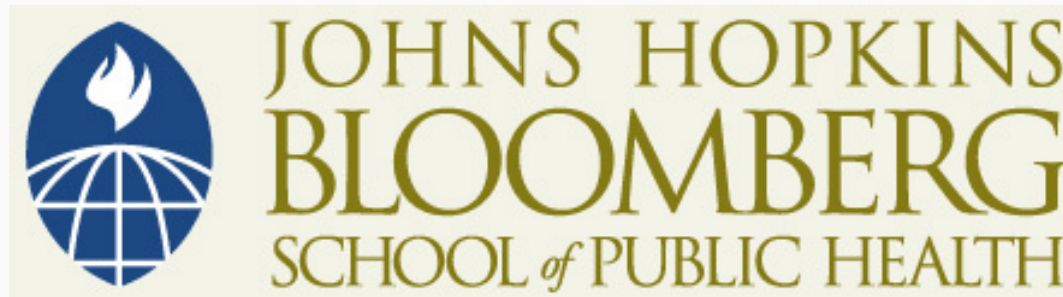


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Adolescents and STIs

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Professor of Pediatrics
Johns Hopkins School of Medicine

Outline

- Epidemiology of bacterial STIs and HIV among adolescents
- Adolescent development, race/ethnicity, and STIs
- Adolescent socio-sexual networks and STIs
- Environment and adolescent STIs
- Changing the environment

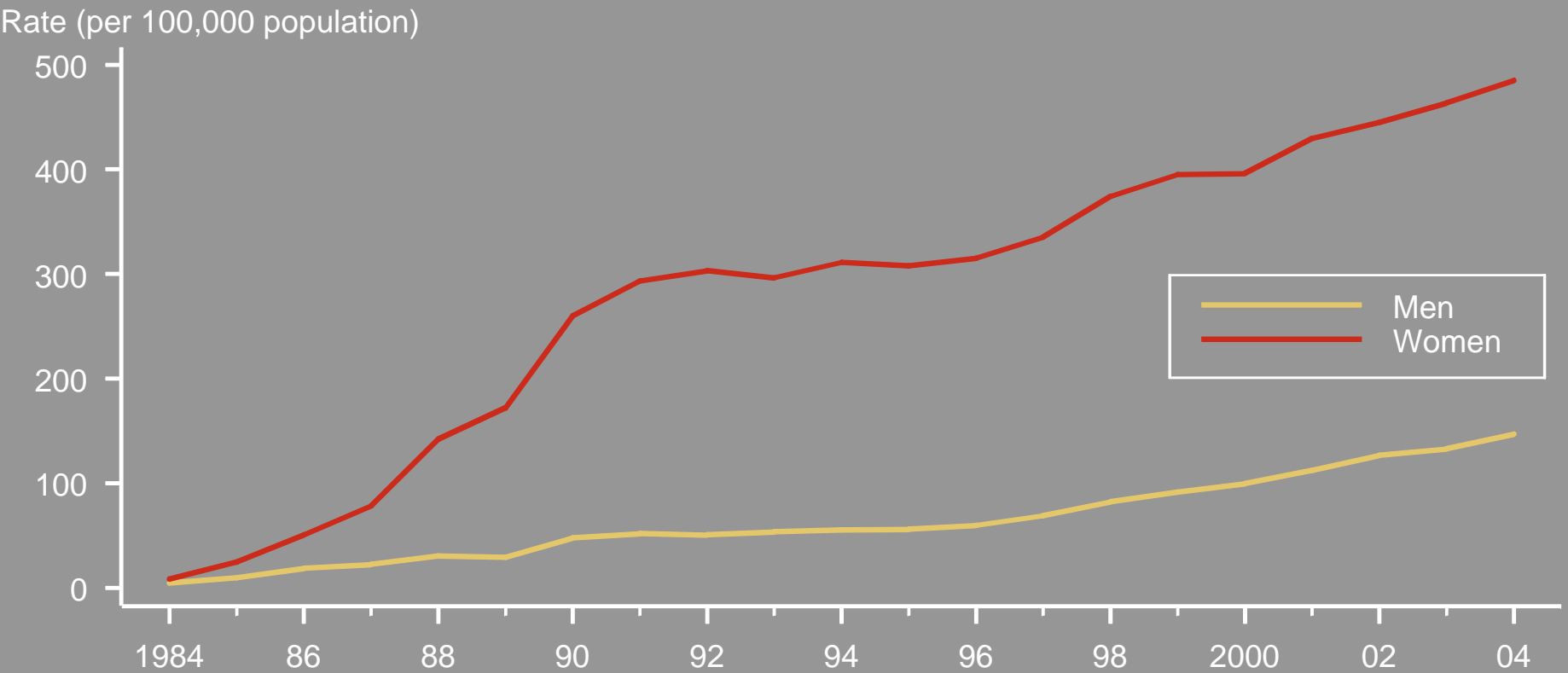


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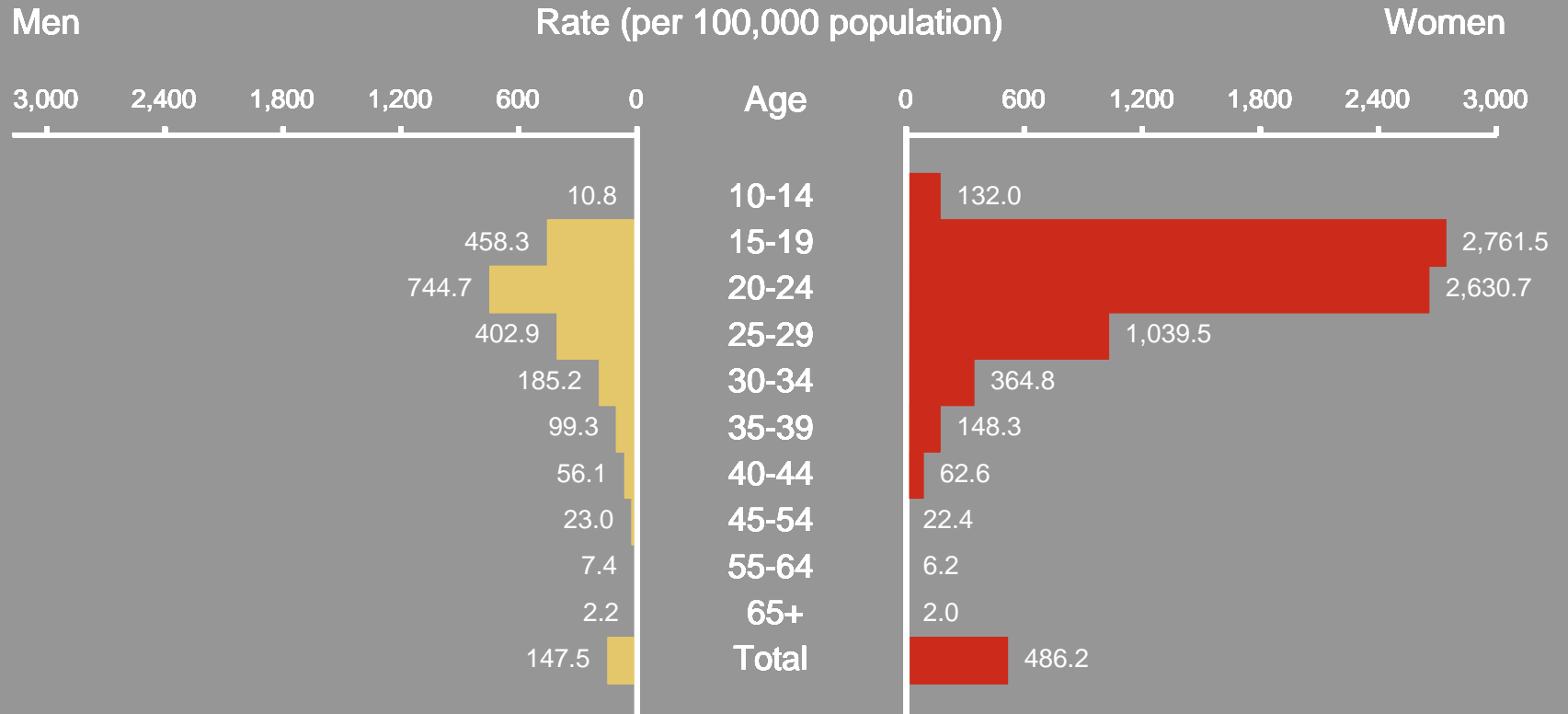
Section A

Epidemiology

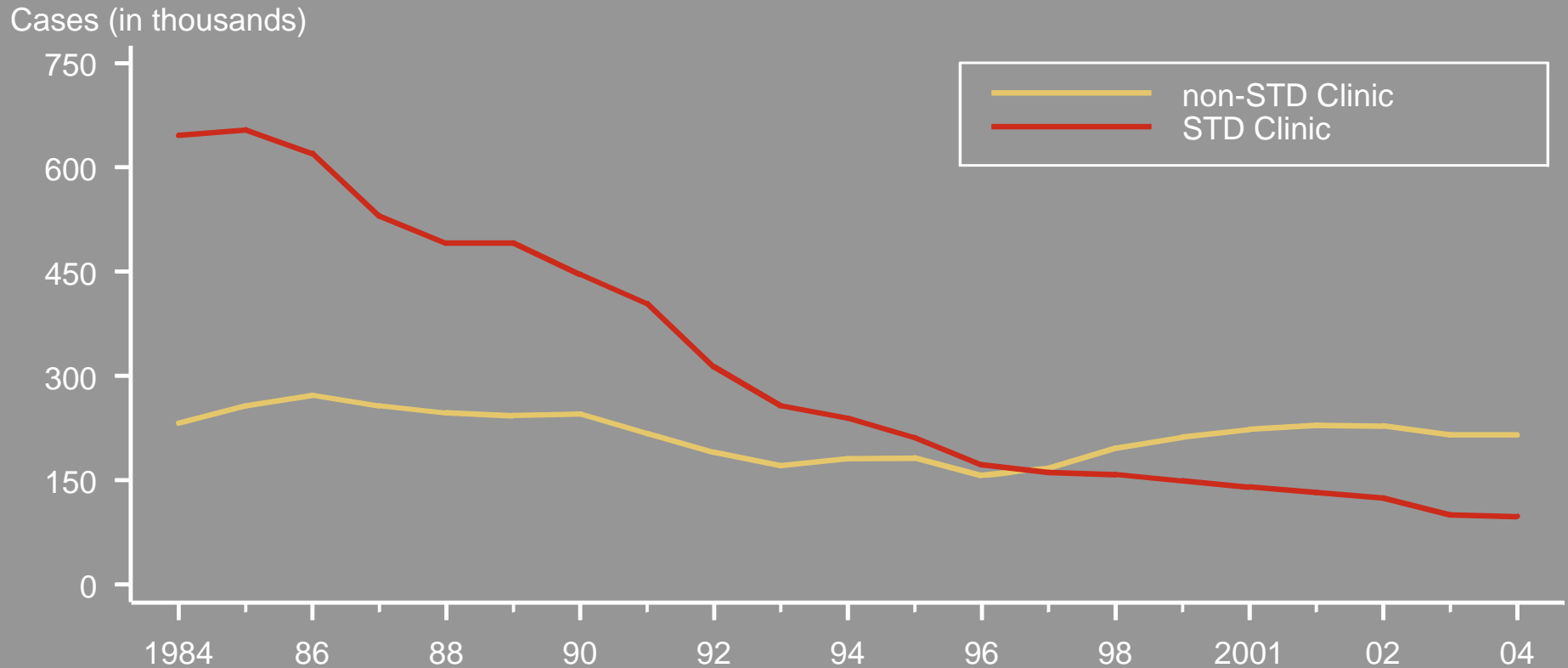
Chlamydia—Rates by Sex: United States, 1984-2004



