Sexually transmissible infections in men who have sex with men

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Session outline

- Prevalence of men who have sex with men (MSM) behaviour
- Historical patterns of STIs in MSM
- Determinants of STI transmission
  - Why the recent increases in STIs among MSM?
- HIV/STI interaction
- STI (& a little HIV) data from Sydney MSM cohort studies

How common is male homosexual sex in Australia?

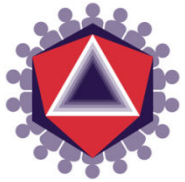
- Australian Study of Health & Relationships: 2001/2002
  - 1st national sexual health survey,
  - random digit dialling telephone survey
  - n=20,000 (>10,000 men)

- 5% men: ever had homosexual genital contact

- 1.9% men: homosexual experience in last year

Grulich et al. Aust N Z J Public Health 2003;27:155-63

Historical patterns of STIs in MSM



- Before mid 1980s (pre-AIDS)
  - High rates esp. gonorrhoea, syphilis, Hep B
- Mid-1980s – mid-1990s
  - Substantial decline due to various factors including
    - Effective public education & health promotion strategies
    - Safer sex behaviour, reduction partner nos.
    - Selective mortality of high-risk MSM from AIDS
- After mid-1990s
  - Rising rates of many STIs as result of
    - Condom fatigue
    - HIV risk reduction strategies
  - Increasing chlamydia, Syphilis epidemics, LGV resurgence
  - High-risk HIV positive disproportionately affected by STIs

Why the recent increases in STIs among MSM?

Factors affecting STIs in MSM

(1) Biological

- Immunity (Hep A, Hep B)
- Pheno/Genotypic changes (Ab resistance)
- Epidemiological synergy (interactions between STIs)
  e.g. HIV & other STIs
  - AIDS-assoc mortality early 1990s → 50% ↓ syphilis incidence[1]
  - Combination HIV antiretroviral therapy
    → ↑ survival of high-risk MSM
    → ↑ bacterial STIs but little effect on HIV incidence

(1) Chesson et al. Sex Transm Dis 2003;30:419-24

Factors affecting STIs in MSM

(2) Individual behaviour

- High partner numbers & concurrent partnerships

- Anal sexual behaviours
  - ↓ condom use for anal sex
  - HIV seroconcordant - "serosorting"
    - STI transmission risk, but no HIV risk
  - HIV serodiscordant – "seropositioning"
    - ↓ HIV risk, but STI risk remains

- Determinants of behaviour
  - e.g. recreational drug use

Factors affecting STIs in MSM

(3) Growth of sexual "marketplace"

- Internet gay dating sites
- Sex-on-premises venues & sex parties
- ↑ International travel
  - Globalisation of gay community events

Health in Men (HIM) Study

- Largest Australian gay men's cohort, community-based
- 1427 HIV negative participants
- Recruited 2001-2004 – followed to mid-2007
- Two annual interviews
- Annual HIV ± STI testing & annual STI self-report

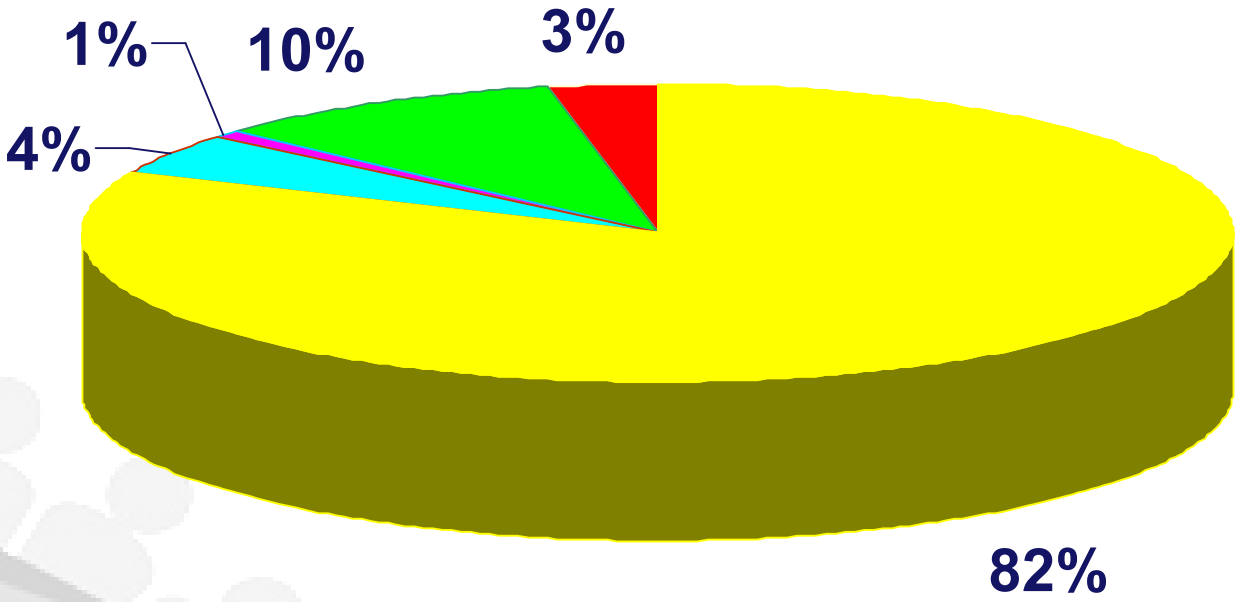
- One of the most comprehensive studies of the sexual health of gay men in the world
  - Probably *THE* most comprehensive in terms of STI testing

