UPDATES TO SEXUALLY TRANSMITTED DISEASES

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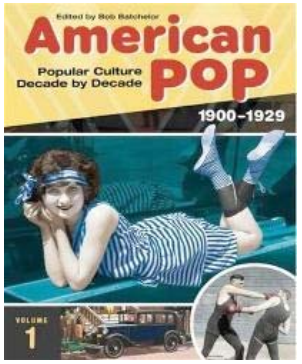
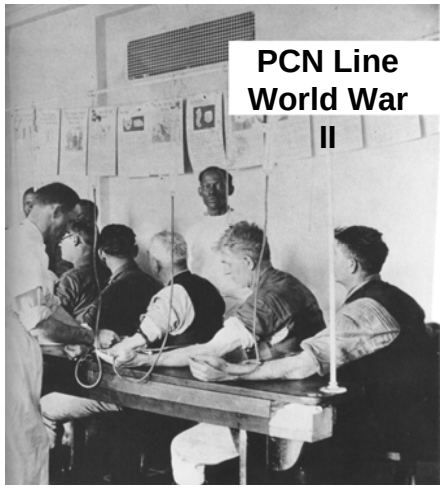
Objectives

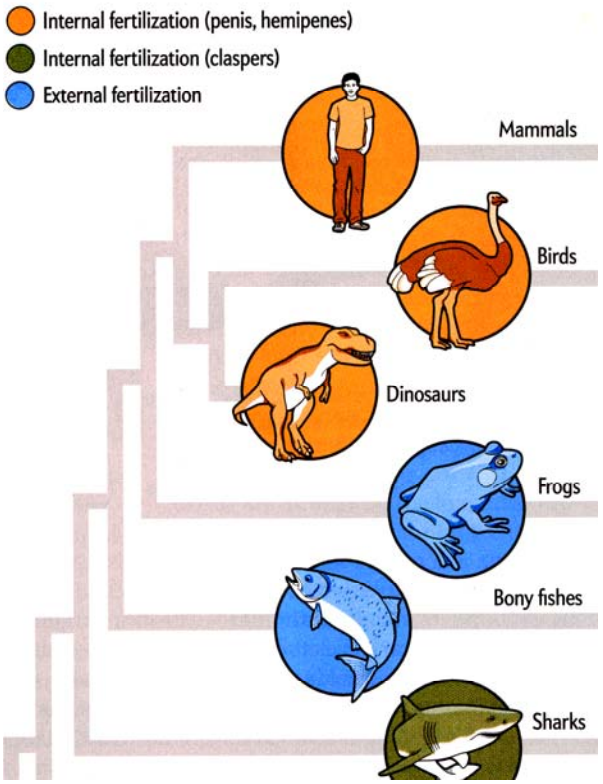
Discuss advancements in sexually transmitted diseases and infection prevention aspects

Disclosure: Research support from Salix, Schering/Merck, GSK, Pfizer, Sanofi, NIH, & VA

Sexually Transmitted Infections







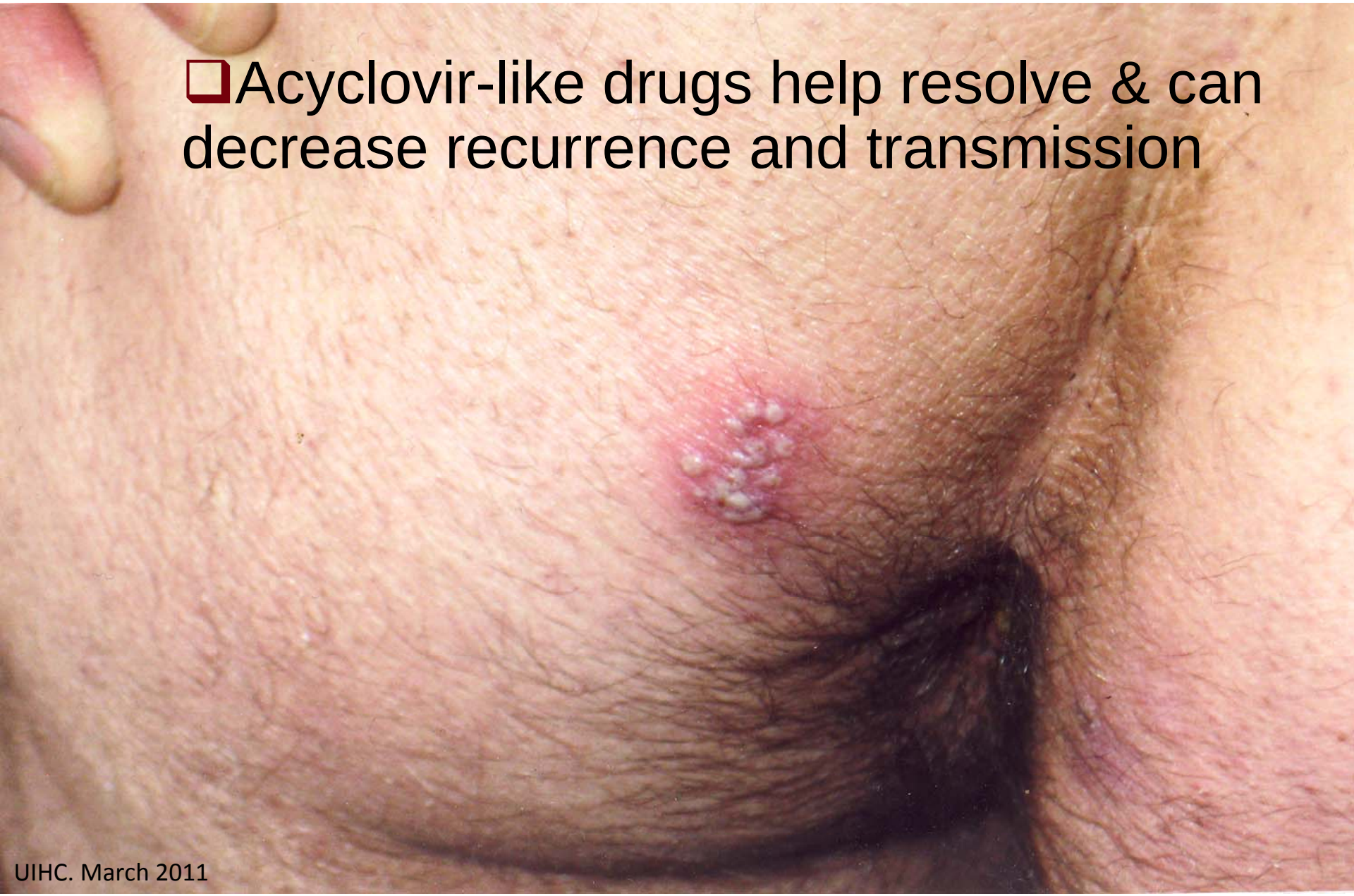
- Co-evolution in biology, behavior, & society
- Herpes in non-human primates
- STD & stigmatization date to antiquity