Chlamydia—Age- and Sex-Specific Rates: United States, 2004

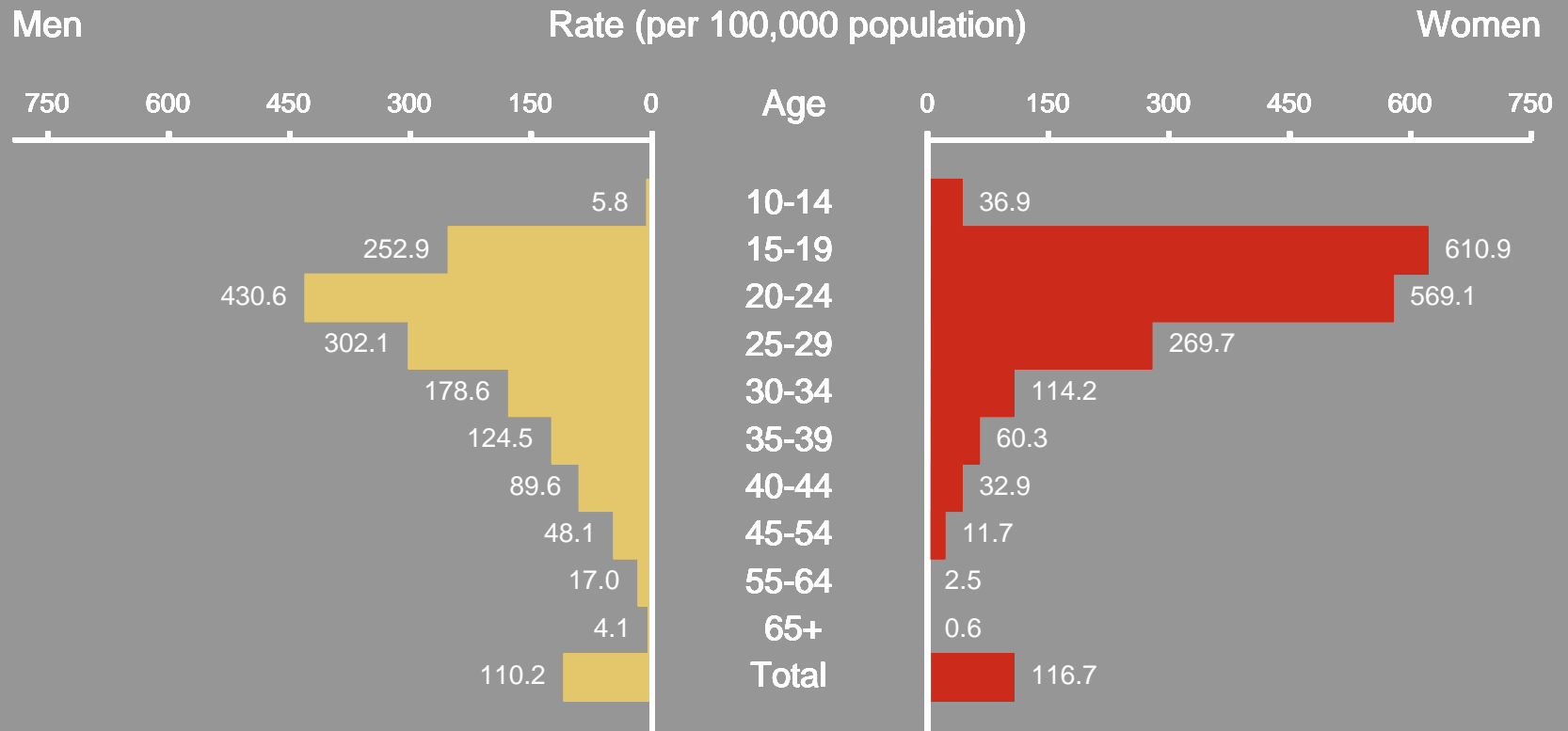


Gonorrhea—Reported Cases by Reporting Source: U.S, 1984-2004

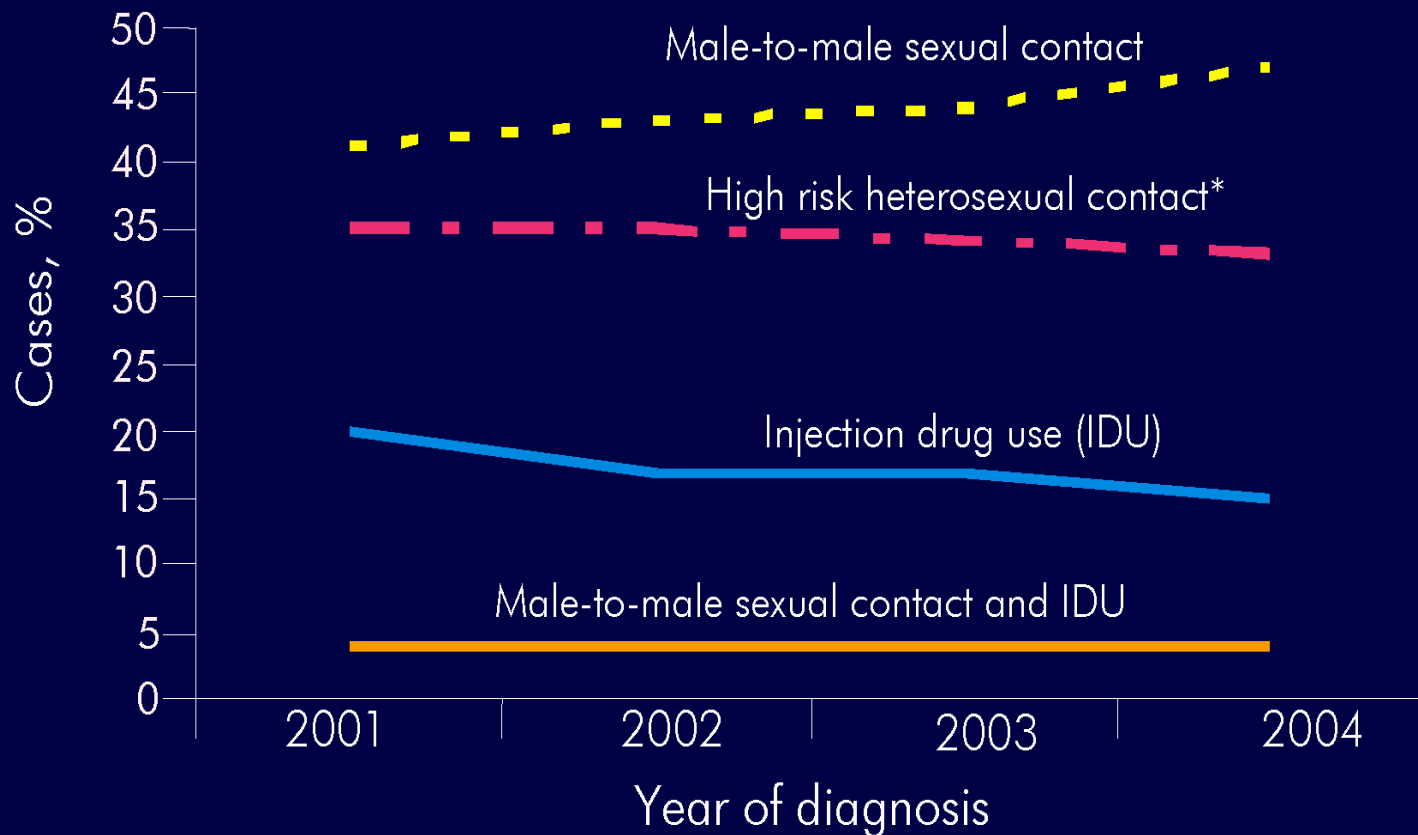


Note: Prior to 1996, the STD clinic source of this report corresponded to the public (clinic) source of the report, and the non-STD clinic category corresponded to a private source of the report. After 1996, as states began reporting morbidity data electronically, the specific source of a report (i.e., STD clinic) began to be reported from an increasing number of states.

Gonorrhea—Age- and Sex-Specific Rates: United States, 2004



Proportion of HIV/AIDS Cases among Adults and Adolescents, by Transmission Category: 2001-2004 (35 Areas)

