

# How do you like your gonorrhoea: dead or alive?



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# Dead is better...?

- Our experiences with gonorrhoea since 1999
- Performance of the cobas 4800 CT/NG assay
- Female urines are still rubbish
- What are we finding?



# 2000: Amplicor Study with Wellington SHC

- 562 Paired samples for culture and PCR provided by WSHC

Pre 16s All specimens			
		Culture+	Culture-
	PCR+	5	9
	PCR-	0	548
Sens	1		
Spec	0.983871		
PPV	<b>0.357143</b>		
NPV	1		

Males			
		Culture+	Culture-
	PCR+	5	4
	PCR-	0	243
Sens	1		
Spec	0.983806		
PPV	<b>0.555556</b>		
NPV	1		

Females			
		Culture+	Culture-
	PCR+	0	5
	PCR-	0	305
Sens	#DIV/0!		
Spec	0.983923		
PPV	0		
NPV	1		

Post 16s All specimens			
		Culture+	Culture-
	PCR+	5	1
	PCR-	0	556
Sens	1		
Spec	0.998205		
PPV	<b>0.833333</b>		
NPV	1		

Males			
		Culture+	Culture-
	PCR+	5	1
	PCR-	0	246
Sens	1		
Spec	0.995951		
PPV	<b>0.833333</b>		
NPV	1		



Rubbish Performance

# 2006: Where's the gono?

- A case of PID that occurred post TOP was found to have *N. gonorrhoeae* that had not been detected on routine screening by the referrer (unpublished clinic report). **? Culture missing infections**
- Developed a panel of PCR's for *Trichomonas vaginalis*, *Ureaplasma* species, *Mycoplasma genitalium* and used Amplicor + GyrA for NG on 300 self-taken swabs.

Organism	N positive	%
<b>Neisseria gonorrhoeae</b>	<b>0</b>	<b>0</b>
Mycoplasma genitalium	26	8.7
Trichomonas vaginalis	6	2
Ureaplasma parvum	165	55
Ureaplasma urealyticum	39	13
Ureaplasma Co-infection	20	6.7



