

## SUPPLEMENTAL MATERIALS

<b>Table of Contents</b>	<b>Pages</b>
<b>Supplemental Material, p1:</b> Annotated Bibliography	2 - 3
<b>Supplemental Material, p2:</b> ICD-9 diagnosis codes and CPT codes	4 - 6
<b>Supplemental Material, p3:</b> HIV Testing Percentage by State	7 - 10
<b>Supplemental Material, p4:</b> Changes in HIV testing among non-dual eligible Medicaid enrollees with schizophrenia from 2002 to 2012	11
<b>Supplemental Material, p5:</b> Logistic Regression of HIV testing among Medicaid patients with schizophrenia, 2002 & 2012	12
<b>Supplemental Material, p6:</b> Sensitivity analysis: Logistic regression of HIV testing among Medicaid patients with schizophrenia adjusted for any annual medical visit, 2002 & 2012	13 - 14
<b>Supplemental Material, p7:</b> Sensitivity Analysis: Adjusted logistic regression of HIV testing among Medicaid patients by schizophrenia status, 2012	15

## Supplemental Material, p1: Annotated Bibliography

In this annotated bibliography, we provide more background information on the literature regarding HIV prevalence, HIV risk behaviors, and HIV testing among people with serious mental illness (e.g., schizophrenia, bipolar disorder). For each study, we provide the following information:

- Study design
- Single site vs multi-site
- Setting (inpatient, outpatient)
- US Region
- # of patients
- Year of examination

### HIV Prevalence

- **Cournos F, Empfield M, Horwath E, Kramer M. The management of HIV infection in state psychiatric hospitals. *Psychiatric Services* 1989;40:153-7.** Cross-sectional, multi-site study in New York inpatients (N=15,000) from 1983-1988.
- **Cournos F, Empfield M, Horwath E, Schrage H. HIV infection in state hospitals: case reports and long-term management strategies. *Psychiatric Services* 1990;41:163-6.** Case-report, single-site study in New York inpatient unit (N=5) in 1987.
- **Horwath E, Kramer M, Cournos F, Empfield M, Gewirtz G. Clinical presentations of AIDS and HIV infection in state psychiatric facilities. *Psychiatric Services* 1989;40:502-6.** A review of selected cases of HIV/AIDS presenting among patients at three state psychiatric hospitals in New York City (N=unknown) from 1980-1989.
- **Walkup J, Crystal S, Sambamoorthi U. Schizophrenia and major affective disorder among Medicaid recipients with HIV/AIDS in New Jersey. *American journal of public health* 1999;89:1101-3.** Cross-sectional, multi-site study in New Jersey inpatient and outpatient settings (N=8,294) from 1988-1996.
- **Walkup J, Blank MB, Gonzalez JS, et al. The impact of mental health and substance abuse factors on HIV prevention and treatment. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2008;47:S15-S9.** A research agenda including US-wide studies of both inpatient and outpatient samples (N=unknown) from the 1980s-2008 .

### HIV Risk Behaviors

- **Morgan EE, Woods SP, Weber E, Dawson MS, Carey CL, Moran LM, et al. HIV-associated episodic memory impairment: evidence of a possible differential deficit in source memory for complex visual stimuli. *J Neuropsychiatry Clin Neurosci.* 2009;21(2):189-98.** Case-control, single-site study in San Diego, California (N=95).
- **Waters FAV, Maybery MT, Badcock JC, Michie PT. Context memory and binding in schizophrenia. *Schizophrenia Research.* 2004;68(2-3):119-25.** Case-control, single-site study in Perth, Western Australia (N=67).

### HIV Testing

- **Walkup, J., McAlpine, D. D., Olsson, M., Boyer, C., & Hansell, S. (2000). Recent HIV testing among general hospital inpatients with schizophrenia: findings from four New York City sites. *The Psychiatric Quarterly*, 71(2), 177–193.** Cross-sectional, multi-site study of New York inpatient settings (N=300) from 1994–1995.
- **Pirl, W. F., Greer, J. A., Weissgarber, C., Liverant, G., & Safren, S. A. (2005). Screening for infectious diseases among patients in a state psychiatric hospital. *Psychiatric services*, 56(12), 1614–1616.** Cross-sectional single-site study in Boston, MA inpatient unit (N=655) from 1997-1999.
- **Goldberg, R. W., Himelhoch, S., Kreyenbuhl, J., Dickerson, F. B., Hackman, A., Fang, L. J., Brown, C. H., Wohlheiter, K. A., & Dixon, L. B. (2005). Predictors of HIV and hepatitis testing and related**

- service utilization among individuals with serious mental illness. *Psychosomatics*, 46(6), 573–577. Cross-sectional multi-site study of Baltimore, MD outpatient settings (N=200) in 2000.
- Desai, M. M., Rosenheck, R. A., & Desai, R. A. (2007). Prevalence and correlates of human immunodeficiency virus testing and posttest counseling among outpatients with serious mental illness. *The Journal of nervous and mental disease*, 195(9), 776–780. Cross-sectional multi-site study of outpatients in Connecticut public-sector facilities (N=487) from 1996-1998.
  - Yehia, B. R., Cui, W., Thompson, W. W., Zack, M. M., McKnight-Eily, L., DiNenno, E., Rose, C. E., & Blank, M. B. (2014). HIV testing among adults with mental illness in the United States. *AIDS patient care and STDs*, 28(12), 628–634. Cross-sectional multi-site study in all 50 states and the District of Columbia (N=21,785) in 2007.
  - Rizza, S. A., MacGowan, R. J., Purcell, D. W., Branson, B. M., & Temesgen, Z. (2012). HIV screening in the health care setting: status, barriers, and potential solutions. *Mayo Clinic Proceedings*, 87(9), 915-924. A review of HIV infection and CDC testing practices in the United States from 1985-2012.
  - Mohajer, M. A., Lyons, M., King, E., Pratt, J., & Fichtenbaum, C. J. (2012). Internal medicine and emergency medicine physicians lack accurate knowledge of current CDC HIV testing recommendations and infrequently offer HIV testing. *Journal of the International Association of Physicians in AIDS Care*, 11(2), 101–108. A cross-sectional electronic survey study with emergency medicine and internal medicine physicians (N=232) in Cincinnati, OH in 2010.
  - Zheng, M. Y., Suneja, A., Chou, A. L., & Arya, M. (2014). Physician barriers to successful implementation of US Preventive Services Task Force routine HIV testing recommendations. *Journal of the International Association of Providers of AIDS Care*, 13(3), 200–205. A review of HIV testing guidelines, physician adherence to HIV testing guidelines, and physician barriers to HIV testing in the United States from 1997-2012.
  - Arya, M., Zheng, M. Y., Amspoker, A. B., Kallen, M. A., Street, R. L., Viswanath, K., & Giordano, T. P. (2014). In the routine HIV testing era, primary care physicians in community health centers remain unaware of HIV testing recommendations. *Journal of the International Association of Providers of AIDS Care*, 13(4), 296–299. A cross-sectional electronic survey study with primary care physicians (N=312) in publicly funded community health centers in Houston, TX in 2013.
  - Knox, M. D., & Clark, C. F. (1991). Early HIV detection: a community mental health role. *Journal of mental health administration*, 18(1), 21–26. A review of the role of community mental health centers in early HIV testing and detection in the United States through 1980s.
  - Knox, M. D., Davis, M., & Friedrich, M. A. (1994). The HIV mental health spectrum. *Community mental health journal*, 30(1), 75–94. A conceptual framework to identify HIV service requirements and training in community mental health centers.
  - Satriano J. (2002) Routine HIV Testing for the Severely Mentally Ill: Considerations and Cautions. *Journal of Psychiatric Practice*, 8(3):143-50. A policy paper on the impact of HIV on those with severe mental illness and changes in mental/public health laws in the United States from 1980s-2000.
  - Walkup J, Satriano J, Barry D, Sadler P, Cournos F. (2002) HIV testing policy and serious mental illness. *American Journal of Public Health*, 92(12):1931-40. A survey study with experts in HIV and severe mental illness (N=28) across the United States in 2002.