MANHUNT

Scientific American. Jan 2011

iowa city craigslist > personals > casual encounters

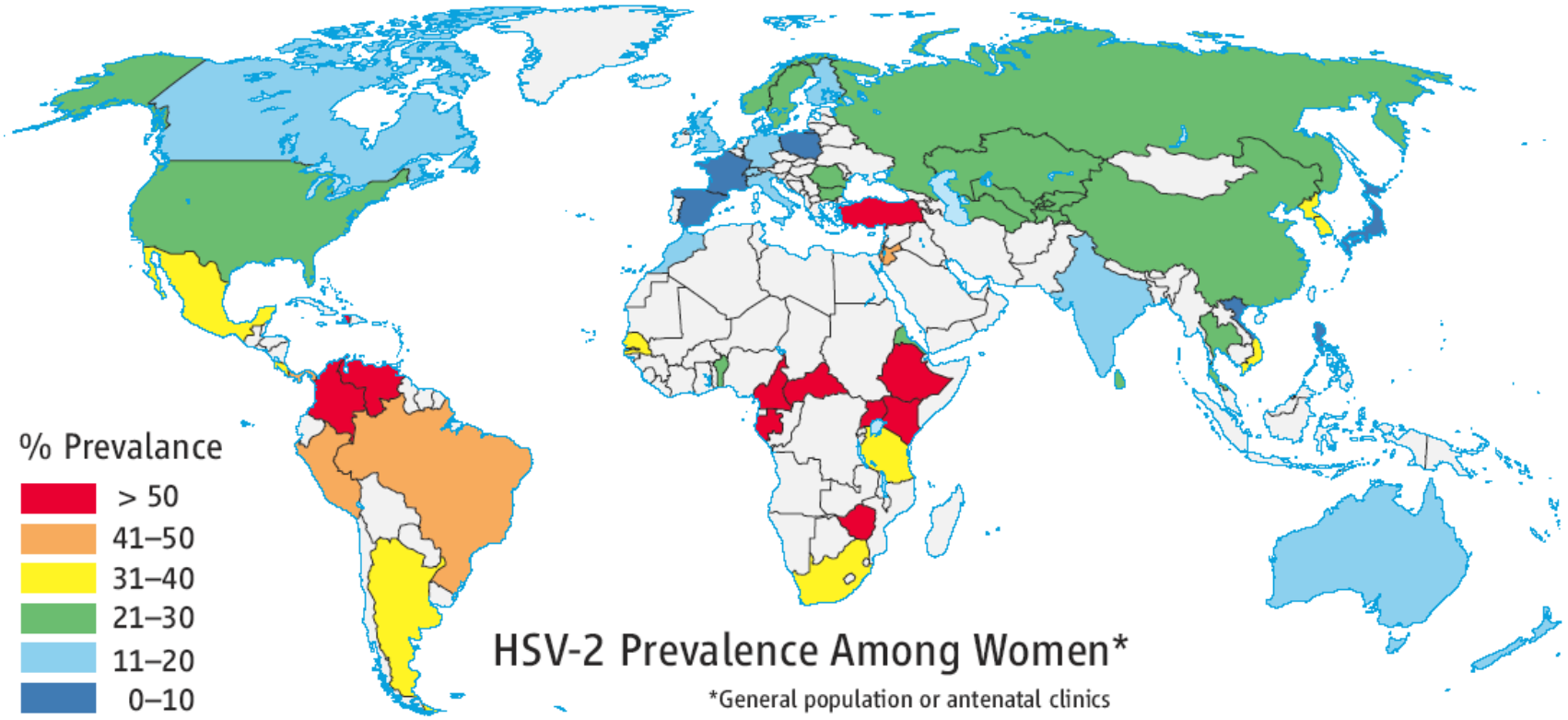
Anogenital Herpes



- Acyclovir-like drugs help resolve & can decrease recurrence and transmission

UIHC. March 2011

Genital Herpes

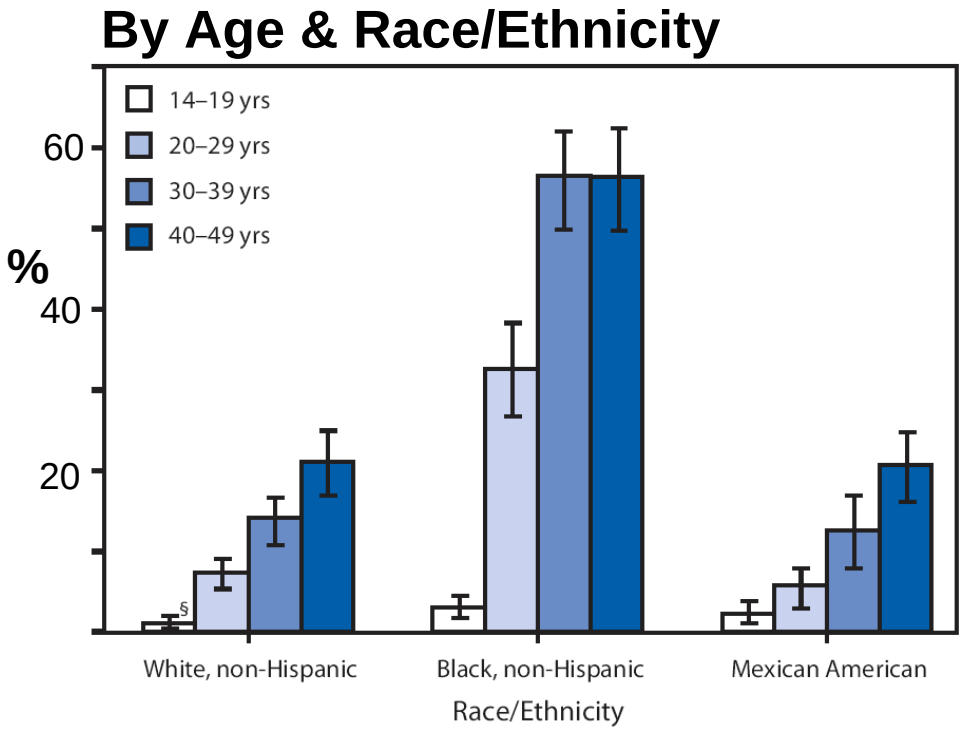


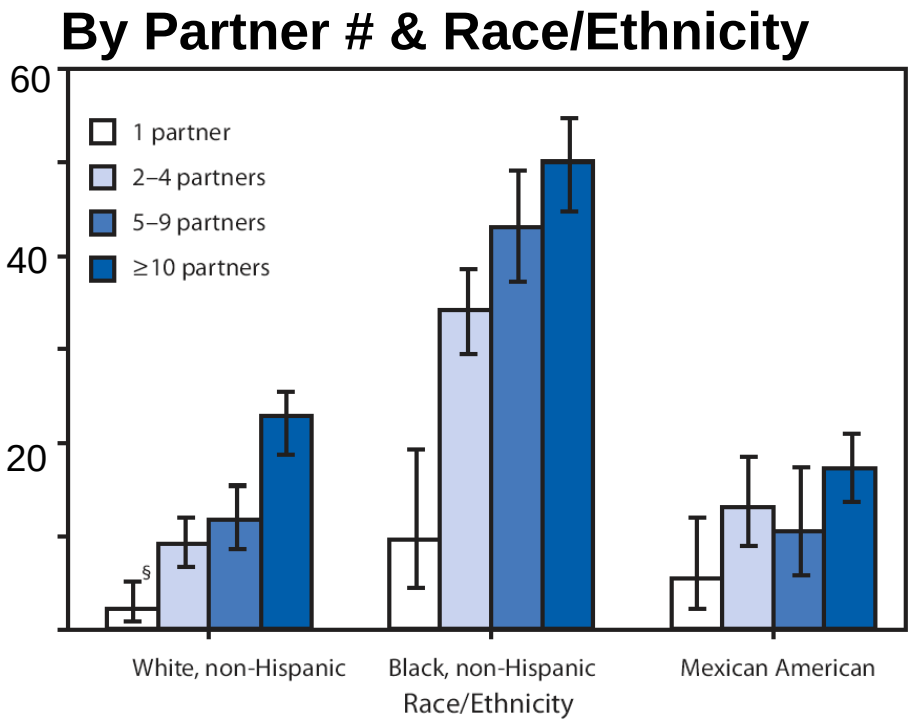
- 500 million people infected with HSV-2

Cohen, J. Science. Vol 330. 2010

HSV-2 Seroprevalence in U.S.

NHANES 2005-2008



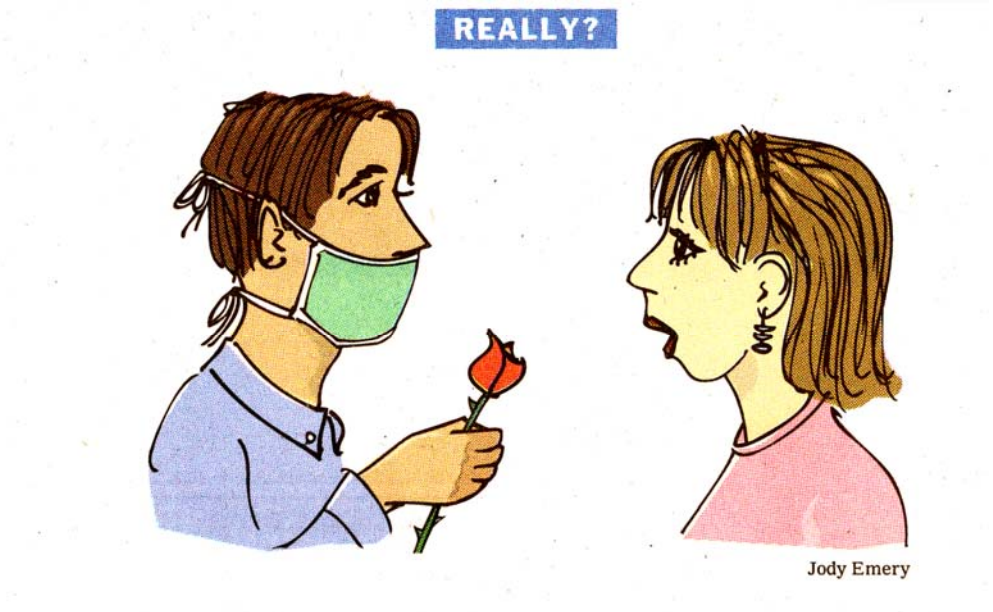


- 80% didn't know they had HSV-2
- HSV-2 serologic testing not recommended

MMWR. Vol 59 (15), 2010

Failure of Investigational HSV-2 Vaccine

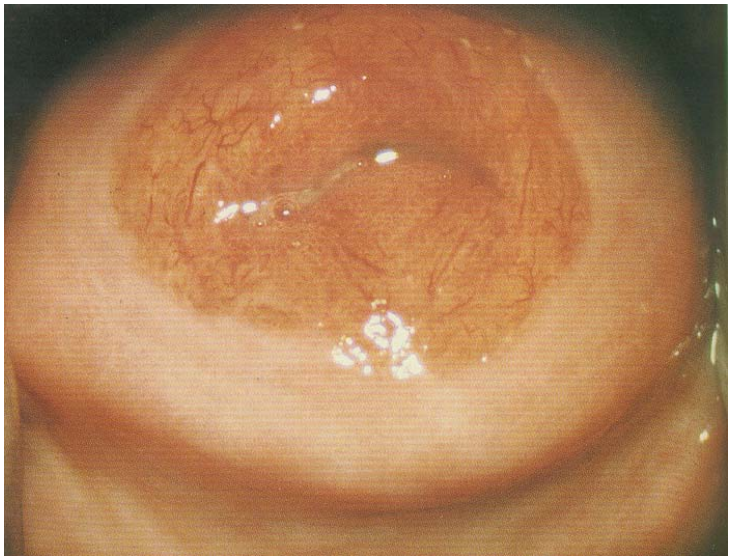
- 8 year study completed 2010
- NIH spent $27.6 million



