

**Bacterial STI Screening Rates by Symptomatic Status  
among Men Who Have Sex with Men in the United States:  
A Hierarchical Bayesian Analysis**

Supplemental Appendix

**Table S1.** Census Region and Division Categorization

<b>Region</b>	<b>Division</b>	<b>State</b>
Northeast	<i>1 New England</i>	Connecticut
		Maine
		Massachusetts
		New Hampshire
		Rhode Island
	<i>2 Middle Atlantic</i>	New Jersey
New York		
Pennsylvania		
Midwest	<i>3 East North Central</i>	Illinois
		Indiana
		Michigan
		Ohio
		Wisconsin
	<i>4 West North Central</i>	Iowa
		Kansas
		Minnesota
		Missouri
		Nebraska
South	<i>5 South Atlantic</i>	North Dakota
		South Dakota
		Delaware
		Florida
		Georgia
		Maryland
		North Carolina
		South Carolina
	Virginia	
	West Virginia	
	Washington, D. C.	
	<i>6 East South Central</i>	Alabama
		Kentucky
Mississippi		
Tennessee		
<i>7 West South Central</i>	Arkansas	
	Louisiana	
	Oklahoma	
	Texas	
West	<i>8 Mountain</i>	Arizona
		Colorado
		Montana
		Nevada
		New Mexico
		Utah
		Wyoming
	<i>9 Pacific</i>	Alaska
		California
		Hawaii
		Oregon
		Washington

**Figure S1.** Geographic Distribution of ART-Net Respondents (n = 2,572)



**Table S2.** Varying Intercept Negative Binomial Model Coefficients for Per-Year Rates of All Bacterial STI (Syphilis, Gonorrhea, Chlamydia) Testing/Screening by Symptomatic Status among US Men Who Have Sex with Men