**Supplemental Material, p2. ICD-9 diagnosis codes and CPT codes**

Variable	ICD-9 Code	CPT code	Definition
Alcohol Use Disorder	303 (with wildcard)		Alcohol dependence syndrome
Anxiety Disorders	300.0 (with wildcard)		Anxiety, dissociative and somatoform disorders
Cannabis Use Disorder	304.3 (with wildcard)		Cannabis dependence
	305.2 (with wildcard)		Nondependent cannabis abuse
Chlamydia	77.98		Unspecified diseases of conjunctiva due to chlamydiae
	78.88		Other specified diseases due to chlamydiae
	79.98		Unspecified chlamydial infection
	99.41		Other nongonococcal urethritis, chlamydia trachomatis
	099.5 (with wildcard)		Other venereal diseases due to chlamydia trachomatis
Cocaine Use Disorder	304.2 (with wildcard)		Cocaine dependence
	305.6 (with wildcard)		Nondependent cocaine abuse
Depressive Disorders	296.2 (with wildcard)		Major depressive disorder single episode
	296.3 (with wildcard)		Major depressive disorder recurrent episode
	296.82		Atypical depressive disorder
	311		Depressive disorder, not elsewhere classified
	300.4		Dysthymic disorder
Diabetes Mellitus	250 (with wildcard)		Diabetes Mellitus
Dyslipidemia	272 (with wildcard)		Disorders of lipid metabolism
Gonococcal Infection	098 (with wildcard)		Gonococcal infections
	647.1 (with wildcard)		Gonorrhea complicating pregnancy childbirth or the puerperium
Hepatitis B Infection	070.2 (with wildcard)		Viral Hepatitis B with hepatic coma
	070.3 (with wildcard)		Viral Hepatitis B without mention of hepatic coma
	70.42		Hepatitis delta without mention of active hepatitis B disease with hepatic coma
	70.52		Hepatitis delta without mention of active hepatitis B disease or hepatic coma
	V02.61		Hepatitis B carrier
Hepatitis C Infection	70.51		Acute HCV
	70.41		Acute HCV with Hepatic Coma
	V02.62		HCV Carrier Status
	70.54		Chronic HCV (wildcard)
	70.44		Chronic HCV with Hepatic Coma
	70.7		Unspecified HCV
	70.71		Unspecified HCV with Hepatic Coma
Herpes Simplex	054 (with wildcard)		Herpes Simplex
HIV Infection	042		Human immunodeficiency virus [HIV] disease, Acquired immune deficiency syndrome, Acquired immunodeficiency syndrome, AIDS, AIDS-like syndrome, AIDS-related complex, ARC, HIV infection (symptomatic)
	079.53		HIV-2 infection
	V08		Asymptomatic HIV infection status
	795.71		Nonspecific serologic evidence of HIV
Hypertension	401 (with wildcard)		Essential hypertension
	402 (with wildcard)		Hypertensive heart disease
	403 (with wildcard)		Hypertensive chronic kidney disease
	404 (with wildcard)		Hypertensive heart and chronic kidney disease
	405 (with wildcard)		Secondary hypertension
Nondependent Drug Abuse	305.0 (with wildcard)		Nondependent drug abuse
Opioid Use Disorder	304.0 (with wildcard)		Opioid type dependence
	305.5 (with wildcard)		Nondependent opioid abuse
Other Drug Use Disorder	304.6 (with wildcard)		Other, specified drug dependence