THE CLAIM *Oral herpes can be transferred to the genitals.*

Gonorrhea

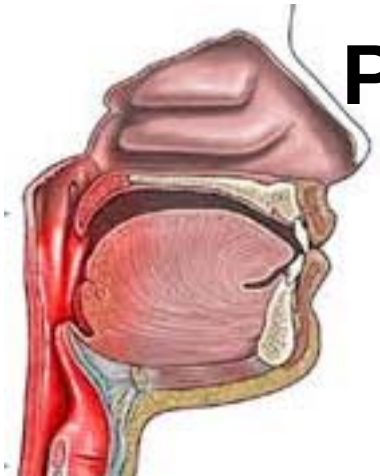
Cervicitis



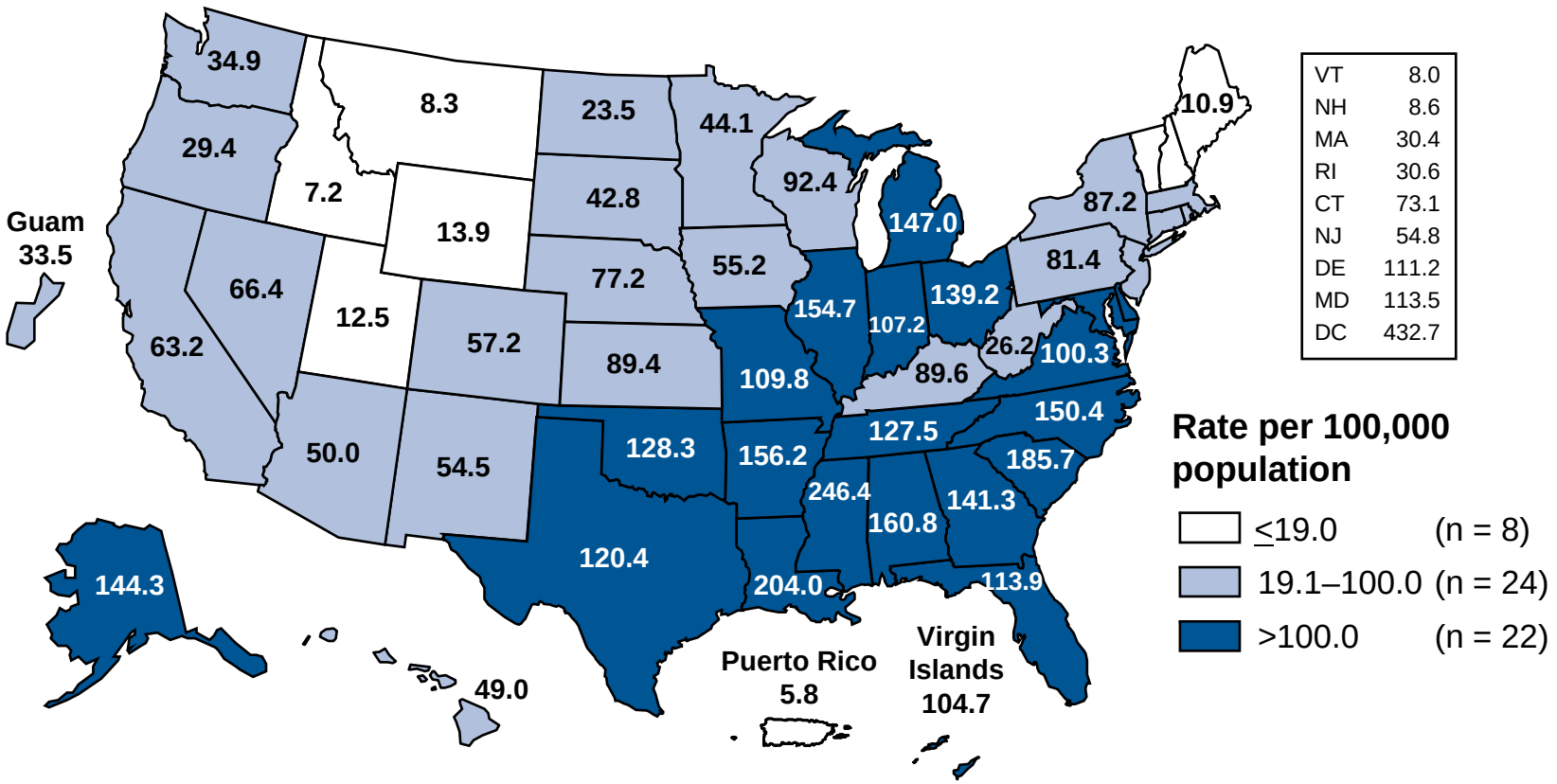
Urethritis

Rectal

Pharyngitis



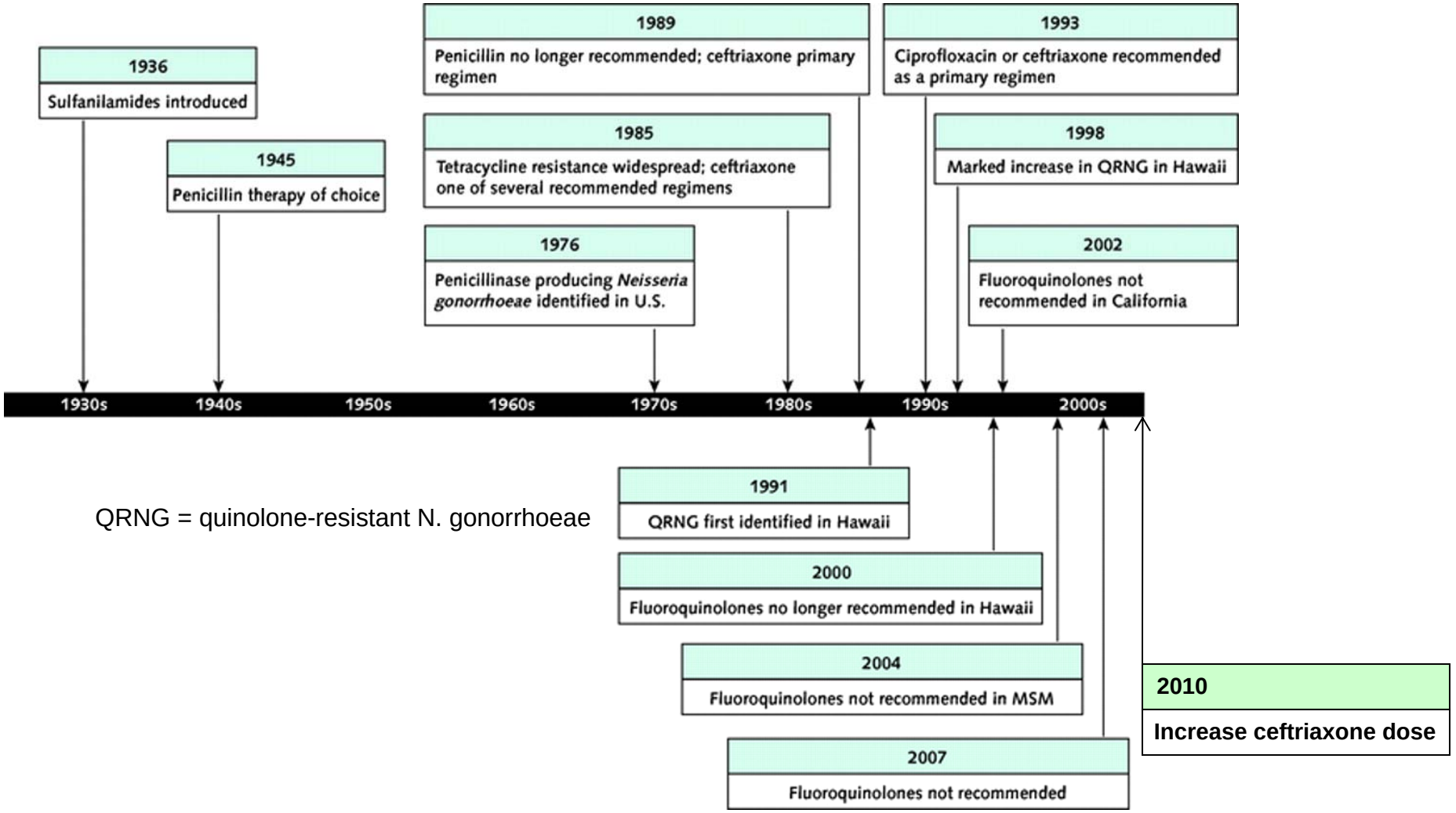
N. gonorrhoeae



- Iowa 2010 - gonorrhea cases (1,804) increased by 9% compared to 2009

Sources: CDC. STD Surveillance, 2009 & IDPH *Bureau of HIV, STD, & Hepatitis*

N. gonorrhoeae – Antimicrobial Resistance in the U.S.



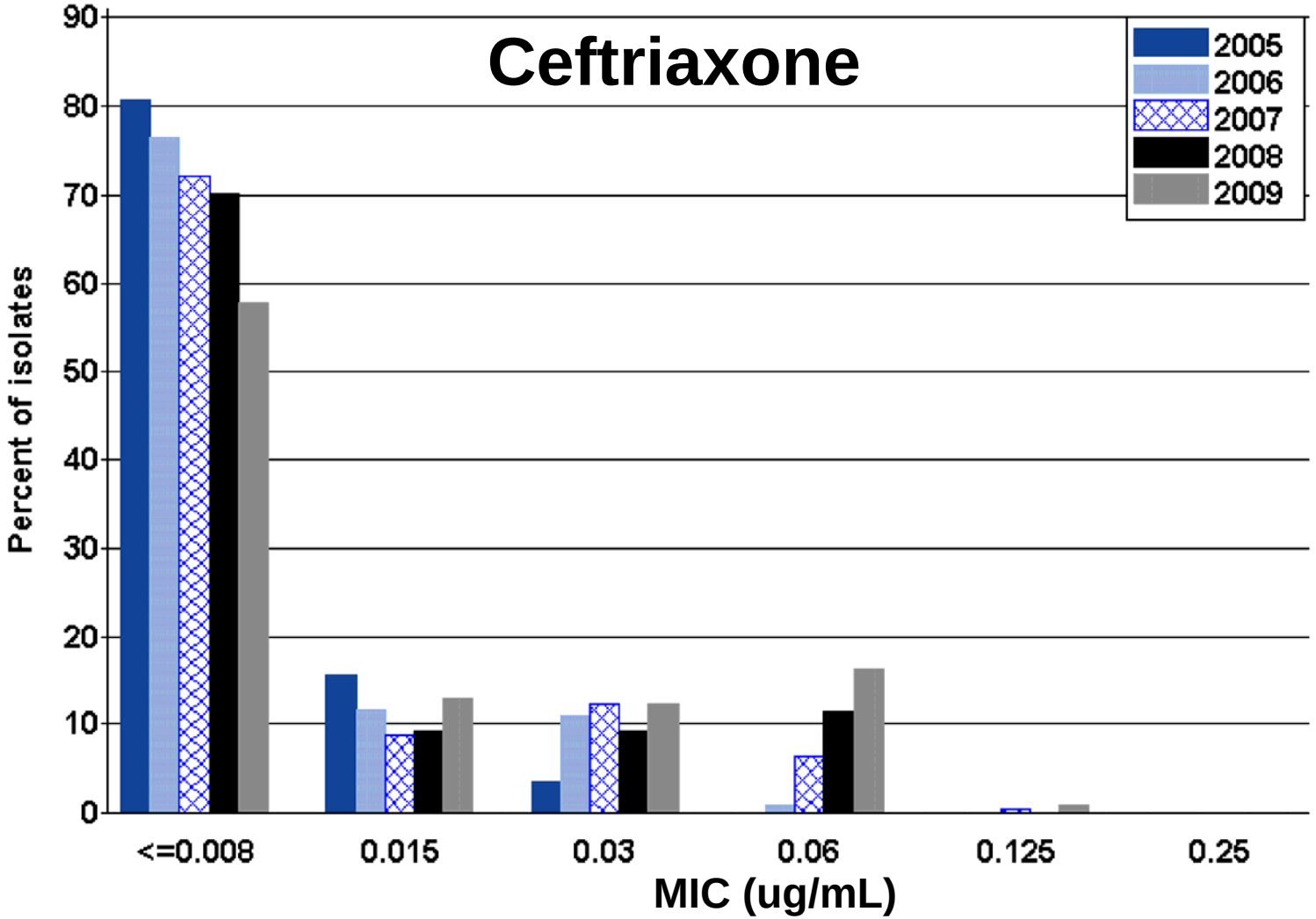
QRNG = quinolone-resistant N. gonorrhoeae