Positive Health (pH) Study

- Similar community-based recruitment & methodology
- HIV positive gay men

Newly acquired HIV by exposure category

Australia 2004-2008



NCHECR Annual Surveillance Report, 2009

STIs increase HIV transmission

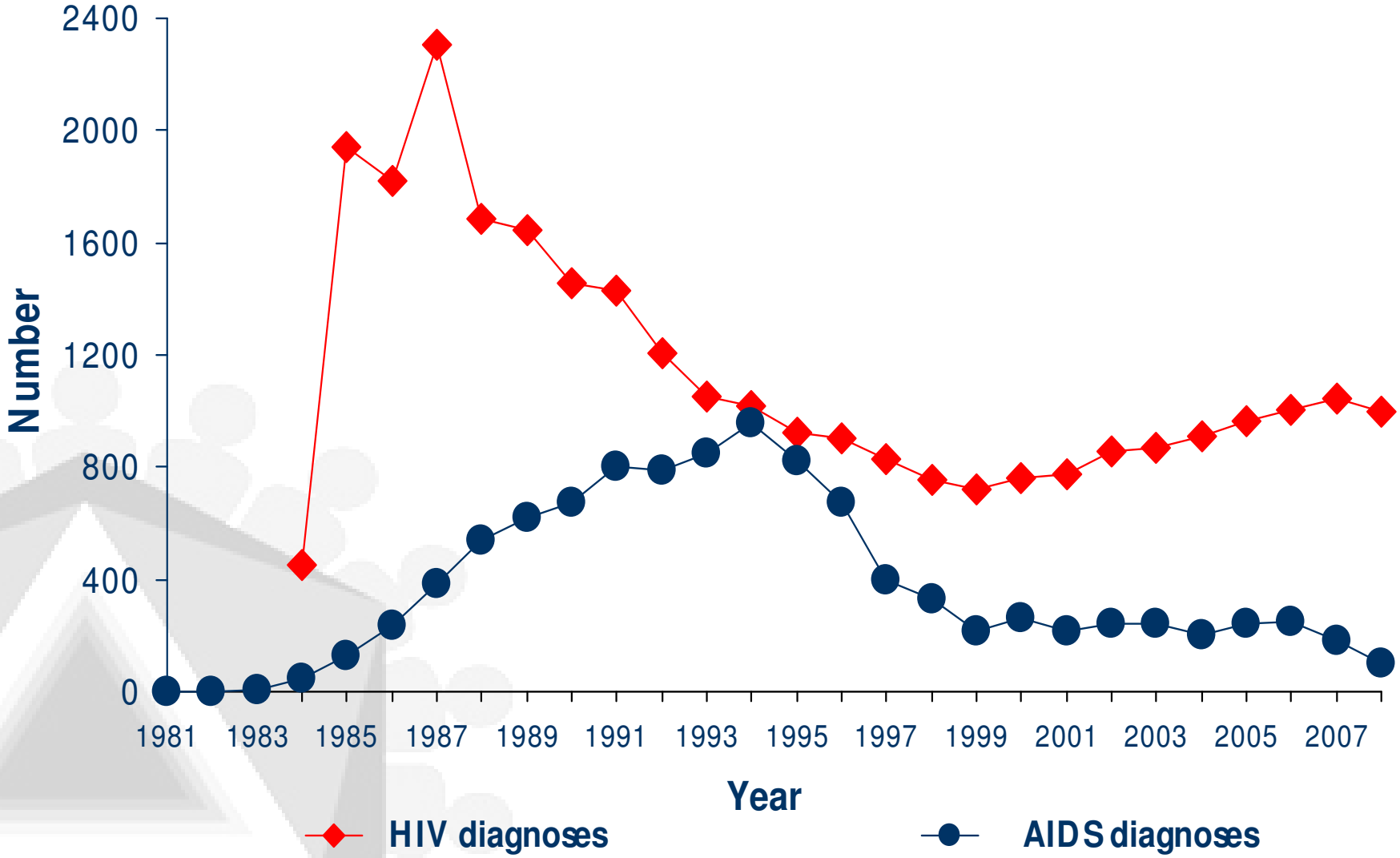
HIM: Anal STIs as independent risk factors for HIV seroconversion

	Adjusted HR	95% CI	P trend value
Anal NG (NAAT)			0.003
No	1	---	
Yes	6.52	1.93-22.06	
Anal warts (self-reported)			0.001
No	1	---	
Yes	3.74	1.70-8.23	
HSV-1 (Prevalent)			0.083
No	1	---	
Yes	2.29	0.90-5.84	
Receptive UAI withdrawal with HIV unknown			<0.001
Receptive UAI to ejaculation with HIV positive			<0.001

HR, hazard ratio; CI: confidence interval

Slide courtesy Dr Jeff Jin, NCHECR

HIV & AIDS diagnoses in Australia



NCHECR Annual Surveillance Report, 2009

Why had HIV rates increased among MSM?

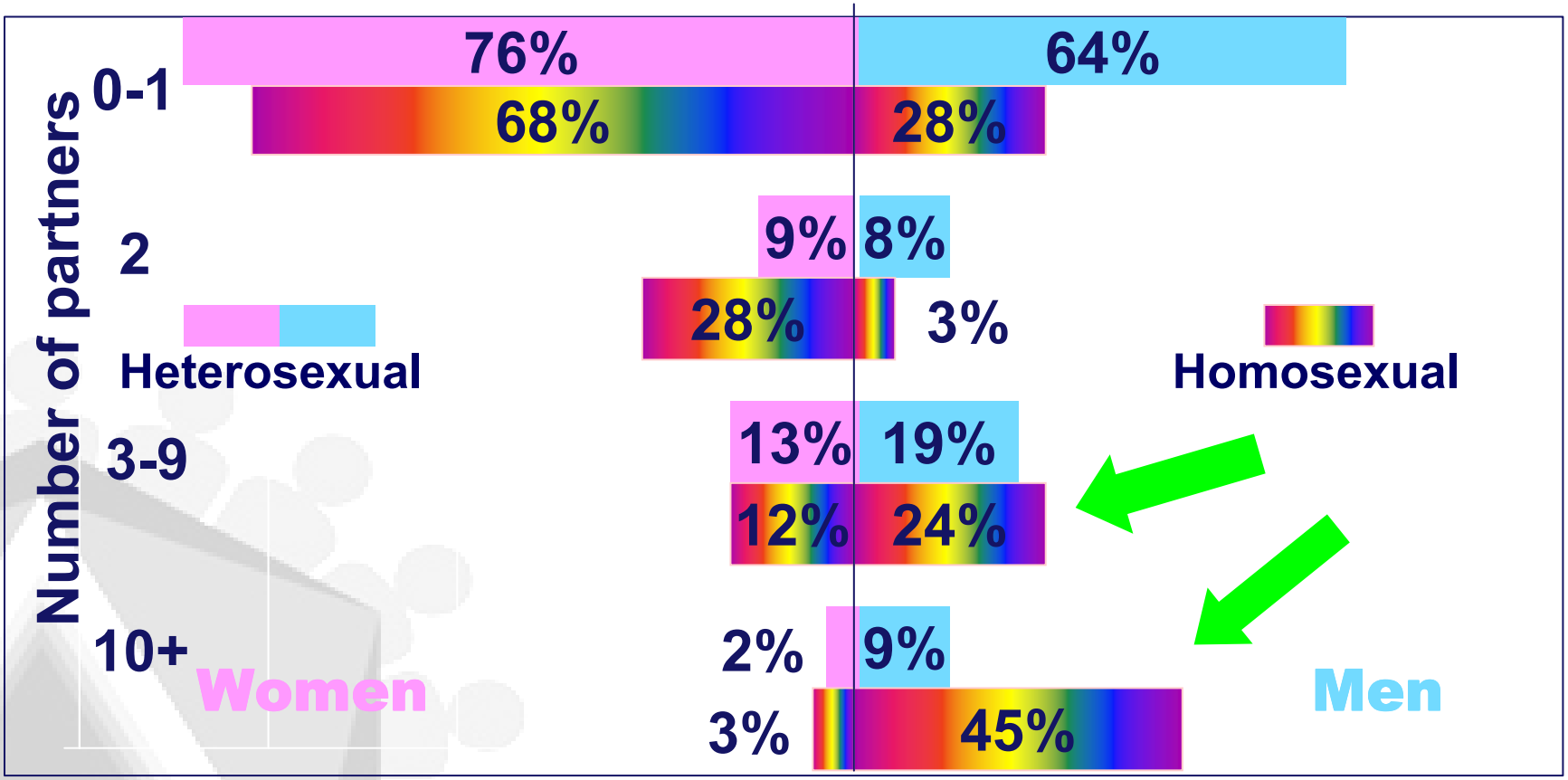
- Mathematical modelling analysis[1] suggested two major factors explained ↑ HIV
  - ↓ condom use
  - **↑ rates of STIs**