	All Testing/Screening		Symptomatic Testing		Asymptomatic Screening	
	Estimate	95% CrI	Estimate	95% CrI	Estimate	95% CrI
<b>Geography</b>						
Average Intercept	-1.195	-1.628, -0.758	-2.724	-3.581, -1.854	-1.271	-1.752, -0.763
City						
Atlanta	-1.201	-1.656, -0.747	-2.586	-3.474, -1.683	-1.302	-1.814, -0.777
Boston	-1.148	-1.611, -0.673	-2.797	-3.703, -1.869	-1.191	-1.719, -0.645
Chicago	-1.170	-1.630, -0.714	-2.872	-3.783, -1.957	-1.208	-1.730, -0.677
Dallas	-1.224	-1.696, -0.753	-2.869	-3.792, -1.949	-1.277	-1.799, -0.735
Denver	-1.162	-1.634, -0.686	-2.785	-3.723, -1.838	-1.221	-1.772, -0.650
Detroit	-1.151	-1.626, -0.670	-2.598	-3.518, -1.650	-1.248	-1.792, -0.695
Houston	-1.325	-1.808, -0.850	-2.662	-3.585, -1.726	-1.464	-2.009, -0.910
Los Angeles	-1.173	-1.625, -0.716	-2.745	-3.630, -1.835	-1.237	-1.743, -0.710
Miami	-1.046	-1.514, -0.570	-2.637	-3.549, -1.721	-1.123	-1.647, -0.563
New York City	-1.160	-1.609, -0.707	-2.684	-3.571, -1.768	-1.240	-1.745, -0.710
Philadelphia	-1.252	-1.711, -0.791	-2.583	-3.493, -1.662	-1.396	-1.924, -0.859
San Diego	-1.089	-1.562, -0.606	-2.675	-3.599, -1.729	-1.148	-1.685, -0.586
San Francisco	-1.003	-1.474, -0.526	-2.653	-3.554, -1.731	-1.058	-1.584, -0.514
Seattle	-1.172	-1.636, -0.703	-2.654	-3.564, -1.732	-1.260	-1.785, -0.708
Washington DC	-1.258	-1.725, -0.802	-2.652	-3.546, -1.732	-1.363	-1.893, -0.830
Census Division						
1 New England	-1.239	-1.716, -0.770	-2.827	-3.764, -1.903	-1.299	-1.831, -0.757
2 Middle Atlantic	-1.198	-1.660, -0.729	-2.671	-3.565, -1.756	-1.287	-1.817, -0.742
3 East North Central	-1.358	-1.819, -0.896	-2.832	-3.736, -1.911	-1.438	-1.955, -0.906
4 West North Central	-1.196	-1.650, -0.744	-2.809	-3.705, -1.899	-1.259	-1.773, -0.731
5 South Atlantic	-1.315	-1.767, -0.859	-2.813	-3.697, -1.916	-1.391	-1.894, -0.870
6 East South Central	-1.236	-1.709, -0.763	-2.808	-3.709, -1.890	-1.301	-1.821, -0.758
7 West South Central	-1.109	-1.561, -0.653	-2.668	-3.568, -1.750	-1.176	-1.685, -0.653
8 Mountain	-1.288	-1.760, -0.822	-2.705	-3.595, -1.788	-1.381	-1.908, -0.843
9 Pacific	-1.190	-1.641, -0.736	-2.791	-3.693, -1.873	-1.246	-1.756, -0.722
<b>Race</b>						
Black (Non-Hisp)	0.337	0.157, 0.571	0.335	-0.042, 0.702	0.344	0.141, 0.551
Hispanic	0.126	-0.006, 0.260	0.285	0.017, 0.551	0.090	-0.062, 0.239
Other (Non-Hisp)	0.156	-0.001, 0.308	0.072	-0.263, 0.411	0.174	0.002, 0.348
White (Non-Hisp)	Ref	-	Ref	-	Ref	-
<b>Age</b>						
Linear	0.066	0.043, 0.089	0.041	-0.007, 0.088	0.063	0.036, 0.088
Quadratic	-0.0009	-0.0012, -0.0007	-0.0008	-0.0014, 0.0002	-0.0009	-0.0012, -0.0006
<b>HIV status</b>						
Uninfected	Ref	-	Ref	-	Ref	-
Infected	0.543	0.401, 0.680	0.640	0.364, 0.919	0.543	0.387, 0.703
<b>Number of Partners</b>						
Linear	0.014	0.011, 0.016	0.026	0.022, 0.031	0.011	0.008, 0.014
<b>Dispersion Parameter</b>						
	1.193	1.082, 1.322	0.481	0.389, 0.603	0.934	0.847, 1.035

· 95% CrI = 95% credible interval

**Table S3.** Varying Intercept & Varying Slope Negative Binomial Model Predictions for Per-Year Rates of All Bacterial STI (Syphilis, Gonorrhea, Chlamydia) Testing/Screening by Symptomatic Status among US Men Who Have Sex with Men

