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Suppression of substance abuse claims in Medicaid data and rates of diagnoses for non-substance abuse conditions

Kathryn Rough, ScM[1,*], **Brian T. Bateman, MD, MSc**[1], **Elisabetta Patorno, MD, DrPH**[1], **Rishi J. Desai, MS, PhD**[1], **Yoonyoung Park, MS**[1], **Sonia Hernandez-Diaz, MD, DrPH**[2], and **Krista F. Huybrechts, MS, PhD**[1]

[1]Division of Pharmacoepidemiology and Pharmacoeconomics, Brigham and Women's Hospital, Boston, Massachusetts

[2]Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, Massachusetts

Introduction

In a change from longstanding practice, the Centers for Medicare & Medicaid Services (CMS) recently began suppressing substance abuse-related claims in the Medicare and Medicaid Research Identifiable Files.[1,2] This change was enacted to comply with a decades-old federal regulation barring third party payers from releasing information from federally funded substance abuse treatment programs without patient consent.[3]

CMS removes any claim containing a diagnostic or procedure code related to substance abuse, meaning that the entire encounter captured by the claim is deleted (including all diagnosis and procedure codes).[1,4] Therefore, important diagnoses linked to substance abuse might also be suppressed.

We examined the association between implementation of the CMS suppression policy and rates of diagnoses for non-substance abuse conditions in Medicaid data.

[*]Corresponding Author Information: Division of Pharmacoepidemiology and Pharmacoeconomics, Brigham and Women's Hospital, 1620 Tremont Street, Suite 3030, Boston, Massachusetts 02120, Phone: 617-432-1569; Fax: 617-566-7805; ker704@mail.harvard.edu.

Author contributions: Kathryn Rough had full access to all of the data in the study and takes responsibility for the integrity of the data and accuracy of the analysis.

Study concept and design: Rough, Bateman, Hernandez-Diaz, Huybrechts

Acquisition, analysis, or interpretation of data: All authors

Statistical analysis: Rough, Park

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Methods

We received Medicaid data for 2000-2006 prior to implementation of the suppression policy (i.e. containing substance abuse codes) and data for 2007-2010 after the policy was enacted, allowing comparison of data without vs with claim suppression. Use of this de-identified database was approved by Partners Institutional Review Board and the need for informed consent was waived.

Based on all diagnosis fields for ICD-9 CM codes, we calculated annual inpatient and outpatient rates (per 100,000 patients utilizing inpatient and outpatient services, respectively) of diagnoses for 6 conditions that commonly co-occur with substance abuse (hepatitis C, human immunodeficiency virus [HIV], cirrhosis, tobacco use, depression, anxiety) and 4 conditions unrelated to substance abuse (type II diabetes, stroke, hypertension, kidney disease).

Segmented linear regression models allowing for first-order autocorrelation were used to test for changes in the rate of each condition in the years after suppression was implemented. Models included a term for the baseline trend (2000-2006) and terms to estimate changes in level and trend after implementation of suppression procedures (2007-2010). For each parameter, 95% Confidence Intervals (CI) were calculated and a 2-sided Wald test was conducted. P-values <0.05 were considered statistically significant.

Analyses were performed in SAS v9.4 (SAS Institute Inc.).

Results

Over the 11-year study, there were 63 million inpatient and 13.6 billion outpatient claims. For inpatient diagnoses, regression models showed a statistically significant negative level change (i.e., immediate reduction in the first year affected by suppression) for conditions commonly co-occurring with substance abuse (Table). Relative to rates observed in 2006, there was an immediate reduction in the 2007 inpatient diagnosis rates (per 100,000 patients) of 56.7% for hepatitis C (-1,233 [95% CI -1,588 to -908]; p<0.001) (displayed in Figure), 51.3% for tobacco use (-5,015 [-6,073 to -3,957]; p<0.001), 48.9% for cirrhosis (-675 [-864 to -486]; p<0.001), 38.4% for depression (-2,712 [-4,377 to -1,047]; p=0.02), 26.6% for anxiety (-795 [-1,220 to -371]; p=0.01), and 24.0% for HIV (-498 [-665 to -330]; p<0.001).

Reductions in outpatient diagnosis rates were less pronounced. While all conditions that commonly co-occur with substance abuse had a negative level change, this decrease was only statistically significant for anxiety, with a 6.3% reduction (-2512 [-4,811 to -213]; p=0.02).

