

An Outbreak of *Neisseria meningitidis* Urethritis Among Men Seeking STD Care in Columbus, Ohio



Abigail Norris Turner, PhD¹, Courtney Maierhofer, MPH¹, Denisse B. Licon, PhD, MPH², Bob Kirkcaldy, MD, MPH³, Elizabeth Briere, MD, MPH³, Melissa Ervin, MT (ASCP)², Tiffany Krauss, RN, BSN², Xin Wang, PhD³, Karen Fields, RN, BSN, MS², Cecilia B. Kretz, PhD³, A. Jeanine Abrams, PhD³, Amanda Dennison, MPH⁴, David Trees, PhD³, Carlos del Rio, MD⁵, David S. Stephens, MD⁵, Yih-Ling Tzeng, PhD⁵, Mysheika Williams Roberts, MD, MPH² and Jose A. Bazan, DO²

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INTRODUCTION

- Neisseria meningitidis* (Nm) is a Gram-negative diplococcus
 - present in the nasopharynx of ~10% of healthy individuals in the general population¹
 - can cause life-threatening, invasive infections including bacterial meningitis and disseminated meningococemia²
- Nm urethritis is much less common than *Neisseria gonorrhoeae* (GC) urethritis³
- Both Nm and GC appear as Gram-negative intracellular diplococci on urethral Gram stain⁴
- Oral sex may be the primary mode of transmission to the urethra⁵
- In January 2015, the STD clinic at Columbus Public Health (Columbus, Ohio) began to detect an increase in Nm-associated urethritis cases in male patients

OBJECTIVE

- Describe clinical and molecular epidemiology of an outbreak of urethral Nm cases among male STD clinic patients in Columbus Ohio between January 1 and November 18, 2015.
- We compared cases of Nm urethritis to cases of men with culture-positive GC urethritis during the same time period

METHODS

Study design and setting

- Combined medical chart data with data captured for CDC's Gonococcal Isolate Surveillance Project (GISP)
- Study period: January 1 to November 18, 2015

Ethical approval

- Ohio State University IRB approved this study

METHODS

Measures

- Collected urethral swabs from male patients for Gram stain and culture
- Collected urine for GC diagnosis via nucleic acid amplification testing (NAAT)
- Performed the following characterization on all urethral Nm isolates: serogrouping, whole genome sequencing, multilocus sequence typing, outer membrane protein gene sequence typing and phylogenetic analysis