	All Testing/Screening		Symptomatic Testing		Asymptomatic Screening	
	<i>Estimate</i>	<i>95% CrI</i>	<i>Estimate</i>	<i>95% CrI</i>	<i>Estimate</i>	<i>95% CrI</i>
<b>HIV-Uninfected</b>						
City-Averaged	1.02	0.90, 1.18	0.14	0.12, 0.17	0.88	0.77, 1.01
Atlanta	1.02	0.84, 1.23	0.17	0.12, 0.24	0.85	0.69, 1.05
Boston	1.14	0.89, 1.48	0.12	0.07, 0.19	1.03	0.80, 1.34
Chicago	1.10	0.90, 1.34	0.13	0.09, 0.19	0.96	0.78, 1.19
Dallas	0.88	0.69, 1.13	0.09	0.06, 0.15	0.80	0.62, 1.05
Denver	1.07	0.79, 1.46	0.12	0.07, 0.21	0.94	0.68, 1.33
Detroit	1.11	0.83, 1.51	0.16	0.10, 0.28	0.93	0.68, 1.31
Houston	0.94	0.72, 1.20	0.22	0.15, 0.35	0.69	0.52, 0.91
Los Angeles	1.11	0.92, 1.35	0.16	0.11, 0.23	0.95	0.78, 1.16
Miami	1.27	0.99, 1.67	0.17	0.11, 0.27	1.08	0.82, 1.44
New York City	1.17	1.01, 1.36	0.16	0.12, 0.22	0.99	0.84, 1.17
Philadelphia	1.00	0.78, 1.27	0.24	0.16, 0.36	0.73	0.55, 0.95
San Diego	1.17	0.89, 1.58	0.14	0.08, 0.25	1.04	0.77, 1.41
San Francisco	1.38	1.11, 1.70	0.18	0.12, 0.27	1.17	0.93, 1.49
Seattle	1.05	0.83, 1.44	0.16	0.10, 0.24	0.89	0.68, 1.15
Washington DC	1.02	0.84, 1.24	0.17	0.12, 0.25	0.84	0.68, 1.05
<b>HIV-Infected</b>						
City-Averaged	1.78	1.46, 2.18	0.25	0.18, 0.35	1.53	1.24, 1.88
Atlanta	2.07	1.56, 3.04	0.34	0.22, 0.65	1.66	1.23, 2.44
Boston	1.93	1.26, 2.91	0.22	0.12, 0.45	1.74	1.10, 2.60
Chicago	1.97	1.44, 2.81	0.22	0.12, 0.41	1.74	1.27, 2.51
Dallas	1.57	1.11, 2.27	0.16	0.08, 0.30	1.44	1.00, 2.11
Denver	1.86	1.20, 2.90	0.20	0.09, 0.43	1.67	1.06, 2.64
Detroit	1.88	1.19, 2.86	0.29	0.14, 0.60	1.58	0.98, 2.49
Houston	1.52	0.96, 2.21	0.38	0.20, 0.70	1.14	0.69, 1.69
Los Angeles	1.89	1.35, 2.62	0.30	0.18, 0.53	1.60	1.10, 2.20
Miami	2.16	1.51, 3.12	0.29	0.15, 0.54	1.87	1.29, 2.70
New York City	1.95	1.41, 2.60	0.28	0.17, 0.48	1.68	1.20, 2.26
Philadelphia	1.65	1.06, 2.40	0.40	0.21, 0.77	1.22	0.77, 1.81
San Diego	1.99	1.33, 2.97	0.26	0.14, 0.51	1.75	1.13, 2.63
San Francisco	2.38	1.66, 3.38	0.35	0.20, 0.64	2.02	1.36, 2.90
Seattle	1.98	1.40, 2.98	0.28	0.15, 0.53	1.67	1.18, 2.57
Washington DC	1.76	1.19, 2.59	0.29	0.14, 0.53	1.49	1.00, 2.22

**Table S4.** Varying Intercept Logistic Model Coefficients for Never Testing/Screening for All Bacterial STI (Syphilis, Gonorrhea, Chlamydia) in the Past 2 Years by Symptomatic Status among US Men Who Have Sex with Men