Identification & Rx of STIs by regular screening of sexually active MSM likely to be an effective strategy in reducing new HIV infections

(1) Wilson et al. Mathematical models to investigate recent trends in HIV notifications among men who have sex with men in Australia. NCHECR, February 2008

Numbers of partners (5yrs)

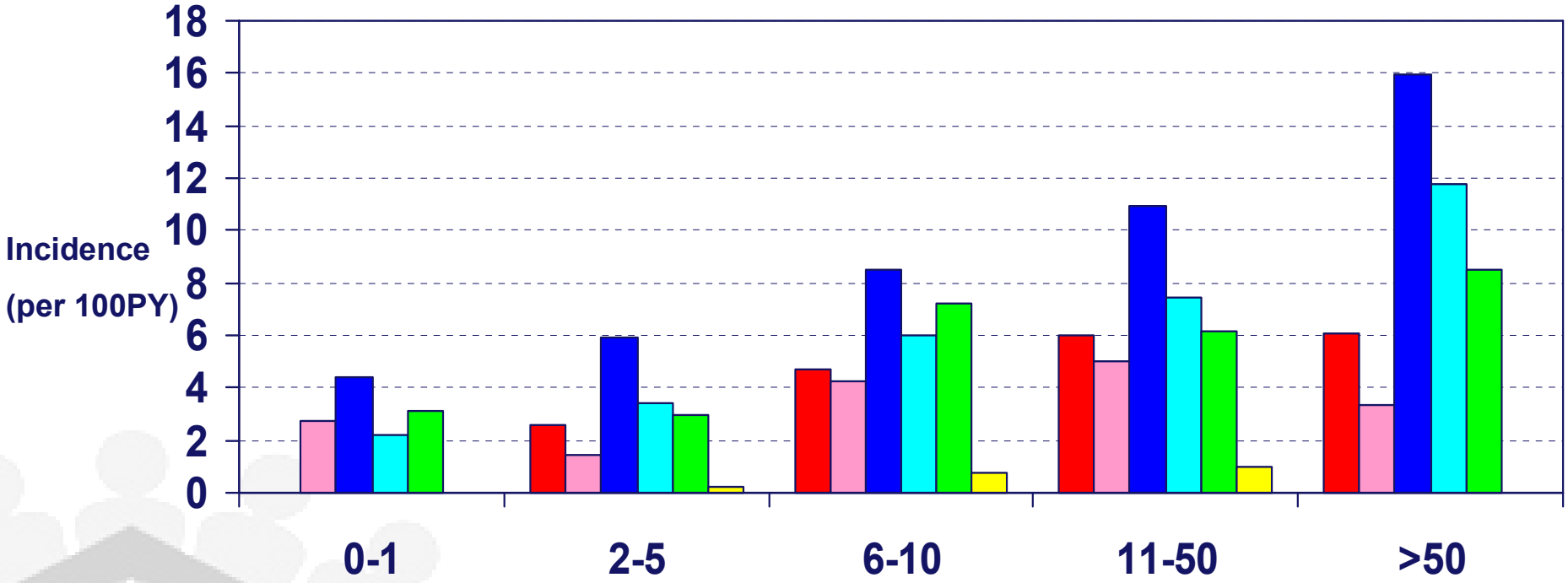
Australian Study of Health & Relationships



De Visser et al. *Aust NZ J Public Health* 2003 (Slide courtesy Prof Basil Donovan)