	304.8 (with wildcard)		Combinations excluding opioids
	304.9 (with wildcard)		Unspecified drug dependence
	305.9 (with wildcard)		Other, mixed or unspecified drug abuse
	648.3 (with wildcard)		Drug dependence complicating pregnancy, childbirth, or the puerperium
Psychosis NOS	298 (with wildcard)		Other nonorganic psychosis
Syphilis	091 (with wildcard)		Early syphilis symptomatic
	092 (with wildcard)		Early syphilis latent
	093 (with wildcard)		Cardiovascular syphilis
	094 (with wildcard)		Neurosyphilis
	095 (with wildcard)		Other forms of late syphilis with symptoms
	096 (with wildcard)		Late syphilis, latent
	097 (with wildcard)		Other and unspecified syphilis
	647.0 (with wildcard)		Syphilis complicating pregnancy childbirth or the puerperium
HIV Testing		86311	HIV antigen testing <sup>13</sup>
		86312	HIV/AIDS testing, but it is specifically "HTLV-III antibody detection, ELISA" <sup>13</sup>
		86314	HIV/AIDS testing, but it is specifically "HTLV-III antibody detection" <sup>13</sup>
		86689	Western Blot for HIV antibody <sup>13-18</sup>
		86701	(HIV-1)
		86702	(HIV-2)
		86703	HIV Antibodies, HIV-1/HIV-2, EIA with Reflex to HIV-1, Western Blot
		87390	HIV-1 direct AG (ICD), ELISA
		87391	HIV-2 antigen
		87389	HIV-1 antigen([s], with HIV-1 and HIV-2 antibodies, single result)
		87534	HIV-1 Nucleic Acid Detection – Direct Probe Technique
		87535	HIV-1 Nucleic Acid Detection – Amplified Probe Technique
		87536	HIV-1 Nucleic Acid Quantification <sup>13-17</sup>
		87537	HIV-2 Nucleic Acid Detection – Direct Probe Technique
		87538	HIV-2 Nucleic Acid Detection – Amplified Probe Technique
		87539	HIV-2 Nucleic Acid Quantification
		G0432	Infectious agent antibody detection by enzyme immunoassay (eia) technique, hiv-1 and/or hiv-2, screening
		G0433	Infectious agent antigen detection by enzyme-linked immunosorbent assay (ELISA) technique, antibody, HIV-1 or HIV-2, screening
		G0435	Infectious agent antigen detection by rapid antibody test of oral mucosa transudate, HIV-1 or HIV-2, screening.
		S3645	Hiv-1 antibody testing of oral mucosal transudate
Outpatient Non-psychiatric Medical Visits		99201	Office or other outpatient visit for the evaluation and management of a new patient, which requires these three key components: a problem focused history -- a problem focused examination -- and straightforward medical decision making. Counseling and/or co.
		99202	Office or other outpatient visit for the evaluation and management of a new patient, which requires these three key components: an expanded problem focused history -- an expanded problem focused examination -- and straightforward medical decision making..
		99203	Office or other outpatient visit for the evaluation and management of a new patient, which requires these three key components: a detailed history -- a detailed examination -- and medical decision making of low complexity. Counseling and/or coordination o.
		99204	Office or other outpatient visit for the evaluation and management of a new patient, which requires these three key components: a comprehensive history -- a comprehensive examination -- and medical decision making of moderate complexity. Counseling and/or.

- 99205 Office or other outpatient visit for the evaluation and management of a new patient, which requires these three key components: a comprehensive history -- a comprehensive examination -- and medical decision making of high complexity. Counseling and/or coo.
- 99211 Office or other outpatient visit for the evaluation and management of an established patient, that may not require the presence of a physician. Usually, the presenting problem(s) are minimal. Typically, 5 minutes are spent performing or supervising these.
- 99212 Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components: a problem focused history -- a problem focused examination -- straightforward medical decision making.
- 99213 Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components: an expanded problem focused history -- an expanded problem focused examination -- medical decision mak.
- 99214 Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components: a detailed history -- a detailed examination -- medical decision making of moderate complexity. Counse.
- 99215 Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components: a comprehensive history -- a comprehensive examination -- medical decision making of high complexity..
- 99241 Office consultation for a new or established patient, which requires these three key components: a problem focused history -- a problem focused examination -- and straightforward medical decision making. Counseling and/or coordination of care with other p.
- 99242 Office consultation for a new or established patient, which requires these three key components: an expanded problem focused history -- an expanded problem focused examination -- and straightforward medical decision making. Counseling and/or coordination.
- 99243 Office consultation for a new or established patient, which requires these three key components: a detailed history -- a detailed examination -- and medical decision making of low complexity. Counseling and/or coordination of care with other providers or.
- 99244 Office consultation for a new or established patient, which requires these three key components: a comprehensive history -- a comprehensive examination -- and medical decision making of moderate complexity. Counseling and/or coordination of care with othe.
- 99245 Office consultation for a new or established patient, which requires these three key components: a comprehensive history -- a comprehensive examination -- and medical decision making of high complexity. Counseling and/or coordination of care with other pr.
-