	All Testing/Screening		Symptomatic Testing		Asymptomatic Screening	
	Estimate	95% CrI	Estimate	95% CrI	Estimate	95% CrI
<b>Geography</b>						
Average Intercept	1.125	0.395, 1.831	1.939	1.123, 2.828	0.839	0.161, 1.533
City						
<i>Atlanta</i>	1.253	0.485, 2.011	1.839	0.978, 2.773	0.991	0.264, 1.722
<i>Boston</i>	1.079	0.273, 1.853	2.029	1.138, 2.984	0.741	-0.019, 1.498
<i>Chicago</i>	1.159	0.373, 1.927	2.048	1.173, 3.000	0.770	0.033, 1.519
<i>Dallas</i>	1.301	0.514, 2.079	2.026	1.135, 2.973	0.881	0.151, 1.631
<i>Denver</i>	1.120	0.287, 1.915	1.940	1.041, 2.910	0.839	0.056, 1.622
<i>Detroit</i>	1.207	0.380, 2.008	1.858	0.942, 2.835	1.037	0.296, 1.848
<i>Houston</i>	1.182	0.382, 1.959	1.911	1.036, 2.851	0.933	0.184, 1.681
<i>Los Angeles</i>	1.055	0.290, 1.805	1.940	1.066, 2.862	0.802	0.098, 1.525
<i>Miami</i>	0.988	0.175, 1.769	1.842	0.940, 2.793	0.652	-0.109, 1.399
<i>New York City</i>	0.919	0.157, 1.648	1.777	0.897, 2.709	0.730	0.012, 1.462
<i>Philadelphia</i>	1.301	0.515, 2.079	1.882	0.990, 2.812	1.079	0.338, 1.847
<i>San Diego</i>	0.885	0.041, 1.687	1.875	0.953, 2.845	0.629	-0.171, 1.416
<i>San Francisco</i>	0.871	0.051, 1.646	1.825	0.926, 2.775	0.639	-0.116, 1.388
<i>Seattle</i>	1.041	0.238, 1.808	1.826	0.929, 2.776	0.765	0.026, 1.515
<i>Washington DC</i>	1.190	0.410, 1.953	1.916	1.037, 2.862	0.900	0.168, 1.642
Census Division						
<i>1 New England</i>	1.163	0.366, 1.947	2.075	1.189, 3.034	0.900	0.157, 1.658
<i>2 Middle Atlantic</i>	1.215	0.433, 1.986	1.943	1.048, 2.890	0.863	0.127, 1.608
<i>3 East North Central</i>	1.332	0.572, 2.091	2.077	1.201, 3.018	1.018	0.290, 1.759
<i>4 West North Central</i>	0.999	0.233, 1.747	2.028	1.167, 2.962	0.774	0.051, 1.504
<i>5 South Atlantic</i>	1.260	0.496, 1.992	2.031	1.180, 2.954	0.914	0.217, 1.635
<i>6 East South Central</i>	1.322	0.524, 2.105	2.046	1.164, 3.000	0.962	0.221, 1.725
<i>7 West South Central</i>	0.932	0.147, 1.681	1.832	0.947, 2.773	0.705	-0.031, 1.437
<i>8 Mountain</i>	1.165	0.385, 1.921	2.049	1.172, 3.000	0.882	0.152, 1.619
<i>9 Pacific</i>	1.006	0.227, 1.759	1.956	1.072, 2.888	0.753	0.023, 1.484
<b>Race</b>						
Black (Non-Hisp)	-1.031	-1.522, -0.580	-0.364	-0.755, 0.041	-0.806	-1.220, -0.415
Hispanic	-0.093	-0.363, 0.165	-0.145	-0.429, 0.142	0.070	-0.173, 0.318
Other (Non-Hisp)	0.140	-0.154, 0.432	0.139	-0.217, 0.508	0.089	-0.199, 0.374
White (Non-Hisp)	Ref	-	Ref	-	Ref	-
<b>Age</b>						
Linear	-0.102	-0.139, -0.063	-0.034	-0.83, 0.012	-0.078	-0.116, -0.042
Quadratic	0.0014	0.0010, 0.0019	0.0008	0.0002, 0.0014	0.0011	0.0007, 0.0016
<b>HIV status</b>						
Uninfected	Ref	-	Ref	-	Ref	-
Infected	-1.130	-1.488, -0.797	-0.559	-0.860, -0.246	-0.881	-1.193, -0.583
<b>Number of Partners</b>						
Linear	-0.021	-0.027, -0.015	-0.024	-0.028, -0.019	-0.008	-0.013, -0.004

· 95% CrI = 95% credible interval

**Table S5.** Varying Intercept Negative Binomial Model Coefficients for Per-Year Rates of All Bacterial STI (Syphilis, Gonorrhea, Chlamydia) Testing/Screening by Symptomatic Status among US Men Who Have Sex with Men Who Tested/Screened At Least Once in Past 2 Years

