

# Gonorrhea Testing Patterns Among Males in Three Large Clinical Practices in Massachusetts, 2010-2017

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## BACKGROUND

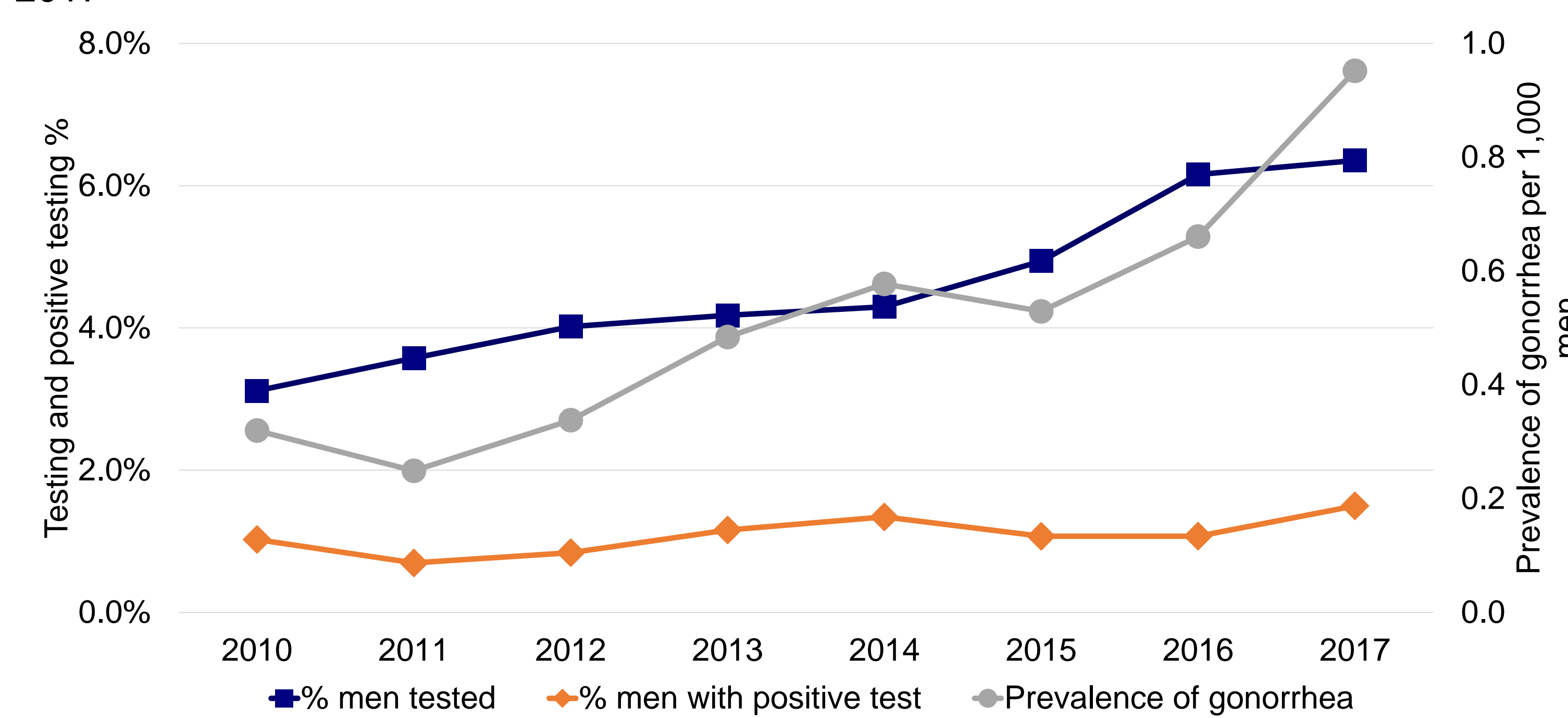
- Incidence of *Neisseria gonorrhoeae* infection among men in Massachusetts has risen by 367% since 2010
- Increased gonorrhea incidence among men may be due to:
  - More gonorrhea screening
  - Increased prevalence of disease due to changes in behavior or antibiotic resistance
- The objective of this study is to investigate whether observed increases in gonorrhea among men is due to more screening, increased prevalence of disease, or a combination of both of these factors