**Supplemental Material, p3. HIV Testing Percentage by State (N = 1,393,161)**

State	Cohort	2002			Adjusted rate (95% CI)	2012			Adjusted rate (95% CI)
		Tested	Total	%		Tested	Total	%	
Alaska	Schizophrenia	12	516	2.3%	2.3% (1.0, 3.6)	13	704	1.8%	1.8% (0.8, 2.8)
	Control	10	390	2.6%	2.8% (1.1, 4.5)	7	802	0.9%	0.9% (0.2, 1.5)
	All	22	906	2.4%	3.1% (1.8, 4.5)	20	1,506	1.3%	1.6% (0.9, 2.2)
Alabama	Schizophrenia	249	4,764	5.2%	5.3% (4.7, 6.0)	614	6,658	9.2%	9.8% (9.0, 10.5)
	Control	182	4,689	3.9%	3.7% (3.2, 4.2)	763	6,510	11.7%	11.3% (10.6, 12.0)
	All	431	9,453	4.6%	3.8% (3.4, 4.1)	1,377	13,168	10.5%	9.2% (8.7, 9.6)
Arkansas	Schizophrenia	164	2,515	6.5%	6.5% (5.6, 7.5)	301	3,736	8.1%	8.4% (7.5, 9.2)
	Control	377	3,006	12.5%	11.9% (10.8, 13.0)	276	3,267	8.4%	8.5% (7.6, 9.4)
	All	541	5,521	9.8%	8.9% (8.2, 9.6)	577	7,003	8.2%	7.9% (7.3, 8.5)
California	Schizophrenia	2,770	42,646	6.5%	6.9% (6.6, 7.1)	4,106	58,362	7.0%	7.5% (7.3, 7.8)
	Control	2,694	55,841	4.8%	4.7% (4.5, 4.8)	7,802	70,649	11.0%	10.4% (10.2, 10.6)
	All	5,464	98,487	5.5%	5.7% (5.5, 5.8)	12,000	129,011	9.2%	9.3% (9.1, 9.4)
Colorado	Schizophrenia	21	858	2.4%	2.7% (1.6, 3.9)	90	1,750	5.1%	5.6% (4.5, 6.7)
	Control	35	1,625	2.2%	2.2% (1.5, 3.0)	162	5,100	3.2%	3.0% (2.5, 3.5)
	All	56	2,483	2.3%	2.6% (1.9, 3.3)	252	6,850	3.7%	4.4% (3.8, 5.0)
Connecticut	Schizophrenia	187	2,921	6.4%	6.4% (5.6, 7.3)	849	4,808	17.7%	17.2% (16.1, 18.2)
	Control	41	3,186	1.3%	1.2% (0.9, 1.6)	1,009	9,007	11.2%	11.5% (10.9, 12.2)
	All	228	6,107	3.7%	3.5% (3.1, 3.9)	1,858	13,815	13.4%	14.0% (13.4, 14.6)
Florida	Schizophrenia	1,235	14,279	8.6%	9.0% (8.5, 9.4)	1,669	18,301	9.1%	9.6% (9.2, 10.0)
	Control	545	11,350	4.8%	4.6% (4.2, 4.9)	1,902	20,534	9.3%	8.9% (8.5, 9.3)
	All	1,780	25,629	6.9%	6.1% (5.9, 6.4)	3,571	38,835	9.2%	8.7% (8.5, 9.0)
Georgia	Schizophrenia	12	7,286	0.2%	0.2% (0.1, 0.3)	71	12,719	0.6%	0.6% (0.4, 0.7)
	Control	14	6,143	0.2%	0.2% (0.1, 0.4)	82	9,956	0.8%	0.8% (0.6, 1.0)
	All	26	13,429	0.2%	0.2% (0.1, 0.2)	153	22,675	0.7%	0.6% (0.5, 0.7)
Hawaii	Schizophrenia	43	1,491	2.9%	2.8% (2.0, 3.7)	15	2,597	0.6%	0.6% (0.3, 0.9)
	Control	34	1,647	2.1%	2.0% (1.3, 2.6)	16	2,924	0.5%	0.6% (0.3, 0.8)
	All	77	3,138	2.5%	3.6% (2.8, 4.3)	31	5,521	0.6%	0.9% (0.6, 1.2)
Iowa	Schizophrenia	29	856	3.4%	3.5% (2.3, 4.7)	144	2,624	5.5%	5.4% (4.6, 6.3)
	Control	38	1,793	2.1%	2.2% (1.5, 2.8)	157	5,419	2.9%	2.9% (2.4, 3.3)
	All	67	2,649	2.5%	3.1% (2.4, 3.9)	301	8,043	3.7%	4.5% (4.0, 5.0)
Idaho	Schizophrenia	54	898	6.0%	5.7% (4.3, 7.2)	73	1,612	4.5%	4.5% (3.5, 5.5)
	Control	27	652	4.1%	4.1% (2.6, 5.6)	36	1,047	3.4%	3.6% (2.5, 4.8)
	All	81	1,550	5.2%	6.0% (4.7, 7.2)	109	2,659	4.1%	5.0% (4.0, 5.9)
Illinois	Schizophrenia	517	13,836	3.7%	3.8% (3.5, 4.1)	2,220	18,602	11.9%	12.5% (12.0, 13.0)
	Control	179	10,199	1.8%	1.6% (1.4, 1.9)	1,564	25,418	6.2%	6.0% (5.8, 6.3)