Workowski K A et al. Ann Intern Med 2008;148:606-613

Cephalosporin MIC creep

N. gonorrhoeae – Cephalosporin MIC Creep

Minneapolis



Source: CDC

MIC, minimum inhibitory concentration

Gonorrhea Testing Goes NAAT

- Nucleic acid amplification test (NAAT) very sensitive & specific (urine or swab)
  - NAAT used in 80% of tests
  - Only half of labs report doing culture

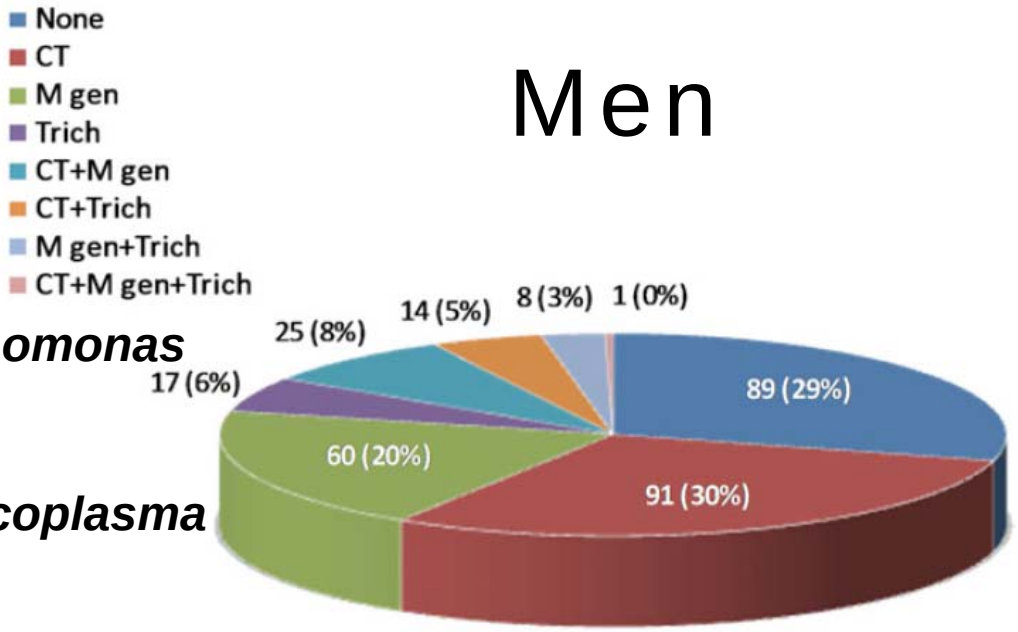
2007 Data. 90 labs.

Type of Test	Labs Reporting Testing (%)	Total Tests Reported (%)	Urine Tests† (%)	Vaginal Swab Tests† (%)
Any GC testing	**90 of 94 (95.7)**	**3,157,827**	**556,337 (18.6)**	**406,653 (12.7)**
Non-NAAT*		**560,128 (17.7)**	**12,538 (2.1)**	**91,159 (22.4)**
Culture	49 (54.4)	157,294 (4.9)	10 (0.0)	659 (0.2)
Hybrid Capture 2 (Digene)	0 (0.0)	0 (0.0)		
PACE 2 (Gen-Probe)	13 (14.4)	89,894 (2.8)	---	2,395 (0.6)
PACE 2C (Gen-Probe)	11 (12.2)	312,940 (9.7)	12,528 (2.1)	88,105 (21.7)
NAAT**		**2,524,382 (80.0)**	**540,446 (97.1)**	**312,012 (76.7)**
SDA (Becton Dickinson)	26 (28.9)	755,958 (23.4)	218,227 (39.2)	260,944 (64.2)
Aptima Combo 2 (Gen-Probe)	53 (58.9)	1,733,430 (53.8)	312,924 (56.2)	51,067 (12.6)
Aptima GC (Gen-Probe)	4 (4.4)	12,414 (0.4)	15 (0.0)	1 (0.0)
PCR COBAS Amplicor (Roche)	1 (1.1)	18,300 (0.6)	5,000 (0.9)	---
PCR Amplicor MWP (Roche)	1 (1.1)	4,280 (0.1)	4,280 (0.8)	---
Other Antigen Tests	**4 (4.4)**	**73,317 (2.3)**	**3,353 (0.6)**	**3,482 (0.9)**

Source: CDC. 2011

Nongonococcal Urethritis

Men



Trich, *Trichomonas vaginalis*

M gen, *Mycoplasma genitalium*

CT, *Chlamydia trachomatis*

Recommended Regimens
Azithromycin 1 g orally in a single dose
OR
Doxycycline 100 mg orally twice a day for 7 days

2010 STD Treatment Guidelines

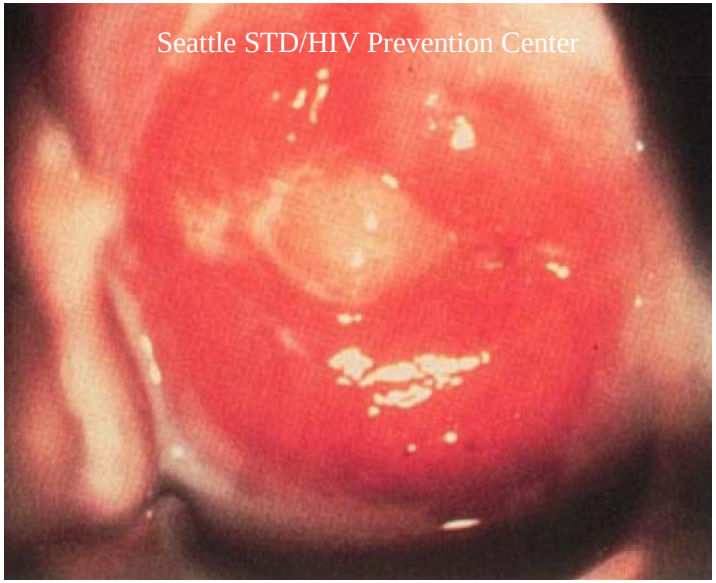
Schwebke, J.R., et al. Clin Infect Dis. 52:163, 2011
MMWR. STD Treatment Guidelines, 2010

Chlamydia

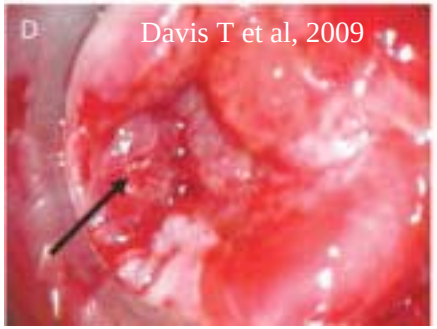
- ~2.8 million infections annually
- Cervix, urethra, rectum, throat
- Often asymptomatic

