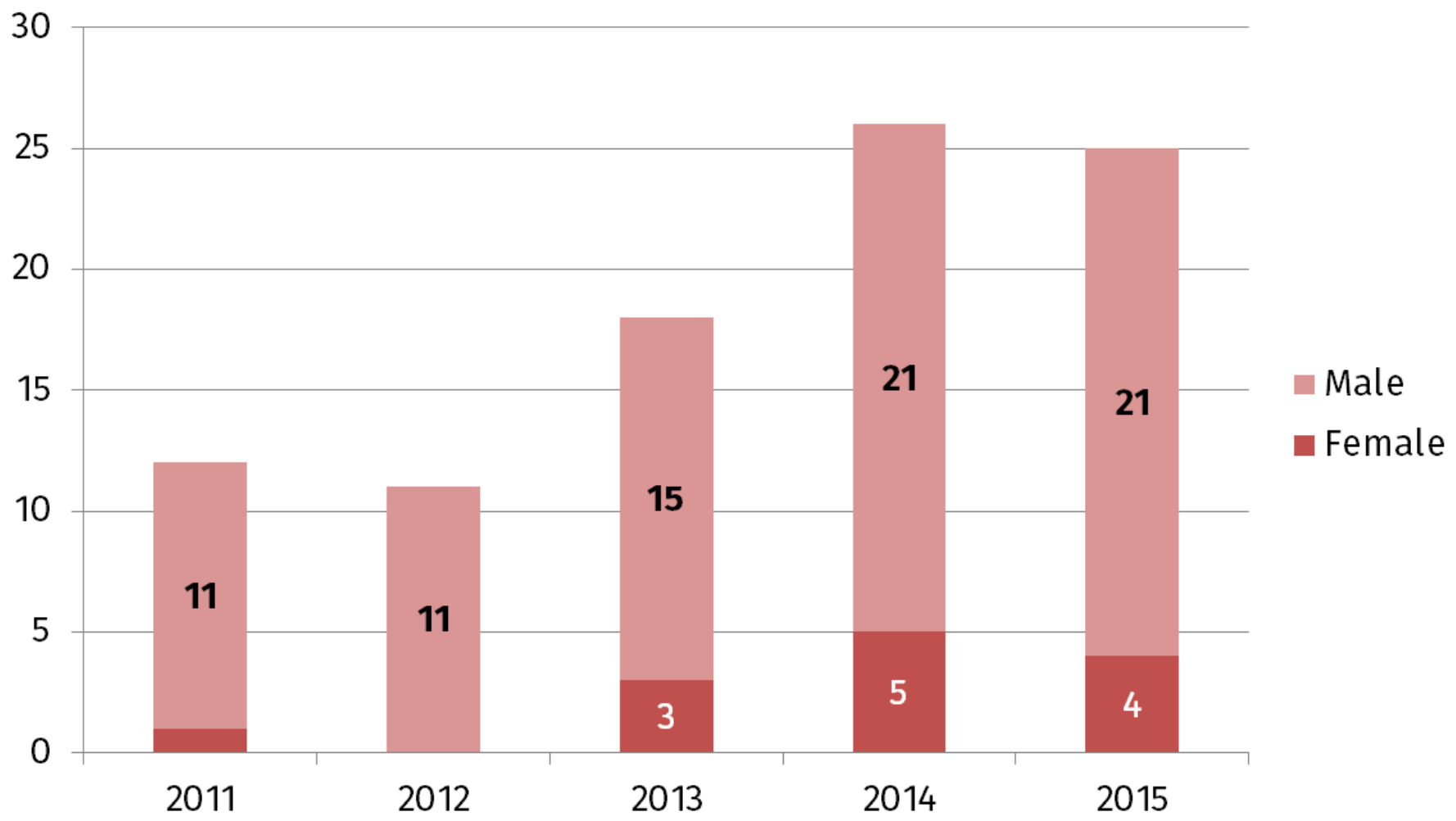
**Figure S1. Reported Primary and Secondary Syphilis in American Indian/Alaskan Natives, Arizona 2011-2015**