# How to improve specificity & PPV?

- Two targets (or more) are better than one

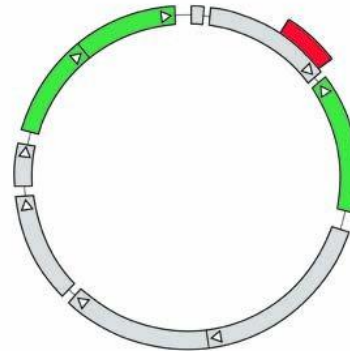
## EDITORIAL

*Chlamydia trachomatis*

A new genetic variant of *Chlamydia trachomatis*

Björn Herrmann

A thrilling story in Sweden, with global impact



## Clinical Details.

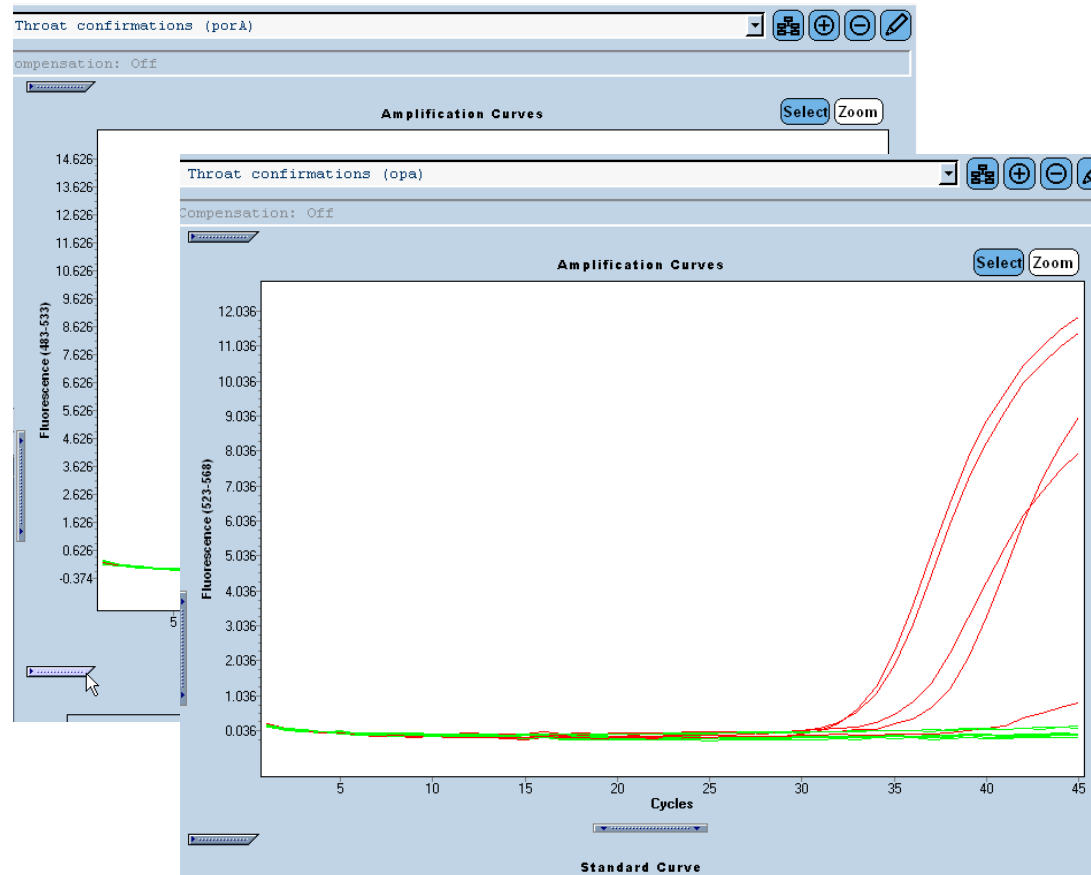
upst 6/52 ago, 3/52 hx dysuria and discharge ? chlamydia and gonorrhea , girl was from Sweden

# Time to re-evaluate...

- Retrospective comparison of culture with cobas CT/NG test results in 18,247 urogenital and 666 non genital samples submitted for both CT and NG testing.
- Analytical specificity assessed using a panel of bacterial isolates comprising Neisseria and non-Neisseria species.
- Required >95% specificity and >90%, PPV (Dimech et al 2004, Smith et al 2005).
- Discordant samples were further investigated by in-house real-time PCR assays (porA, opa targets) and clinical records where available.