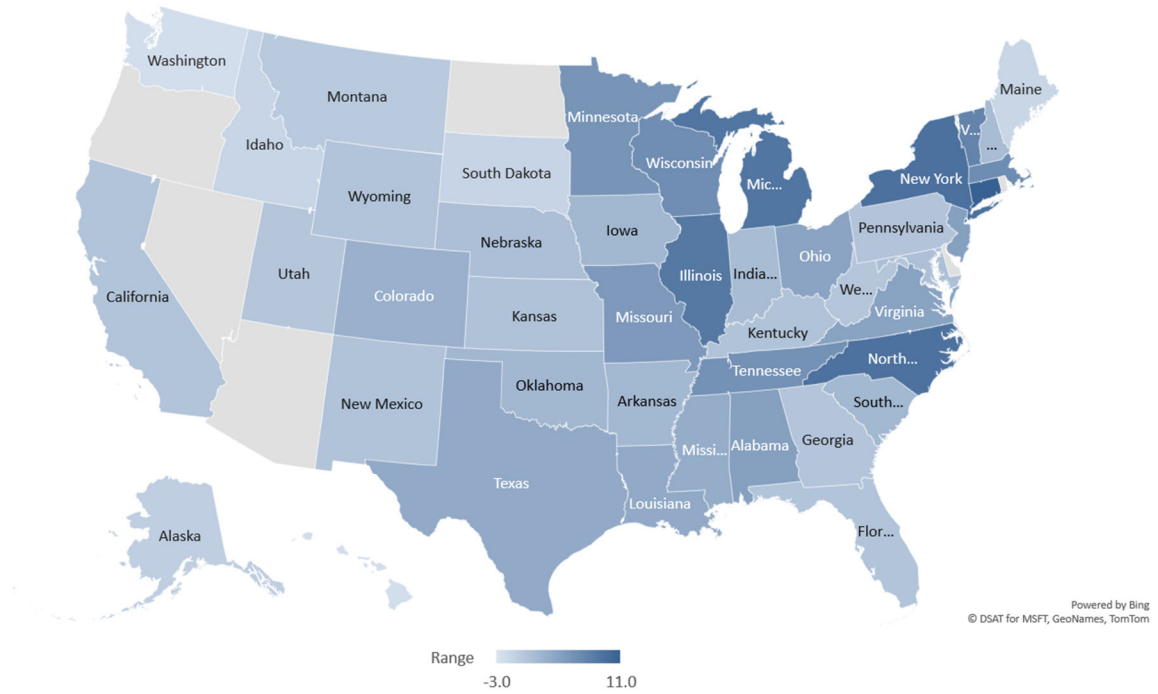
	All	696	24,035	2.9%	2.4% (2.2, 2.5)	3,784	44,020	8.6%	8.2% (7.9, 8.4)
Indiana	Schizophrenia	159	4,049	3.9%	3.8% (3.3, 4.4)	313	5,950	5.3%	5.2% (4.7, 5.8)
	Control	124	3,666	3.4%	3.3% (2.7, 3.8)	346	7,150	4.8%	5.0% (4.5, 5.5)
	All	283	7,715	3.7%	3.7% (3.3, 4.2)	659	13,100	5.0%	5.4% (5.1, 5.8)
Kansas	Schizophrenia	57	1,464	3.9%	3.8% (2.9, 4.8)	95	2,003	4.7%	4.6% (3.7, 5.5)
	Control	33	1,160	2.8%	2.9% (1.9, 3.9)	91	1,811	5.0%	5.2% (4.1, 6.2)
	All	90	2,624	3.4%	3.6% (2.8, 4.3)	186	3,814	4.9%	5.3% (4.6, 6.1)
Kentucky	Schizophrenia	164	4,055	4.0%	3.7% (3.1, 4.2)	238	5,188	4.6%	4.4% (3.8, 4.9)
	Control	149	6,095	2.4%	2.5% (2.1, 2.9)	213	5,870	3.6%	4.0% (3.5, 4.5)
	All	313	10,150	3.1%	3.8% (3.4, 4.2)	451	11,058	4.1%	5.2% (4.8, 5.7)
Louisiana	Schizophrenia	315	5,687	5.5%	5.5% (4.9, 6.1)	703	8,051	8.7%	8.8% (8.2, 9.4)
	Control	253	5,016	5.0%	5.2% (4.6, 5.8)	800	11,568	6.9%	6.8% (6.4, 7.3)
	All	568	10,703	5.3%	4.6% (4.3, 5.0)	1,503	19,619	7.7%	6.7% (6.4, 7.1)
Massachusetts	Schizophrenia	99	3,085	3.2%	3.4% (2.7, 4.0)	773	7,842	9.9%	9.8% (9.1, 10.4)
	Control	347	12,548	2.8%	2.8% (2.5, 3.1)	1,189	18,908	6.3%	6.2% (5.9, 6.6)
	All	446	15,633	2.9%	3.6% (3.2, 4.0)	1,962	26,750	7.3%	9.0% (8.6, 9.4)
Maryland	Schizophrenia	19	5,212	0.4%	0.4% (0.2, 0.5)	106	7,545	1.4%	1.4% (1.2, 1.7)
	Control	49	4,346	1.1%	1.0% (0.7, 1.3)	104	13,947	0.7%	0.8% (0.6, 0.9)
	All	68	9,558	0.7%	0.6% (0.5, 0.8)	210	21,492	1.0%	0.9% (0.8, 1.0)
Maine	Schizophrenia	57	1,052	5.4%	5.2% (3.9, 6.5)	56	1,409	4.0%	3.9% (2.9, 4.9)
	Control	55	4,070	1.4%	1.4% (1.0, 1.7)	70	4,062	1.7%	1.7% (1.3, 2.1)
	All	112	5,122	2.2%	4.0% (3.2, 4.8)	126	5,471	2.3%	3.6% (2.9, 4.2)
Michigan	Schizophrenia	5	1,052	0.5%	0.5% (0.1, 0.9)	1,467	15,926	9.2%	8.8% (8.3, 9.2)
	Control	16	10,252	0.2%	0.2% (0.1, 0.2)	1,021	17,586	5.8%	6.1% (5.7, 6.4)
	All	21	11,304	0.2%	0.3% (0.1, 0.5)	2,488	33,512	7.4%	7.1% (6.8, 7.4)
Minnesota	Schizophrenia	178	3,153	5.6%	5.8% (5.0, 6.6)	812	6,731	12.1%	11.1% (10.4, 11.8)
	Control	145	3,808	3.8%	3.7% (3.2, 4.3)	960	13,180	7.3%	7.6% (7.2, 8.1)
	All	323	6,961	4.6%	5.1% (4.5, 5.6)	1,772	19,911	8.9%	9.9% (9.4, 10.3)
Missouri	Schizophrenia	226	5,730	3.9%	3.8% (3.3, 4.3)	811	9,249	8.8%	8.8% (8.2, 9.3)
	Control	226	8,633	2.6%	2.6% (2.3, 3.0)	462	6,637	7.0%	7.1% (6.5, 7.7)
	All	452	14,363	3.1%	3.2% (2.9, 3.5)	1,273	15,886	8.0%	7.9% (7.5, 8.3)
Mississippi	Schizophrenia	207	4,085	5.1%	4.8% (4.1, 5.4)	405	5,264	7.7%	7.7% (7.0, 8.4)
	Control	168	3,624	4.6%	4.7% (4.0, 5.4)	365	4,343	8.4%	8.8% (8.0, 9.6)
	All	375	7,709	4.9%	4.0% (3.6, 4.4)	770	9,607	8.0%	7.1% (6.6, 7.6)
Montana	Schizophrenia	16	561	2.9%	2.7% (1.4, 4.0)	24	928	2.6%	2.6% (1.6, 3.6)
	Control	9	546	1.6%	1.6% (0.6, 2.6)	5	572	0.9%	1.0% (0.1, 1.8)
	All	25	1,107	2.3%	2.8% (1.7, 3.9)	29	1,500	1.9%	2.2% (1.4, 3.1)