## Primary/Secondary Syphilis Cases by Age Group Among American Indians/Alaskan Natives, 2015



# Primary/Secondary Syphilis Cases by Gender Among American Indians/Alaskan Natives, 2011-2015



# Multiple STIs

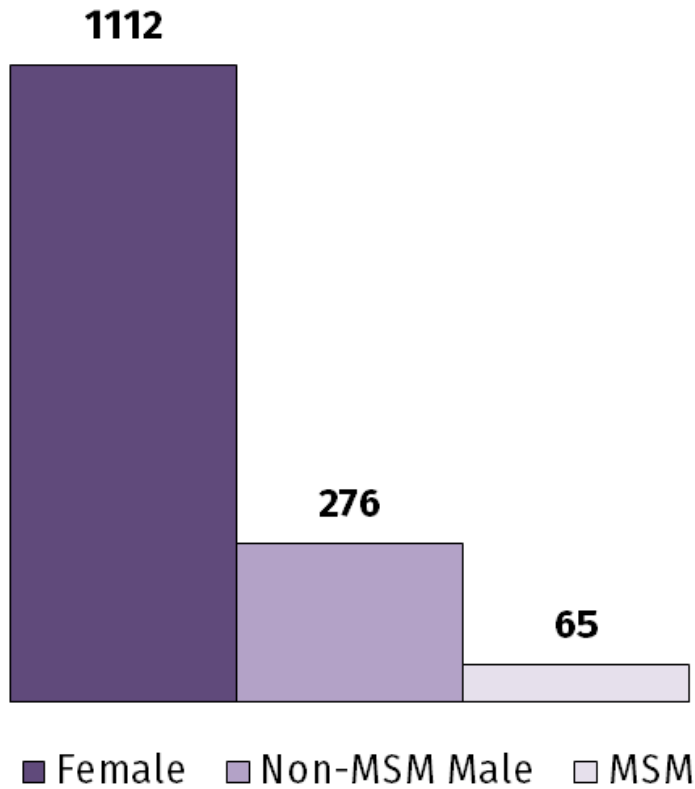


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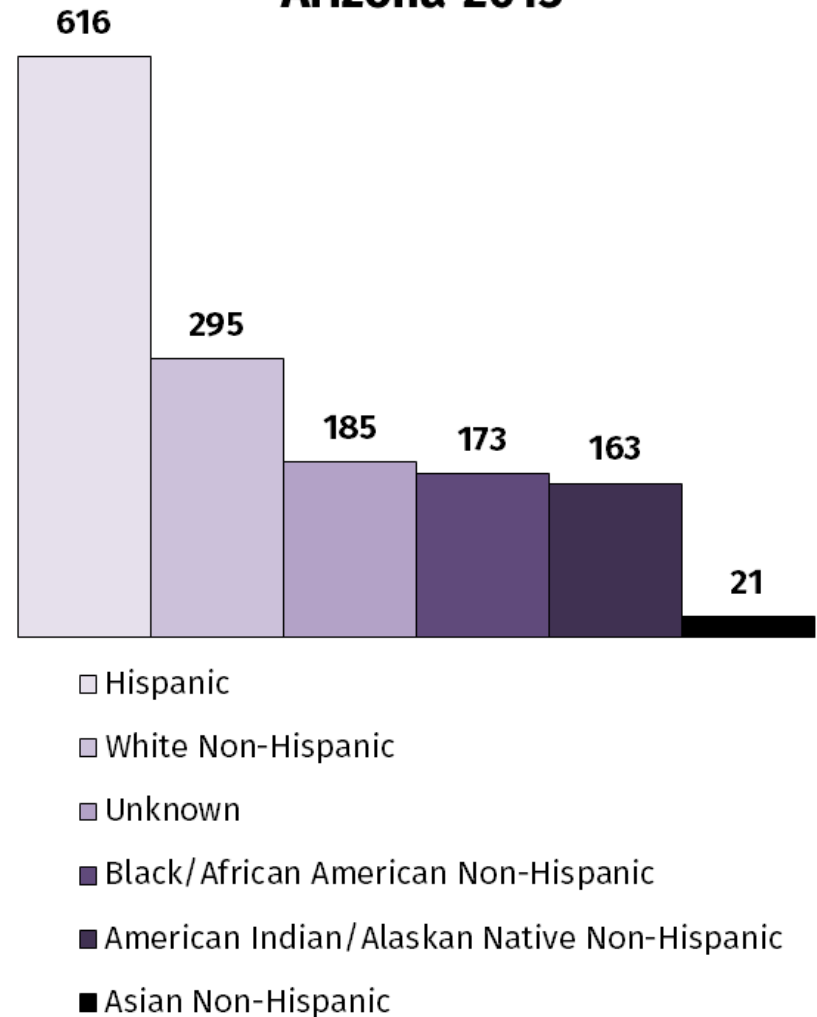
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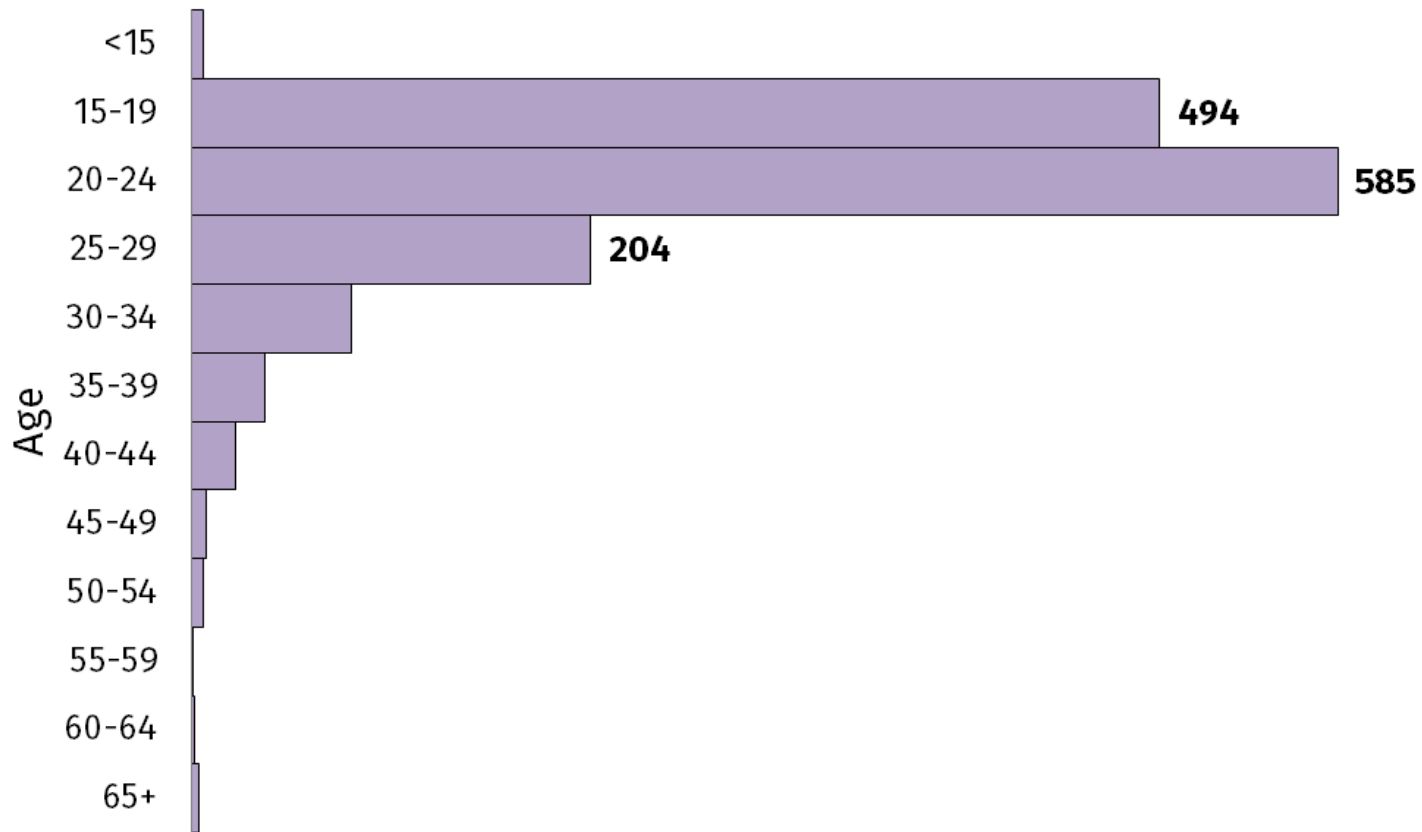
**Figure SF18: Repeat Chlamydia Infections by Gender/Sexual Preference, Arizona 2015**



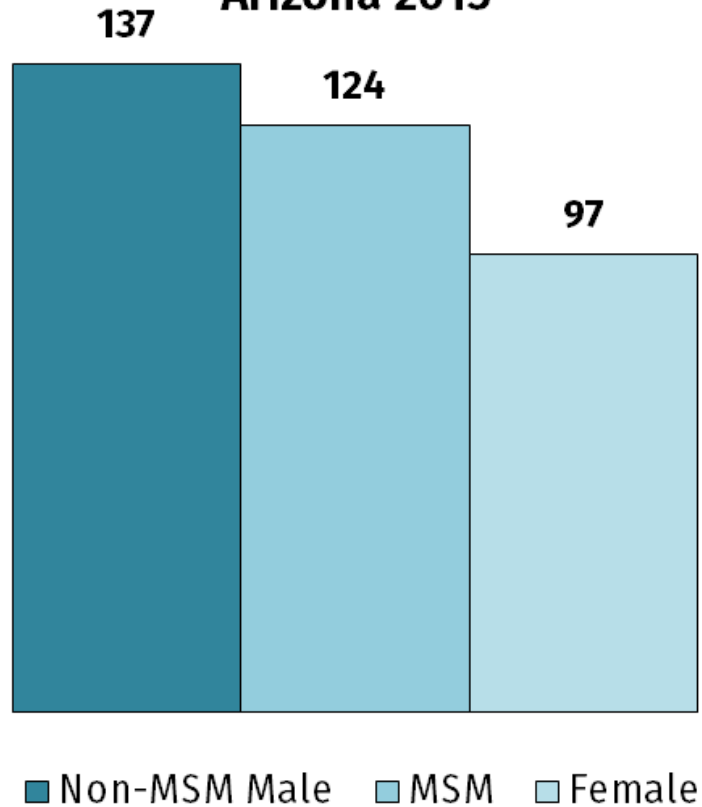
**Figure SF19: Repeat Chlamydia Infections by Race/Ethnicity, Arizona 2015**