Urethritis

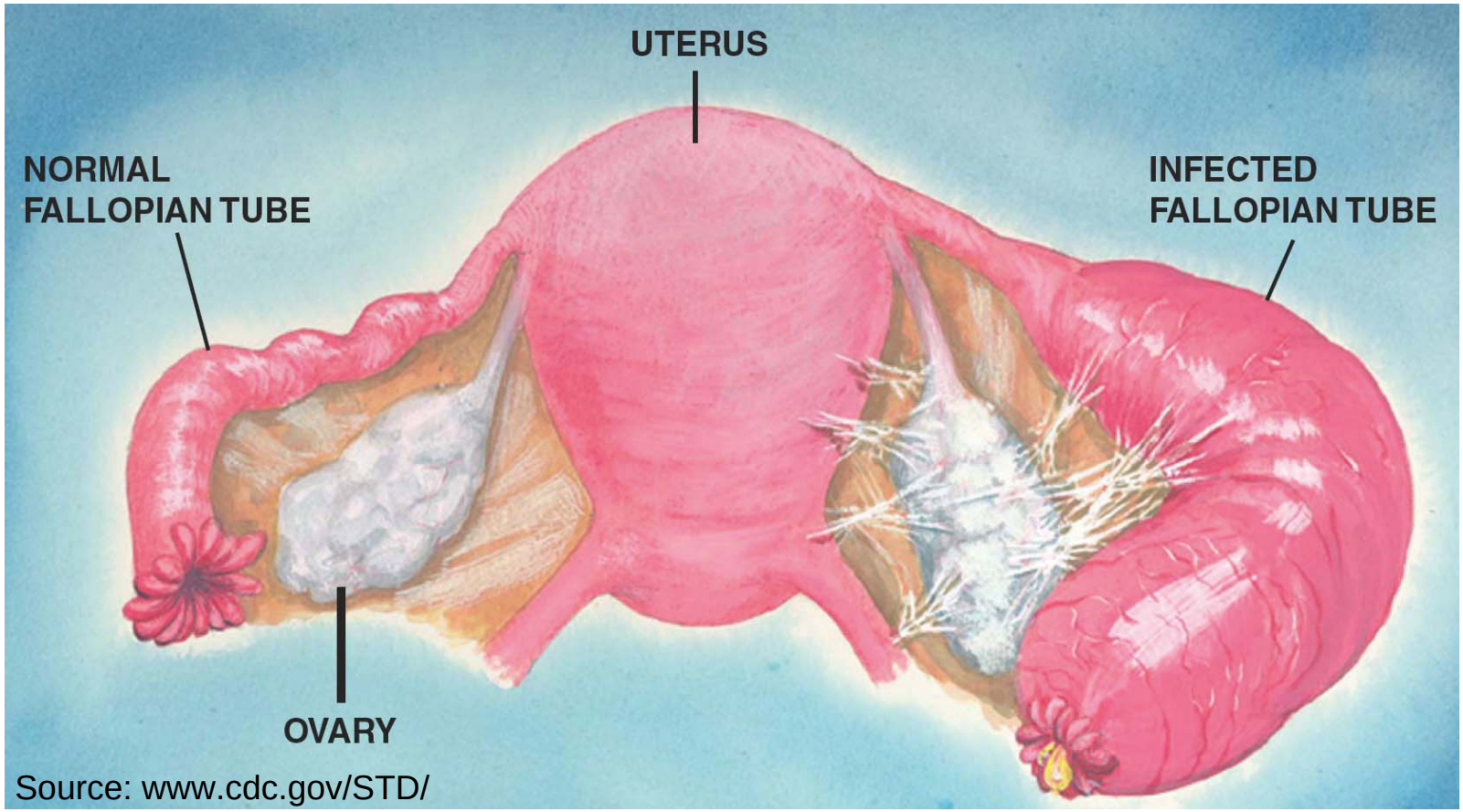
Cervicitis



Proctitis



Chlamydia

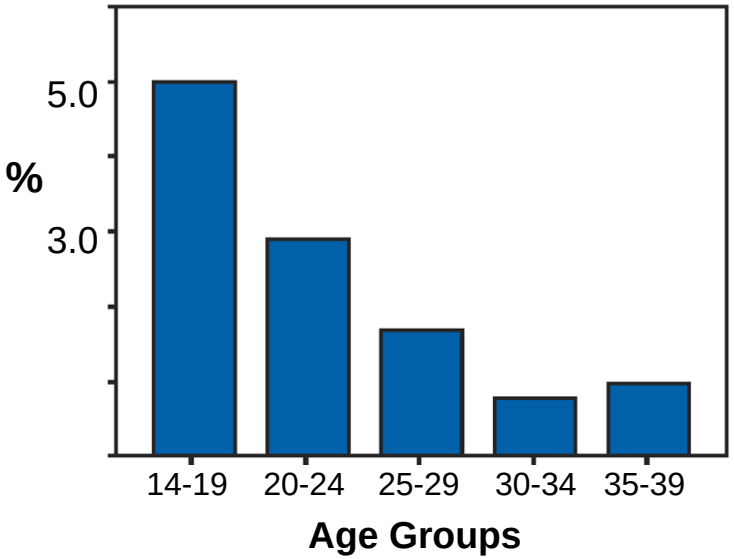


- Pelvic Inflammatory Disease (PID)
- Leading cause of tubal factor infertility, which involves 0.7-3.0% of married women

Chlamydia

- Annual chlamydia screening for all sexually active young females (age < 25 y)

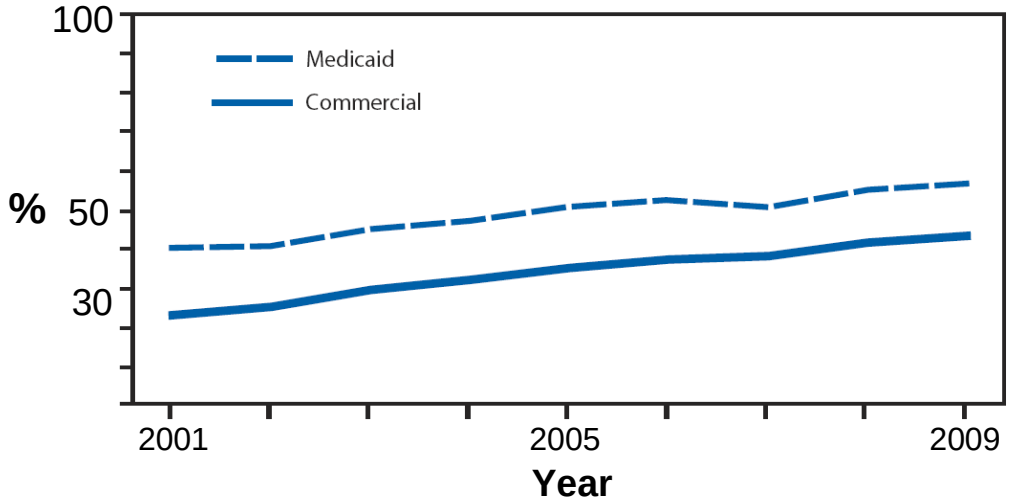
Prevalence Among of Sexually Active Persons in U.S., 2009



Prevalence Among of Women Age 15-24 yrs in Iowa, 2009

Testing Site	No. Clinics	No. Tested	Percent Positive
Family Planning	44	27,986	6.8
STD	7	1,951	18.0
Other	6	2,082	6.0

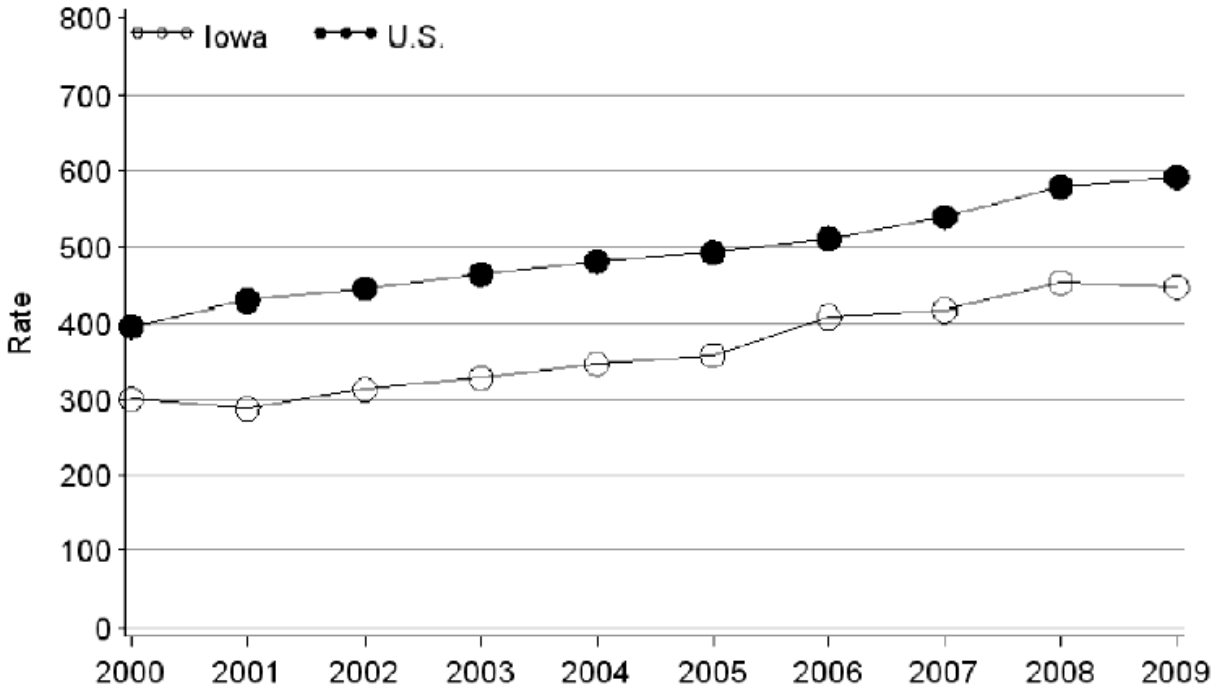
Percentage of Sexually Active Young Women Screened



MMWR 60:370, 2011

Chlamydia In Iowa

Rate per 100,000



U.S.

Iowa

- True or false increase in rate of infection?

Source: IDPH & CDC

Chlamydia Testing by NAAT

- Very sensitive & specific (urine or swab)
- Need for rectal swab? If not done, chlamydia missed in ~80% of MSM & ~20% of women[1]
- H/O anal intercourse not good predictor of rectal chlamydial infection[2]

1. Bachmann LH, et al. J Clin Microbiol. 2010.
2. Barry PM, et al . Obstet Gynecol. 2010
3. MMWR 2011

2007 data[3]
90 labs

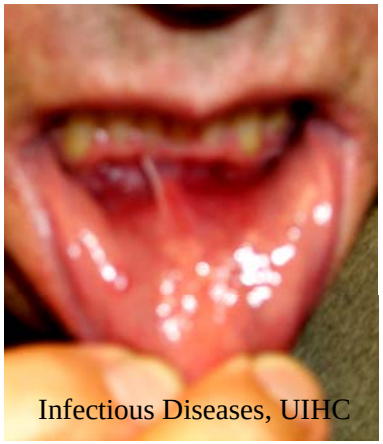
NAAT used in ~82% of tests

Type of Test	Labs Reporting Testing (%)	Total Tests Reported(%)	Urine Tests† (%)	Vaginal Swab Tests† (%)
Any CT testing	**87 of 94 (92.6)**	**3,290,390**	**582,265 (17.7)**	**424,316 (12.9)**
Non-NAAT*		**524,947 (16.0)**	**30 (0.0)**	**108,550 (25.6)**
Culture	10 (11.5)	2,379 (0.1)	---	2 (0.0)
DFA	3 (3.4)	245 (0.0)	---	---
EIA	2 (2.3)	62,420 (1.9)	30 (0.0)	---
Hybrid Capture 2 (Digene)	1 (1.1)	47,402 (1.4)	---	---
PACE 2 (Gen-Probe)	13 (14.9)	109,681 (3.3)	---	17,510 (4.1)
PACE 2C (Gen-Probe)	11 (12.6)	302,820 (9.2)	---	91,038 (21.4)
NAAT**		**2,684,278 (81.6)**	**578,882 (99.4)**	**312,284 (73.6)**
SDA (Becton Dickinson)	28 (32.2)	844,093 (25.7)	242,422 (41.6)	265,684 (62.6)
Aptima Combo 2 (Gen-Probe)	51 (58.6)	1,747,651 (53.1)	303,558 (52.1)	45,074 (10.6)
Aptima CT(Gen-Probe)	8 (9.2)	46,643 (1.4)	13,813 (2.4)	1,526 (0.4)
PCR COBAS Amplicor (Roche)	2 (2.3)	34,802 (1.1)	8,000 (1.4)	---
PCR Amplicor MWP (Roche)	1 (1.1)	11,089 (0.3)	11,089 (1.9)	---