## METHODS

- Gonorrhea testing patterns were assessed with electronic medical record data from 3 clinical practices using the Electronic medical record Support for Public Health surveillance platform (ESP, [esphealth.org](http://esphealth.org))
- Males ≥15 years with at least one encounter from 2010-2017 were included in analyses
- Outcomes assessed annually from 2010-2017 included:
  - Percentage of men tested for gonorrhea
  - Percentage of men tested for gonorrhea with a positive result
  - Prevalence of laboratory-confirmed gonorrhea
- Log-binomial regression models were used to examine linear changes in outcomes, expressed as risk ratios (RR) with 95% confidence intervals (CI) comparing each year to the previous
- Covariates of interest: age; race/ethnicity; HIV status; PrEP use; gonorrhea symptoms; diagnosis of high risk sexual behavior
- Generalized estimating equation methods were used to account for within-person correlation induced by repeated gonorrhea tests or positive tests from 2010-2017

## RESULTS

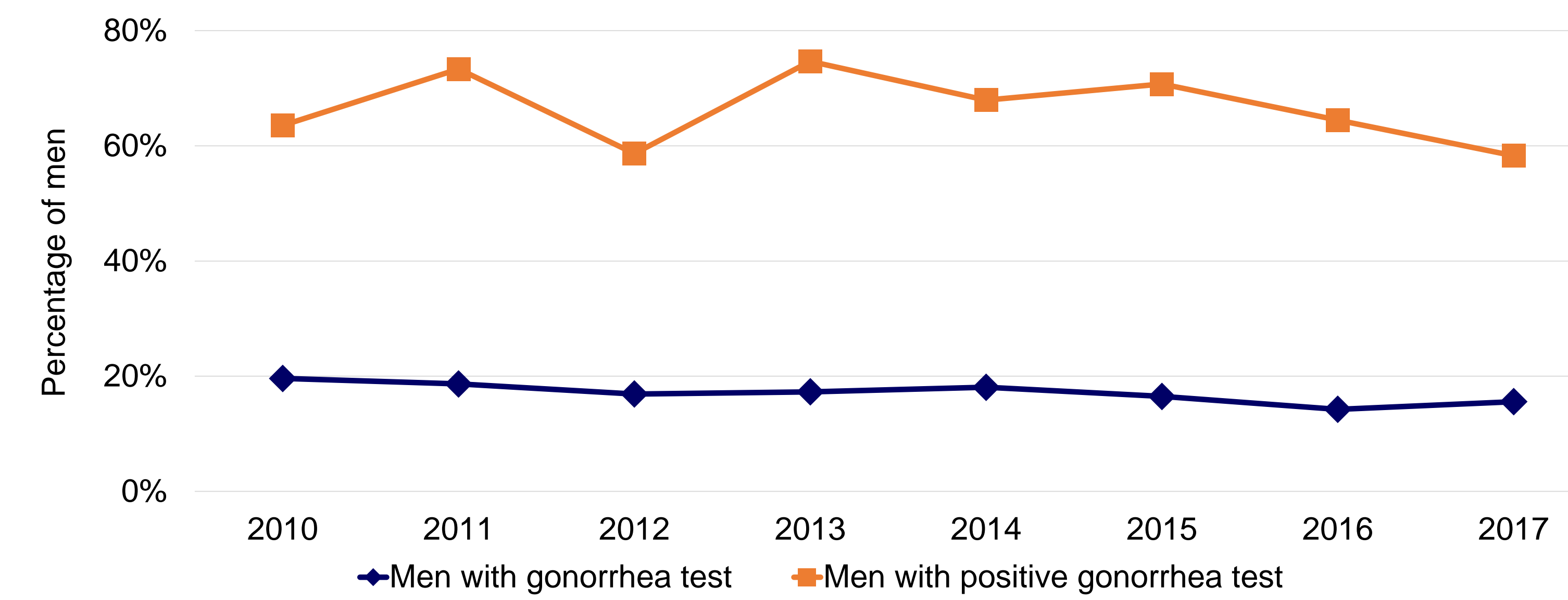
Figure 1. Observed percentage of men tested for gonorrhea, percentage of men tested for gonorrhea with a positive result, and prevalence of laboratory-confirmed gonorrhea, 2010-2017



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## RESULTS

Figure 2. Prevalence of gonorrhea symptoms\* among men tested for gonorrhea and men with a positive gonorrhea test, 2010-2017



\*Gonorrhea symptoms include urethritis, urethral discharge, dysuria, epididymitis, testicular pain, proctitis, rectal bleeding, pharyngitis, tonsillitis, throat pain, conjunctivitis, and eye pain, and were measured up to 7 days before or after a gonorrhea test