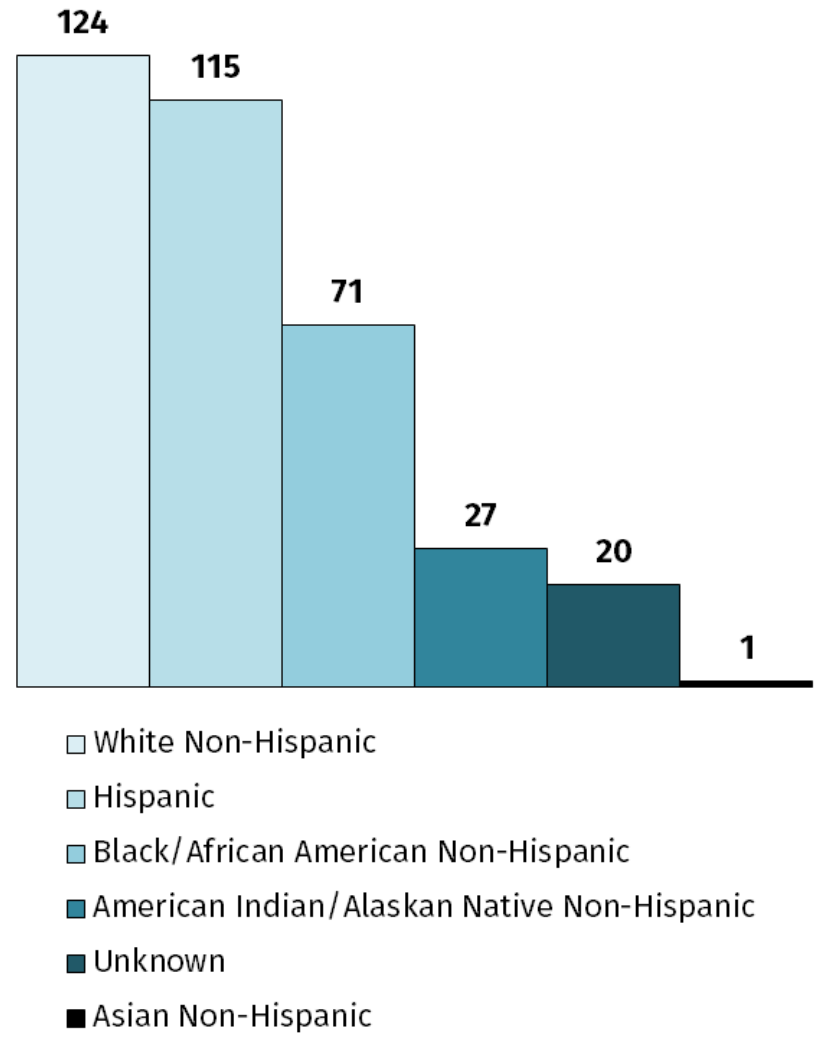
# Figure SF20: Repeat Chlamydia Infections by Age, Arizona 2015



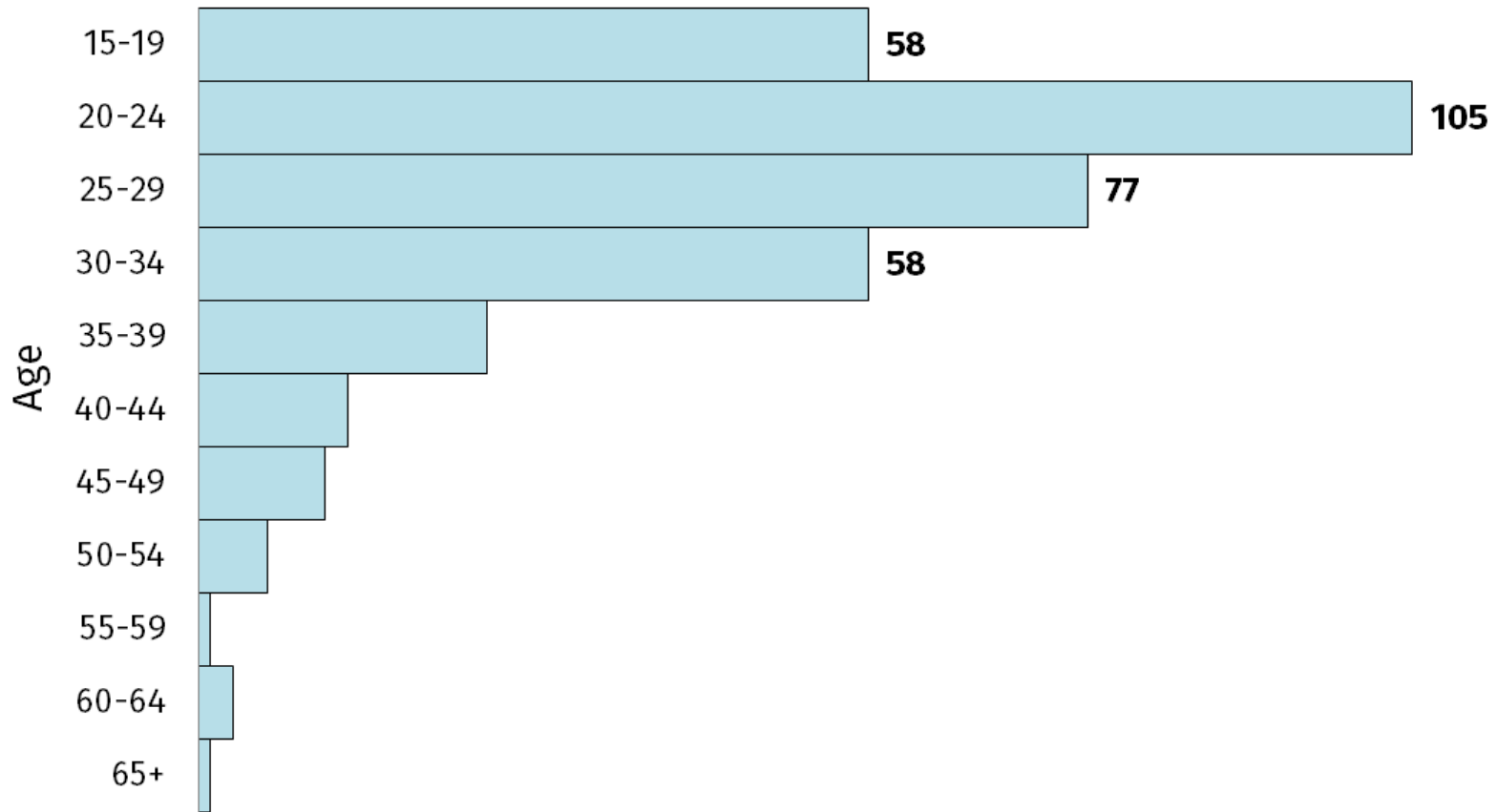
**Figure SF21: Repeat  
Gonorrhea Infections by  
Gender/Sexual Preference,  
Arizona 2015**