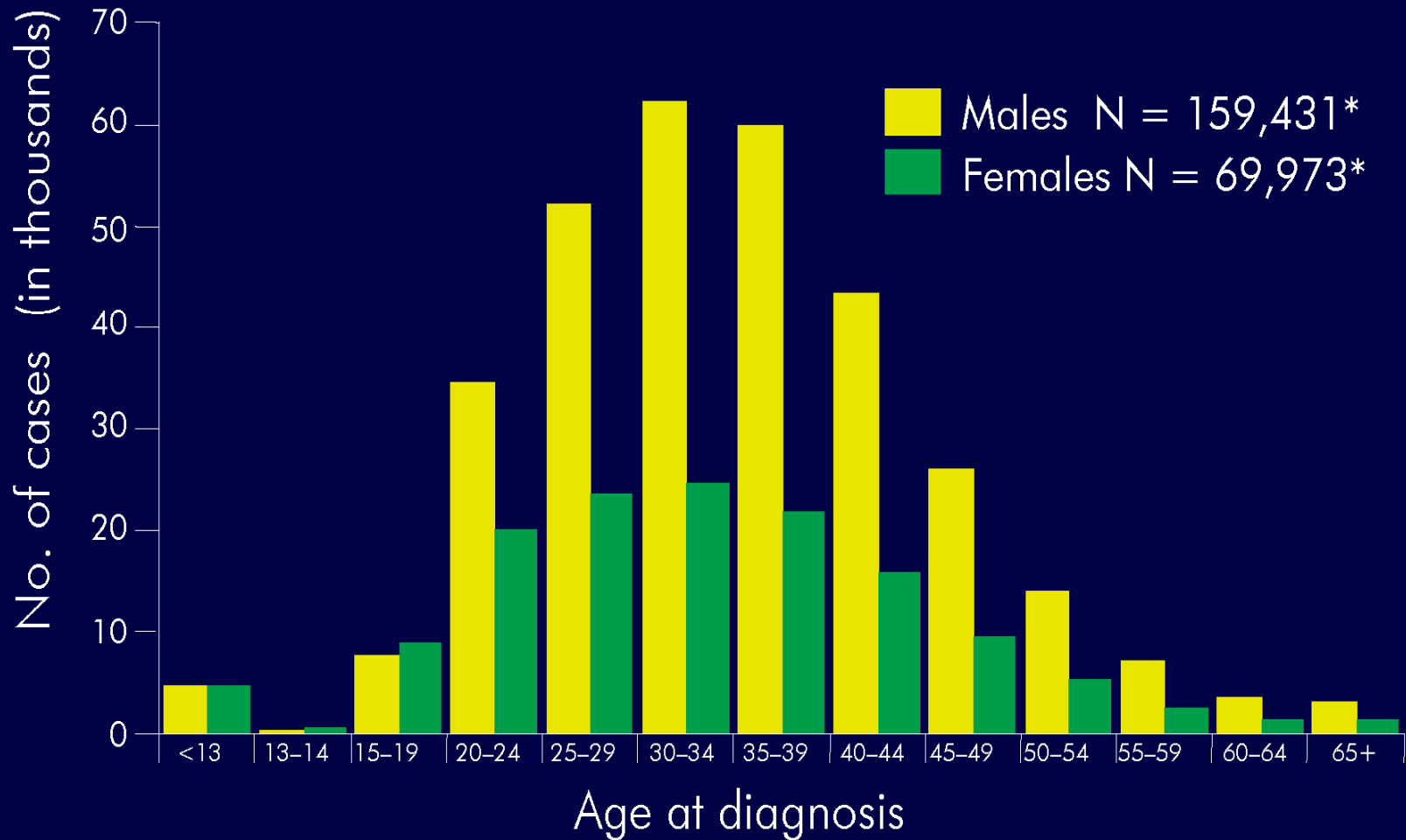


Note. Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis. Data from 35 areas with confidential name-based HIV infection reporting since at least 2000. Data have been adjusted for reporting delays and cases without risk factor information were proportionally redistributed.

* Heterosexual contact with a person known to have or at high risk for HIV infection.



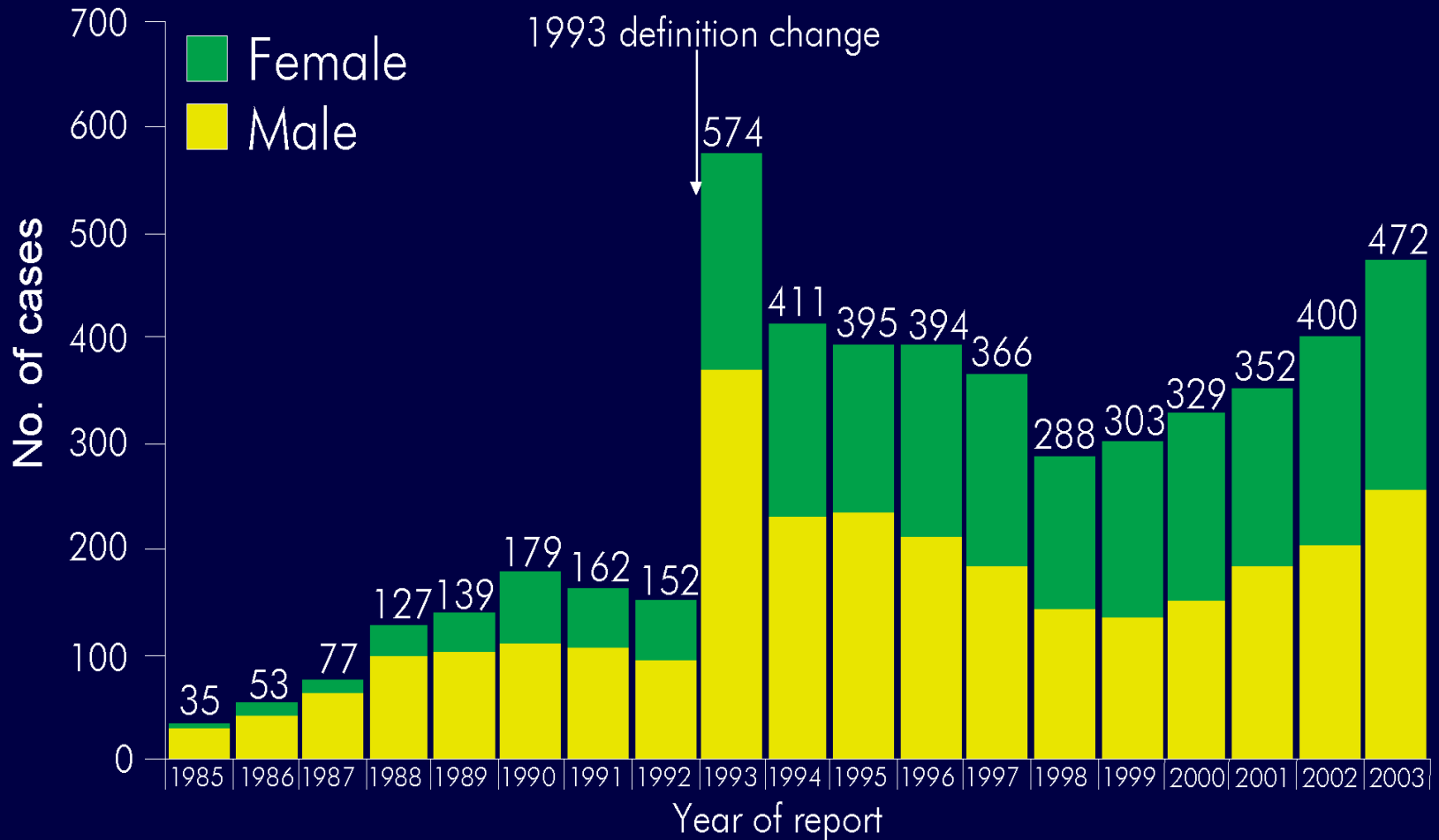
Reported Cases of HIV Infection (Not Aids) by Age and Sex, Cumulative through 2004 (42 Areas)



Note. Data from 42 areas with confidential name-based HIV infection reporting as of December 2004.
* Excludes 7 persons of unknown sex.



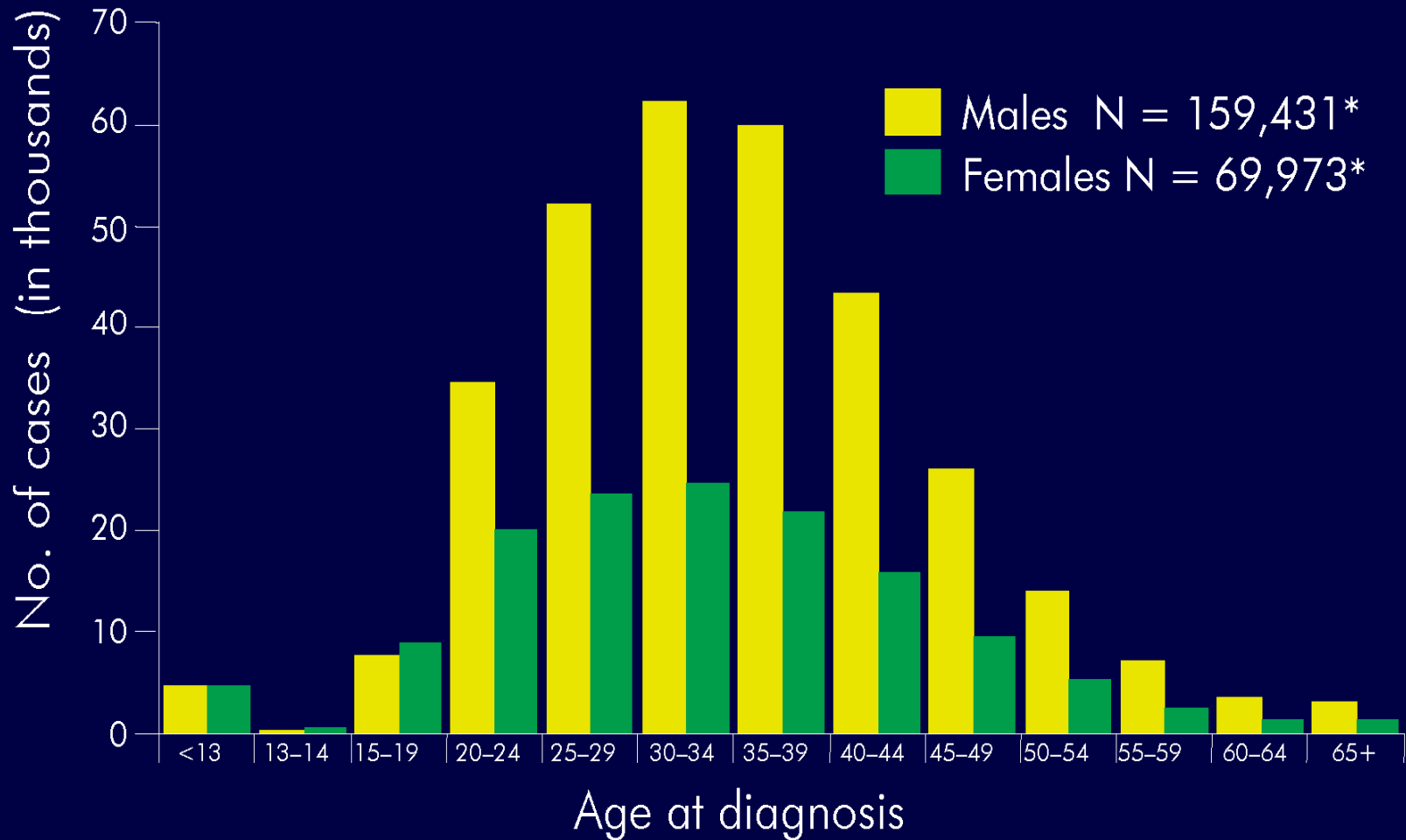
Reported AIDS Cases among Adolescents 13 to 19 Years of Age by Sex: U.S., 1985-2003 (N = 5,208)



Note. Data based on person's age at diagnosis.