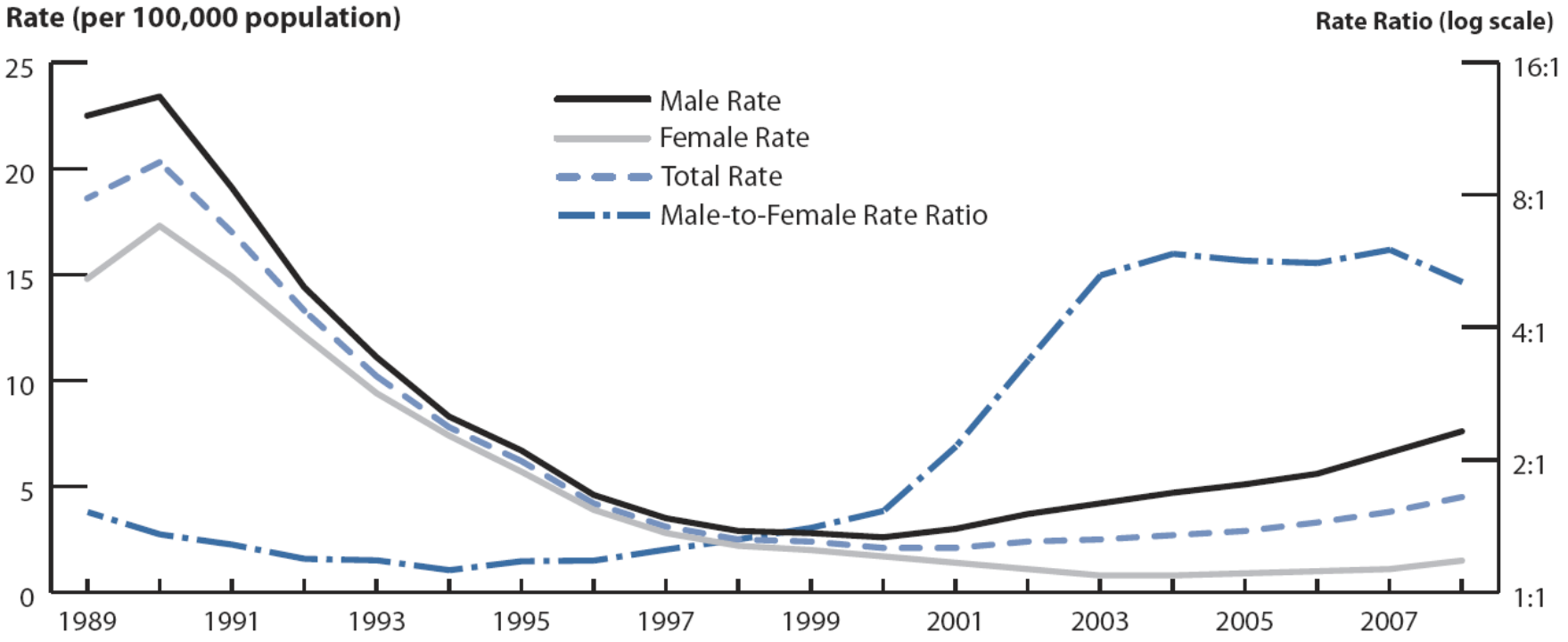
Syphilis

Primary

Secondary



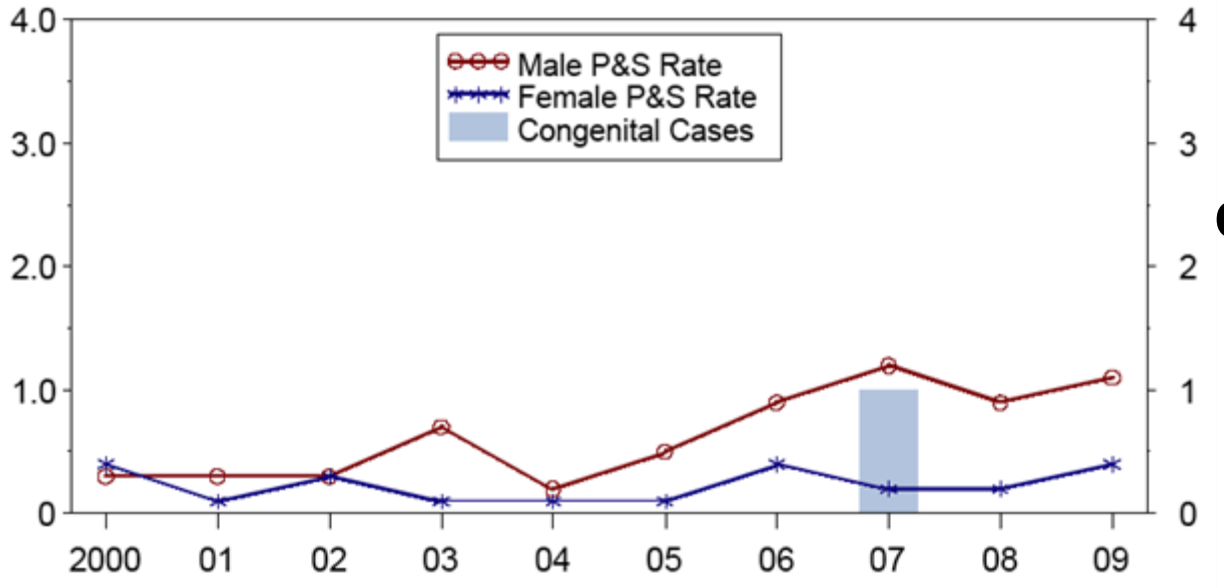
Increase in 1º & 2º Syphilis Rates and Male-to-Female Rate Ratio



http://www.cdc.gov/std/stats08/main.htm

Syphilis Increase in Iowa

Primary and Secondary (P&S) Syphilis Rate and Congenital Syphilis Cases, 2000-2009



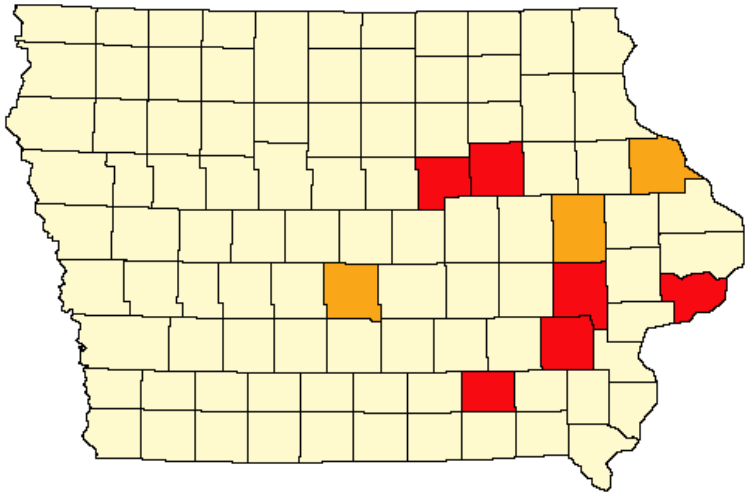
- Rate among blacks was 16 times that of whites

Source: CDC and IDPH

IA 2009: ~Half of Syphilis Cases in MSM

N= 23 Cases of Early Syphilis

P&S Syphilis Rate by County in 2009

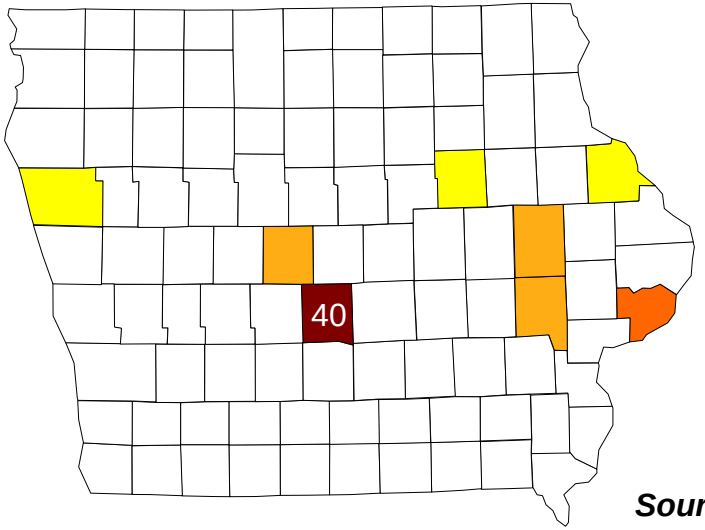


Rate (per 100,000 population)