**Figure SF22: Repeat  
Gonorrhea Infections by  
Race/Ethnicity, Arizona 2015**



# Figure SF23: Repeat Gonorrhea Infections by Age, Arizona 2015



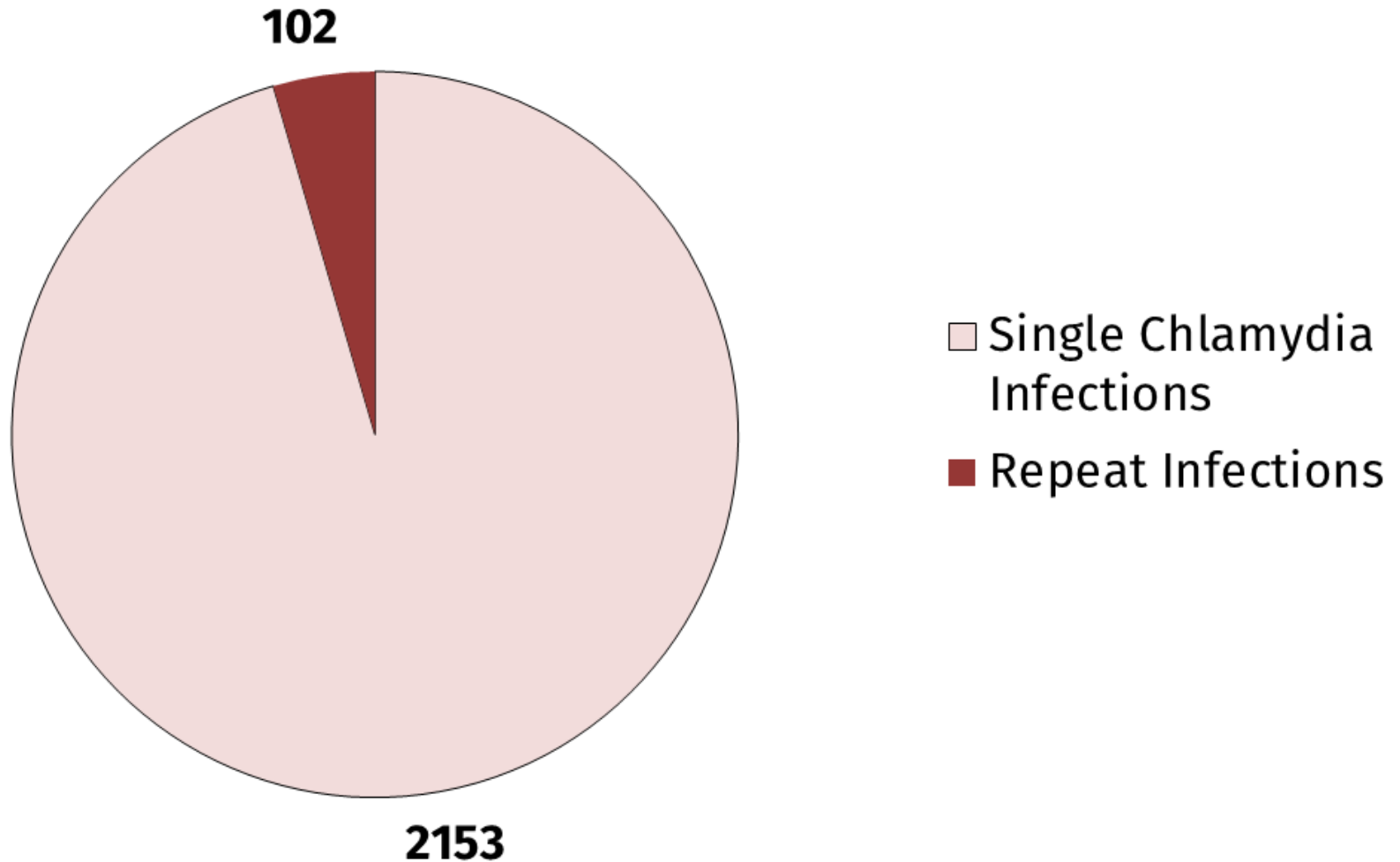
# Multiple STIs in the American Indian/Alaskan Native Population



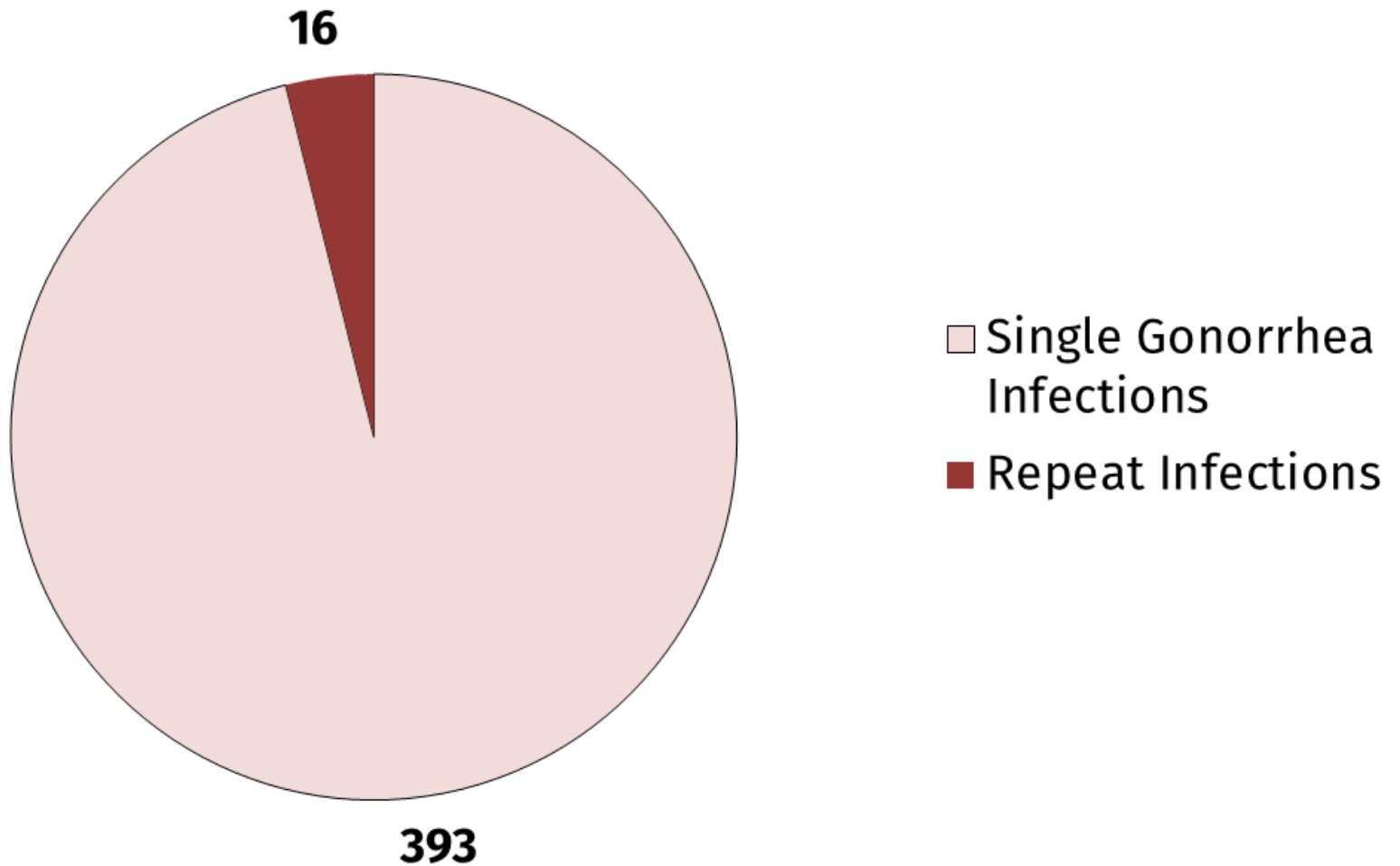
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## Single and Repeat Chlamydia Infections in American Indian/Alaskan Natives, Arizona 2015