	<b>All Testing/Screening</b>		<b>Asymptomatic Screening</b>	
	<i>Estimate</i>	<i>95% CrI</i>	<i>Estimate</i>	<i>95% CrI</i>
<b>Geography</b>				
Average Intercept	-0.129	-0.470, 0.192	-0.232	-0.616, 0.119
City				
<i>Atlanta</i>	-0.084	-0.434, 0.257	0.190	-0.578, 0.176
<i>Boston</i>	-0.107	-0.462, 0.232	-0.210	-0.613, 0.167
<i>Chicago</i>	-0.102	-0.452, 0.235	-0.205	-0.603, 0.164
<i>Dallas</i>	-0.117	-0.481, 0.217	-0.234	-0.639, 0.142
<i>Denver</i>	-0.113	-0.476, 0.232	-0.205	-0.610, 0.184
<i>Detroit</i>	-0.095	-0.455, 0.254	-0.164	-0.575, 0.234
<i>Houston</i>	-0.197	-0.569, 0.145	-0.332	-0.768, 0.051
<i>Los Angeles</i>	-0.139	-0.490, 0.196	-0.231	-0.631, 0.134
<i>Miami</i>	-0.075	-0.429, 0.274	-0.195	-0.595, 0.179
<i>New York City</i>	-0.153	-0.510, 0.176	-0.247	-0.645, 0.115
<i>Philadelphia</i>	-0.126	-0.480, 0.207	-0.249	-0.651, 0.122
<i>San Diego</i>	-0.119	-0.482, 0.220	-0.220	-0.627, 0.157
<i>San Francisco</i>	-0.068	-0.422, 0.277	-0.161	-0.557, 0.220
<i>Seattle</i>	-0.121	-0.480, 0.212	-0.229	-0.631, 0.141
<i>Washington DC</i>	-0.165	-0.531, 0.168	-0.286	-0.698, 0.083
Census Division				
<i>1 New England</i>	-0.153	-0.517, 0.188	-0.238	-0.645, 0.137
<i>2 Middle Atlantic</i>	-0.105	-0.460, 0.233	-0.231	-0.637, 0.144
<i>3 East North Central</i>	-0.190	-0.553, 0.142	-0.295	-0.701, 0.074
<i>4 West North Central</i>	-0.160	-0.512, 0.174	-0.243	-0.643, 0.122
<i>5 South Atlantic</i>	-0.182	-0.535, 0.149	-0.295	-0.692, 0.067
<i>6 East South Central</i>	-0.109	-0.465, 0.232	-0.209	-0.610, 0.169
<i>7 West South Central</i>	-0.117	-0.471, 0.213	-0.208	-0.602, 0.161
<i>8 Mountain</i>	-0.184	-0.550, 0.156	-0.297	-0.711, 0.076
<i>9 Pacific</i>	-0.155	-0.512, 0.174	-0.244	-0.645, 0.123
<b>Race</b>				
Black (Non-Hisp)	0.105	-0.021, 0.236	0.120	-0.017, 0.257
Hispanic	0.116	0.018, 0.215	0.133	0.027, 0.239
Other (Non-Hisp)	0.204	0.086, 0.321	0.213	0.093, 0.335
White (Non-Hisp)	Ref	-	Ref	-
<b>Age</b>				
Linear	0.029	0.012, 0.048	0.030	0.011, 0.051
Quadratic	-0.0004	-0.0007, -0.0002	-0.0004	-0.0007, -0.0002
<b>HIV status</b>				
Uninfected	Ref	-	Ref	-
Infected	0.276	0.180, 0.371	0.260	0.159, 0.362
<b>Number of Partners</b>				
Linear	0.008	0.007, 0.010	0.008	0.006, 0.010
<b>Dispersion Parameter</b>				
	4.994	4.321, 5.850	5.115	4.375, 6.071

· 95% CrI = 95% credible interval