North Carolina	Schizophrenia	234	6,149	3.8%	3.8% (3.3, 4.3)	1,437	10,946	13.1%	12.7% (12.1, 13.3)
	Control	312	7,385	4.2%	4.3% (3.8, 4.8)	1,132	11,197	10.1%	10.3% (9.8, 10.9)
	All	546	13,534	4.0%	3.6% (3.3, 3.9)	2,569	22,143	11.6%	10.1% (9.7, 10.5)
North Dakota	Schizophrenia	0	161	0.0%	0.0% (0.0, 0.0)	1	292	0.3%	0.4% (-0.4, 1.2)
	Control	0	422	0.0%	0.0% (0.0, 0.0)	2	291	0.7%	0.6% (-0.2, 1.4)
	All	0	583	0.0%	0.0% (0.0, 0.0)	3	583	0.5%	0.6% (-0.1, 1.3)
Nebraska	Schizophrenia	37	1,047	3.5%	3.5% (2.4, 4.7)	72	1,550	4.6%	4.7% (3.6, 5.8)
	Control	27	1,117	2.4%	2.3% (1.5, 3.2)	44	999	4.4%	4.4% (3.2, 5.7)
	All	64	2,164	3.0%	3.0% (2.3, 3.7)	116	2,549	4.6%	4.7% (3.9, 5.6)
New Hampshire	Schizophrenia	18	465	3.9%	3.9% (2.1, 5.6)	29	566	5.1%	5.3% (3.4, 7.1)
	Control	22	422	5.2%	4.9% (2.9, 6.9)	47	656	7.2%	7.3% (5.3, 9.3)
	All	40	887	4.5%	5.7% (4.0, 7.4)	76	1,222	6.2%	8.1% (6.4, 9.8)
New Jersey	Schizophrenia	409	6,626	6.2%	6.1% (5.5, 6.7)	967	9,345	10.3%	10.4% (9.8, 11.1)
	Control	295	6,484	4.5%	4.5% (4.0, 5.0)	1,199	13,154	9.1%	9.2% (8.7, 9.6)
	All	704	13,110	5.4%	5.1% (4.7, 5.5)	2,166	22,499	9.6%	9.6% (9.2, 9.9)
New Mexico	Schizophrenia	75	1,522	4.9%	4.9% (3.8, 5.9)	152	2,608	5.8%	5.6% (4.7, 6.4)
	Control	32	1,498	2.1%	2.1% (1.4, 2.8)	123	3,327	3.7%	3.9% (3.2, 4.6)
	All	107	3,020	3.5%	3.6% (2.9, 4.3)	275	5,935	4.6%	5.1% (4.5, 5.7)
New York	Schizophrenia	1,302	33,711	3.9%	3.7% (3.5, 3.9)	5,870	45,528	12.9%	12.7% (12.4, 13.0)
	Control	1,041	32,452	3.2%	3.3% (3.1, 3.5)	6,042	74,085	8.2%	8.4% (8.2, 8.6)
	All	2,343	66,163	3.5%	3.5% (3.3, 3.6)	12,000	119,613	10.0%	10.3% (10.1, 10.5)
Ohio	Schizophrenia	467	11,174	4.2%	4.1% (3.8, 4.5)	1,411	17,354	8.1%	8.0% (7.6, 8.4)
	Control	343	12,857	2.7%	2.6% (2.4, 2.9)	1,168	23,444	5.0%	5.1% (4.8, 5.4)
	All	810	24,031	3.4%	3.3% (3.1, 3.5)	2,579	40,798	6.3%	6.4% (6.2, 6.7)
Oklahoma	Schizophrenia	34	2,598	1.3%	1.4% (0.9, 1.8)	162	4,941	3.3%	3.3% (2.8, 3.8)
	Control	69	2,150	3.2%	3.2% (2.5, 4.0)	133	5,328	2.5%	2.4% (2.0, 2.8)
	All	103	4,748	2.2%	2.6% (2.1, 3.1)	295	10,269	2.9%	3.0% (2.7, 3.4)
Pennsylvania	Schizophrenia	112	3,756	3.0%	3.3% (2.7, 3.9)	188	5,136	3.7%	3.8% (3.3, 4.4)
	Control	89	14,480	0.6%	0.6% (0.5, 0.7)	483	22,147	2.2%	2.1% (1.9, 2.3)
	All	201	18,236	1.1%	1.9% (1.6, 2.2)	671	27,283	2.5%	3.0% (2.8, 3.3)
South Carolina	Schizophrenia	203	4,056	5.0%	5.1% (4.4, 5.8)	309	4,814	6.4%	6.9% (6.2, 7.7)
	Control	261	6,166	4.2%	3.9% (3.4, 4.3)	420	7,257	5.8%	5.9% (5.3, 6.4)
	All	464	10,222	4.5%	3.7% (3.4, 4.1)	729	12,071	6.0%	5.4% (5.0, 5.8)
South Dakota	Schizophrenia	9	303	3.0%	3.0% (1.1, 4.9)	9	470	1.9%	1.9% (0.7, 3.1)
	Control	6	397	1.5%	1.5% (0.3, 2.6)	15	478	3.1%	3.2% (1.6, 4.8)
	All	15	700	2.1%	2.6% (1.3, 3.9)	24	948	2.5%	3.2% (2.0, 4.5)
Tennessee	Schizophrenia	131	5,124	2.6%	2.3% (1.9, 2.7)	631	7,646	8.3%	7.5% (6.9, 8.1)
	Control	354	24,787	1.4%	1.6% (1.4, 1.7)	639	9,768	6.5%	6.1% (5.7, 6.6)

	All	485	29,911	1.6%	2.0% (1.8, 2.2)	1,270	17,414	7.3%	7.2% (6.8, 7.5)
Texas	Schizophrenia	583	11,932	4.9%	4.8% (4.4, 5.2)	1,932	23,683	8.2%	8.1% (7.7, 8.4)
	Control	314	8,751	3.6%	3.8% (3.4, 4.2)	1,151	13,686	8.4%	8.5% (8.0, 8.9)
	All	897	20,683	4.3%	4.1% (3.8, 4.4)	3,083	37,369	8.3%	8.1% (7.8, 8.4)
Utah	Schizophrenia	4	169	2.4%	2.5% (0.1, 5.0)	34	1,205	2.8%	2.9% (1.9, 3.8)
	Control	15	771	1.9%	1.9% (1.0, 2.9)	78	2,040	3.8%	3.8% (3.0, 4.6)
	All	19	940	2.0%	2.7% (1.2, 4.1)	112	3,245	3.5%	4.1% (3.4, 4.8)
Virginia	Schizophrenia	136	4,610	3.0%	3.1% (2.6, 3.6)	544	7,480	7.3%	7.1% (6.6, 7.7)
	Control	101	3,291	3.1%	3.2% (2.6, 3.9)	369	6,810	5.4%	5.2% (4.7, 5.7)
	All	237	7,901	3.0%	2.9% (2.5, 3.3)	913	14,290	6.4%	5.5% (5.2, 5.9)
Vermont	Schizophrenia	7	184	3.8%	3.5% (1.0, 6.0)	44	402	10.9%	10.2% (7.4, 13)
	Control	33	1,451	2.3%	2.2% (1.5, 3.0)	130	2,678	4.9%	5.0% (4.2, 5.8)
	All	40	1,635	2.4%	3.8% (2.3, 5.4)	174	3,080	5.6%	9.7% (8.0, 11.3)
Washington	Schizophrenia	184	3,270	5.6%	5.8% (5.0, 6.6)	241	6,963	3.5%	3.5% (3.1, 4.0)
	Control	189	5,615	3.4%	3.3% (2.8, 3.8)	292	7,085	4.1%	4.0% (3.6, 4.5)
	All	373	8,885	4.2%	5.1% (4.6, 5.6)	533	14,048	3.8%	4.5% (4.1, 4.9)
Wisconsin	Schizophrenia	133	3,730	3.6%	3.7% (3.1, 4.3)	572	5,557	10.3%	9.8% (9.0, 10.5)
	Control	146	5,425	2.7%	2.6% (2.2, 3.0)	596	11,985	5.0%	5.1% (4.7, 5.5)
	All	279	9,155	3.0%	3.3% (2.9, 3.7)	1,168	17,542	6.7%	7.5% (7.1, 8.0)
West Virginia	Schizophrenia	62	2,272	2.7%	2.5% (1.9, 3.1)	87	2,997	2.9%	2.7% (2.2, 3.3)
	Control	55	3,101	1.8%	1.8% (1.3, 2.3)	50	3,324	1.5%	1.7% (1.2, 2.2)
	All	117	5,373	2.2%	3.0% (2.4, 3.5)	137	6,321	2.2%	3.0% (2.5, 3.5)
Wyoming	Schizophrenia	7	156	4.5%	4.4% (1.2, 7.5)	12	232	5.2%	4.9% (2.3, 7.6)
	Control	3	199	1.5%	1.6% (-0.2, 3.4)	12	309	3.9%	3.9% (1.8, 6.0)
	All	10	355	2.8%	3.4% (1.3, 5.4)	24	541	4.4%	5.2% (3.2, 7.1)
USA (Total)	Schizophrenia	11,048	235,066	4.7%	4.7% (4.6, 4.7)	30,566	368,274	8.3%	8.3% (8.2, 8.4)
	Control	9,409	303,506	3.1%	3.1% (3.1, 3.2)	33,556	486,315	6.9%	6.9% (6.8, 7.0)
	All	20,457	538,572	3.8%	3.8% (3.7, 3.8)	64,123	854,589	7.5%	7.5% (7.5, 7.6)