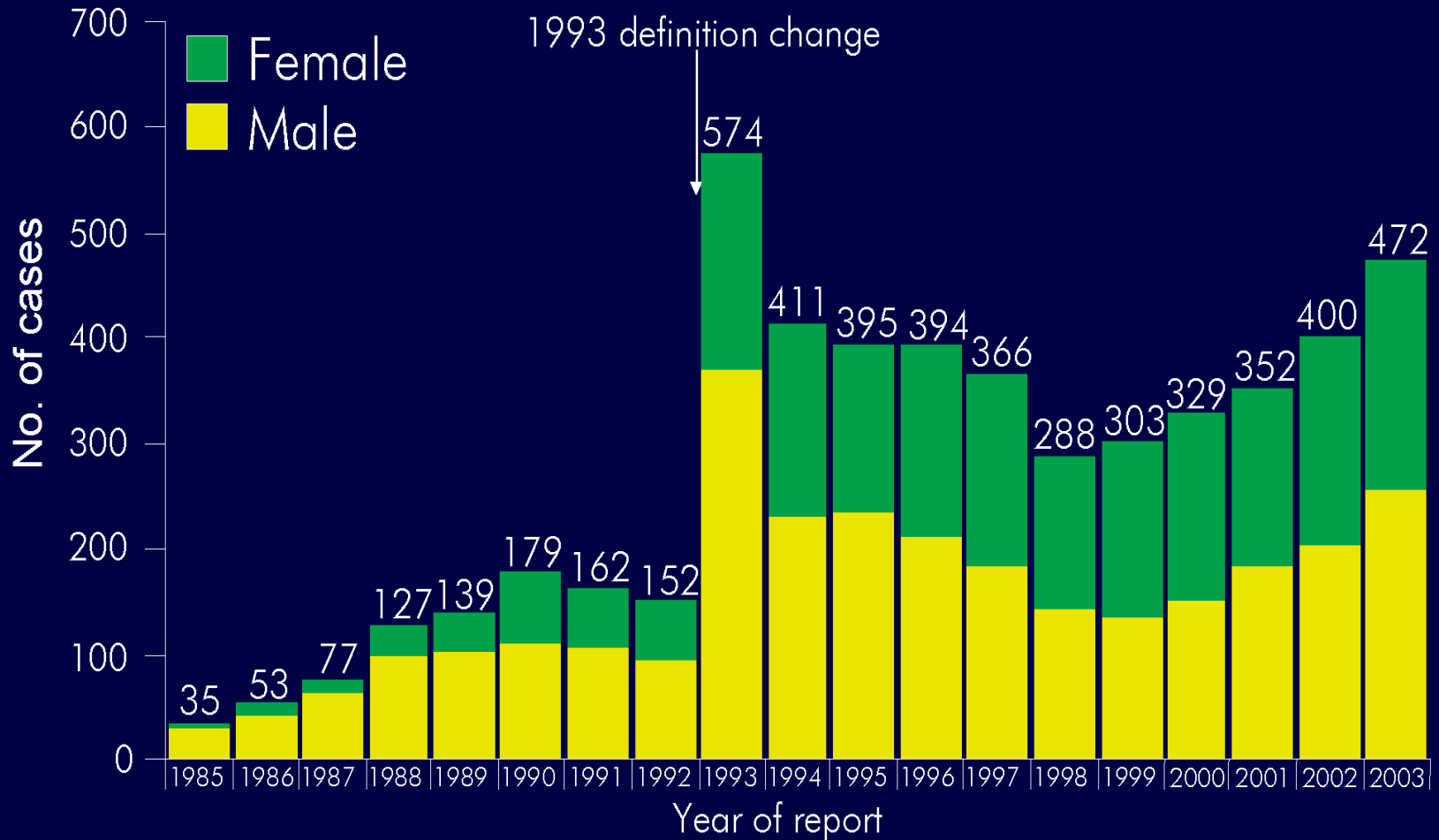
Reported Cases of HIV Infection (Not Aids) by Age and Sex, Cumulative through 2004 (42 Areas)



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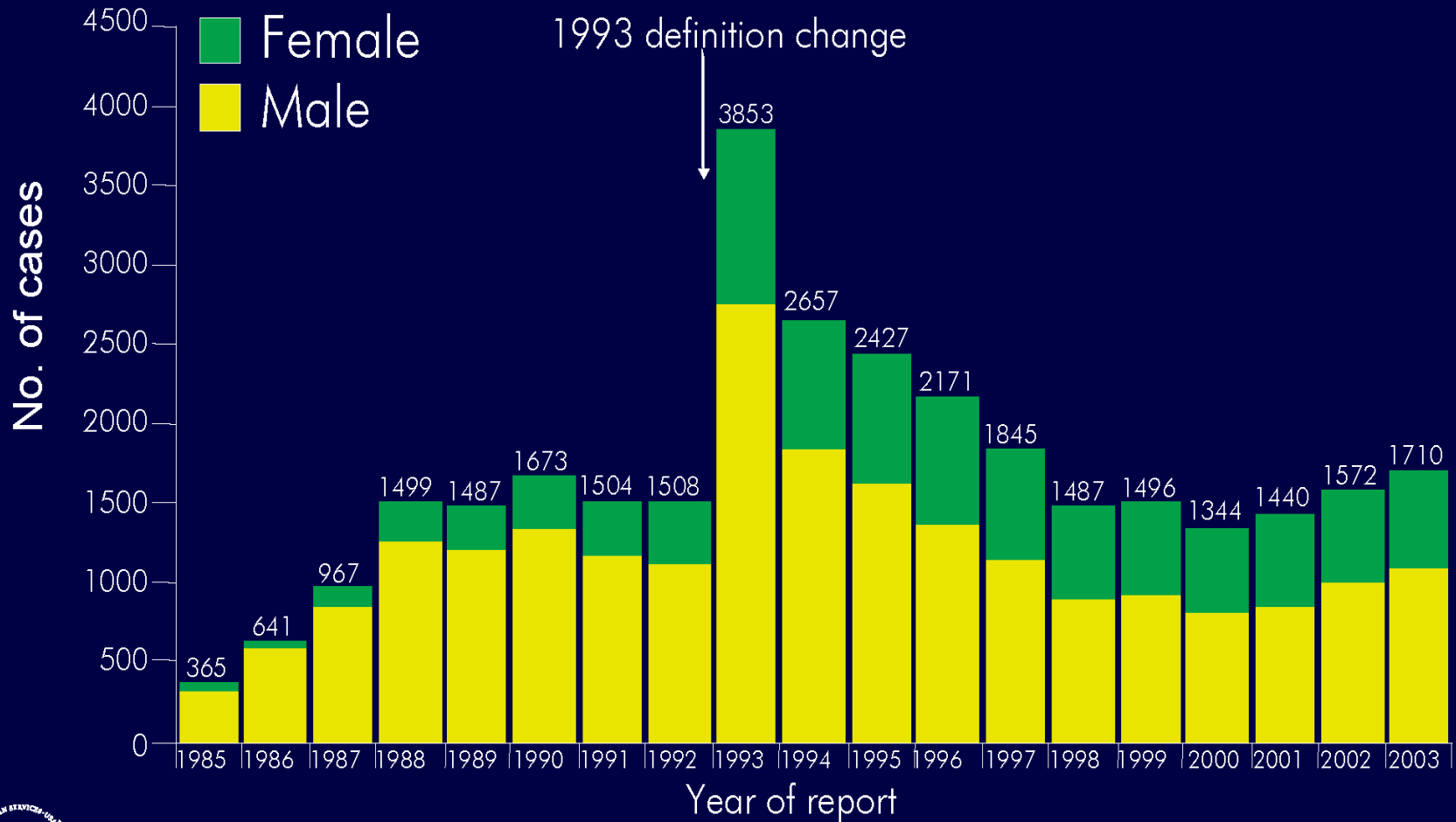
Reported AIDS Cases among Adolescents 13 to 19 Years of Age by Sex: U.S., 1985-2003 (N = 5,208)



Note. Data based on person's age at diagnosis.



Reported AIDS Cases among Young Adults 20 to 24 Years of Age, by Sex: U.S., 1985-2003 (N = 31,646)



Note. Data based on person's age at diagnosis.





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Section B

Adolescent Development

Adolescence

- Period of psychological growth when emancipation and individuation occur closely tied to biologic changes and development of abstract thinking

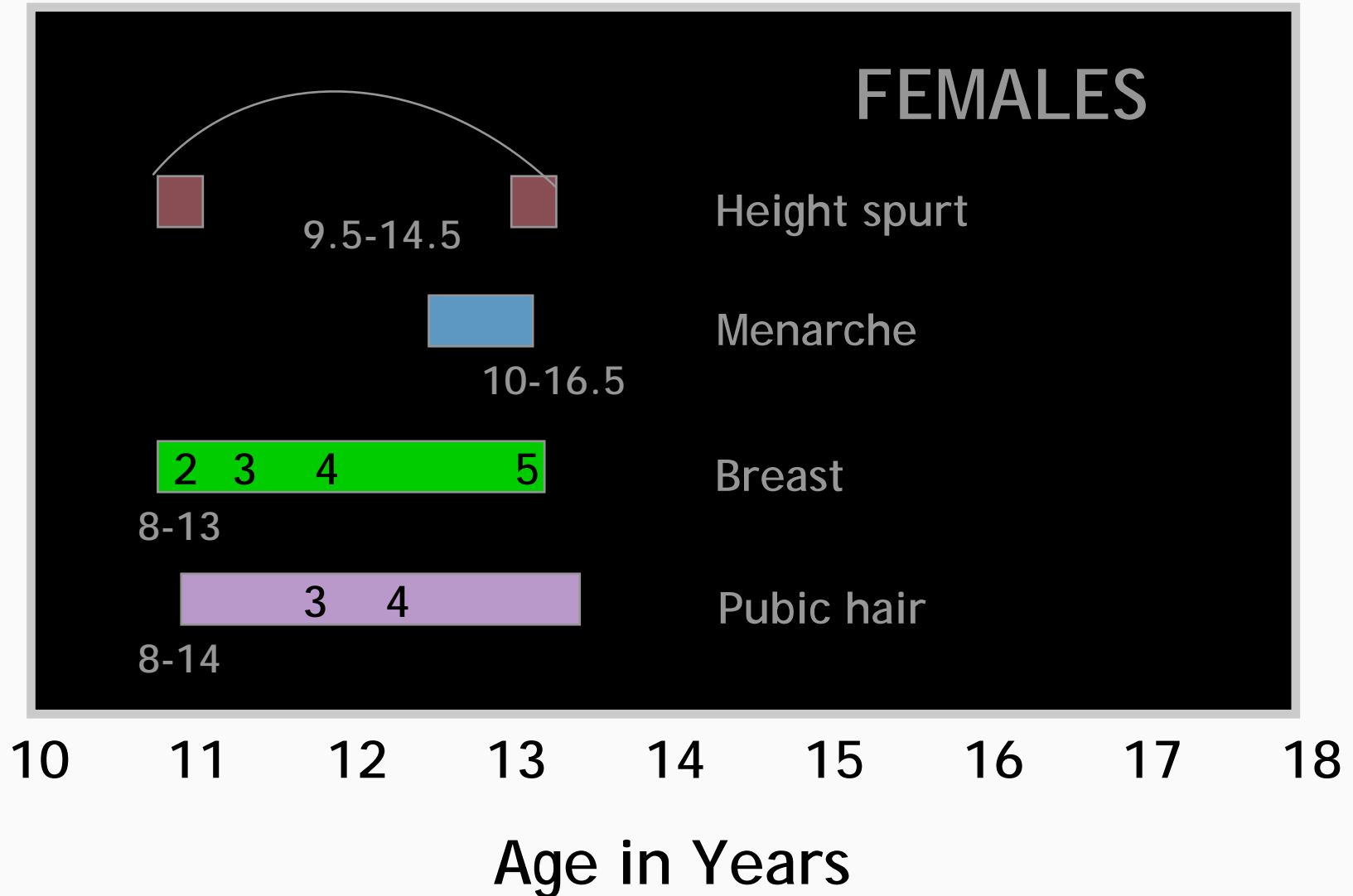
Puberty

- Biologic process resulting in physical transformation from child to reproductively mature adult

