Temporal Patterns in Chlamydia Repeat Testing and Positivity Rates in Massachusetts

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Objective

• Evaluate current rates and temporal trends in adherence with national guidelines recommending chlamydia test-of-cure for pregnant females and test-of-reinfection for all patients.
Incidence Rate of Reported Chlamydia Cases per 100,000 Population by Gender, Massachusetts, 2006–2015

Data Source: MDPH, Bureau of Infectious Disease, data are current as of 10/4/16 and subject to change.

STD Treatment Guidelines

• For pregnant women, test-of-cure to document chlamydial eradication 3-4 weeks after completion of therapy is recommended.

• For all patients, test-of-reinfection approximately 3 months after treatment is recommended.

• Repeat testing at <3 weeks after completion of therapy is not recommended because it can lead to false-positive results.
ESP – EMR Support for Public Health

Software and architecture to extract, analyze, and transmit electronic health information from providers to public health

• Surveys codified EMR data for patients with conditions of public health interest

• Generates secure electronic reports for the state health department

• Designed to be compatible with any EMR system

JAMIA 2009;16:18-24
MMWR 2008;57:372-375
Am J Pub Health 2012;102:S325–S332
ESP: Automated disease detection and reporting for public health

Practice EMR’s

ESP Server

Health Department

- diagnoses
- lab results
- meds
- vital signs
- demographics

Notifiable disease case reports

Aggregate-level custom queries

JAMIA 2009;16:18-24
Am J Public Health 2012;102:S325–S332
Am J Public Health 2014;104:2265-2270
Methods

• Identified patients infected with C. trachomatis from 3 multi-site independent clinical practice groups, which together cover about 1.4 million people (~20% of the Massachusetts population).

• Included all patients with a positive culture or nucleic acid amplification chlamydia between January 1, 2010 and December 31, 2015.

• Follow-up chlamydia tests were identified from 1 to 365 days following the index test result.
Methods (continued)

We assessed the percentage of pregnant female cases with:

- **Test-of-cure**: repeat test at 3 to 5 weeks
- **Late test-of-cure**: repeat test at 6 to 7 weeks
- **Test-of-reinfection**: repeat test at 8 to 16 weeks
- **Late test-of-reinfection**: repeat test at 17 weeks to 1 year
- **Both a test-of-cure and a test-of-reinfection (during recommended time periods)**: repeat test at 3 to 5 weeks and 8 to 16 weeks
- **Both a test-of-cure and a test-of-reinfection (maximally generous time periods)**: repeat test at 3 to 7 weeks and repeat test 8 weeks to 1 year
Methods (continued)

We assessed the percentage of non-pregnant female and male cases with:

• Early test-of-reinfection: repeat test at 3 to 7 weeks
• Test-of-reinfection: repeat test at 8 to 16 weeks
• Late test-of-reinfection: repeat test at 17 weeks to 1 year
Methods (continued)

• A trend analysis was performed to evaluate any significant increases or decreases during the query period.

• Fit binomial regression models using generalized estimating equations (GEE) with an independence working correlation structure.

• Selected best fitting model (linear vs. fully flexible) using the quasi-likelihood under the independence model criterion (QIC).
Cases Retested within 1 Year

- **Pregnant female cases**: 87% (N = 844/972)
- **Non-pregnant female cases**: 68% (N = 7,024/10,309)
- **Male cases**: 41% (N = 2,050/4,973)
Cumulative incidence curve for time to first follow-up chlamydia test

- N = 844/972
- N = 7,024/10,309
- N = 2,050/4,973
Pregnant Female Cases

Test-of-Cure

- 3-5 weeks (37%)
- 6-7 weeks (12%)

Test-of-Reinfection

- 8-16 weeks (39%)
- 17 weeks-1 year (29%)

Recommended

Late
Pregnant Female Cases

- N = 7,024/10,309
- N = 2,050/4,973

3-5 weeks
6-7 weeks
8-16 weeks
17 weeks – 1 year

- 3-5 weeks and 8-16 weeks
- 3-7 weeks and 8 weeks - 1 year

Recommended
Maximally generous

Both Test-of-Cure and Test-of-Reinfection
Non-Pregnant Female and Male Cases

Test-of-Reinfection

Non-pregnant female cases

- 8-16 weeks (18%)
- 3-7 weeks (25%)
- 17 weeks-1 year (22%)

Male cases

- 8-16 weeks (9%)
- 3-7 weeks (12%)
- 17 weeks-1 year (16%)

65%

36%
Cases Retested Inappropriately Early (<3 weeks)

- Pregnant female cases: 11%
- Non-pregnant female cases: 10%
- Male cases: 9%
Percent of cases retested within recommended time period by year

- Test-of-Cure (Pregnant female cases)
- Test-of-Reinfection (Pregnant female cases)
- Test-of-Reinfection (Non-pregnant female cases)
- Test-of-Reinfection (Male cases)
Key Findings

• We found considerable under-testing for cure in pregnant women and for reinfection in all patients during the recommended time periods.

• We saw no evidence in improvements between 2010 and 2015.

• We observed inappropriately early testing among all groups.
Limitations

• We were only able to identify chlamydia retesting if a second test was ordered within the same practice group as the index positive test result.

• It is possible that there was some misclassification of pregnancy status.

• Our results may not accurately reflect retesting rates for the statewide Massachusetts population or for patients who do not seek follow-up care within the same practice group where they had their original positive test.
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