## Single and Repeat Gonorrhea Infections in American Indian/Alaskan Natives, Arizona 2015



# HIV/STD Co-Infections



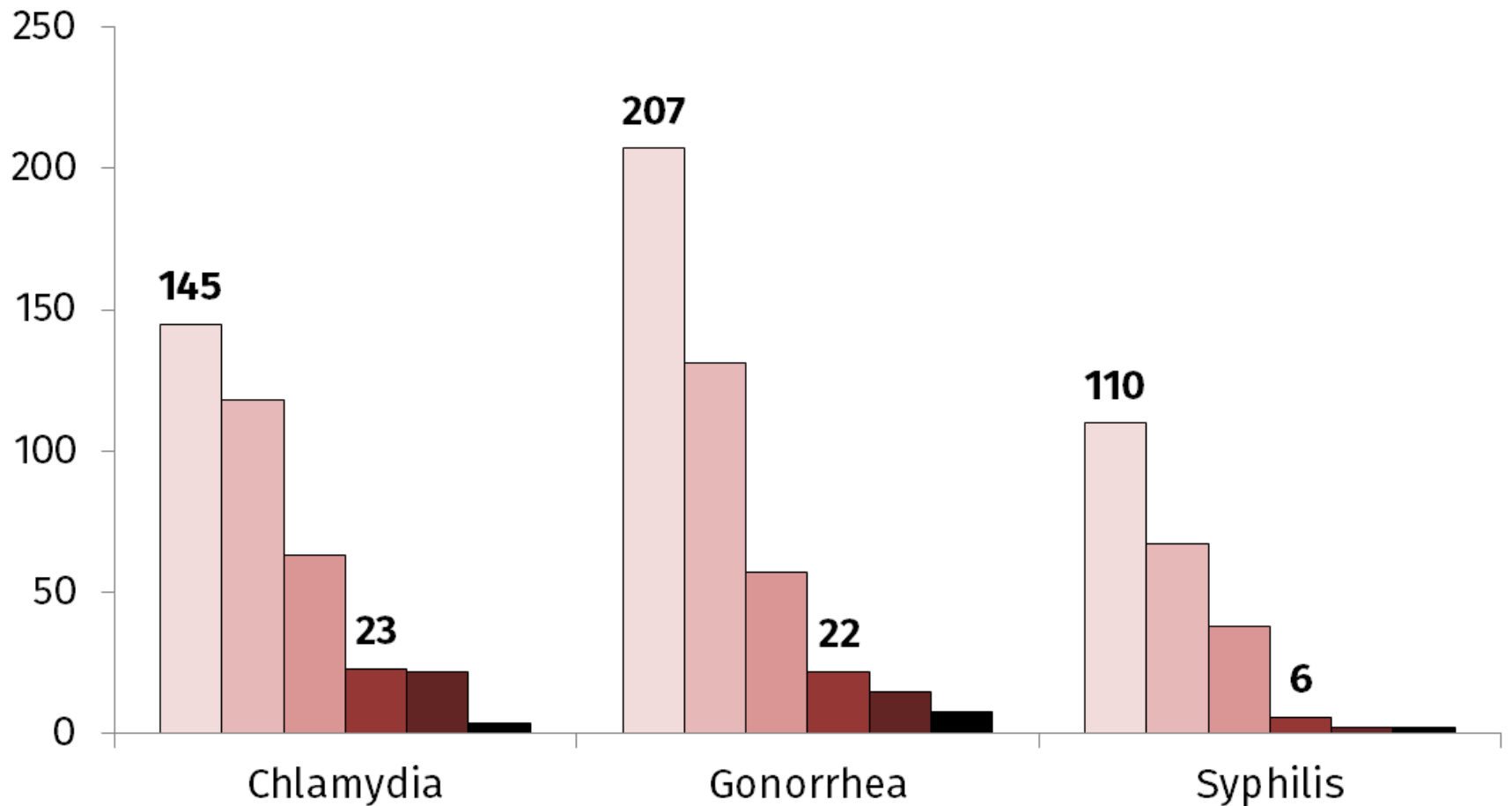
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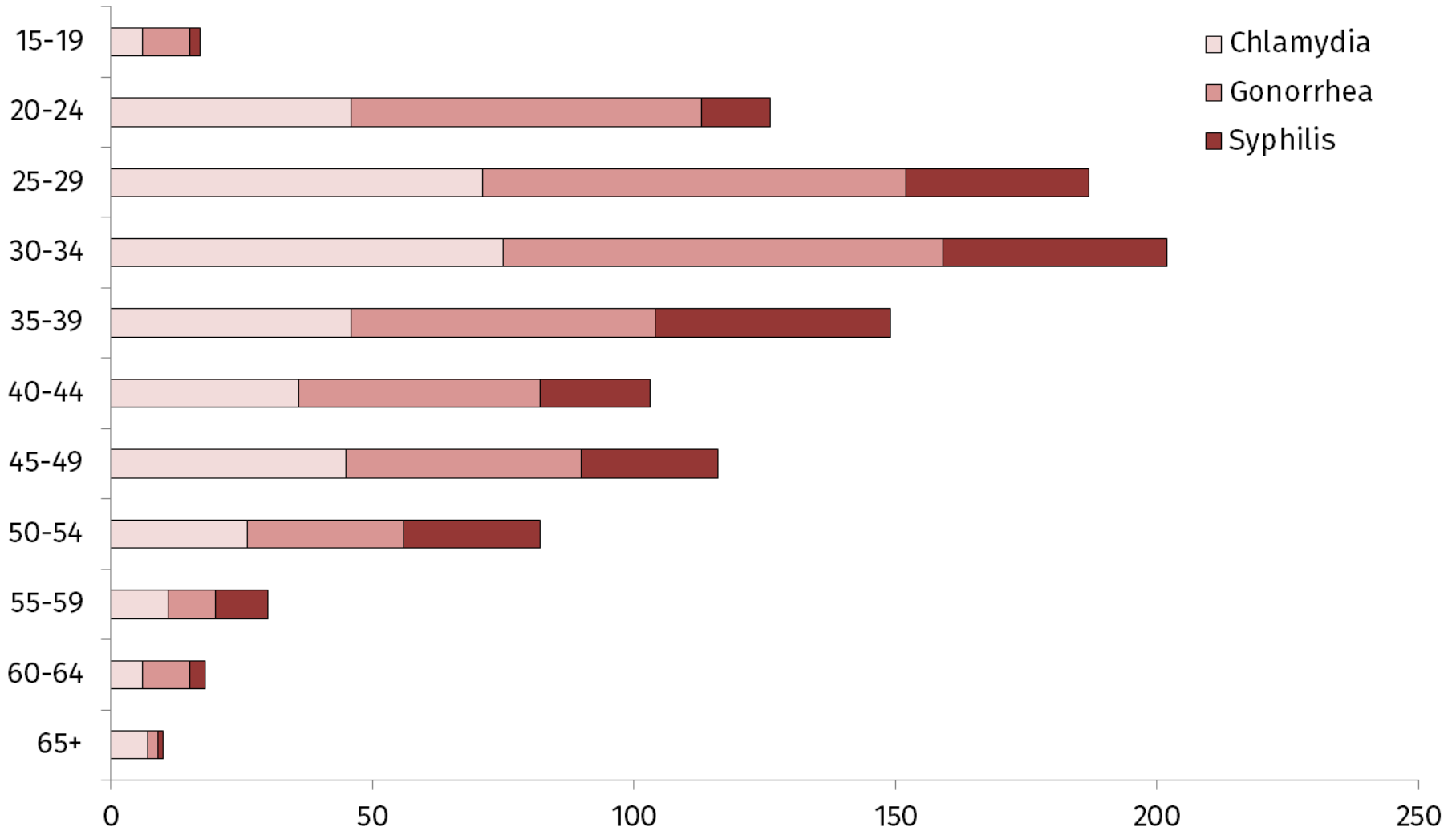