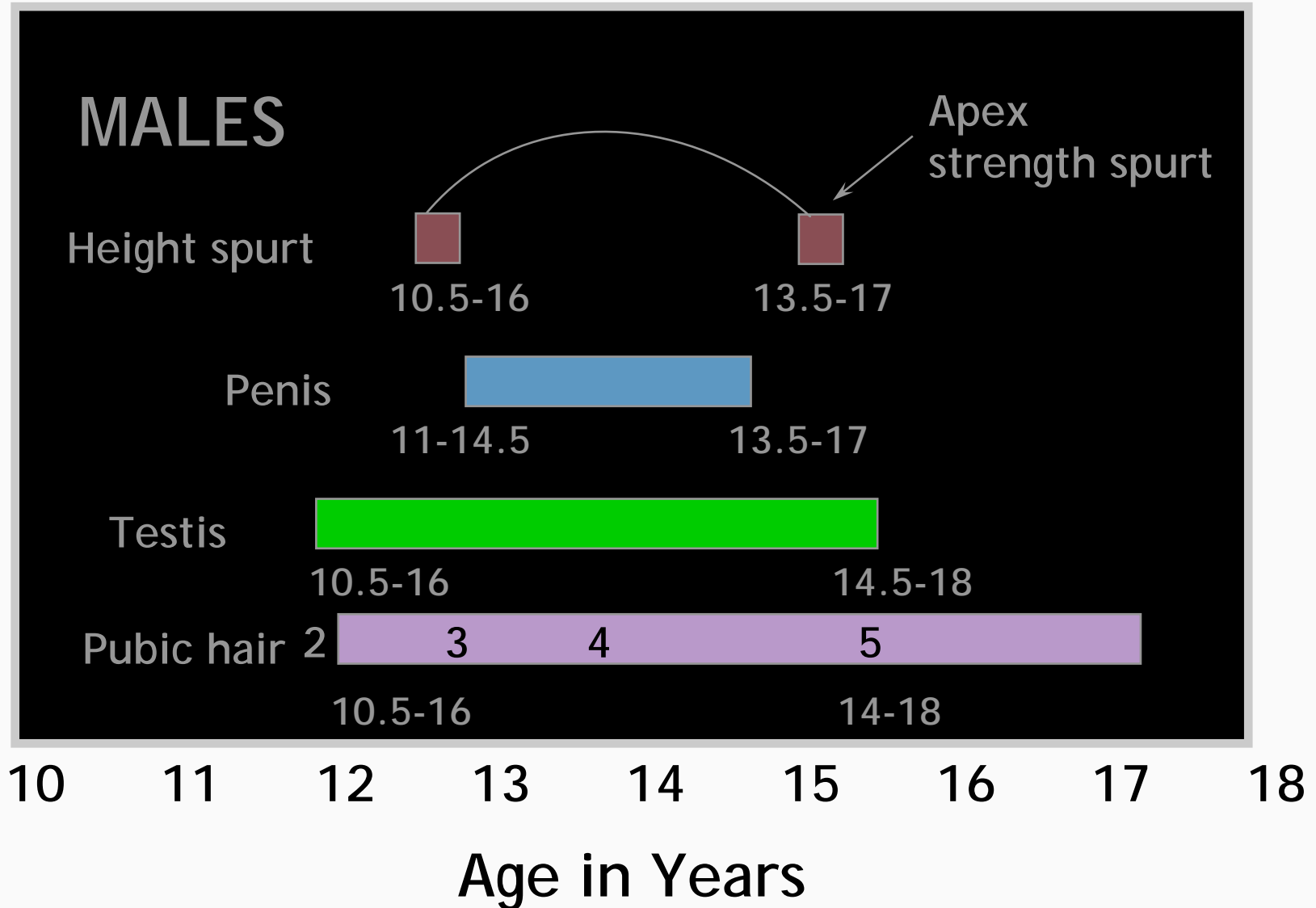
Features of Puberty

- Hormonal changes
- Physical changes
- Variable timing and tempo
- Predictable sequence

Second Degree Sex Development: Differential Maturation



Second Degree Sex Development: Differential Maturation



Early Adolescence (11-14-Years-Old)

- Beginning of individuation from family
- Same sex group activities
- Beginning of increase in sex drive
- Onset of risk behaviors
- Concrete/early operational thinking

Middle Adolescence (14-17-Years Old)

- Conflicts with parents (autonomy)
- Peer influence greatest
- Onset of sexual behavior
- Continue risk behaviors
- Formal operational thinking

Late Adolescence (17-21-Years-Old)

- Rapprochement with parents
- Less influenced by peers
- Intimacy in relationships
- Career and educational goals “clear”
- Changing risk behaviors
- Formal operational thinking

Susceptibility to STIs during Adolescence

- Biological
- Behavioral
- Social factors

Biological Factors

- Less immunity
 - Fewer prior infections
 - Anovulatory cycles associated with menarche
- Cervical ectopy

Sexual Behaviors of High School Students in 2003, YRBS

Sex Ever		Sex Last 3 Months		> 4 Lifetime SP	
Male	Female	Male	Female	Male	Female
71%	57%	53%	43%	41%	15%