- <=0.4
- 0.41-2.2
- >2.2

N= 127 Cases of New HIV Diagnoses

New HIV Diagnoses by County in 2009

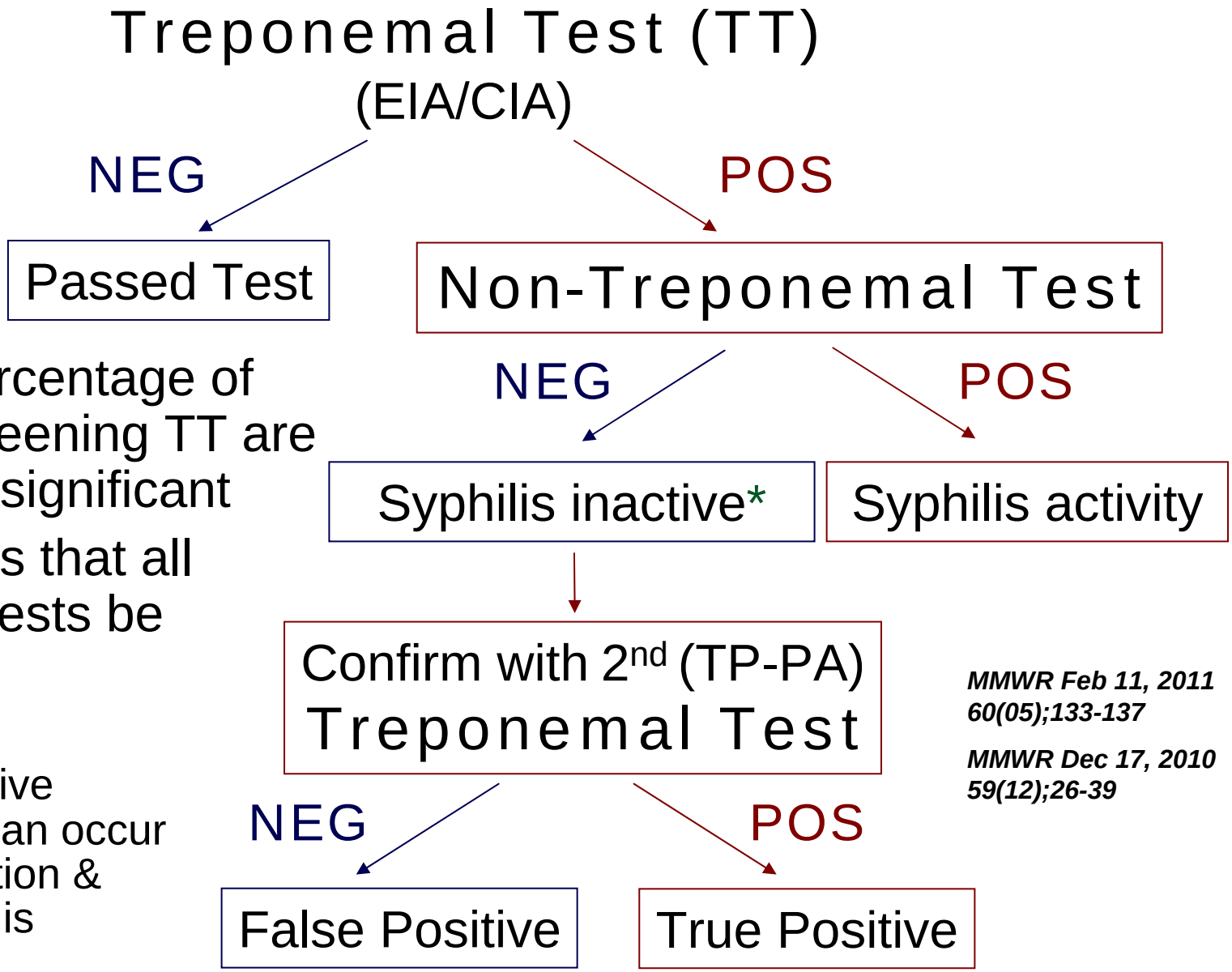


No. of Cases

- >25
- 15-24
- 10-14
- 6-10
- 1-5

Source: IDPH Bureau of HIV, STD, & Hepatitis

Reverse Screening



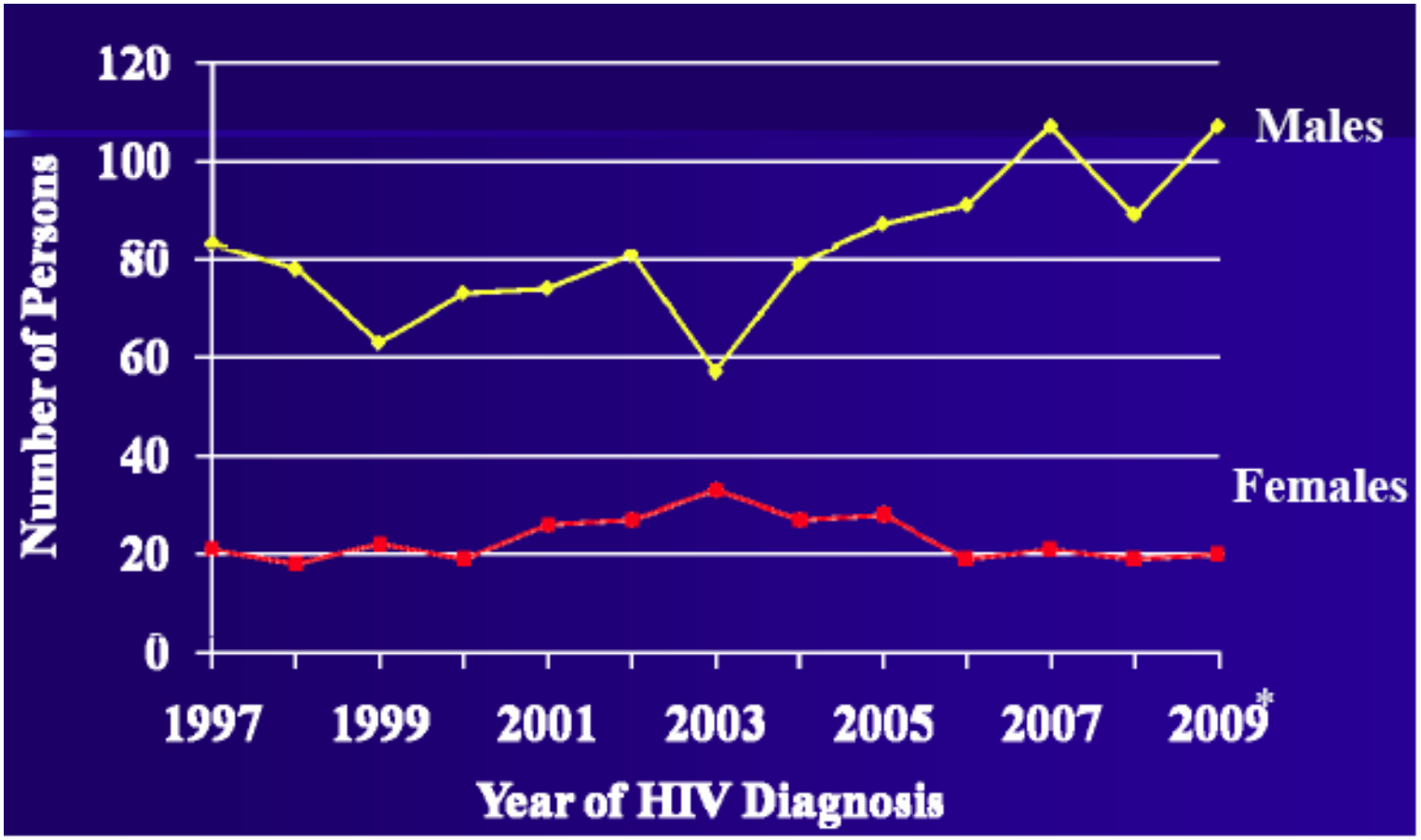
- Small percentage of initial screening TT are clinically significant
- CDC asks that all positive tests be reported