# HIV/STD Co-Infections by Race, Arizona, 2015

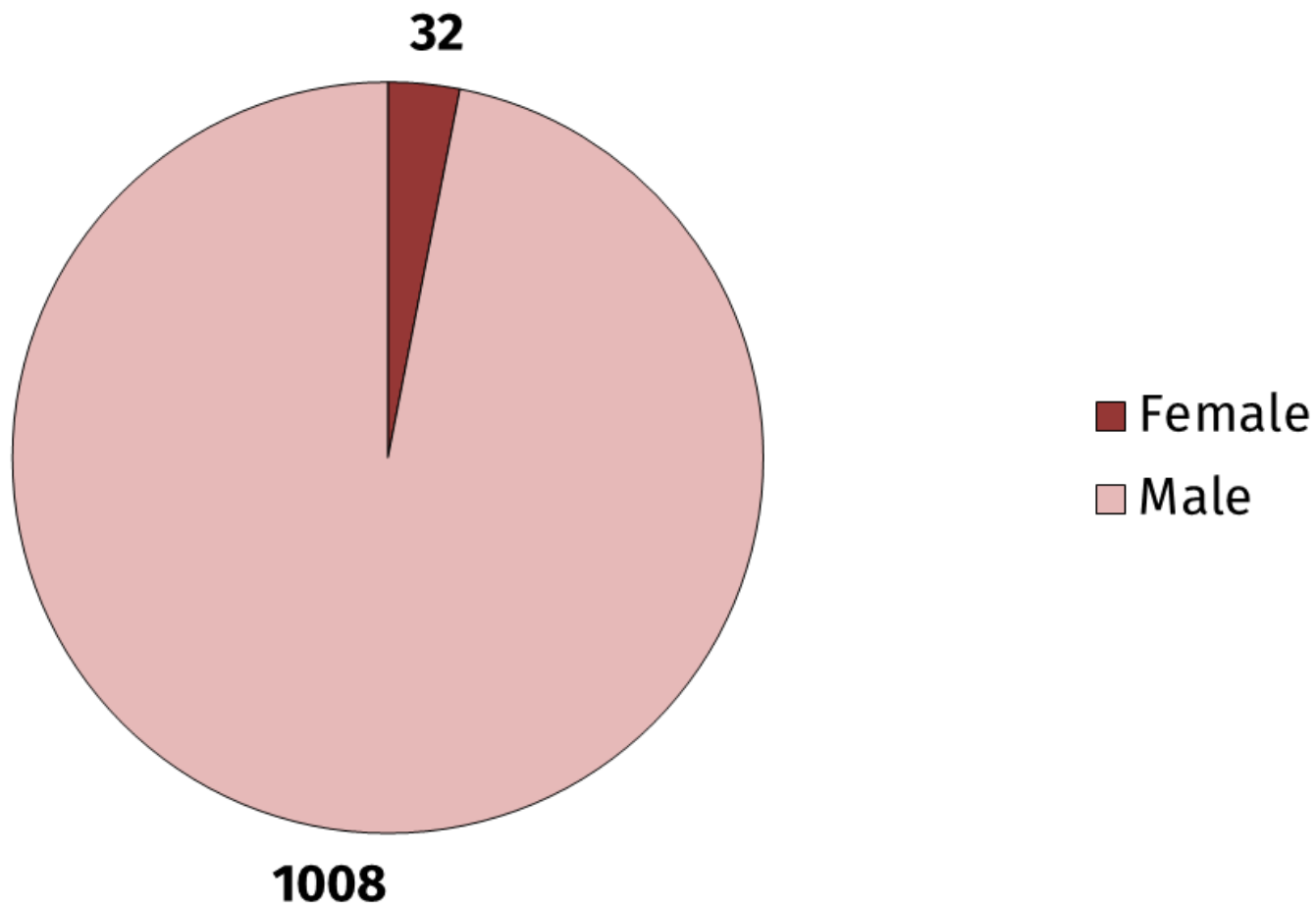
- White Non-Hispanic
- Black/African American Non-Hispanic
- Unknown
- Hispanic
- American Indian/Alaskan Native Non-Hispanic
- Asian Non-Hispanic