Discussion

Conditions unrelated to substance abuse appeared generally unassociated with CMS' suppression practices. However, implementation of the policy coincided with sudden and substantial decreases in the rates of inpatient diagnoses for conditions commonly co-

occurring with substance abuse, while only anxiety showed significant reductions in outpatient diagnosis rates.

Underestimation of diagnoses has the potential to bias health services research studies and epidemiological analyses where affected conditions are outcomes or confounders. In studies of healthcare utilization, the number of missing claims may vary in a non-random fashion between groups defined by demographics, disease, or locality. Comparisons between groups may lead to spurious conclusions - a hospital that regularly admits substance abusers will have artificially low rates of re-admission, giving a false appearance of better performance.

A potential limitation is that the observations are susceptible to influence from secular trends, including changes in Medicaid eligibility, coding practices, or the true underlying prevalence of the medical conditions. However, the marked, immediate decline in inpatient rates of comorbidities related to substance abuse following the beginning of the suppression period suggests that our findings were likely the result of CMS' suppression policies.

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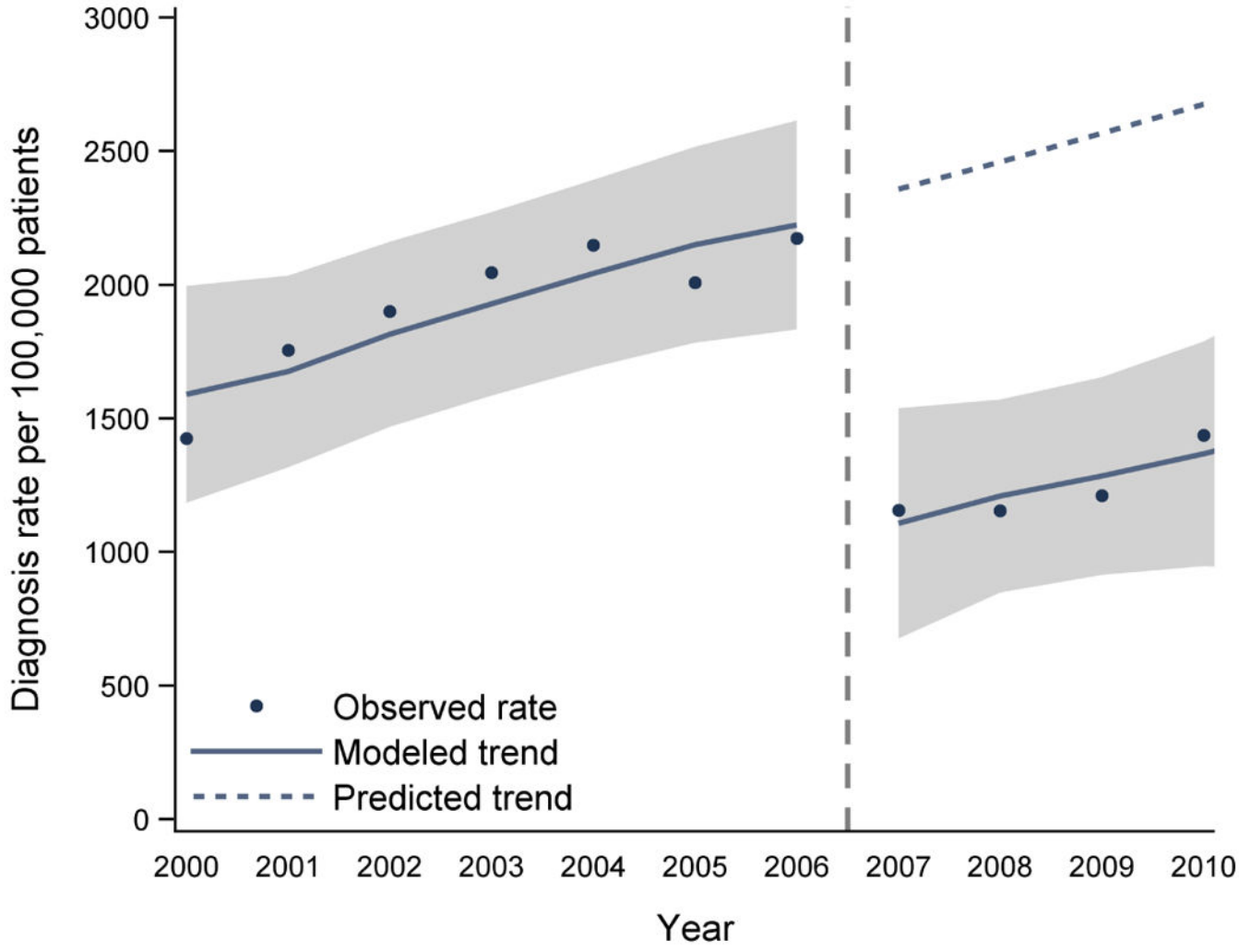

Figure. Rate of inpatient Hepatitis C diagnoses and segmented linear regression results before and after CMS suppression

Abbreviations: CMS, Centers for Medicare and Medicaid Services

Note: the 'predicted trend' is the projected rate of diagnoses in the absence of the CMS suppression procedures, based on a continuation of the baseline trend.