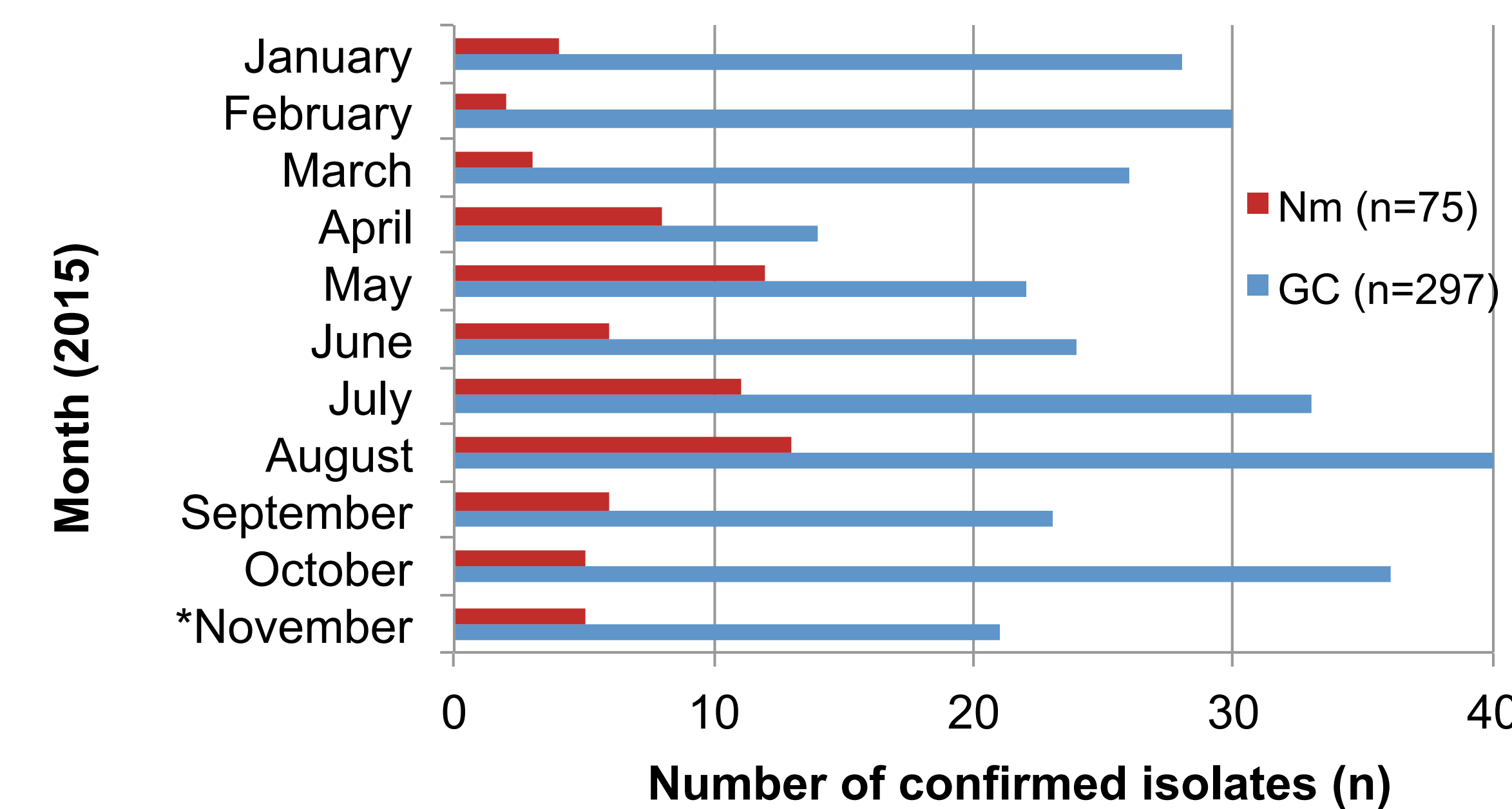
Statistical analysis

- Examined demographic, clinical and behavioral characteristics of Nm and GC urethritis cases to compare men with Nm urethritis to culture-positive GC urethritis cases

RESULTS

- Of 372 isolates with Gram-negative intracellular diplococci, 20% (n=75) were Nm and 80% (n=297) were GC
- All Nm isolates were non-groupable, sequence type (ST) 11 and monophyletic within clonal complex (CC) 11
- All Nm isolates had similar antigen typing results: PorA P1.5-1,10-8, PorB 2-2, and FetA F3-6), except one isolate which had a different PorB type (2-78)

Figure 1: Male patients with confirmed Nm or GC urethritis (n=372)



* Through November 18

Table 1: Prevalence of participant characteristics of male patients with confirmed Nm or GC urethritis (n=372)

	Nm cases		GC cases		p-value
	N=75	(%)	N=297	(%)	
Black	61	(81)	212	(71)	0.08
Non-Hispanic	68	(91)	272	(92)	0.42
Heterosexual	74	(99)	233	(78)	<0.01
Age, years	31	(24-38)	28	(23-38)	0.20
Num. sex partners (3 months)	2	(1-3)	2	(2-4)	0.02

Figure 2: Prevalence of high risk behaviors of male patients with confirmed Nm or GC urethritis (n=372)