Condom and Contraceptive Use of High School Students in 2003, YRBS

Condom Last Sex		Pill Last Sex	
Male	Female	Male	Female
76%	64%	13%	21%

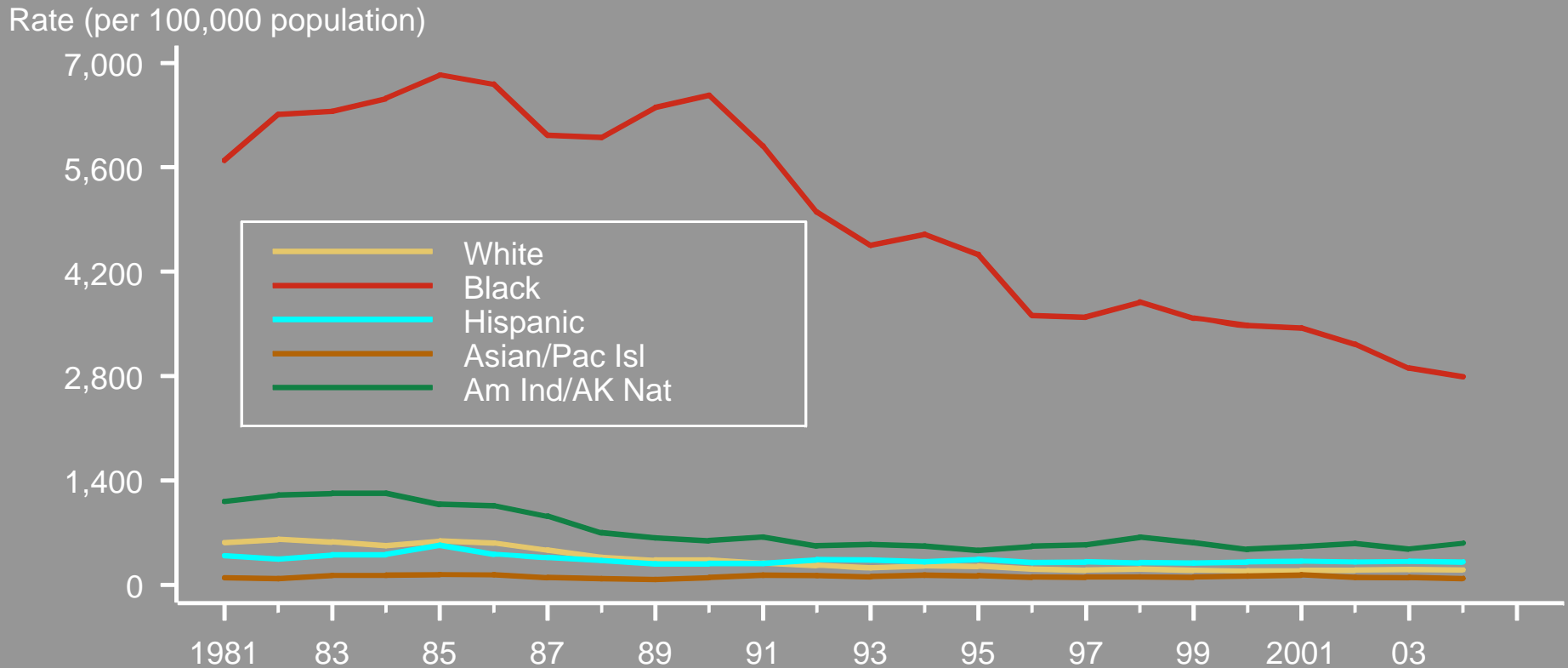


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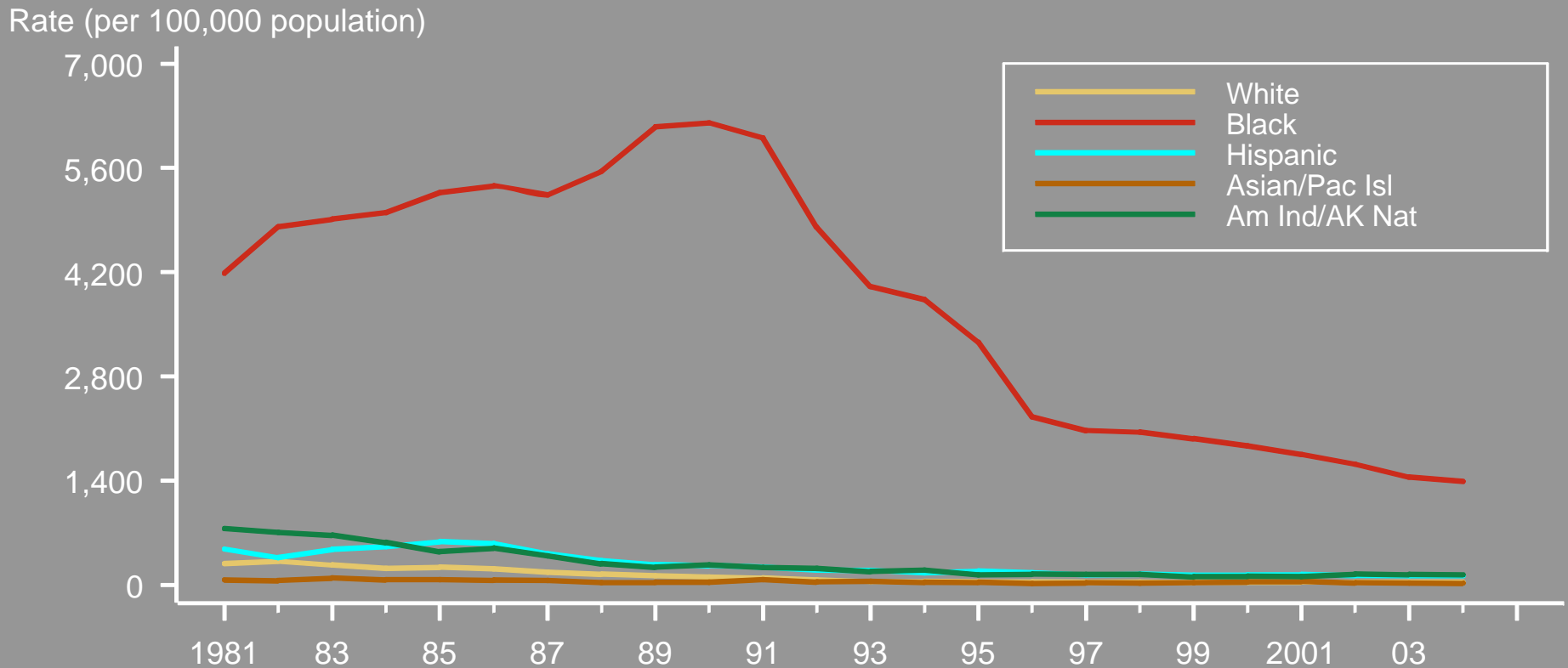
Section C

Racial/Ethnic Differences in STIs

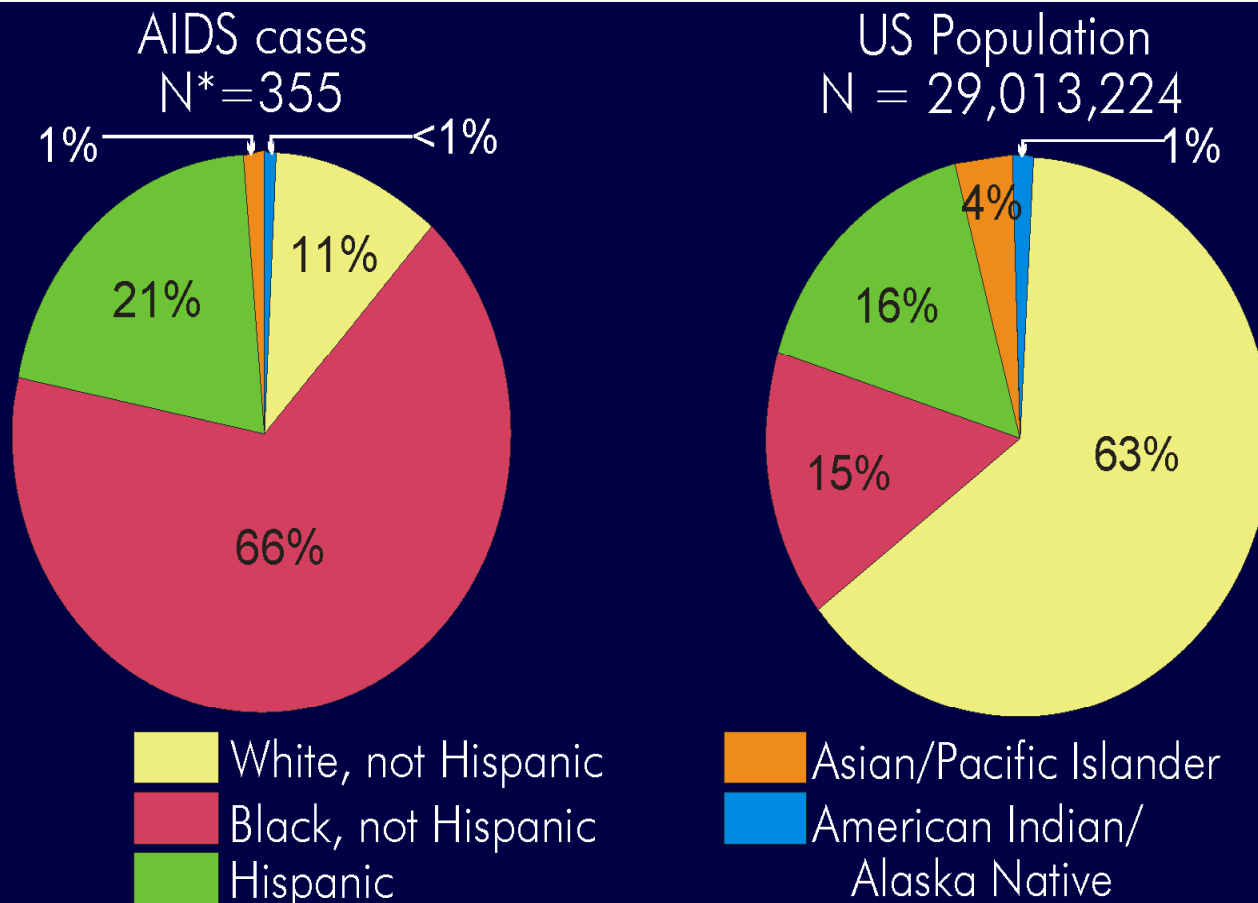
Gonorrhea—Rates among 15- to 19-Year-Old Females by Race and Ethnicity: United States, 1981-2004



Gonorrhea—Rates among 15- to 19-Year-Old Males by Race and Ethnicity: United States, 1981-2004



Proportion of AIDS Cases and Population among Adolescents 13 to 19-Years-of-Age, by Race/Ethnicity Reported in 2003



Note. Data based on person's age at AIDS diagnosis. Excludes persons from US dependencies, possessions, and associated nations.

* Includes 1 person of unknown race or multiple races.



- To determine whether racial/ethnic differences in SES and personal behaviors explain differences in STD rates

Methods

- 1992 Youth Risk Behavior Survey supplement to the National Health Interview Survey (YRBS-NHIS)
- Representative sample of households in the U.S. with at least one adolescent
- 5,189 sexually active adolescents 14-21-years-old
- Included in-school and out-of-school youth

Measures

- Sociodemographic and socioeconomic factors—age, gender, race/ethnicity, school status, region, income, and parental education
- Sexual behaviors—age at sexual debut, number of partners in a lifetime and in the last three months, condom use in the last sexual experience, and alcohol/drug use at last sexual encounter
- Self-reported history on an STD

Analysis

- Multivariate logistic regression of self-reported STDs
- SUDAAN for standard error estimates
- All estimates were based on weighted data

Relative Risks for STIs by Race/Ethnicity (95%CI)

White	1.32 (0.61, 2.85)
African-American	3.16 (1.44, 6.91)*
Hispanic	0.99 (0.40, 2.25)
Other (reference)	1.00

*p<0.001

Relative Risks for STIs by Race/Ethnicity, Adjusted for SES and Sexual Behavior (95%CI)

White	1.11 (0.49, 1.69)
African-American	3.66 (1.55, 8.67)*
Hispanic	1.12 (0.46, 2.72)
Other (reference)	1.00

*p<0.001

Study Objectives

- To compare the number of reported cases of chlamydia and gonorrhea for black and white non-Hispanic adolescents
- To determine the effects of social status on the variation in the rates of chlamydia and gonorrhea for black and white non-Hispanic adolescents

Overview

- Secondary analysis of San Francisco's STD morbidity data
- Compared race and social status-specific rates of GC and CT
- Used 1990 census data to develop indicators of social status
- Analysis at census block-group level

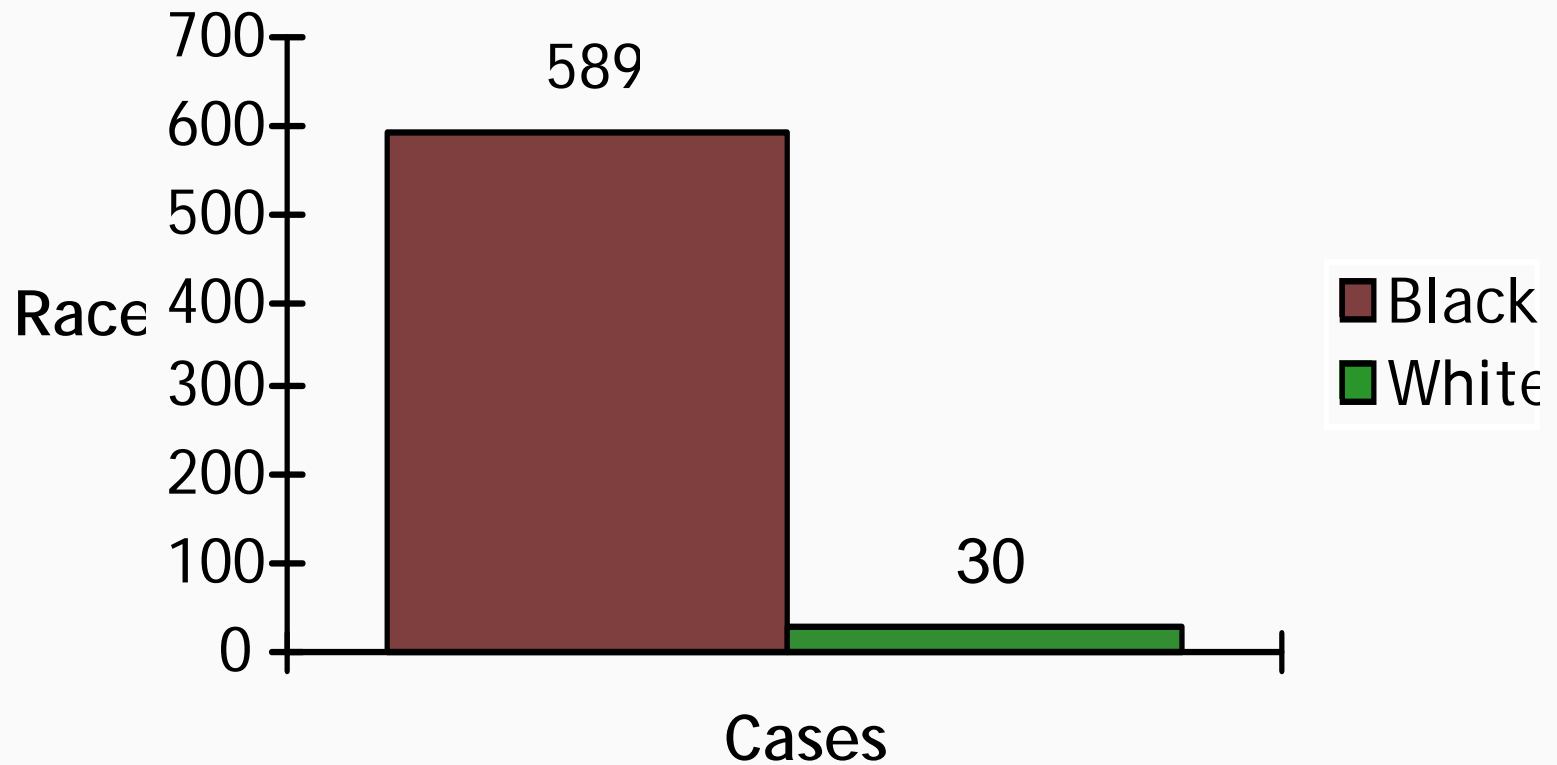
Social Class Strata

- Working Class/Poverty (WCC/POV)
- Working Class/Non-Poverty (WCC/NPOV)
- Professional Class/Poverty (PROF/POV)
- Professional Class/Non-Poverty (PROF/NPOV)

