CHLAMYDIA TRACHOMATIS INCIDENCE FROM SELF-REPORTS AND SEROLOGY BY GENDER, AGE-PERIOD AND PARTNER NUMBERS IN A BIRTH COHORT

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BACKGROUND

Better understanding of the epidemiology of *Chlamydia trachomatis* would assist in prevention and control, which is currently focussed on those aged <25 years.[1] Research is hindered by asymptomatic infections and analyses based upon clinical data; care must be taken when extrapolating such findings as they depend on who is being tested.[2] Improved serological detection of Chlamydia infection in epidemiological studies could more confidently estimate past exposure.[3,4]

To assess this, we explored Chlamydia incidence by age-period in a cohort study, using a combination of a recently characterised serological assay (with higher sensitivity* than commercially available assays and proven antibody persistence)[4] and self-reported diagnoses.

** Assay sensitivity is significantly higher in women (83%) than men (54%), so serology will undercount infections in men more than women and, therefore, cannot be used to compare by gender.*

METHODS

- Sexual health (including self-reported Chlamydia diagnosis) and behaviour information was collected from a cohort of 1,037 participants born in Dunedin, New Zealand in 1972/3, at regular intervals up to age 38.
- Sera drawn at ages 26, 32 and 38 were tested for antibodies to C. *trachomatis*-specific Pgp3 antigen using a sandwich enzyme-linked immunosorbent assay.
- Chlamydia incidence, calculated using self-reported diagnoses and seropositivity, was examined by age-period (up to age 26; 26–32; and 32–38 years) and sexual behaviour for men and women; incidence rate ratios were modelled using Poisson regression.

RESULTS

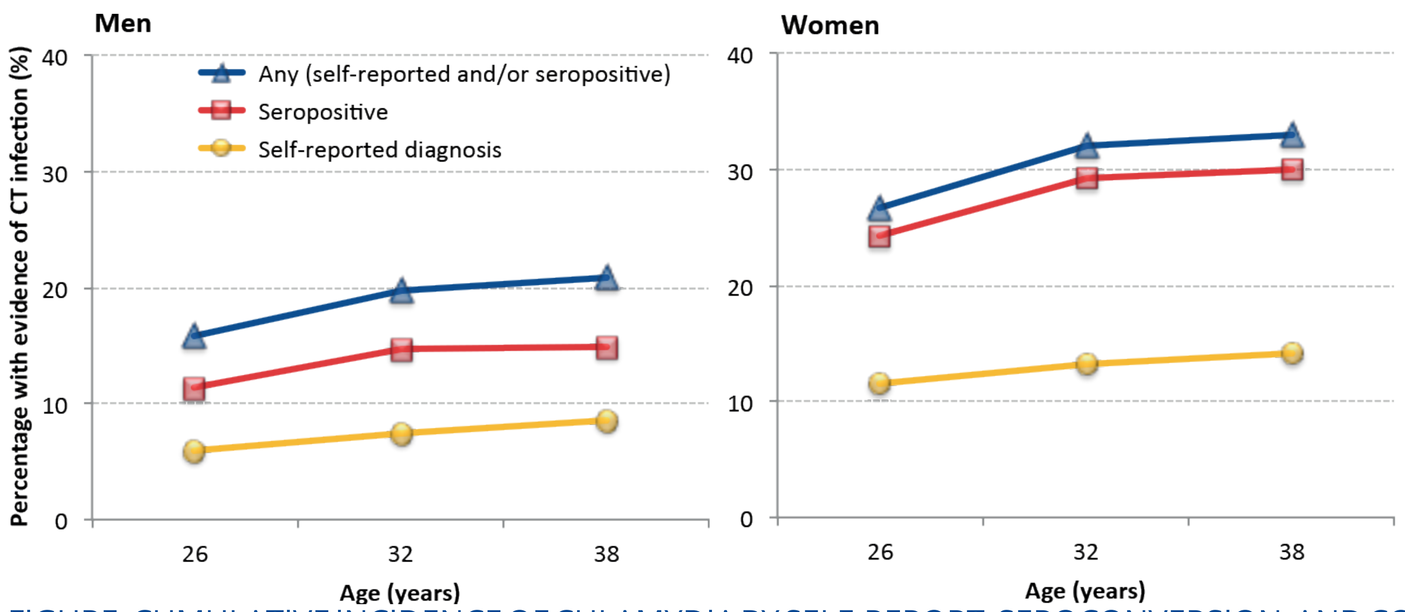

FIGURE: CUMULATIVE INCIDENCE OF CHLAMYDIA BY SELF-REPORT, SEROCONVERSION, AND COMBINED EVIDENCE AT EACH AGE PERIOD BY GENDER