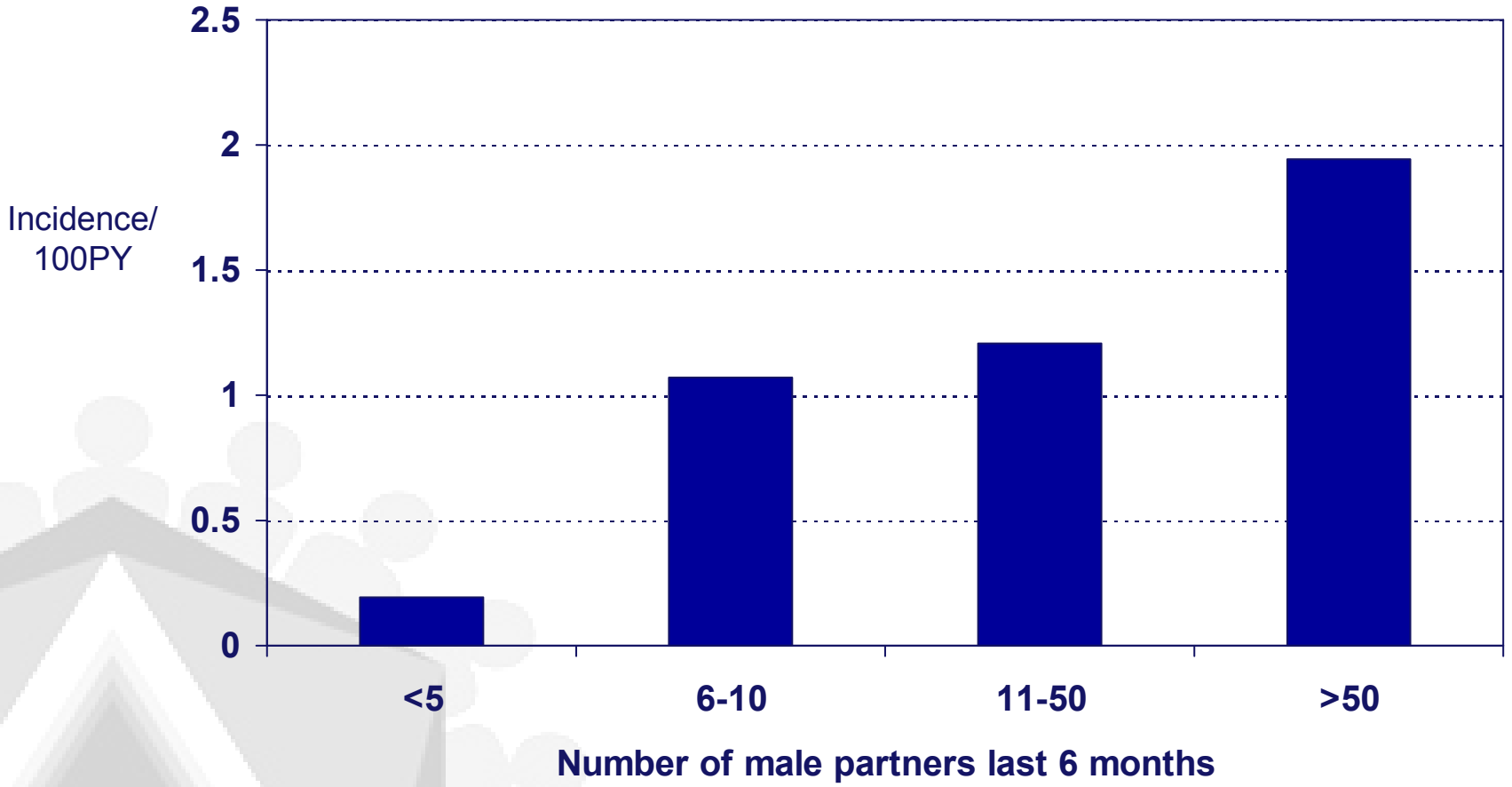
Partner numbers remains a major predictor of STIs in gay men

HIM: NG/CT & partner numbers[1-3]



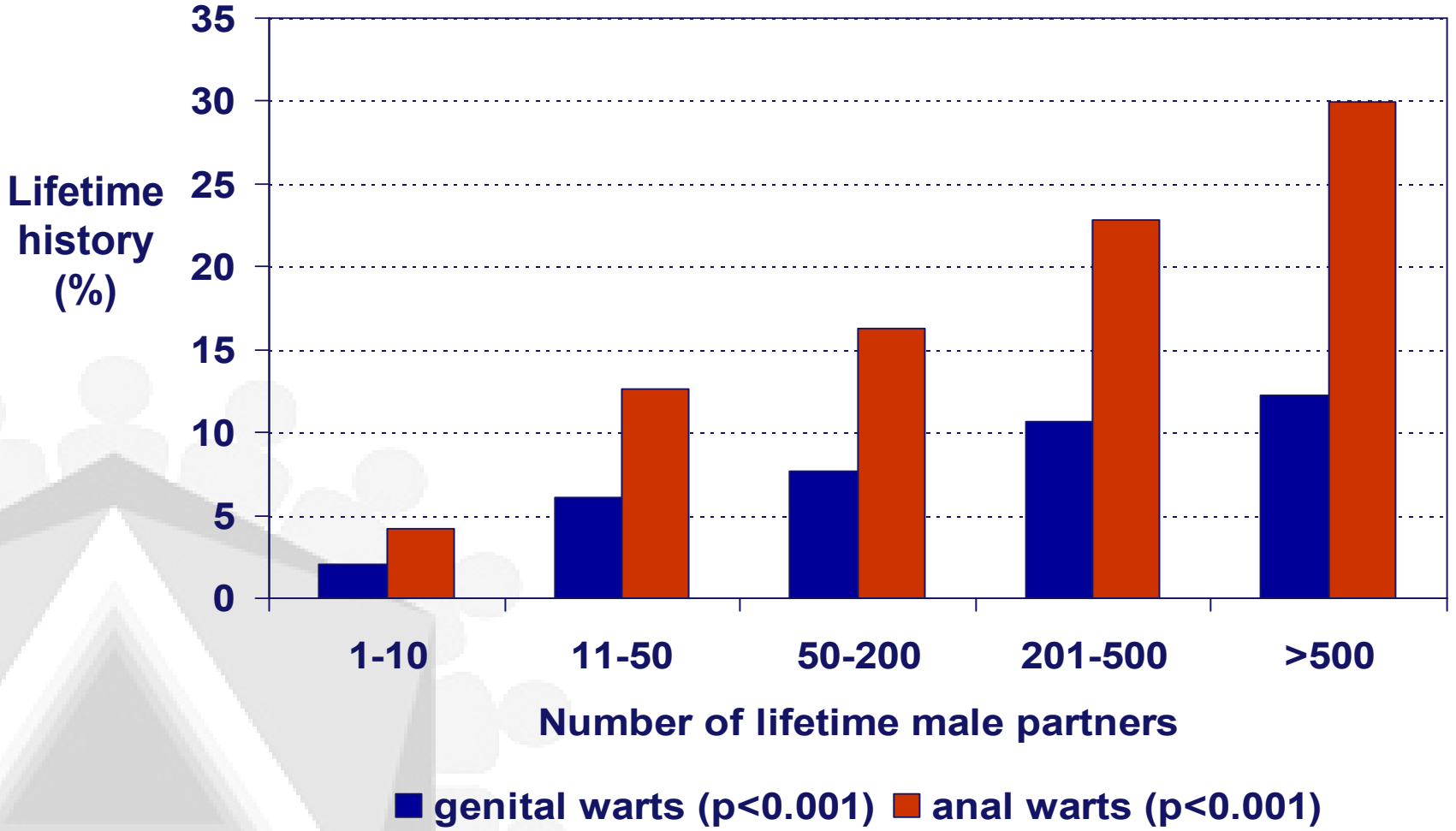
1. Jin et al. Sex Transm Infect 2007;83:113-9
2. Templeton et al. Sex Transm Infect 2008;84:361-3
3. Templeton et al. Sex Transm Infect 2009 *(in press)*