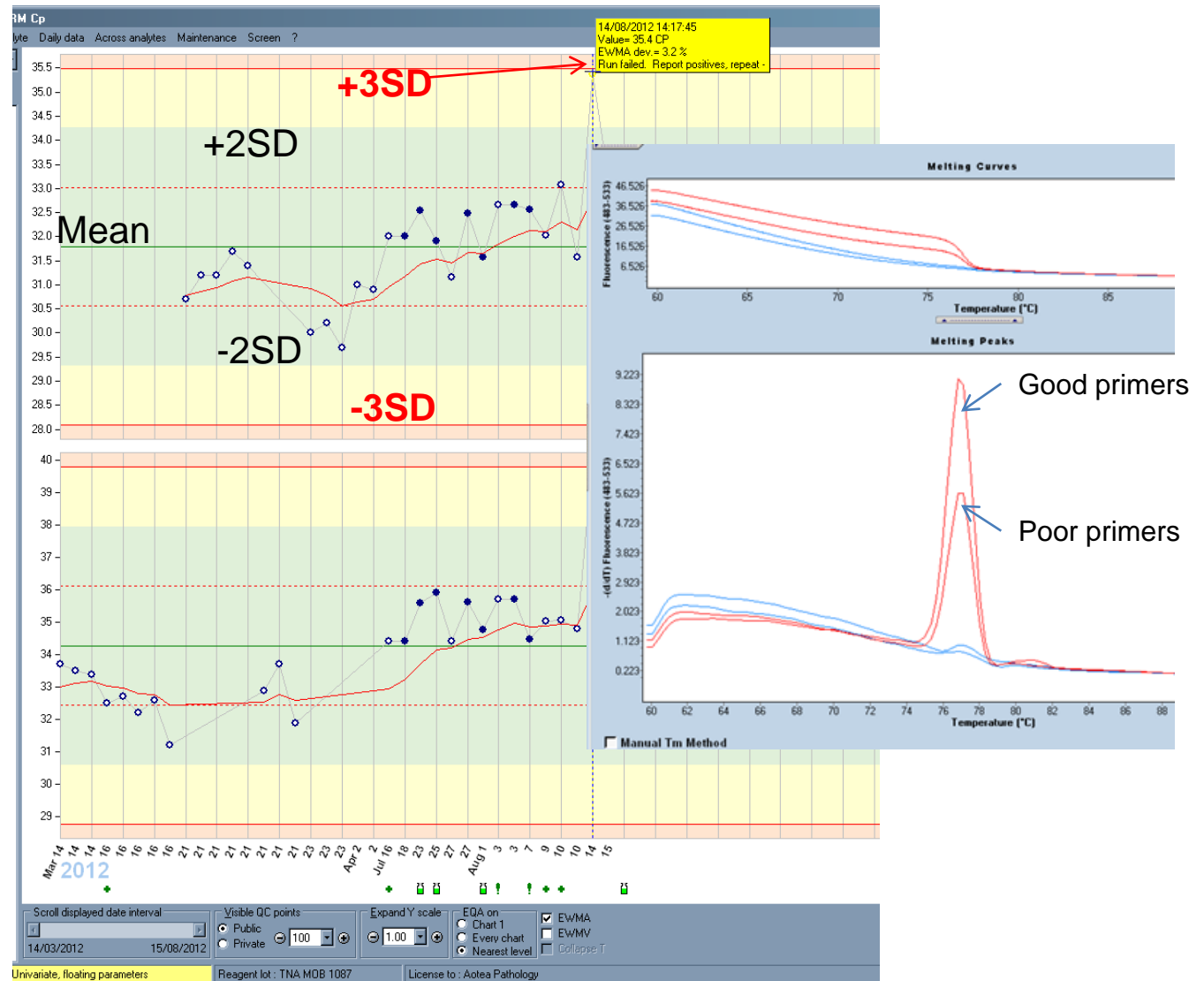


# PorA +opa confirmatory assay



Aotea Pathology will provide porA/opa supplementary testing for referred specimens.  
Contact Dr Collette Bromhead for inquiries: [cbromhead@apath.co.nz](mailto:cbromhead@apath.co.nz)

# Quality assurance of in-house confirmatory assays





# Assay Performance – All Specimens

Table 1: Performance of the cobas 4800 NG assay by specimen type

Specimen	N	Sensitivity	Specificity	PPV	NPV
Urogenital *	18,247	98.7%	99.9%	93.7%	100%
Non-genital	666	100%	99.8%	92.9%	100%
All	18,913	98.6%	99.9%	91.7%	100%

\*Genital swabs and urines were grouped as “Urogenital” specimens for analytical purposes.



# Disadvantages of retrospective audits

- Insufficient throat swabs as nobody tests for CT in throat\* → still confirming all non-genital positives

\*Look again! We have found 4 Throat CT positives now that this site is being routinely tested.

- Historical specimens had been discarded therefore could not confirm discrepant.

# Urine specimens

- Not recommended for females
  - Low sensitivity
  - Not suitable as a sole screening specimen for females

Specimen	N	Sensitivity	Specificity	PPV	NPV
Female urine	570	86.7%	100%	100%	99.6%
Male urine	986	100%	100%	100%	100%