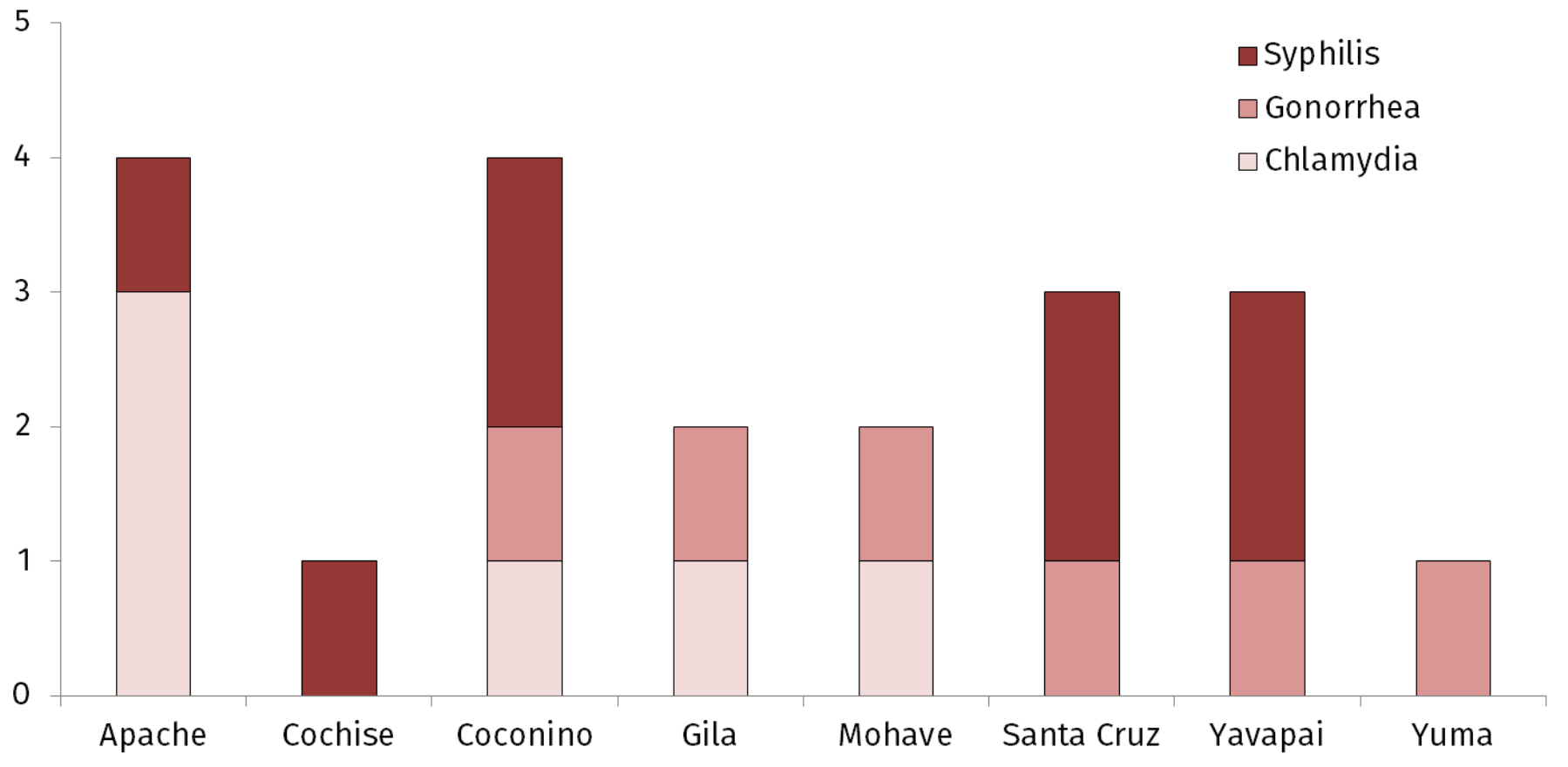
## HIV/STD Co-Infections by Age Group, Arizona, 2015



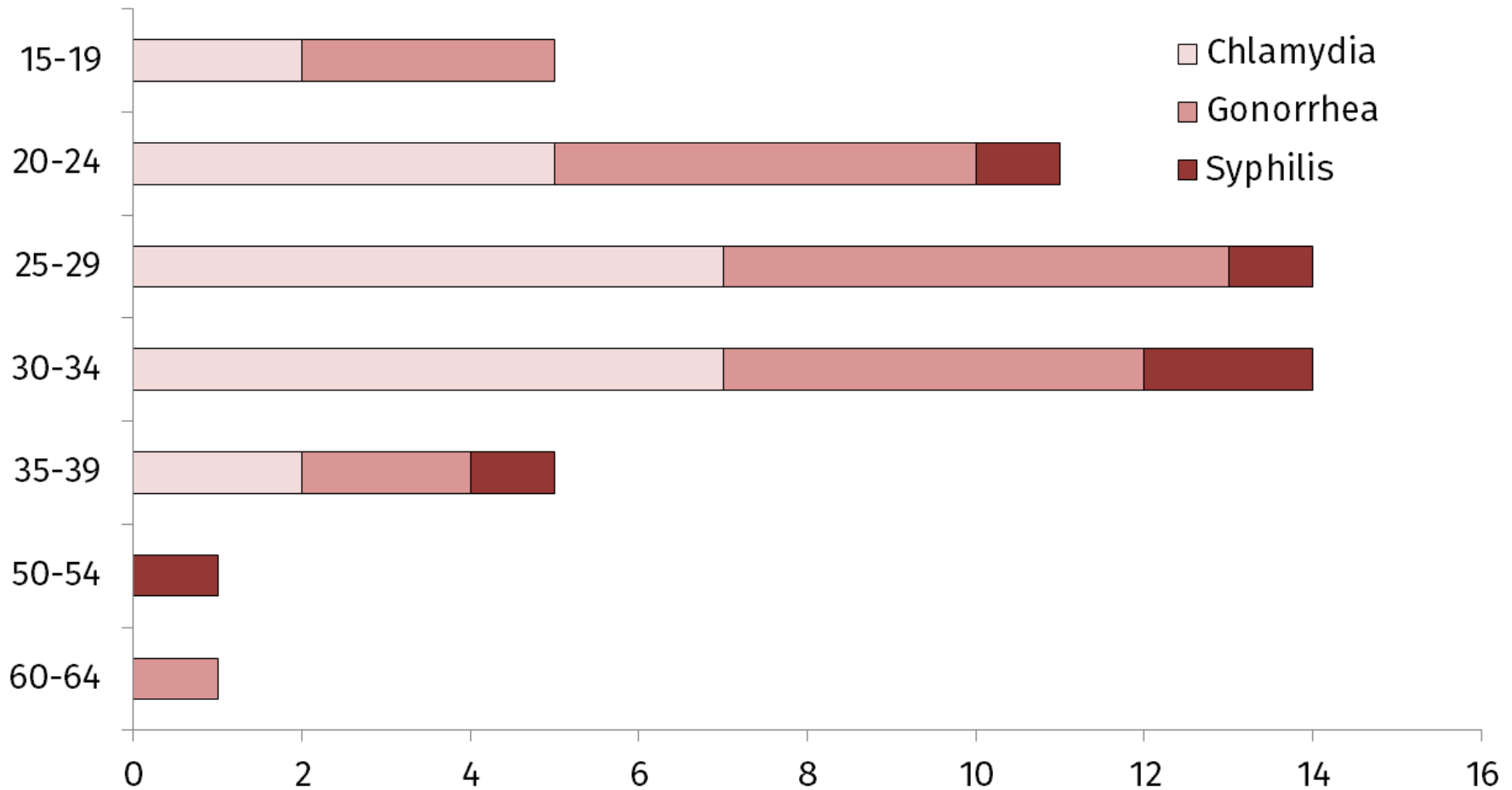
## HIV/STD Co-Infections by Gender, Arizona, 2015