HIM: Syphilis & partner numbers



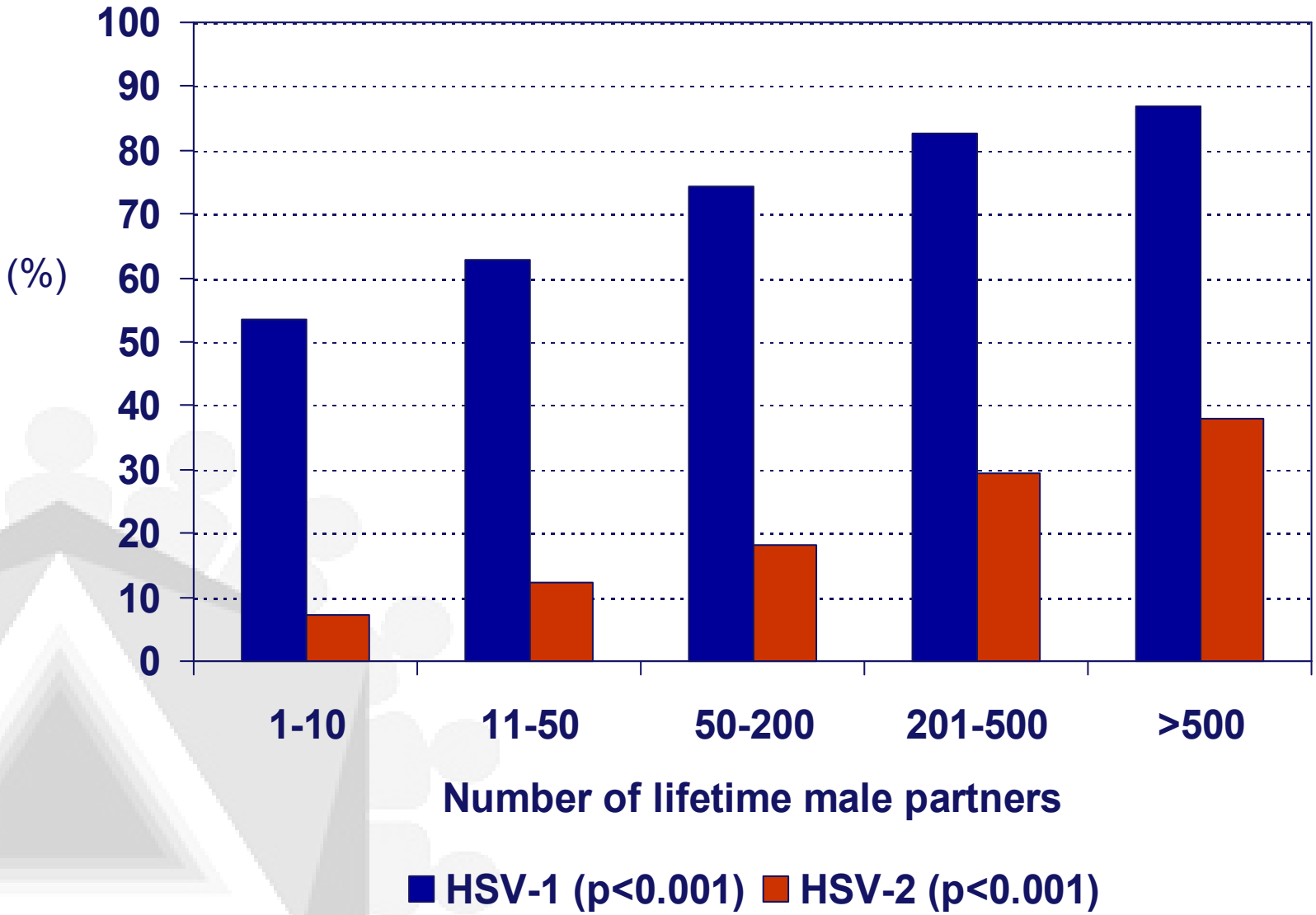
Jin et al. Med J Aust 2005;183:179-183

HIM: Warts & partner numbers



Jin et al. Sex Transm Dis 2007;34:488-93

HIM: Prevalent HSV & partner numbers

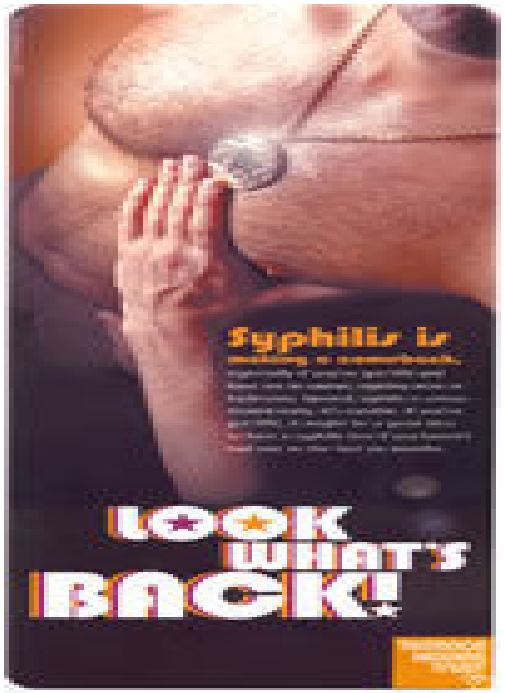


Jin et al. J Infect Dis 2006;194:561-70

More frequent STI screening is indicated in those with more sexual partners

Syphilis

- Re-emerged in most industrialized countries in last decade, mostly in highly sexually active gay men
- Australia 2000-2008
  - Infectious syphilis rates: 1 → 15/100,000
- At least 50% HIV+
  - Incidence 10X higher in pH vs. HIM cohorts[1]
  - UAI with HIV+ partners: major risk factor[1]
- Role of oral sex
  - relatively safe for HIV
  - efficient transmission mode for syphilis[1,2]
- Health promotion activities: little impact
- “Syphilaxis” trial



