Factors Associated with Delayed Chlamydia Treatment, Massachusetts, 2015

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Background

- In 2015, there were 24,143 laboratory confirmed chlamydia cases in Massachusetts; incidence rate was 357.9 per 100,000
- Delayed treatment in symptomatic pelvic inflammatory disease patients is associated with infertility and ectopic pregnancy
- Timely treatment is a key element for prevention and control of chlamydia infection

Objectives

- To examine factors associated with delayed chlamydia treatment in Massachusetts

Methods

- All laboratory-confirmed chlamydia cases reported to the Massachusetts Department of Public Health in 2015 were categorized as metropolitan or non-metropolitan (micropolitan, small town, rural) by home address based on Rural-Urban Commuting Area (RUCA) codes developed from 2010 census
- We sampled all non-metropolitan cases (242 cases) and an equivalent number of metropolitan/unknown address cases (242 cases) were randomly selected
- Clinician phone interviews were conducted January 2016 through May 2016
- Cases were excluded if: prior infection in 2015, non-Massachusetts resident, homeless, incarcerated, clinician unavailable for interview, or treatment information unavailable
- Adjusted odds (aOR) of treatment delay (defined as ≥4 days from specimen collection to antibiotic initiation) were calculated using multivariate logistic regression (backward elimination) in SAS 9.3 (SAS Institute, Inc, Cary, NC).

Results

CASE FLOW DIAGRAM

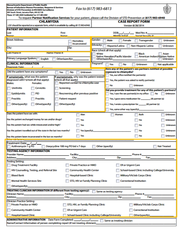
N = 484 cases

Excluded cases: 60 cases
Non-MA residents 18
More than 1 infection in same subjects 17
No information about treatment 9
Incarcerated 9
No return calls from provider 4
Homeless 2
Trachoma case 1
Lab report error 1

N = 424 cases

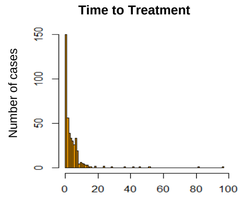
Contact providers and obtain case details to complete the chlamydia case report form

SELECTED VARIABLES OF INTEREST



Patient factors	Age Gender Race/ethnicity Sexual orientation Pregnancy status Reason for testing Metro/Non-metropolitan residence
Treating facility factors	Practice setting (Private, Family planning, Community health center, ER/Urgent care, Hospital based clinic, etc.) Clinician type (MD/DO, NP/PA/CNM) Travel distance Test turnaround time Time to treatment

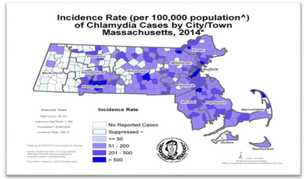
CHLAMYDIA CASE DISTRIBUTION BY TIME BETWEEN SPECIMEN COLLECTION TO ANTIBIOTIC INITIATION (N=424)



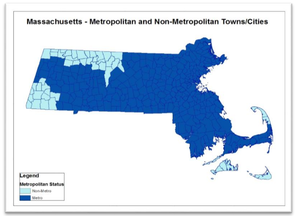
Mean 4.5 days
Median 3 days
75% were treated within 6 days
(Range 0 - 99 days)

Primary outcome is **treatment delay**
- Defined as ≥ 4 days from specimen collection to antibiotic initiation

DISTRIBUTION OF SELECTED CASES (N=424)



STD, HIV/AIDS and Viral Hepatitis Surveillance Report 2014, MDPH



CHARACTERISTICS OF SELECTED CASES (N=424)

Variables		Non-metropolitan (n=200)	Metropolitan (n=224)	Overall (n=424)	P value
Age (yr)	Mean (range)	27 (15-68)	24.5 (15-68)	25.8 (15-68)	-
Gender	**Female**	**109 (54.5%)**	**143 (63.8%)**	**252 (59.4%)**	**0.0506**
	Male	**91 (45.5%)**	**81 (36.2%)**	**172 (40.6%)**	
Race	White	**141 (70.5%)**	89 (39.7%)	230 (54.3%)	**< .0001**
	Black	23 (11.5%)	**41 (18.3%)**	64 (15.1%)	
	Hispanic	17 (8.5%)	**54 (24.1%)**	71 (16.8%)	
	Other	4 (2%)	18 (8.0%)	22 (5.2%)	
	Unknown	15 (7.5%)	22 (9.8%)	37 (8.7%)	
Sexual Orientation	**MSM/MSMW***	**37 (18.5%)**	**15 (6.7%)**	**52(12.3%)**	**0.0031**
	MSW*	39 (19.5%)	46 (20.5%)	85 (20.0%)	
	Men Unknown*	15 (7.5%)	20 (8.93%)	35 (8.3%)	
	Women	109 (54.5%)	143 (63.8%)	252 (59.4%)	
Reason Tested	Symptomatic	76 (38%)	88 (39.3%)	164 (38.7%)	0.1611
	Reported Contact	34 (17%)	24 (10.7%)	58 (13.7%)	
	Other/Unknown	90 (45%)	112 (50%)	202 (47.6%)	
Treating Facility Type	Community Health Center	54 (27%)	55 (24.6%)	109 (25.7%)	**0.0009**
	ED/Urgent care	17 (8.5%)	18 (8.0%)	35 (8.3%)	
	Family Planning Clinic, STD Clinic, HIV Counselling	**47 (23.5%)**	25 (11.2%)	72 (17.0%)	
	Hospital-based Clinic	47 (23.5%)	**70 (31.3%)**	117 (27.6%)	
	Private practice/HMO	33 (16.5%)	41 (18.3%)	74 (17.5%)	
	School-based Clinic	2 (1%)	**15 (6.7%)**	17 (4.0%)	
Provider Type	MD/DO	93 (46.5%)	121 (54.0%)	214 (50.5%)	0.1222
	NP/PA/CNM	105 (53.5%)	103 (46.0%)	210 (49.5%)	
Time to Treatment	≥ 4 days	91 (45.5%)	88 (39.3%)	179 (42.2%)	0.1959
	≤ 3 days	109(54.5%)	136 (60.7%)	245 (57.8%)	
Test Turnaround Time	≥ 3 days	112(56%)	68(30.4%)	180 (42.5%)	**< .0001**
	≤ 2 days	88 (44%)	156 (69.6%)	244 (57.6%)	
Travel Distance	> 4 miles	108(54%)	105(46.9%)	213 (50.2%)	0.143
	≤ 4 miles	92(47%)	119(53.1%)	211 (49.8%)	

