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Incremental Value of Using Medicaid Claim Files to Study Comorbid Conditions and Treatments in Dually Eligible Beneficiaries

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Abstract

Background—Although investigations using Medicare claims files are ubiquitous in the health services research literature, Medicaid claims files are used less frequently. Nonetheless, Medicaid is the major payer for healthcare among low-income persons.

Objective—To assess the added value of Medicaid claim files for identifying comorbid conditions and cancer treatments in a dually eligible sample.

Research Design—Data were obtained from linked statewide tumor registries from 2 contiguous Midwestern states (Michigan and Ohio), Medicare and Medicaid enrollment files, and Medicare and Medicaid claims files. We estimated the prevalence of Charlson Comorbidity Index conditions by counting the number of patients with these conditions in the Medicare claims files alone. We then estimate the expected percent increase in the prevalence of comorbid conditions (along with the 95% confidence interval) that could be obtained by using both Medicare and Medicaid claim files. We followed a similar procedure to identify treatments provided to dually eligible patients.

Results—Medicaid claims added very few individuals with comorbid conditions over those identified through Medicare claim files. The increase in the prevalence of comorbid conditions was between 0% and 2.5%. Likewise, Medicaid claims identified few individuals with cancer treatments who were not already identified through Medicare claim files, although variations were noted between the 2 states.

Conclusions—This study suggests that the incremental value of Medicaid inpatient, outpatient, and carrier claims is relatively small over what can be obtained from Medicare claims data.

Keywords

administrative data Medicare and Medicaid; dual eligibility

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The Principal Investigator had full access to all of the data in the study and takes responsibility for the integrity for the data and the accuracy of the data analysis.

Although investigations using Medicare claim files are ubiquitous in the health services research literature, Medicaid claims files are used less frequently. Researchers must either access Medicaid files on a state-by-state basis or obtain Medicaid Analytic Extract files from the Centers for Medicare and Medicaid Services (CMS), which can be a costly option,¹ and one that could limit the possibility of linking Medicaid claim files with other sources of patient-level data (eg, disease registries).

Advantages of working with state Medicaid agencies include the ability to link with other files, complete patient enrollment and coverage information, and timely data. However, states vary in how they process and maintain Medicaid claim files and in their interest in and resources for working with researchers. Medicaid agencies may feel restricted in sharing their data given the current regulatory environment and privacy rules. If Medicaid data are obtained, there are many challenges associated with linking them to other files.²⁻⁴ Nevertheless, Medicaid is the primary payer for certain categories of low-income people and for long-term nursing home care services⁵; and until Medicare part D became available, Medicaid was the only source for prescription drug utilization for low-income individuals.

Using data from 2 contiguous Midwestern states, Michigan and Ohio, we examined the incremental value of Medicaid claim files for identifying comorbid conditions and cancer treatments among dually eligible Medicare and Medicaid beneficiaries. This assessment informs researchers who are weighing the potential gain from Medicaid claim files when studying dually eligible beneficiaries. Dually eligible beneficiaries are the most vulnerable among the elderly population, accounting for a disproportionate share of Medicaid and Medicare utilization and payments⁶ and a disproportionate share of chronic illness relative to other Medicare enrollees.⁷ However, many researchers base their assessment of healthcare utilization among dually eligible with Medicare claims alone without knowledge of how much Medicaid claims would have added to their analysis.⁸⁻¹²

We study the occurrence of comorbid conditions among the dually eligible because these conditions are negatively correlated with cancer treatment¹³⁻¹⁷ and an accurate assessment of them is essential to fully understand disparities in cancer care. Disparities in treatment have been noted between dually eligible and Medicare-only patients diagnosed with cancer.¹⁸⁻²⁰ However, if dually eligible beneficiaries receive care that is documented in Medicaid, but not Medicare claims, the extent of disparate treatment may be over-stated by analysts using Medicare claim files alone. Such an assessment is useful to researchers considering whether to expend resources to obtain Medicaid claim files.

METHODS

Data

Data were from linked statewide tumor registries, Medicare and Medicaid enrollment and claims files. These databases were developed independently by investigators in Michigan and Ohio. The studies, with their respective data users' agreement from the CMS, were approved by the Institutional Review Boards at Michigan State University, Michigan Department of Community Health, Virginia Commonwealth University for the Michigan part, and by the Ohio Department of Health, the Ohio Department of Job and Family Services, and University Hospitals of Cleveland for the Ohio part. The present study was carried out independently after investigators agreed on the study design and analytic strategies. Data by the respective parties were shared in aggregate only. The databases are described in greater detail elsewhere.^{3,4}

Medicaid enrollment files were used to identify patients, aged 65 and older, dually eligible for Medicare and Medicaid. The extent of Medicaid coverage included Medicare enrollees who have Medicare part B premium covered (ie, Specified Low-Income Medicare Beneficiaries); have both their Medicare part B premium and their Medicare cost-sharing amounts covered (ie, Qualified Medicare Beneficiaries); or receive full Medicaid benefits in addition to the coverage of part B premium and Medicare cost-sharing amounts. In Michigan, approximately 90% of dually eligible patients received full Medicaid benefits; equivalent information was not available for Ohio.