1. Jin et al. Sex Health 2009;6:281-4
2. Jin et al. Med J Aust 2005;183:179-183

Hepatitis C

- Long debate over possibility of sexual transmission

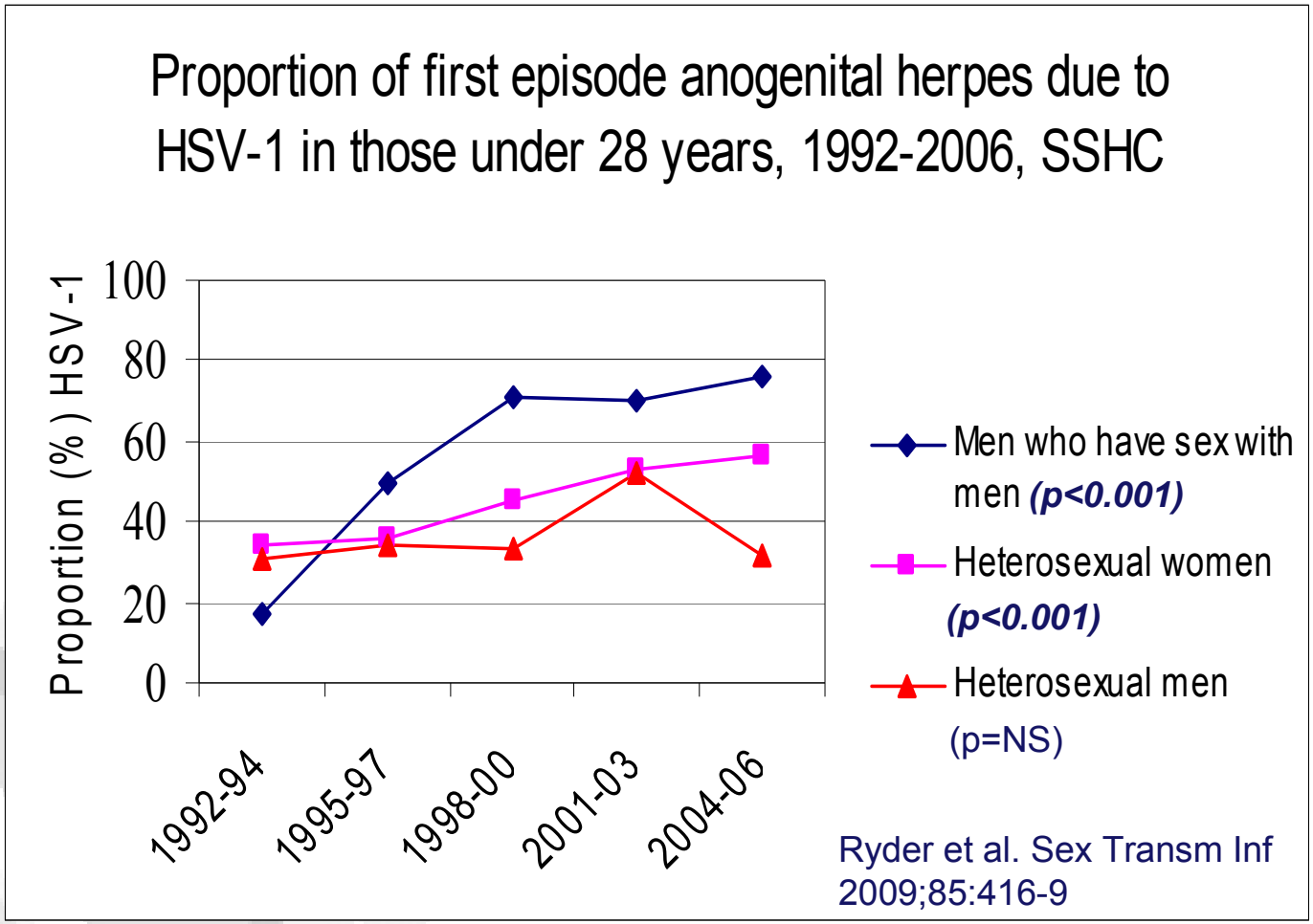
- HIM: HIV negative MSM[1,2]
  - prevalence Australian MSM same as general pop'n[1]
  - Incidence 0.11/100PY
    - 4/5 new HCV infections – no IDU risk[2]

- HIV positive MSM – probable sexual transmission
  - Amsterdam cohort [3]
    - HCV strains different from those circulating in IDUs
    - 60X ↑ risk with Hx IDU, 4X ↑ risk in HIV+
    - >50% - history of genital ulcer disease and traumatic sex

Regular HCV screening for HIV + MSM without BBV risk

1. Jin et al. Aust N Z J Public Health 2005;29:536-9
2. Jin et al. Sex Transm Infect 2010;86:25-8
3. Van de Laar et al. J Infect Dis 2007;196:230-8

Anogenital Herpes Simplex Virus



HSV-1 incidence >10% PY in young MSM (low seroprev & ↑ oral sex in young)

HSV-1 now predominantly an STI in MSM

Jin et al. J Infect Dis 2006;194: 561-70

Gonorrhoea & Chlamydia in HIM

- common except for pharyngeal chlamydia
  - Incidence anogenital chlamydia 2X that of gonorrhoea

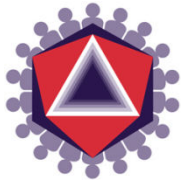
- Symptoms:
  - Urethral gono: vast majority symptomatic – no screening
  - Anal gono/chlamydia: mostly asymptomatic → screen
  - Pharyngeal gono: symptoms not associated → screen

- Wide variety of behavioural risk factors for anogenital infection other than unprotected anal sex
  - e.g. oral sex, digital anal penetration, sex toys

Regular screening for chlamydia and gonorrhoea should be encouraged for all MSM

Urethral & anal NG/CT: Jin et al. Sex Transm Infect 2007;83:113-9
Pharyngeal CT: Templeton et al. Sex Transm Infect 2008;84:361-3
Pharyngeal NG: Templeton et al. Sex Transm Infect 2009 *(Epub Oct 19)*

Anogenital warts in HIM



Genital warts:

- 9% lifetime history
- Incidence 0.9 per 100 PY

Anal warts:

- 20% lifetime history
- Incidence 1.9 per 100 PY

Independent risk factors: younger age & several manual sexual practices

- genital warts: insertive fingering (p trend=0.018)

Anogenital warts commonly transmitted by manual sexual practices

Role of HPV vaccine in prevention?