- At age 38, 75.8% of men and 76.3% of women had serology and questionnaire data for all three age-periods.
- By age 38, 20.9% of men and 33.0% of women had evidence of past Chlamydia infection (see Figure).
- The highest incidence was from first coitus to age 26 years; 16.0 and 25.6 per 1000 person-years in men and women, respectively.
- Incidence rates dropped in the subsequent age-periods, but for men and women in all age-periods rates increased with increasing number of sexual partners.
- After adjusting for confounders, age-period was not associated with the risk of Chlamydia; number of partners was the only signifiant determinant of risk for men and women (see Table).

TABLE: INCIDENCE RATE RATIOS FOR CHLAMYDIA BY AGE PERIOD, NUMBER OF PARTNERS AND AGE OF FIRST COITUS, IN MEN AND WOMEN

	Men						Women					
	Crude			Adjusted*			Crude			Adjusted*		
	IRR	(95% CI)	P-value	IRR	(95% CI)	P-value	IRR	(95% CI)	P-value	IRR	(95% CI)	P-value
Age-period												
First coitus – 26 years	Reference											
26–32 years	0.70	(0.45–1.07)		1.06	(0.66–1.70)		0.52	(0.36–0.75)		1.12	(0.73–1.71)	
32–38 years	0.44	(0.27–0.73)	0.005	0.94	(0.53–1.64)	0.922	0.21	(0.12–0.36)	<0.001	0.61	(0.34–1.12)	0.150
Number of sexual partners in the period												
0–1	Reference											
2–4	2.85	(1.24–6.56)		2.31	(0.97–5.52)		3.69	(1.89–7.20)		3.28	(1.66–6.49)	
5–9	4.02	(1.81–8.90)		3.92	(1.72–8.92)		6.05	(3.14–11.66)		4.97	(2.46–10.06)	
10 or more	6.42	(3.08–13.40)	<0.001	6.03	(2.70–13.49)	<0.001	10.65	(5.81–19.51)	<0.001	7.97	(3.95–16.06)	<0.001
Age of first coitus (years)												
≥18	Reference											
15–17	1.18	(0.75–1.86)		0.93	(0.58–1.49)		1.65	(1.06–2.59)		1.01	(0.64–1.61)	
≤14	1.69	(1.02–2.80)	0.115	1.01	(0.58–1.76)	0.916	2.28	(1.38–3.78)	0.006	1.11	(0.65–1.91)	0.879

** Adjusted for all variables in the table, and same-sex sexual contact in the period and highest educational qualification.*

CONCLUSIONS

Chlamydia infection was very common amongst this cohort by age 38. However, the age-specific incidence rate up to 26 years for women was lower than estimates in other countries for similiar age ranges,[5,6] suggesting the cumulative incidence in other populations will now be even greater.

The individual risk of incident infection was not significantly different when aged 26–38 years than when younger (after accounting for partner numbers); emphasizing that Chlamydia testing is an important public health measure, and must also be considered for those aged >24 years who have multiple partners.

REFERENCES

1 European Centre for Disease Prevention and Control. Chlamydia control in Europe.: Stockholm, 2009.
2 Op de Coul EL, et al. Who participates in the Dutch Chlamydia screening? A study on demographic and behavioral correlates of participation and positivity. Sexs trans disss 2012;39(2):97-103.
3 Johnson AM, Horner P. A new role for Chlamydia trachomatis serology? Sex trans inf 2008;84(2):79-80
4 Horner P, et al. Sensitive detection of Chlamydia trachomatis Pgp3 antibody demonstrates antibody persistence and correlates with self-reported infection and behavioural risks in a blinded cohort study. 2015
5 Price MJ, et al. Incidence of Chlamydia trachomatis infection in women in England: two methods of estimation. Epidemiol Infect 2013:1-15.
6 Walker J, Tabrizi SN, Fairley CK, et al. Chlamydia trachomatis incidence and re-infection among young women--behavioural and microbiological characteristics. PloS one 2012;7(5):e37778

ACKNOWLEDGEMENTS / DISCLOSURE OF INTEREST

This study was funded by Health Research Council of New Zealand, Public Health England and the NIHR BRC at Imperial College. No pharmaceutical grants were received in the development of this study.