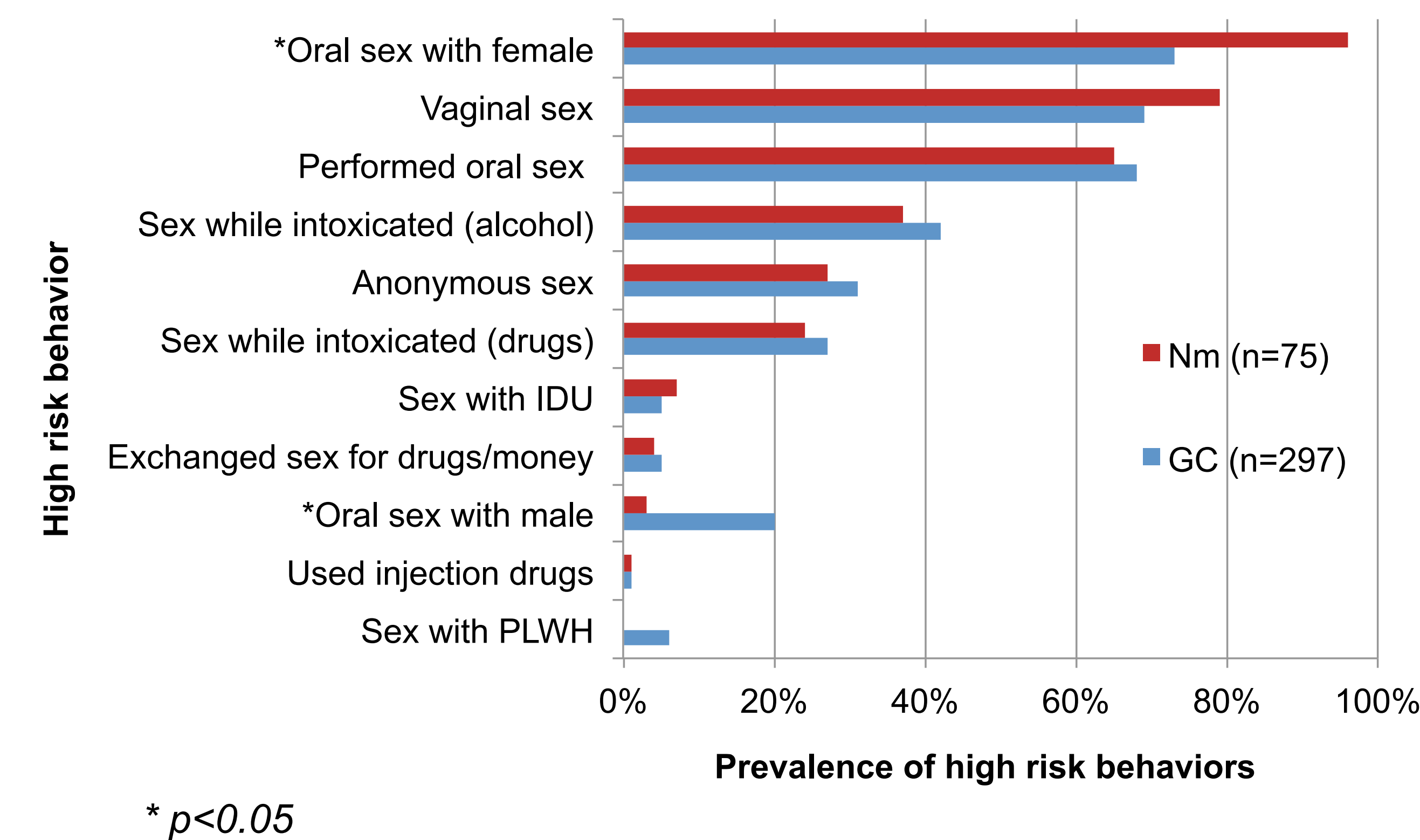
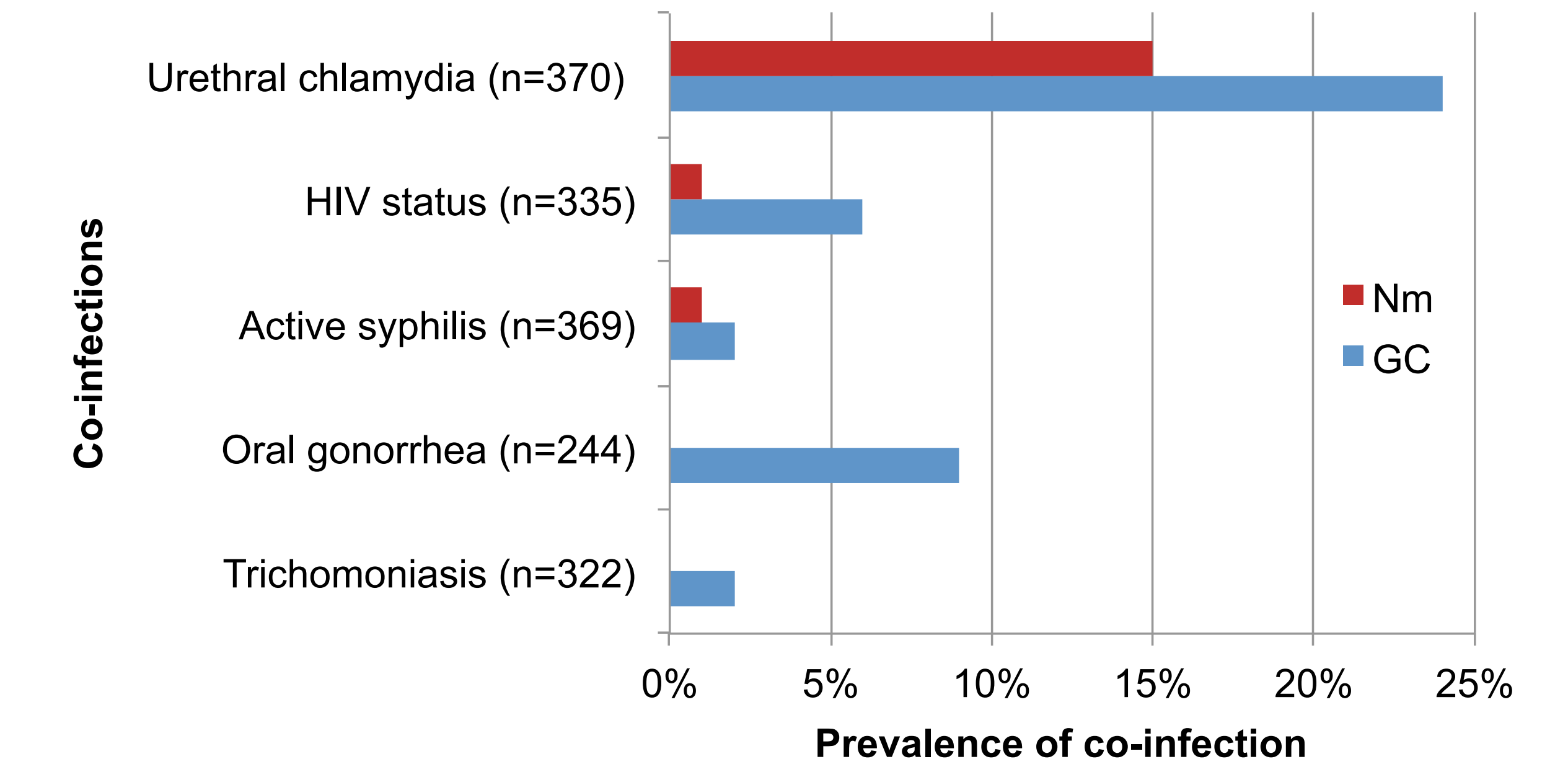