## HIV/STD Co-Infections by County, Not Including Maricopa, Pima, and Pinal, Arizona 2015



## HIV/STD Co-Infections by Age Group in American Indian/Alaskan Natives, Arizona 2015



# The Main Takeaway: Risk for HIV



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# STIs: One gateway to HIV

- Meta-analysis of 31 longitudinal studies demonstrated a 4 fold increased risk in HIV infection with any laboratory documented STI
- 2 to 3-fold increase in HIV shedding among those with genital STIs
- 50% of an HIV-positive military population were diagnosed with any STI prior to HIV diagnosis



# Special Populations: STIs and HIV in MSM

- MSM are at an increased risk for STIs and HIV
- Rate of GC in men increased 10.5% from 2013-2014
- The rate of P&S syphilis in men has increased every year since 2000
  - 2014 rate: 11.7 per 100,000
  - 82.9% of cases occurred among MSM
- Approximately 40,000 HIV cases nationwide in 2014
  - Estimated 30,000 new HIV diagnoses in MSM in US every year





# STIs: One gateway to HIV in MSM

- Prior GC/CT infections in MSM
  - 2 or more rectal infections have been shown to be associated with 8-fold increased risk in HIV
  - Fraction of HIV infections attributable to GC or CT in young MSM is 14.6%
  - 3-fold risk of HIV infection among MSM diagnosed with rectal CT/GC (controlling for sexual behavior)



# PrEP: Opportunities for high-risk patients

- Efficacy of PrEP (TDF/FTC)
  - iPrEx Trial: 92%
  - Partners PrEP: 90%
  - TDF2: 85%
- Recommended as a prevention option:
  - Sexually active adult MSM at substantial risk for HIV
  - Heterosexually active men and women at substantial risk for HIV
  - Adult injection drug users at substantial risk of HIV acquisition



# Data Sources

- PRISM
  - ADHS STD Control Program Database
  - Surveillance and Case Management
- eHARS
  - HIV surveillance database
  - HARS records linked within PRISM



# Patient Sample

- STI diagnosis reported to CDC between 2009-2013
  - Reportable STIs: Chlamydia, Gonorrhea, Syphilis
- Infected cases of STIs and HIV:
  - Diagnosis of an STI between 2009 and 2013
  - Diagnosis of HIV after January 1, 2009\*
- HARS record linked to the patient record in the STD database
- County of diagnosis for both STIs and HIV: Maricopa



# Data Analyses

- Descriptive statistics
  - Basic statistics (frequencies, means, case counts) to better understand the data
- Logistic regression analysis
  - Looking for characteristics that can help “predict” our outcome (HIV diagnosis following an STI diagnosis)



# Results



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# STIs and HIV in Maricopa County, AZ: 2009-2013

- 109,918 cases of CT, GC, and Syphilis
- 2,262 cases of emergent HIV
- 607 cases diagnosed with an STI and HIV
  - 26.8% of emergent HIV cases
  - 44.0% diagnosed with an STI prior to HIV diagnosis



# Demographics in Cases with STIs Prior to HIV Infection

Descriptive statistics for individuals diagnosed with an STI prior to being diagnosed with HIV, Maricopa County, 2009-2013				
	Chlamydia (%)	Gonorrhea (%)	Syphilis (%)	Total (%)
<b>Gender</b>				
Male	30.71	40.82	21.72	<b>93.26</b>
<b>Race</b>				
White	12.73	18.35	7.49	38.58
Black	8.24	8.61	1.87	18.73
AI/AN	1.50	1.12	0.37	3.00
Other	12.36	14.98	12.36	39.70
<b>Ethnicity</b>				
Hispanic	12.36	14.61	11.99	38.95
<b>Age</b>				
≤29	23.60	28.46	12.73	64.79
MSM	30.52	<b>41.37</b>	22.09	<b>93.98</b>
<b>Risks</b>				
Male sexual contact with other male	26.59	<b>37.08</b>	17.60	<b>81.27</b>



# STIs Prior to HIV Infection

- Mean number of STIs prior to HIV infection:
  - 1.04 ( $\pm 0.25$ , range: 1-4)
- STIs prior to HIV diagnosis:
  - 43.6% Gonorrhea
  - 34.3% Chlamydia
  - 22.1% Syphilis
- Mean time to HIV diagnosis:
  - 2.15 years ( $\pm 1.46$ )



# Predictors of HIV Diagnosis

- Controlling for age, race, and gender
- Odds of HIV diagnosis following STI diagnosis:
  - In non-Hispanics diagnosed with Chlamydia is 4.32 (95% CI: 2.1-8.9) times the odds in non-Hispanics diagnosed with P&S Syphilis
  - In non-Hispanics diagnosed with Gonorrhea is 6.34 (95% CI: 3.1-12.9) times the odds in non-Hispanics diagnosed with P&S Syphilis



# Findings and Recommendations

- Who could benefit from targeted intervention?
  - MSM
  - Chlamydia/gonorrhea positive/repeat diagnosis



# Limitations

- Underestimate of cases diagnosed with STIs and HIV in PRISM
  - Not all HARS records have been linked
  - The database used prior to PRISM was a surveillance only tool
- Evaluating a static time period and assuming a static population
  - HIV cases could have been diagnosed with an STI prior to 2009
  - STI cases could have moved out of the State and been diagnosed with HIV



# What's Next?

- In depth analysis of STIs commonly diagnosed prior to and after HIV diagnosis
  - According to this study:
    - CT/GC more common before
    - P&S Syphilis more common after
- PRISM and Partner Services
  - As of July 2015, PRISM is being used for all HIV Partner Services data entry in Maricopa County
  - Evaluation of this data in 2-3 years?



*QUESTIONS?*

# STI Prevention is HIV Prevention



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# References

Full list of sources available upon request



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# *THANK YOU!*

Ryan Kreisberg | Senior Epidemiologist  
[ryan.kreisberg@azdhs.gov](mailto:ryan.kreisberg@azdhs.gov) | 602-364-4761

azhealth.gov

@azdhs

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