*Note: Rate estimates are adjusted for age, sex, and race/ethnicity; CI = confidence interval.*



**Supplemental Material, p4.** Changes in HIV testing among non-dual eligible Medicaid enrollees with schizophrenia from 2002 to 2012

**Supplemental Material, p5.** Logistic Regression of HIV testing among Medicaid patients with schizophrenia, 2002 & 2012 (N = 603,340)

Predictor Class	Variable	2002 (n = 235,066)		2012 (n = 368,274)	
		OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Demographics</b>					
<i>Sex</i>	Female	1.59 (1.52, 1.66)	<.000	1.71 (1.66, 1.75)	<.000
	Male (REF)	1.00		1.00	
<i>Race/ethnicity</i>	Black	1.40 (1.33, 1.46)	<.000	2.12 (2.05, 2.18)	<.000
	AI/AN	0.87 (0.67, 1.13)	0.293	0.95 (0.81, 1.11)	0.502
	Asian/PI	0.42 (0.32, 0.55)	<.000	1.08 (0.97, 1.20)	0.158
	Hispanic/Latino	1.55 (1.45, 1.65)	<.000	2.00 (1.92, 2.08)	<.000
	NHOPI	0.97 (0.82, 1.16)	0.772	0.79 (0.68, 0.91)	<.000
	Multiracial	0.91 (0.56, 1.48)	0.711	1.90 (1.58, 2.27)	0.001
	Unknown	1.18 (1.09, 1.27)	<.000	1.28 (1.22, 1.34)	<.000
	White (REF)	1.00		1.00	
<i>Age</i>	15-19	4.32 (3.68, 5.07)	<.000	3.01 (2.77, 3.27)	<.000
	20-29	4.74 (4.14, 5.44)	<.000	3.58 (3.37, 3.82)	<.000
	30-39	3.78 (3.32, 4.32)	<.000	2.74 (2.57, 2.92)	<.000
	40-49	2.90 (2.55, 3.30)	<.000	2.15 (2.02, 2.29)	<.000
	50-59	1.76 (1.54, 2.02)	<.000	1.53 (1.44, 1.62)	<.000
	60-64 (REF)	1.00		1.00	
<i>Comorbidities<sup>a</sup> Substance Use</i>	Alcohol	1.23 (1.15, 1.32)	<.000	1.28 (1.23, 1.33)	<.000
	Opioid	1.18 (1.07, 1.31)	0.001	1.24 (1.18, 1.31)	<.000
	Cocaine	1.32 (1.22, 1.44)	<.000	1.34 (1.27, 1.41)	<.000
	Amphetamine	1.54 (1.30, 1.83)	<.000	1.08 (0.98, 1.18)	0.107
	Cannabis	0.92 (0.83, 1.01)	0.095	1.12 (1.07, 1.17)	<.000
	Other	1.57 (1.47, 1.69)	<.000	1.47 (1.41, 1.53)	<.000
	None (REF)	1.00		1.00	
<i>Psychiatric</i>	Anxiety	1.35 (1.27, 1.44)	<.000	1.14 (1.10, 1.18)	<.000
	Depression	1.36 (1.30, 1.42)	<.000	1.28 (1.25, 1.32)	<.000
	None (REF)	1.00		1.00	
<i>Medical</i>	Hepatitis B	1.69 (1.43, 2.01)	<.000	2.04 (1.80, 2.31)	<.000
	Hepatitis C	3.51 (3.24, 3.81)	<.000	2.70 (2.56, 2.84)	<.000
	Diabetes Mellitus	0.96 (0.91, 1.02)	0.215	1.00 (0.96, 1.03)	0.860
	Hypertension	1.13 (1.08, 1.19)	<.000	1.10 (1.06, 1.13)	<.000
	Dyslipidemia	1.46 (1.38, 1.54)	<.000	1.27 (1.23, 1.31)	<.000
	None (REF)	1.00		1.00	
<i>STI</i>	HSV	3.39 (2.94, 3.90)	<.000	3.44 (3.18, 3.71)	<.000
	Chlamydia	2.78 (2.06, 3.76)	<.000	4.64 (3.97, 5.42)	<.000
	Syphilis	3.79 (3.12, 4.60)	<.000	3.28 (2.82, 3.82)	<.000
	Gonococcal	2.34 (1.78, 3.08)	<.000	3.53 (2.90, 4.30)	<.000
	None (REF)	1.00		1.00	

Abbreviations: AI/AN = American Indian/Alaskan Native; PI = Pacific Islander; NHOPI = Native Hawaiian/Other Pacific Islander; OR = odds ratio; CI = confidence interval; STI = sexually transmitted infection; REF = reference group.

Estimates are adjusted for race/ethnicity, age, gender, and comorbidities (substance use, psychiatric, medical).

<sup>a</sup>Respective comorbid reference group includes those who do not have the condition.