Table 2: Prevalence of symptoms and treatment provided to male patients with confirmed Nm or GC urethritis (n=372)

	Nm cases		GC cases		p-value
	N=75	(%)	N=297	(%)	
Symptoms					
Urethral discharge	68	(91)	275	(93)	0.43
Dysuria	51	(68)	217	(73)	0.43
Treatment provided					
Ceftriaxone (250mg) + Azithromycin (1g)	74	(99)	233	(78)	<0.01

Figure 3: Prevalence of sexually transmitted co-infections of male patients with confirmed Nm or GC urethritis (n=372)



CONCLUSIONS

- 75 confirmed cases of urethritis due to a distinct Nm clade (non-groupable and ST-11 clonal complex) occurred in the Columbus STD clinic between January and 18 November 2015
- Black, heterosexual, HIV-negative men comprise the majority of cases
- Oral sex may be an underappreciated risk factor for transmission of Nm to the urethra
- Transmission of Nm through vaginal or anal sex cannot be ruled out without additional investigation

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AFFILIATIONS

- Ohio State University College of Medicine, Columbus, Ohio
- Columbus Public Health (CPH), Columbus, Ohio
- Centers for Disease Control and Prevention (CDC), Atlanta, Georgia
- Ohio Department of Health (ODH), Columbus, Ohio
- Emory University School of Medicine, Atlanta, Georgia