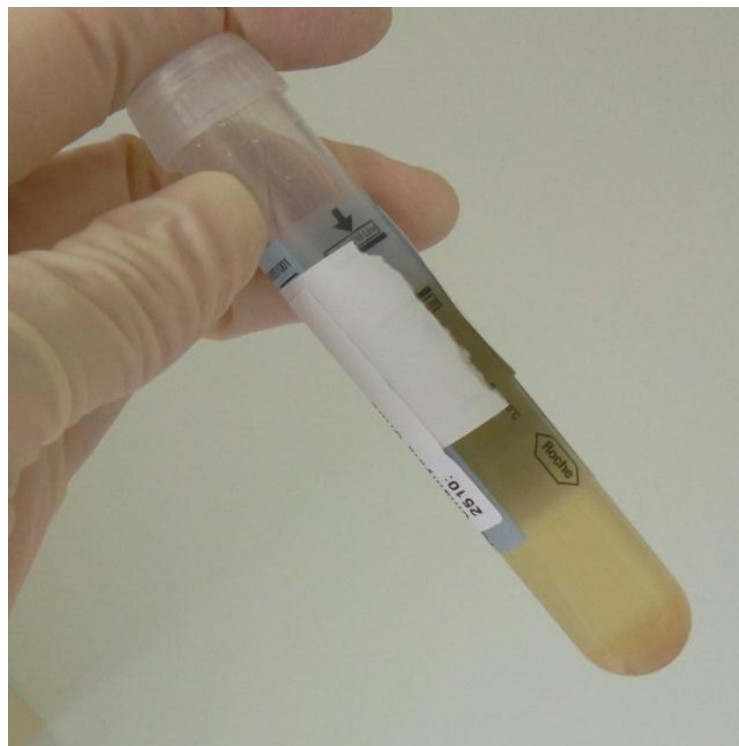
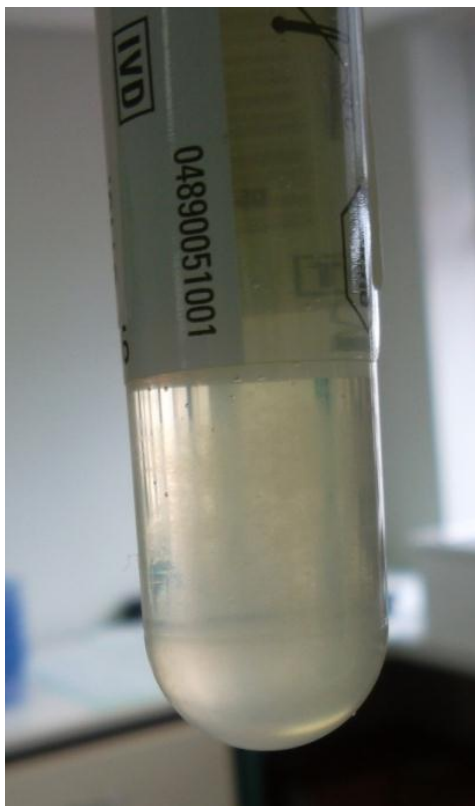
# Analytical and Clinical Specificity

**Table 1: Analytical specificity panel**

Panel name	Organism 1	Organism 2	Organism 3	Organism 4	Organism 5	NG PCR
Eye 1	<i>H. influenzae</i>	<i>S. pneumoniae</i>	<i>S. aureus</i>	<i>S. epidermis</i>		Neg
Eye 2	<i>S. viridians</i>	<i>H. influenzae</i>	<i>H. parainfluenzae</i>	<i>H. influenzae</i>		Neg
Rectal 1	<i>E. faecalis</i>	<i>S. epidermis</i>	<i>E. coli</i>	<i>F. neophorum</i>		Neg
Rectal 2	<i>C. albicans</i>	<i>S. agalactiae</i>	<i>E. faecium</i>	<i>C. freundii</i>		Neg
Throat 1	<i>S. pyogenes</i>	<i>S. viridians</i>	<i>C. albicans</i>	<i>N. meningitidis</i>	<i>F. necrophorum</i>	Neg
Throat 2	<i>N. meningitidis</i>	<i>N. meningitidis</i>	<i>S. aureus</i>	<i>N. lactamica</i>		Neg
Geni (M)	<i>C. albicans</i>	<i>C. glabrata</i>				Neg
Geni (F)	<i>C. albicans</i>	<i>S. agalactiae</i>	<i>L. acidophilus</i>	<i>C. glabrata</i>	<i>G. vaginalis</i>	Neg
Urine 1	<i>S. saprophyticus</i>	<i>K. pneumoniae</i>	<i>E. coli</i>	<i>C. freundii</i>		Neg
Urine 2	<i>S. marcescens</i>	<i>E. faecium</i>	<i>E. faecalis</i>	<i>P. mirabilis</i>		Neg
Skin 1	<i>A. Colcoaecticus</i>	<i>S. pyogenes</i>	<i>M. luteus</i>			Neg
Skin 2	<i>S. aureus</i>	<i>S. viridians</i>	<i>C. albicans</i>	<i>E. coli</i>		Neg
Staph	<i>S. aureus</i>	<i>S. aureus</i>	<i>S. epidermis</i>	<i>S. saprophyticus</i>		Neg
Strep	<i>S. pyogenes</i>	<i>S. agalactiae</i>	<i>S. viridians</i>	<i>S. pneumoniae</i>		Neg
Coliforms	<i>E. coli</i>	<i>K. pneumoniae</i>	<i>S. marcescens</i>			Neg
NG	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>		Pos
Resistant NG	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>	<i>N. gonorrhoeae</i>		Pos
Other Neisseria 1	<i>N. Lactamica</i>	<i>N. subflava</i>	<i>N. meningitidis</i>	<i>N. meningitidis</i>		Neg
Other Neisseria 2	<i>N. cinerea</i>	<i>N. meningitidis</i>	<i>N. sicca</i>	<i>N. flava</i>		Neg