Table

Annual rates of diagnoses per 100,000 patients for selected conditions in Medicaid before and after suppression of substance abuse claims and results of segmented linear regression analysis

	Inpatient diagnoses											
	Rates of diagnoses[c]				Model results							
	2000	2006	2007	2010	Level change[e]	95% CI		p-value	Trend change[f]	95% CI		p-value
Related conditions[a]												
Hepatitis C	1,424	2,173	1,156	1,437	-1,233	-1,558	-908	< 0.001	-21	-157	114	0.77
HIV	3,058	2,076	1,254	1,428	-498	-665	-330	< 0.001	204	136	273	< 0.001
Cirrhosis	1,362	1,381	779	894	-675	-864	-486	< 0.001	38	-39	114	0.37
Tobacco use	5,274	9,768	5,872	8,735	-5,015	-6,073	-3,957	< 0.001	165	-233	564	0.45
Depression	6,795	7,068	4,668	6,677	-2,712	-4,377	-1,047	0.02	615	-70	1,301	0.13
Anxiety	2,301	2,991	2,344	3,522	-795	-1,220	-371	0.01	281	107	456	0.02
Unrelated conditions[b]												
Type II diabetes	6,069	7,864	7,266	9,946	-1,012	-2,175	151	0.14	556	92	1,021	0.06
Stroke	1,088	884	885	1,250	71	-58	199	0.32	144	93	195	0.002
Hypertension	11,531	13,534	11,864	16,726	-2,193	-4,343	-43	0.09	1,251	392	2,110	0.03
Kidney disease	3,923	4,904	4,937	7,959	-37	-697	623	0.92	817	551	1,082	< 0.001
	Outpatient diagnoses											
	Rates of diagnoses[d]				Model results							
	2000	2006	2007	2010	Level change[e]	95% CI		p-value	Trend change[f]	95% CI		p-value
Related conditions[a]												
Hepatitis C	2,206	3,080	2,912	3,686	-463	-1,464	538	0.33	90	-313	492	0.68
HIV	9,937	9,439	8,753	9,392	-470	-1,561	621	0.42	340	-100	781	0.16
Cirrhosis	1,470	1,591	1,518	2,114	-99	-324	127	0.42	193	103	283	0.005
Tobacco use	1,510	3,807	4,105	7,384	-5	-271	261	0.97	809	683	936	< 0.001
Depression	48,282	45,220	40,574	48,941	-4,846	-9,852	160	0.10	3,652	1,670	5,634	0.01
Anxiety	32,145	40,044	38,520	47,051	-2,512	-4,811	-213	0.02	1,654	886	2,422	0.004
Unrelated conditions[b]												

	Inpatient diagnoses											
	Rates of diagnoses[c]				Model results							
	2000	2006	2007	2010	Level change[e]	95% CI		p-value	Trend change[f]	95% CI		p-value
Type II diabetes	23,875	32,231	32,488	46,598	350	-3,053	3,752	0.85	3,661	2,309	5,013	0.002
Stroke	5,569	4,420	4,445	5,937	577	-210	1,363	0.20	725	412	1,039	0.004
Hypertension	26,337	32,180	32,308	47,917	499	-3,842	4,841	0.83	4,549	2,797	6,301	0.002
Kidney disease	16,411	17,998	18,741	26,924	1,250	-1,408	3,908	0.39	2,660	1,599	3,721	0.003

Abbreviations: CI, confidence interval; HIV, human immunodeficiency virus

[a] 'Related conditions' are known to commonly co-occur with substance abuse disorders

[b] 'Unrelated conditions' are thought to be less directly related to substance abuse disorders

[c] Estimated as number of inpatient diagnoses per 100,000 patients utilizing inpatient services

[d] Estimated as number of outpatient diagnoses per 100,000 patients utilizing outpatient services

[e] 'Level change' is the instantaneous change in the baseline trend in the first year affected by suppression (2007)

[f] 'Trend change' is the change in annual trend of the diagnosis rate in the years affected by suppression (2007-2010).