*False negative RPR/VDRL can occur early in infection & tertiary syphilis

MMWR Feb 11, 2011 60(05);133-137

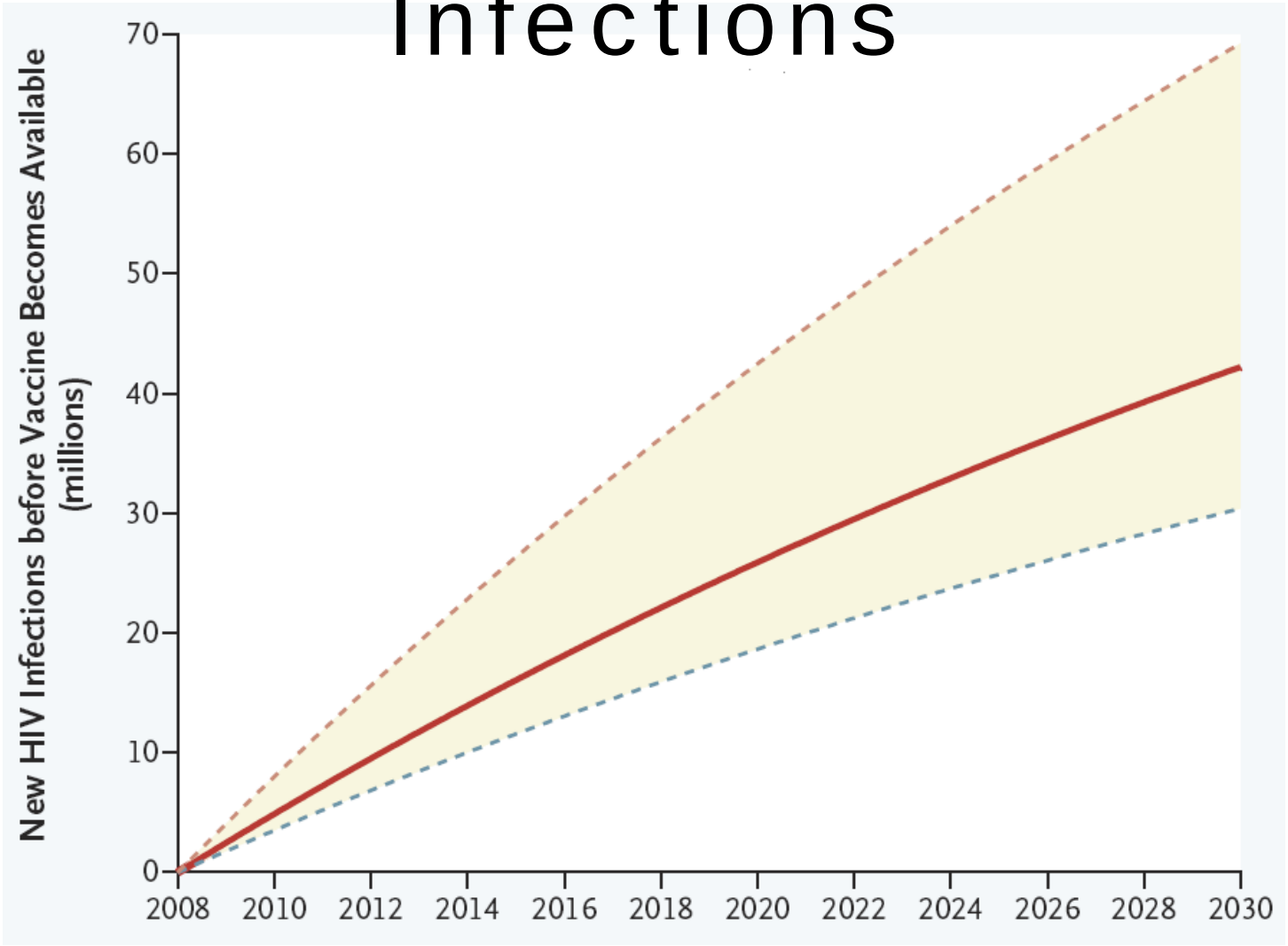
MMWR Dec 17, 2010 59(12);26-39

Increase in Number of New HIV Diagnoses in Iowa



Source: IDPH Bureau of HIV, STD, & Hepatitis

Global Scale of New HIV Infections



Lagakos & Gable. NEJM. 2008

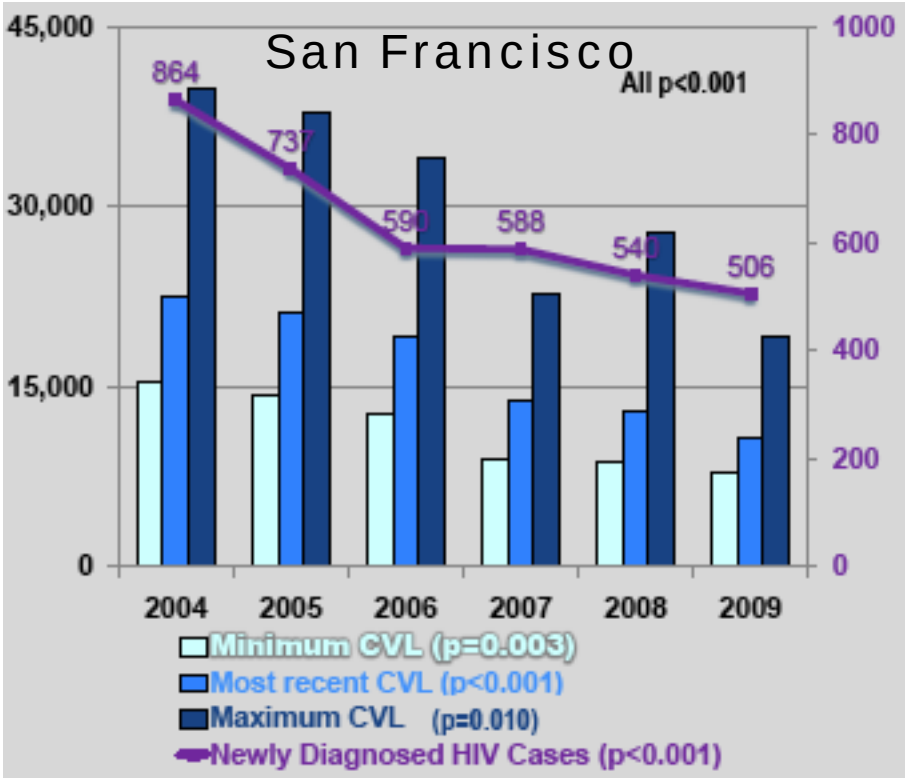
New Prevention Approaches

- Pre-exposure prophylaxis (**PrEP**)
  - Once-daily pill - 2 antiretroviral drugs (TDF-FTC)
    - 44% effective in MSM (iPrEx study)[1]
    - Study in heterosexual women stopped early, lack of benefit (FEM-PrEP study)
  - Vaginal gel containing tenofovir (TDF) decreases HIV infection in women by 39% (CAPRISA study)[2]
- CDC endorses PREP for **MSM** & issued guidelines[3]

1. *Grant, R.M., et al. NEJM. 2010*
2. *Karim, Q.A., et al. Science Express 2010*
3. *MMWR. January 2011*

New Prevention Approaches

- Lowering 'community' viral load
  - Sexual transmission of HIV is rare if viral load in HIV+ person is <400 [1]
  - May decrease incidence of new HIV infections[2]
  - More testing, linkage to care, treatment, & retention ($$$)



1. *Attia, S., et al. AIDS. 2009 (meta-analysis of studies)*
2. *Das, M. et al. Abstract 1022. CROI. 2011*

HPV in Males

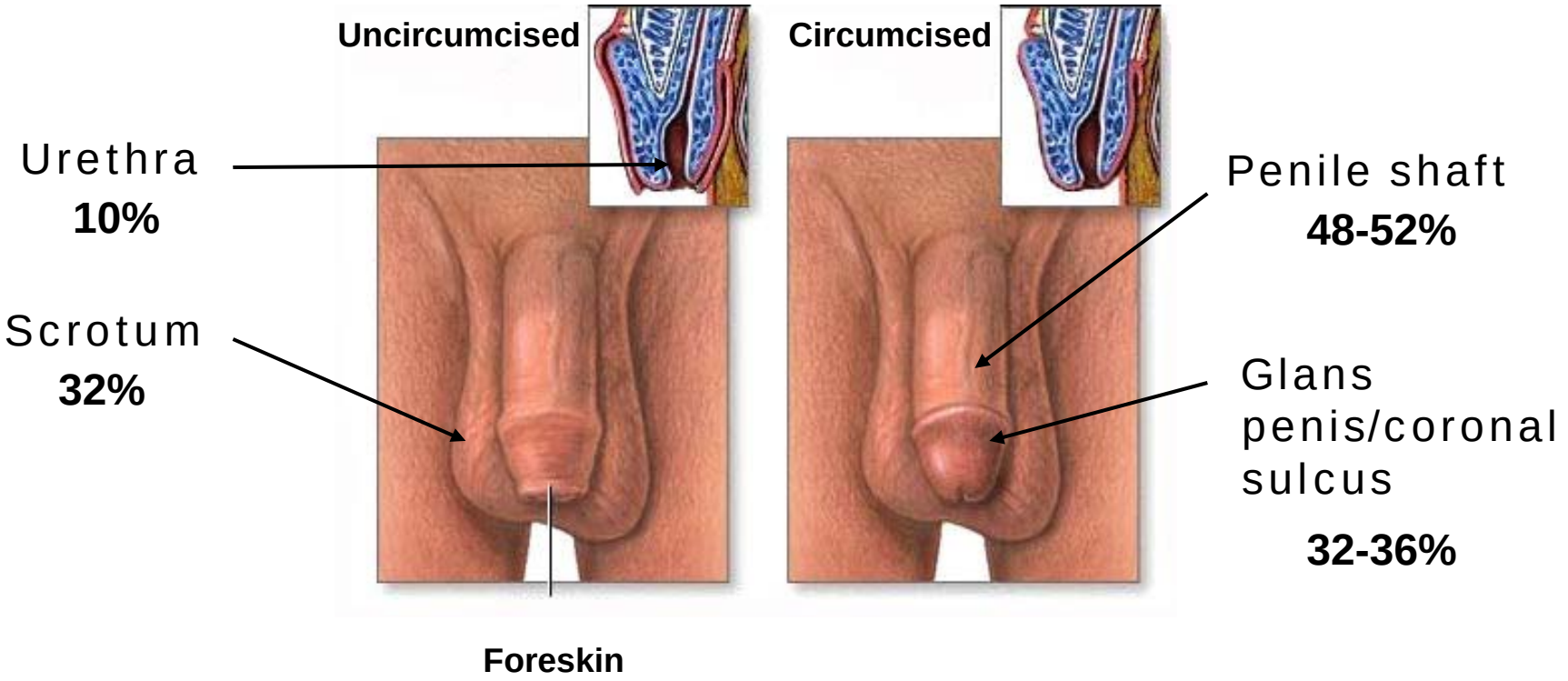
Benign Warts

Squamous Cell Carcinoma & Warts

Low- & High-Risk HPV Types

- **LR-HPV (Low-Risk)**
  - Warts - benign
  - Types 6 & 11 (many other types)
- **HR-HPV (High-Risk)**
  - Oncogenic
  - Types 16 & 18 (13 total types)

HPV (PCR^{+}) Prevalence in Heterosexual Men by Anatomic Site



Giuliano, A.R. et al. J Infect Dis 2007;196:1146–1152

Anal Canal HPV in HIV^{-} Men Who Have Sex with Women

- 12% HPV positive, over 4 y
- 7% with HR-HPV types
- HPV on penis/scrotum increases risk of anal infection (>2-3 fold)

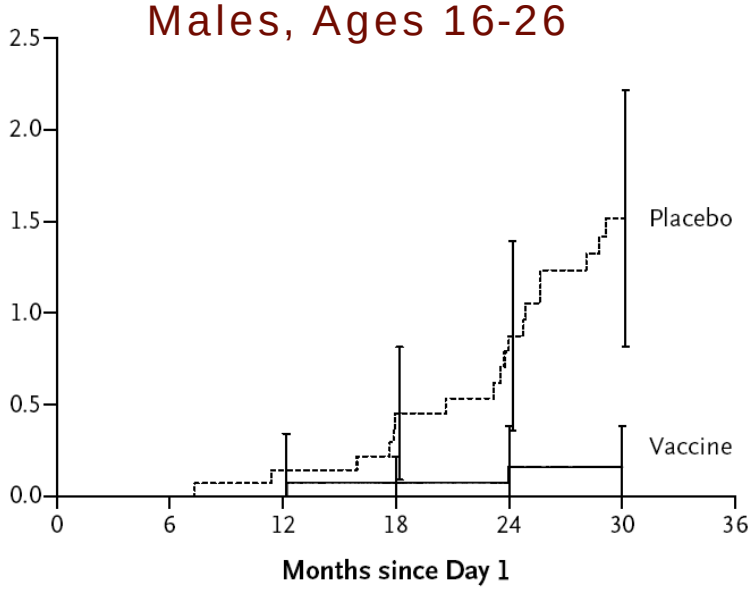
Nyitray, A.G. et al. J Infect Dis 2010;201:1498–1508

HPV Prevention

- Male circumcision[1, 2]
  - Incidence of multiple HR-HPV infections decreased in HIV$^-$ & HIV$^+$ men (RR, 0.45-0.53)
- Quadrivalent HPV vaccine effective in young men[3], & FDA-approved for young men

*HPV-negative prior to vaccination

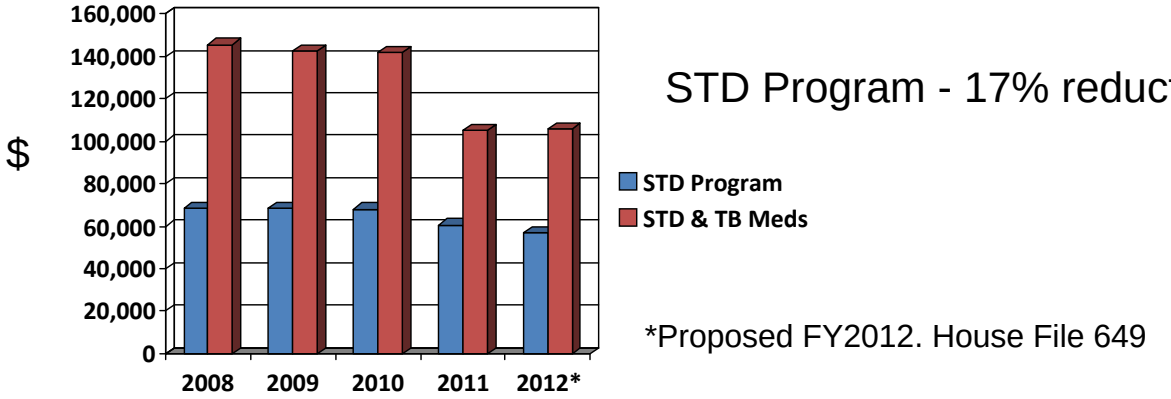
Cumulative Incidence of **External Genital Lesions***



[1]Gray, R.H. et al. J Infect Dis 2010;201:1455–1462
[2]Serwadda, D. et al. J Infect Dis 2010;201:1463–1469
[3]Giuliano, A.R. et al. N Engl J Med 2011;364:401–411

CHALLENGES AHEAD

- Iowa has seen an increase in number of reportable STD cases - gonorrhea, chlamydia, syphilis, and HIV
- Declining State $ for STD testing & prevention



STD Program - 17% reduction

*Proposed FY2012. House File 649

- CDC $ for gonorrhea/chlamydia testing & prevention not keeping pace
- Federal $ for HIV testing & prevention threatened