Jin et al. Sex Transm Dis 2007;34:488-93

Gardasil efficacy in men (1)

- RCT enrolled men age 16-26 <5 lifetime partners
  - no Hx anogenital warts & no anogenital lesions
  - Included 602 MSM

Severity	GARDASIL™ (n = 1,397)		Placebo (n = 1,408)		% Efficacy	95% CI
	Cases	Inc. per 100 PY	Cases	Inc. per 100 PY		
Condyloma	3*	0.1	28	1.0	89.4	65.5, 97.9

Palefsky et al. EUROGIN, France Nov 2008

Gardasil efficacy in men (2)

Efficacy against persistent HPV infection

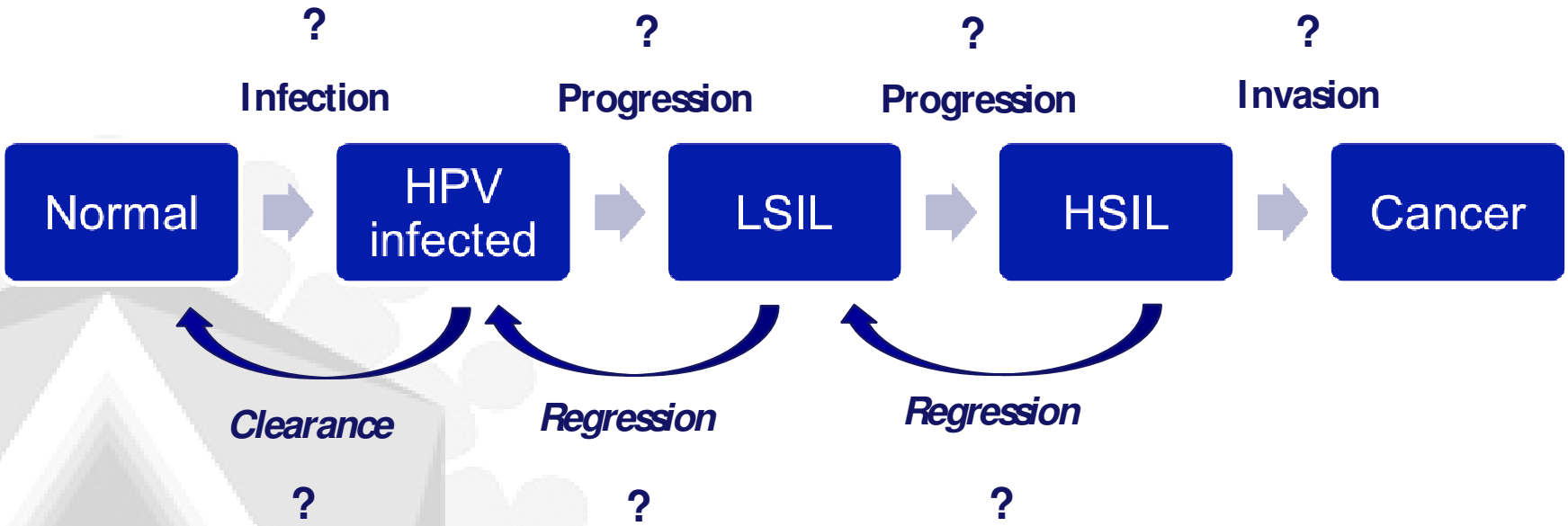
HPV Type	GARDASIL™			Placebo			% Efficacy	95% CI
	n	Cases	Inc. per 100 PY	n	Cases	Inc. per 100 PY		
HPV 6	1,239	4	0.2	1,238	33	1.4	88.0	66.3, 96.9
HPV 11	1,239	1	0.0	1,238	15	0.6	93.4	56.8, 99.8
HPV 16	1,290	9	0.4	1,264	41	1.8	78.7	55.5, 90.9
HPV 18	1,327	1	0.0	1,347	25	1.0	96.0	75.6, 99.9

HPV vax could have substantial impact on HPV-related infection & disease in gay men

Palefsky et al. EUROGIN, France Nov 2008

HPV & anal cancer risk in MSM

HIV positive	90%+	20-50%	1-30%+	40-140/100,000
HIV negative	60-90%	5-15%	0-5%+	20/100,000



Anal cancer rates in MSM are substantially higher than cervical cancer rates were in women before cervical screening was introduced

Slide courtesy Dr Jeff Jin, NCHECR

The role of circumcision in STI/HIV prevention among gay men in HIM

Templeton et al. AIDS 2009;23:2347-51

Templeton et al. J Infect Dis 2009;200:1813-9

Circumcision & incident STI in HIM

STI	Incident cases, no.	Incidence/100PY		Univariate	Multivariate*	
		Circ	Uncirc	HR	HR	p
Urethral gonorrhoea	120	3.06	3.04	1.03 (0.70-1.51)	1.09 (0.72-1.65)	0.67
Anorectal gonorrhoea	107	2.69	2.80	0.96 (0.64-1.44)	0.97 (0.63-1.49)	0.88
Urethral chlamydia	261	6.48	7.06	0.93 (0.72-1.20)	0.98 (0.74-1.30)	0.89
Anorectal chlamydia	176	4.52	4.41	1.03 (0.75-1.42)	1.04 (0.74-1.48)	0.81
Genital warts	33	0.81	1.16	0.70 (0.35-1.42)	0.70 (0.33-1.47)	0.35
Anal warts	60	2.00	1.80	1.10 (0.64-1.92)	1.13 (0.63-2.02)	0.69
HSV-1	33	5.77	5.17	1.12 (0.53-2.35)	1.18 (0.51-2.74)	0.70
HSV-2	28	1.30	1.78	0.74 (0.35-1.58)	0.66 (0.27-1.61)	0.36
Syphilis	20	0.32	0.85	0.39 (0.16-0.94)	0.36 (0.15-0.89)	0.026