**Supplemental Material, p6.** Sensitivity analysis: Logistic regression of HIV testing among Medicaid patients with schizophrenia adjusted for any annual medical visit, 2002 & 2012 ( $N = 603,340$ )

Predictor Class	Variable	2002 ( $n = 235,066$ )		2012 ( $n = 368,274$ )	
		OR (95% CI)	P-value	OR (95% CI)	P-value
<b>Demographics</b>					
<i>Sex</i>	Female	1.42 (1.36, 1.48)	<.000	1.54 (1.50, 1.58)	<.000
	Male (REF)	1.00		1.00	
<i>Race/ethnicity</i>	Black	1.53 (1.46, 1.60)	<.000	2.25 (2.18, 2.32)	<.000
	AI/AN	0.90 (0.70, 1.17)	0.448	0.94 (0.81, 1.10)	0.453
	Asian/PI	0.44 (0.34, 0.57)	<.000	1.14 (1.03, 1.27)	0.012
	Hispanic/Latino	1.69 (1.58, 1.81)	<.000	2.08 (2.00, 2.16)	<.000
	NHOPI	0.97 (0.82, 1.16)	0.749	0.91 (0.79, 1.05)	0.216
	Multiracial	1.07 (0.66, 1.75)	0.775	1.85 (1.54, 2.21)	<.000
	Unknown	1.24 (1.15, 1.34)	<.000	1.32 (1.26, 1.39)	<.000
	White (REF)	1.00		1.00	
<i>Age</i>	15-19	4.00 (3.40, 4.69)	<.000	2.77 (2.55, 3.01)	<.000
	20-29	4.60 (4.02, 5.27)	<.000	3.53 (3.32, 3.76)	<.000
	30-39	3.66 (3.21, 4.18)	<.000	2.68 (2.52, 2.86)	<.000
	40-49	2.80 (2.46, 3.19)	<.000	2.09 (1.97, 2.22)	<.000
	50-59	1.73 (1.51, 1.97)	<.000	1.50 (1.41, 1.59)	<.000
	60-64 (REF)	1.00		1.00	
Outpatient Non-psychiatric Medical Visit	One or more	2.69 (2.55, 2.83)	<.000	3.10 (2.99, 3.22)	<.000
	None (REF)	1.00		1.00	
Comorbidities <sup>a</sup> <i>Substance Use</i>	Alcohol	1.25 (1.17, 1.34)	<.000	1.30 (1.25, 1.35)	<.000
	Opioid	1.27 (1.14, 1.40)	<.000	1.23 (1.17, 1.30)	<.000
	Cocaine	1.39 (1.27, 1.51)	<.000	1.37 (1.30, 1.44)	<.000
	Cannabis	1.49 (1.25, 1.77)	<.000	1.13 (1.03, 1.24)	0.010
	Other	0.93 (0.85, 1.03)	0.187	1.47 (1.41, 1.53)	<.000
	None (REF)	1.59 (1.48, 1.71)	<.000	1.50 (1.44, 1.56)	<.000
		1.00		1.00	
<i>Psychiatric</i>	Anxiety				
	Depression	1.24 (1.17, 1.32)	<.000	1.06 (1.03, 1.10)	<.000
	None (REF)	1.31 (1.25, 1.37)	<.000	1.23 (1.19, 1.26)	<.000
	1.00		1.00		
<i>Medical</i>	Hepatitis B				
	Hepatitis C	1.69 (1.43, 2.01)	<.000	1.71 (1.45, 2.03)	<.000
	Diabetes Mellitus	3.24 (2.99, 3.51)	<.000	2.48 (2.36, 2.61)	<.000
	Hypertension	0.90 (0.85, 0.95)	<.000	0.94 (0.91, 0.98)	0.001
	Dyslipidemia	1.01 (0.96, 1.06)	0.623	0.98 (0.95, 1.01)	0.126
	None (REF)	1.32 (1.25, 1.39)	<.000	1.13 (1.10, 1.17)	<.000
		1.00		1.00	
<i>STI</i>	HSV				
	Chlamydia	3.12 (2.71, 3.60)	<.000	3.11 (2.88, 3.36)	<.000
	Syphilis	2.53 (1.88, 3.41)	<.000	4.15 (3.56, 4.84)	<.000
	Gonococcal	3.70 (3.05, 4.50)	<.000	3.23 (2.78, 3.75)	<.000
	None (REF)	1.00		1.00	

*Abbreviations: AI/AN = American Indian/Alaskan Native; PI = Pacific Islander; NHOPI = Native Hawaiian/Other Pacific Islander; OR = odds ratio; CI = confidence interval; STI = sexually transmitted infection; REF = reference group.*

*Estimates are adjusted for race/ethnicity, age, gender, and comorbidities (substance use, psychiatric, medical).*

*<sup>a</sup>Respective comorbid reference group includes those who do not have the condition.*

**Supplemental Material, p7.** Sensitivity Analysis: Adjusted logistic regression of HIV testing among Medicaid patients by schizophrenia status, 2012 (N = 854,589)

Model Class	Adjusted Models	Cases vs. Controls		
		OR (95% CI)	P-value	
<i>Nested</i>	Model 1 (Minimal)	1.23 (1.52, 1.66)	<.000	
	Model 2 (Full)	0.94 (0.93, 0.96)	<.000	
	Model 2 minus STI	0.94 (0.93, 0.96)	<.000	
	Model 2 minus SUD	1.01 (0.99, 1.03)	0.221	
	Model 2 minus STI, SUD	0.96 (0.94, 0.98)	<.000	
<i>Restricted</i>		Adj. Testing Rate (%)	P-value	
	Without STI	Control	7.3% (7.2, 7.3)	<.000
		Case	6.9% (6.8, 7.0)	<.000
		Difference	-0.3% (-0.4, -0.2)	<.000
	Without SUD	Control	6.9% (6.8, 7.0)	<.000
		Case	6.3% (6.3, 6.4)	<.000
		Difference	-0.5 (-0.7, -0.4)	<.000
	Without STI, SUD	Control	6.4% (6.3, 6.5)	<.000
		Case	6.2% (6.1, 6.3)	<.000
		Difference	-0.2% (-0.3, -0.1)	<.000

*Abbreviations: STI=sexually transmitted infection; SUD=substance use disorders; OR=odds ratio; CI=confidence intervals; Adj=adjusted. Model 1 is minimally adjusted for age, sex, race/ethnicity. Model 2 includes Model 1 plus comorbidities (STIs, SUD, medical, psychiatric).*