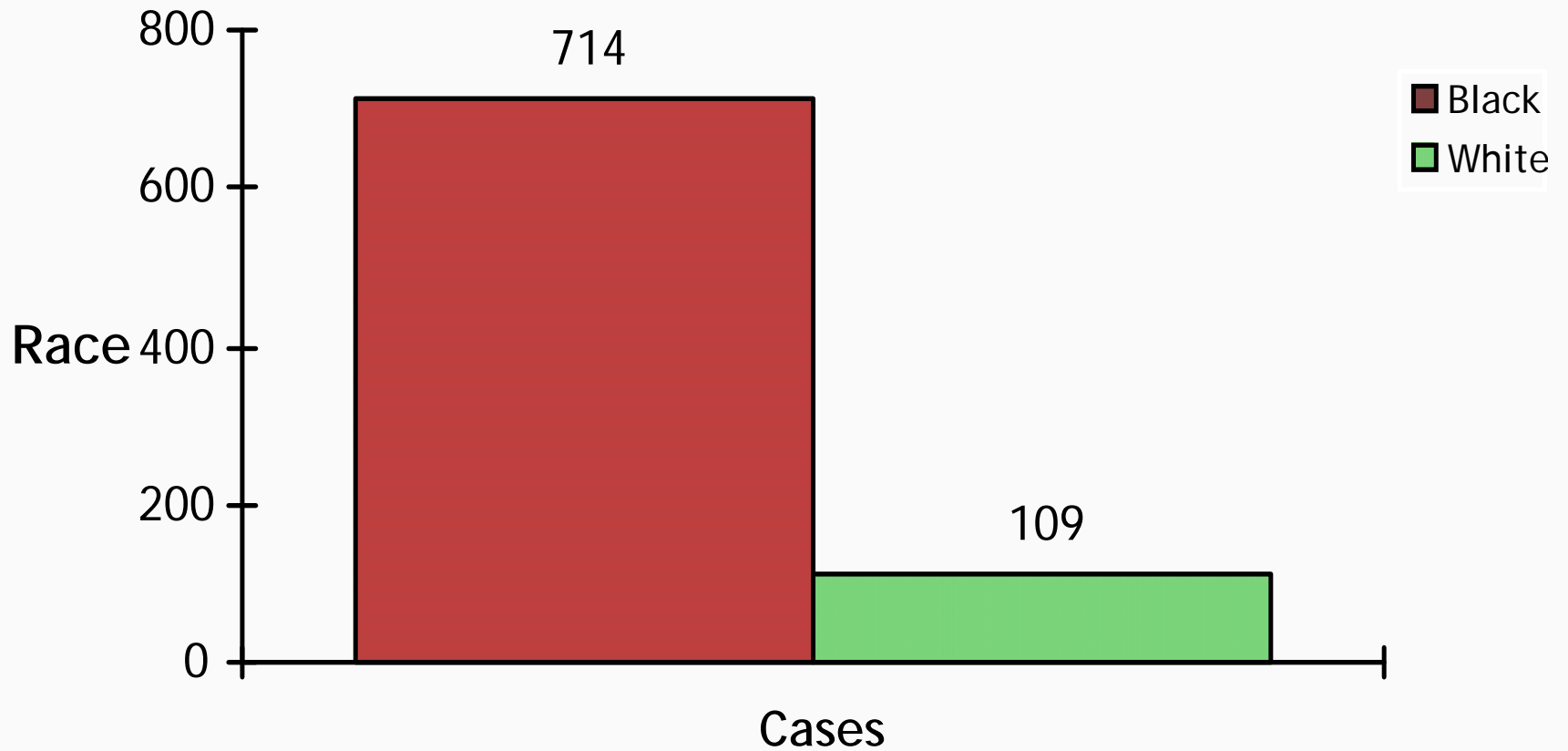
Race and Social Status-Specific Rates

- Stratified race-specific rates for each block-group into one of the four different block-group level social status strata
- Aggregated race-specific rates for block-groups of similar social status

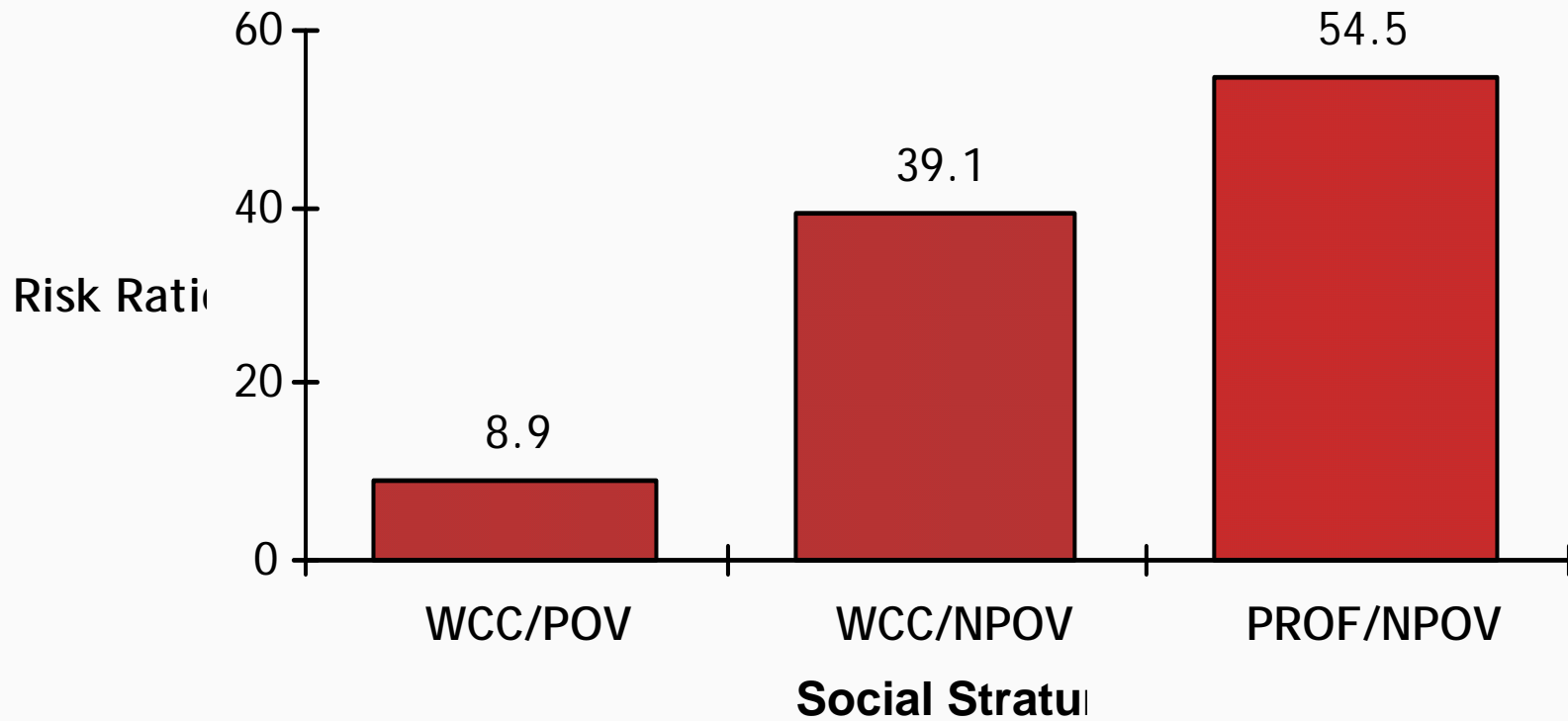
Reported Cases of GC from 1990-1992 by Race