*Adjusted for age & behavioural risk factors for each infection

Templeton et al. J Infect Dis 2009;200:1813-9

Circumcision & HIV in HIM

Entire cohort

	n	Incidence (per 100PY)	Univariate HR	Univariate 95% CI	Univariate p	Multivariate* HR	Multivariate* 95% CI	Multivariate* p
Circumcised					0.532			0.424
No	17	1.02	1	---		1	---	
Yes	29	0.83	0.83	0.45-1.50		0.78	0.42-1.45	

* adjusted for age and potentially serodiscordant UAI

Templeton et al. AIDS 2009;23:2347-51

Circumcision & HIV in HIM

Entire cohort

	n	Incidence (per 100PY)	Univariate HR	Univariate 95% CI	Univariate p	Multivariate* HR	Multivariate* 95% CI	Multivariate* p
Circumcised					0.532			0.424
No	17	1.02	1	---		1	---	
Yes	29	0.83	0.83	0.45-1.50		0.78	0.42-1.45	

* adjusted for age and potentially serodiscordant UAI

Participants who preferred insertive role in anal intercourse

	n	Incidence (per 100PY)	Univariate HR	Univariate 95% CI	Univariate p	Multivariate* HR	Multivariate* 95% CI	Multivariate* p
Circumcised					0.049			0.041
No	5	0.92	1	---		1	---	
Yes	2	0.17	0.19	0.04-0.99		0.11	0.01-0.92	

* adjusted for age and potentially serodiscordant UAI

Templeton et al. AIDS 2009;23:2347-51

A circumcision intervention among gay men is unlikely to have a major impact on acquisition of HIV and most STIs

STIs in HIV neg vs. HIV pos men

	pH cohort	HIM cohort	Comparison after age adjustment
	Prevalence (%)	Prevalence (%)	OR (95% CI)
Hepatitis A	74.5	69.4	1.0 (0.7-1.5)
Hepatitis B			
Prior infection	56.0	18.6	**3.4 (2.4-4.7)**
Vaccination	23.6	52.8	**0.4 (0.2-0.5)**
Syphilis			
Baseline seropositivity	18.6	3.0	**3.6 (2.3-5.7)**
Gonorrhoea			
Urethral gonorrhoea	0.0	0.1	N/A
Anal gonorrhoea	2.9	1.1	**4.8 (1.8-12.4)**
Chlamydia			
Urethral chlamydia	1.7	0.7	**3.4 (1.0-11.5)**
Anal chlamydia	3.8	1.8	**2.2 (1.1-4.6)**

Jin et al. Sex Transm Infect 2007; 83:397-9

- **Most STIs more common in HIV positive than HIV negative gay men**

- **HBV vaccination less common**

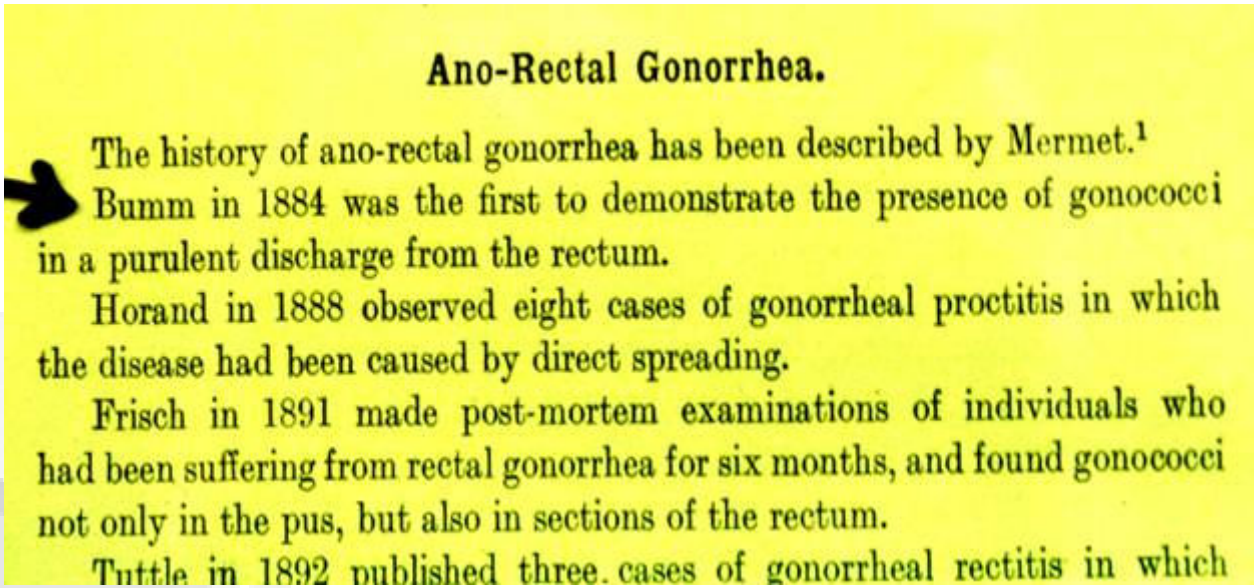
Ensure integration of STI testing into HIV care

In conclusion…

- MSM unlikely to adopt behaviour change for STI (other than HIV) prevention
- Regular STI screening (& vaccination) remains the cornerstone of STI control in MSM
  - Risk assessment (partner nos, unprotected anal sex) guides frequency
  - Screen all 3 sites irrespective of reported behaviour
  - Specifically target highly sexually active HIV+ MSM
- Sexual history is essential component of healthcare for MSM
  - “Do you have sex with men, women or both”
  - “In the last year, what proportion of time have you used condoms for anal sex?”
  - “How many male sexual partners have you had in the last year?”

And finally a bit of history….

“Bum(m) Gonorrrhoea”



Ano-Rectal Gonorrhea.

The history of ano-rectal gonorrhea has been described by Mermet.[1] Bumm in 1884 was the first to demonstrate the presence of gonococci in a purulent discharge from the rectum.

Horand in 1888 observed eight cases of gonorrheal proctitis in which the disease had been caused by direct spreading.

Frisch in 1891 made post-mortem examinations of individuals who had been suffering from rectal gonorrhea for six months, and found gonococci not only in the pus, but also in sections of the rectum.

Tuttle in 1892 published three cases of gonorrheal rectitis in which

Acknowledgments

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- Dr Nathan Ryder (SSHC)