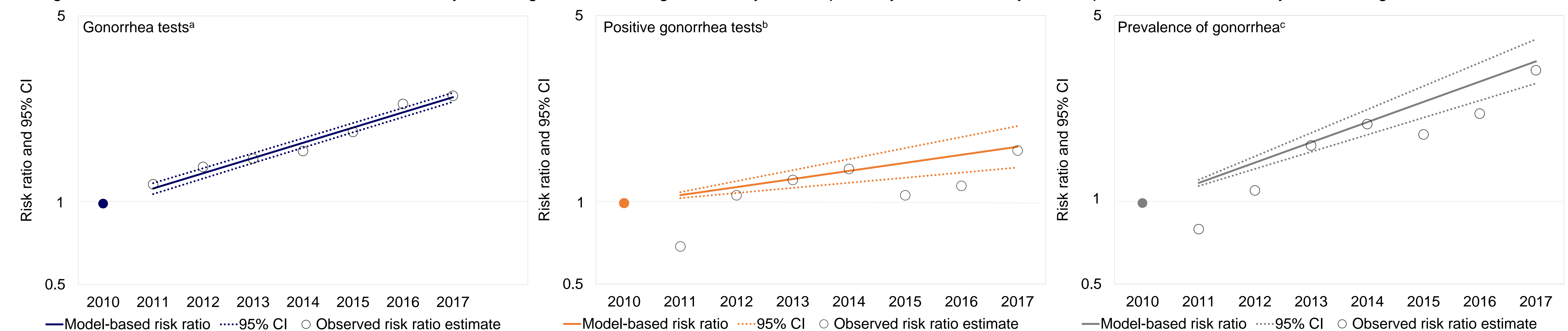
Table 1. Characteristics of men with at least one encounter, men with at least one gonorrhea test, and men with at least one positive gonorrhea test, 2010-2017

	Men with ≥1 encounter (n=678,134)		Men with ≥1 test (n=78,763)		Men with ≥1 positive test (n=1,184)	
Age (in years)	n	%	n	%	n	%
15 - 24	93,081	14%	16,565	21%	201	17%
25 - 34	143,272	21%	29,856	38%	489	41%
35 - 44	121,231	18%	15,794	20%	236	20%
45 - 54	107,632	16%	9,286	12%	172	15%
55 - 64	97,274	14%	5,179	7%	70	6%
≥ 65	115,644	18%	2,083	3%	16	1%
Race/ethnicity						
White	417,030	62%	41,512	53%	490	41%
Black	53,953	8%	13,432	17%	368	31%
Hispanic	12,177	2%	2,527	3%	44	4%
Asian	40,389	6%	4,755	6%	40	3%
Other	54,845	8%	8,578	11%	132	11%
Unknown/Missing	99,740	15%	7,959	10%	110	9%
Living with HIV	2,172	<1%	1,386	2%	86	7%
PrEP use <sup>a</sup>	654	<1%	625	1%	108	9%
High risk sexual behavior <sup>b</sup>	--	--	1,346	2%	82	7%

<sup>a</sup> Men prescribed PrEP between 2010 and 2017

<sup>b</sup> Diagnosis code for high risk sexual behavior, measured up to 7 days before or after a gonorrhea test

Figure 3. Estimated associations between calendar year and gonorrhea testing, calendar year and positivity, and calendar year and prevalence of laboratory-confirmed gonorrhea, 2010-2017



<sup>a</sup> Risk ratios adjusted for age, race, PrEP use, and HIV status <sup>b</sup> Risk ratios adjusted for age, race, PrEP use, HIV status, gonorrhea symptoms, and high risk sexual behavior <sup>c</sup> Risk ratios adjusted for age, race, PrEP use, and HIV status

## RESULTS

- 678,134 men had at least one encounter (~300,000 unique men per calendar year), 78,763 men had at least one gonorrhea test, and 1,184 men had at least one positive gonorrhea test between 2010 and 2017
- Percentage of men tested for gonorrhea increased from 2010 (3.1%) to 2017 (6.4%) [RR: 1.14 (95% CI 1.09, 1.19)]
- Percentage of men tested for gonorrhea with a positive result increased from 2010 (1.0%) to 2017 (1.5%) [RR: 1.07 (95% CI 1.04, 1.10)]
- Prevalence of laboratory-confirmed gonorrhea per 1,000 men increased between 2010 (0.3) and 2017 (1.0) [RR: 1.19 (95% CI 1.16, 1.22)]
- Percentage of men who were symptomatic at the time of their gonorrhea test decreased from 20% in 2010 to 16% in 2017 (p<0.0001)

## CONCLUSIONS

- Significant increases were observed in the percentage of men tested for gonorrhea, the percentage of men tested with a positive result, and the prevalence of laboratory-confirmed gonorrhea
- Percentage of men who had symptoms at the time of their gonorrhea test decreased slightly, indicating that there may have been a small increase in asymptomatic screening of men during this time period
- Results suggest that the observed increases in gonorrhea cases among men in Massachusetts are a result of increased testing and increased prevalence of disease



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