# Why do PCR tests fail?



Interference from muco-purulent discharge

(Miller et al 2012, STD J.)



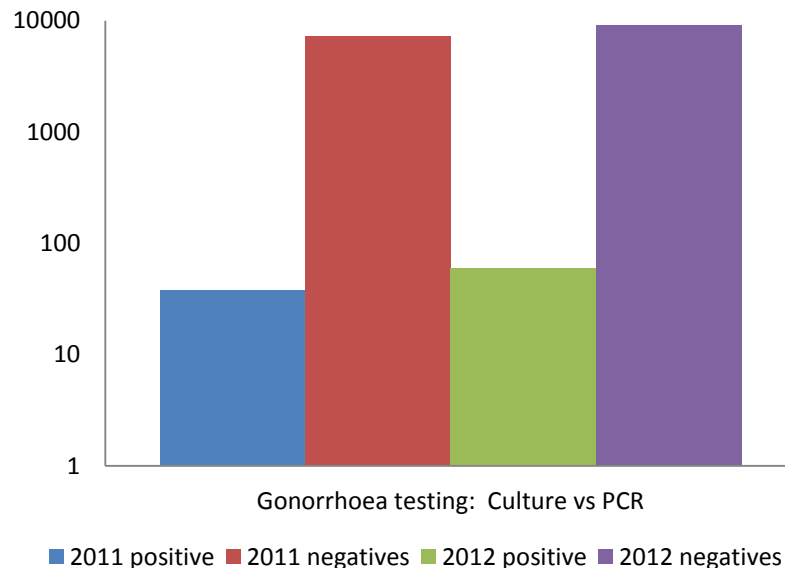
# Why would you ask for a culture?

1. Treatment failure
2. Medico-legal requirements
3. Infant eye swabs
4. Failed PCR results
5. Allergy to empiric treatment
6. Surveillance of Ceftriaxone MIC's