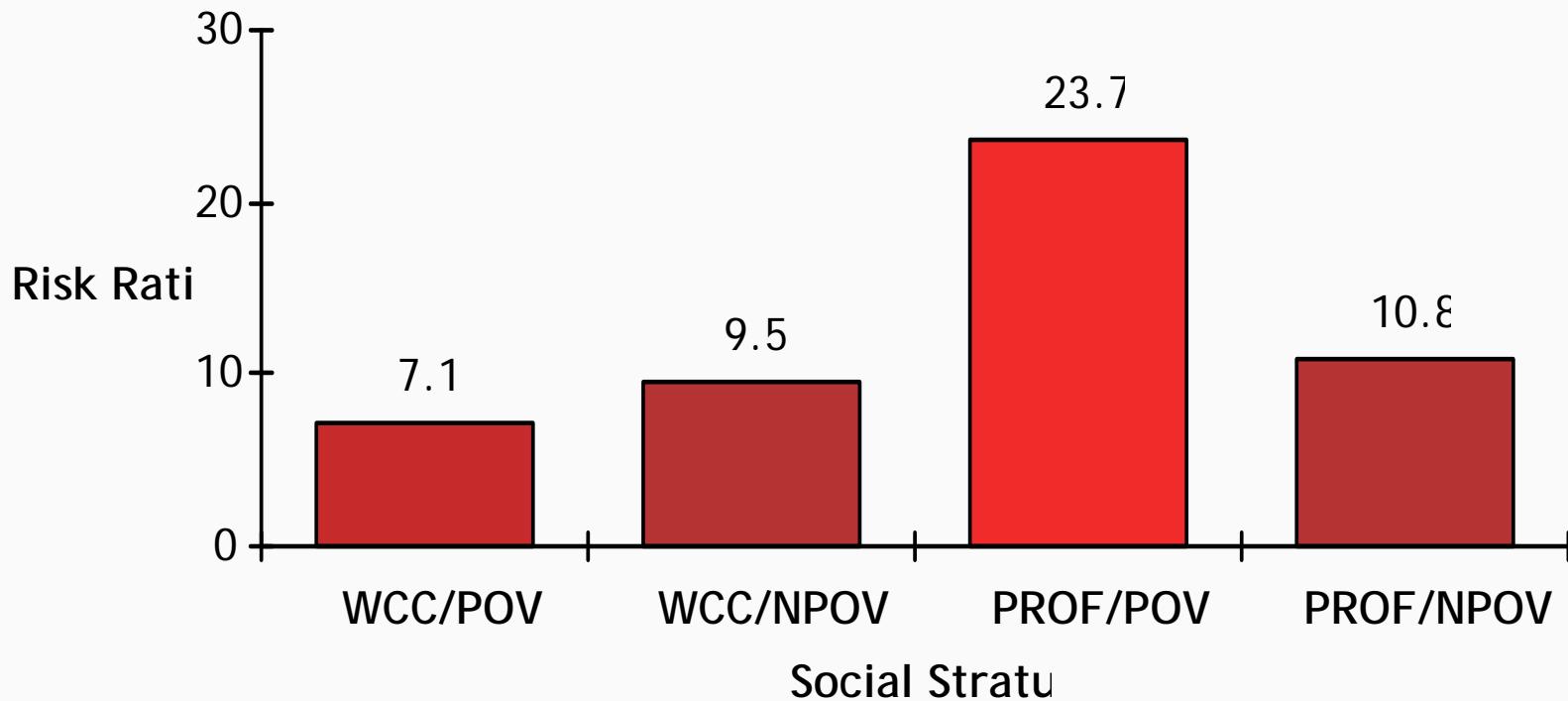
Reported Cases of CT from 1990-1992 by Race



Risk Ratio (Black/White Rate) for GC by Social Status Stratum

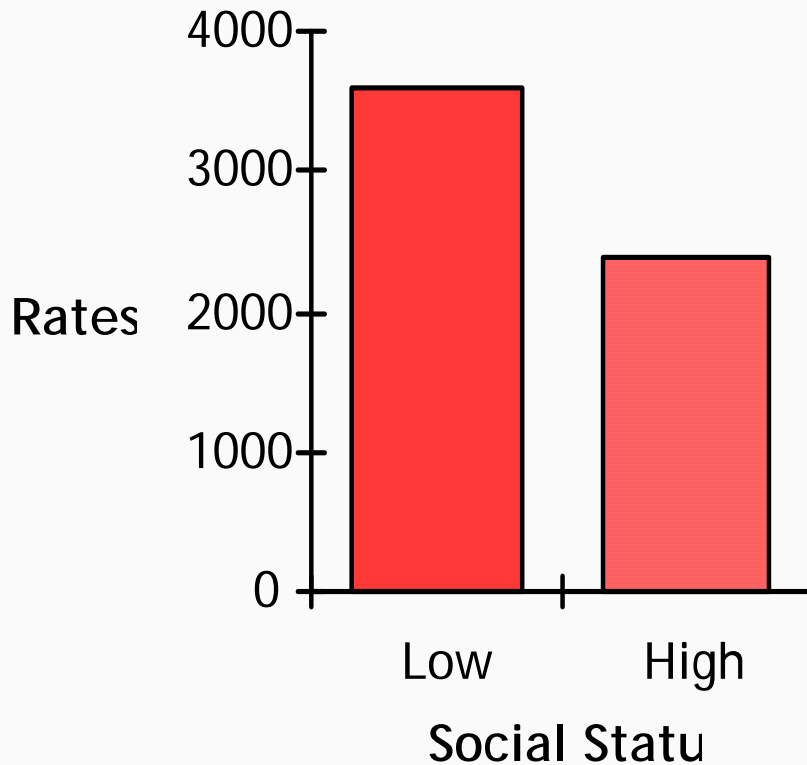


Risk Ratio (Black/White Rate) for CT by Social Status Stratum

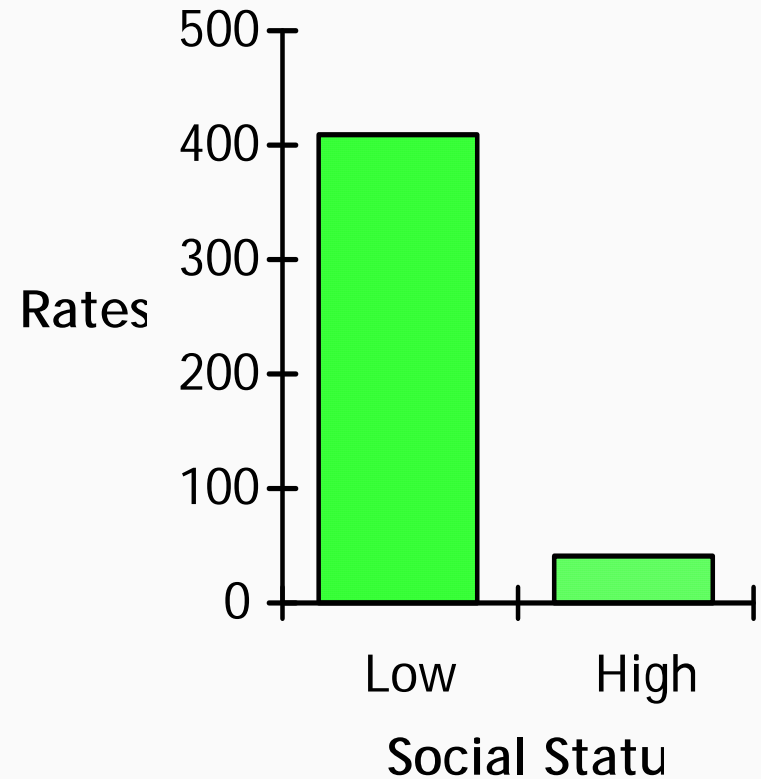


Comparison of Rates of GC for High/Low Social Status Adolescents by Race

Black Adolescents



White Adolescents





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Section D

Environmental Factors and Racial/Ethnic Differences

Environmental Factors

- Built environment
 - Places (e.g., churches, liquor stores)
 - Services (e.g., STD clinics)
- Social environment
 - Social cohesion
 - Social norms

- Assessed housing and school conditions of 55 census block groups
- Developed “broken window” index
- Compared census measures, liquor stores, broken window index with gonorrhea rates
- Liquor stores and broken window index explained more variance in gonorrhea rates than did a poverty index

“Broken Windows” and Gonorrhea: New Orleans, 1994-1996

Poverty Group	Broken Windows	Sample Size	Gonorrhea Rate
Low	Low	25	27
Low	High	4	32
High	Low	10	25
High	High	16	52

- Interviewed 8,782 residents from 343 neighborhoods in Chicago
- Assessed perceptions about social cohesion of their neighborhood
- Compared social cohesion and census data with homicide rates
- Social cohesion explained homicide rates better than census data

Overview

- Teams of ethnographers walked around CBGs at randomly selected times
- Initially toured CBGs and took field notes
- Subsequently, recorded observations using structured instrument
- Only one ethnographer assessed each CBG
- Inter-rater reliability good (kappa > .8)
- Ethnographers were blinded to gonorrhoea status of CBG

Overview

- Eligible youth
 - 18-24-years-old
 - Resident of census block group
- Street intercept of eligible appearing youth at pre-selected venues
 - Counted and approached eligible appearing youth
 - Screened for eligibility
- Interviewer-administered survey
- CD coupon reimbursement
- Verbal consent
 - No identifiers or personal risk behavior data collected

SBI Venue Selection

- Windshield tours identified initial list
- Inspected initial sites for eligible appearing youth
- Brief street interviews (BSI) determine yield
- Counted all eligible appearing youth
 - Approached eligible appearing youth
 - Screened all approached for eligibility
 - Obtained verbal consent and provided minor inducements
- Selected two geographically distinct venues per block group

Description of People at Venues

	High GC n = 10	Low GC n = 10
Drug dealers and users	2	2
Customers of local merchants	1	2
People in transit	3	3
Drug dealers, customers, and people in transit	4	3

Recruitment and Enrollment

	High GC n = 5	Low GC n = 5
Number Approached in BGs	575	398
Number Screened in BGs (percentage approached)	244 (42)	191 (48)
Number Eligible (percentage screened)	129 (53)	115 (60)
Number Interviewed in BGs (percentage eligible)	124 (96)	117 (98)
Number Interviewed in BG (median)	23	22

SBI Participants

	High GC n = 5	Low GC n = 5
Percentage Male	59	69
Mean Age	21	20
Percentage Less than High School	89	91
Percentage in School	36	31
Percentage with Regular Job	49	66

	Cronbach's Alpha	Inter-CBG Correlation
Social Support	.74	.89
Informal Social Control	.85	.19
Night Club	N/A	.85

Correlates of Social Support

	Coefficient	P-Value
Gender (1 = male, 0 = female)	1.51	.002
Nightclubs in CBG	-1.13	.018
Rate of Gonorrhoea in CBG (1 = high, 0 = low)	-1.82	.040



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Section F

Changing the Environment



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Connect to Protect®: A Population-Level Adolescent HIV Prevention Trial

Adolescent HIV Prevention Trials Network (ATN)
Funded by NICHD, NIDA, NIMH, NIAAA

Specific Aim One

- To determine whether mobilized communities can make changes in their structural risk for HIV

Specific Aim Two

- To determine whether changes in a communities' structural risk for HIV results in reduced HIV incidence among adolescent residents over four years

Determinants of HIV Acquisition

- Efficiency of transmission
 - Condom use
 - Co-infection with STIs
 - Viral load
- Likelihood of having infected partner
 - Prevalence in sex networks

Structural Determinants of HIV

- Aspects of the environment that act outside of the control of an individual that impede or facilitate an individual's ability to prevent HIV transmission or acquisition

Structural Determinants of HIV

Macro-Structural Determinants

Poverty
Gender inequality
Racism
Migration/mobility
Stigma

Intermediate-Structural Determinants

Services and resources
Physical structures
Organizational structures
Laws and policies

Changing Structural Determinants

- Top down approach
 - Social and health policy
 - Costs
 - ▶ Impeding local autonomy
 - ▶ Not reflecting local standards
- Bottom-up approach
 - Community mobilization
 - Benefits
 - ▶ Strengthens local autonomy
 - ▶ Incorporates local standards

Community Mobilization

- Collaborative problem solving resulting in changes to the environment that lead to reduced health or other social problems

Community Mobilization

- Strategic planning process
 - Vision statement
 - Mission statement
 - Objectives (what structural changes, when, and by whom)
 - Strategies
 - Action plan
- Action plan implementation
- Continuous evaluation and feedback