* MSM/MSMW represented 37 (40.6%) and 15 (18.5%) of non-metropolitan and metropolitan males, respectively (52 (30.2%) of all selected males)

LOGISTIC REGRESSION, FEMALES (N=252)

Predictors (Female)		cOR	P value	aOR	P value
Age (yr)	15-17	2.22	0.14		
	18-25	1.22	0.50		
	>26	1.0	*Ref*		
Race/Ethnicity	Hispanic	1.74	0.11		
	Non-Hispanic Black	1.29	0.49		
	Other	0.77	0.64		
	Unknown	0.58	0.30		
	Non-Hispanic White	1.0	*Ref*		
Pregnancy Status	Not Pregnant	1.0	*Ref*		
	Pregnant	1.34	0.37		
Reason Tested	**Other/Unknown**	**7.29**	**0.01**	**16.09**	**0.0008**
	Symptomatic	**7.16**	**0.01**	**11.33**	**0.004**
	Reported Contact	**1.0**	***Ref***	**1.0**	***Ref***
Treating Facility Type	Community Health Center	1.37	0.64		
	Family Planning Clinic, STD Clinic, HIV Counselling	8	0.003		
	Hospital-based Clinic	1.66	0.43		
	Private practice/HMO	2.63	0.15		
	School-based Clinic	0.64	0.66		
	ED/Urgent care	1.0	*Ref*		
Provider Type	**NP/PA/CNM**	**1.77**	**0.03**		
	MD/DO	1.0	*Ref*		
Test Turnaround Time	**≥ 3 days**	**6.84**	**<.0001**	**8.69**	**<.0001**
	≤ 2 days	1.0	*Ref*	1.0	*Ref*
Metropolitan Status	Non-Metropolitan	1.71	0.04		
	Metropolitan	1.0	*Ref*		
Travel Distance	≤ 4 miles	1.6	0.06		
	> 4 miles	1.0	*Ref*		

Multivariate logistic regression, backward elimination

LOGISTIC REGRESSION, MALES (N=172)

Predictors (Male)		cOR	P value	aOR	P value
Age (yr)	15-17	1.18	0.86		
	18-25	0.75	0.38		
	>26	1.0	*Ref*		
Race/Ethnicity	Hispanic	1.49	0.38		
	Non-Hispanic Black	0.75	0.56		
	Other	1.52	0.6		
	Unknown	0.73	0.57		
	Non-Hispanic White	1.0	*Ref*		
Sexual Orientation	**MSM/MSMW**	**7.47**	**<.0001**	**3.41**	**0.01**
	Male Unknown	1.87	0.18	2.04	0.18
	MSW	1.0	*Ref*	1.0	*Ref*
Reason Tested	**Other/Unknown**	**18.000**	**<.0001**	**14.41**	**<.0001**
	Symptomatic	2.78	0.08	2.72	0.13
	Reported Contact	**1.0**	***Ref***	**1.0**	***Ref***
Treating Facility Type	Community Health Center	6.33	0.005		
	Family Planning Clinic, STD Clinic, HIV Counselling	0.94	0.94		
	Hospital-based Clinic	4.22	0.05		
	Private practice/HMO	1.86	0.44		
	School-based Clinic	3.8	0.16		
	ED/Urgent care	1.0	*Ref*		
Provider Type	NP/PA/CNM	1.17	0.62		
	MD/DO	1.0	*Ref*		
Test Turnaround Time	**≥ 3 days**	**3.9**	**<.0001**	**3.77**	**0.002**
	≤ 2 days	1.0	*Ref*	1.0	*Ref*
Metropolitan Status	Non-Metropolitan	0.98	0.96		
	Metropolitan	1.0	*Ref*		
Travel Distance	≤ 4 miles	1.05	0.87		
	> 4 miles	1.0	*Ref*		

Multivariate logistic regression, backward elimination

Conclusions

- Nearly one-third of male chlamydia cases reported same-sex engagement
  - ~ 40% of non-metropolitan male cases and ~ 18% of metropolitan male cases were MSM
- 42% of chlamydia cases investigated had delayed treatment
- In multivariable analyses, findings among both males and females indicated
  - Persons who were tested because they were contacts of chlamydia cases had the lowest frequency of delayed treatment
  - Test turnaround time was strongly associated with delays in chlamydia treatment among females and males
- Among males, those who were MSM/MSMW were more likely to have treatment delays

Implications for Programs, Policy, and Research

- Results of the study can enhance health services planning
- Improved laboratory test turnaround time could reduce potential delays in treatment

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