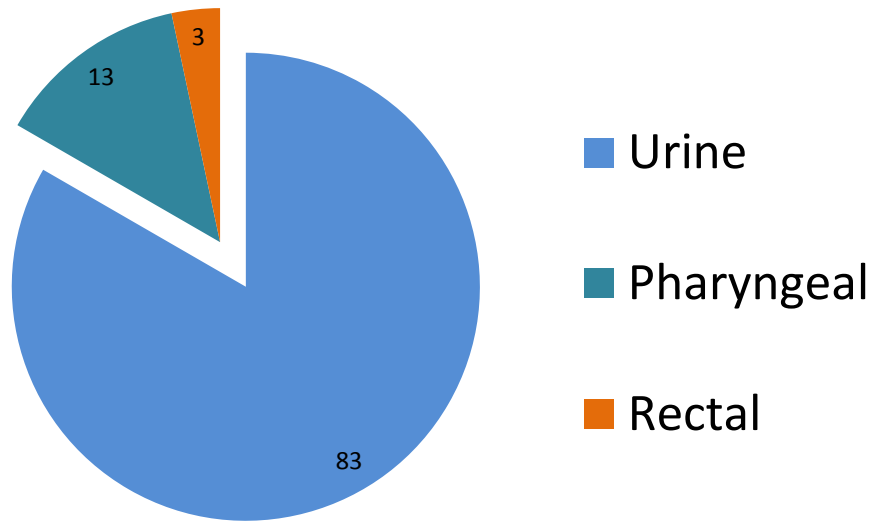


# What are we finding?

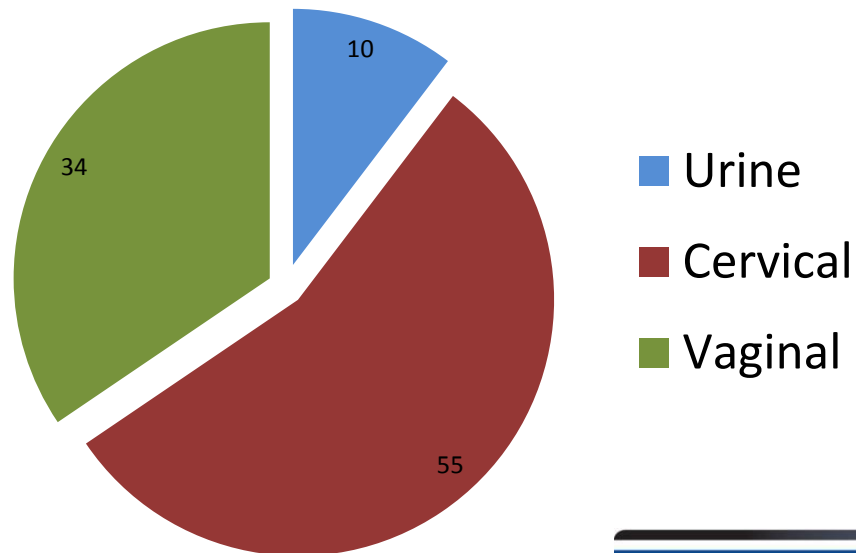
- A statistically significant 27% increase in number of patients tested for gonorrhoea between 2011 and 2012 ( $p < 0.001$ )
- 55% increase in number of positive patients (not significant  $p = 0.39$ )



**Males: % Infections by site**



**Females: % Infections by site**





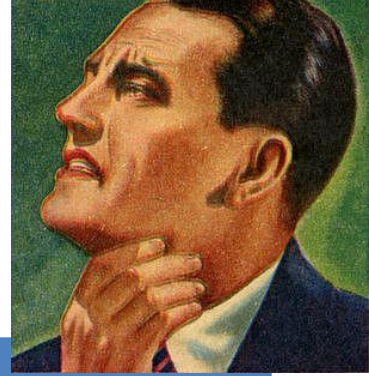
# Surveillance

- 8 cultures performed on symptomatic WSHC patients

Site	Culture	MIC Ceftriaxone(mg/L)	PCR result?
Urethral	Negative		Negative
Urethral	<b>Positive</b>	0.047	<b>Positive</b>
Urethral	Negative		Negative
Urethral	Negative		Negative
Urethral	<b>Positive</b>	0.003	<b>Positive</b>
Urethral	<b>Positive</b>	0.004	<b>Positive</b>
Throat	Negative		<b>Positive</b> (previous test)
Throat	<b>Positive</b>	0.004	<b>Positive</b> (from culture swab)



# Chlamydia in throat?



## Pharyngeal CT/NG Results

Total tested = 278

Chlamydia positive

4 (1.4% of throats tested)

N. gonorrhoeae positive

9 (3.2% of throats tested)

*Scandinavian Journal of Infectious Diseases*, 2011; Early Online, 1–5

**informa**  
healthcare

## ORIGINAL ARTICLE

### Pharyngeal Chlamydia trachomatis is not uncommon any more

ANDREAS KARLSSON<sup>1</sup>, ANDERS ÖSTERLUND<sup>2</sup> & ANNIKA FORSSÉN<sup>1</sup>

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<sup>2</sup>Department of Communicable Disease Prevention and Control, Norrbotten County Council, Luleå, Sweden

- 10% of people with a genital CT infection also had a pharyngeal infection
- 4% of adults with throat symptoms had pharyngeal CT

# Thanks for listening

- Amanda Miller and Nadika Liyanarachchy (APL)
- Mackenzie Nicol, Dr Mark Jones and the Microbiology department (APL)
- Bronwyn Morris (ESR)
- David Whiley (QPID)