Sample

We selected all dually eligible patients diagnosed with female breast, colorectal, or prostate cancer between January 1, 1997 and December 31, 2000. These cancer sites and years of data were common to both states' datasets. Patients were continuously enrolled in Medicaid for at least 12 months before the month of diagnosis. We excluded patients who were not enrolled in Medicare parts A and B or were enrolled in a Health Maintenance Organization because claims data for these patients were not complete. For the comorbidity analysis, we required that patients be continuously enrolled in Medicare and Medicaid for the 12 months preceding cancer diagnosis (N = 1107, Michigan and N = 2435, Ohio). For the treatment analysis, the study population included patients continuously enrolled in Medicare and Medicaid for the 6 months after cancer diagnosis (N = 2356, Michigan and N = 2266, Ohio).

Comorbid Conditions

We used the Deyo et al²¹ and Klabunde et al²² adaptation of the Charlson Comorbidity Index,²³ which has been used to explain the probability and extent of cancer treatment.^{22,24} The comorbidity index included 13 conditions (myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic obstructive pulmonary disease, rheumatologic disease, peptic ulcer disease, mild liver disease, diabetes, diabetes with complications, hemiplegia or paraplegia, and renal disease). There were no participants in the study population with severe liver disease or AIDS. Evidence of a malignancy was excluded because the sample was drawn from a cancer population. We created a summary category for "any comorbidity," which indicated the number of patients who had at least 1 of the 13 comorbid conditions. All inpatient, outpatient and physician Medicare and Medicaid claims for services rendered to patients in the year prior to diagnosis were used.

Treatment

We identified major cancer treatments for breast, colorectal, and prostate cancer for patients continuously dually enrolled in Medicare and Medicaid for 6 months after diagnosis. Michigan patients were diagnosed between January 1, 1997 and June 30, 2000 and Ohio patients were diagnosed between January 1, 1997 and December 31, 2000. We counted surgical, chemotherapy, and radiotherapy claims that occurred within 6 months after diagnosis in the inpatient, outpatient, and carrier files using International Classification of Disease (ICD-9), Current Procedural Terminology codes, and Healthcare Procedural Coding System. Surgical procedures included were breast biopsy, breast nodectomy, lumpectomy, mastectomy, colorectal biopsy, colorectal excision, colorectal resection, colorectal bypass, prostate biopsy, prostate nodectomy, prostatectomy, radical prostatectomy, and orchiectomy. The codes for these procedures and for chemotherapy and radiotherapy are included in an Appendix (Table A1).

Statistical Analysis

We identified the number of patients with comorbid conditions comprising the Charlson Comorbidity Index from the Medicare and Medicaid claim files alone. Next, we estimated the prevalence of these conditions by counting the number of new patients with these conditions in the Medicaid claim files and adding them to the number identified from Medicare claim files alone. Lastly, we estimated the percent increase in the calculated prevalence of comorbid conditions (along with the 95% confidence interval) that could be obtained by using Medicaid in addition to Medicare claim files. We followed a similar procedure to identify treatments provided to dually eligible patients.

All analyses were performed separately by state using SAS V9.1 (SAS institute Inc, Cary, NC). We combined the 3 cancer sites for the assessment of comorbid conditions, but kept the sites separate for the analysis of treatments. In all analyses, we report findings separately by state. Each state designs its own Medicaid program, with different services and reimbursement levels, which differentially affect providers and subsequent health care delivery to patients.

RESULTS

The Michigan and Ohio sample characteristics are reported in Table 1. The Michigan sample was younger than the Ohio sample and had a higher percentage of males and African Americans (due to the higher prevalence of prostate cancer). Most of beneficiaries qualified for Medicare as “aged.”

The number of individuals with comorbid conditions identified from Medicare claims alone, Medicaid claims alone, and Medicare and Medicaid claims is reported in Table 2. The estimated condition-specific percent increase in the calculated prevalence, along with 95% confidence intervals that can be obtained from using both Medicare and Medicaid claims files is also reported. Approximately 64% and 69% of the Michigan and Ohio dually eligible patients, respectively, had at least 1 comorbid condition. Medicaid claims alone identified few patients with comorbid conditions. The highest percent prevalence increase for a single condition identified with Medicaid files was 2.2% (95% CI: 1.3–3.0) for congestive heart failure in Michigan. In Ohio, the highest percent prevalence increase was 2.5% (95% CI: 1.9–3.1) for chronic obstructive pulmonary disease. When considering any co-morbidity rather than a single condition, the percent prevalence increased by nearly 6% (95% CI: 4.4–7.2) in Michigan and 4.5% (95% CI: 3.7–5.3) in Ohio by using Medicaid claims in addition to Medicare claims.

Table 3 reports the cancer treatments identified from Medicare and Medicaid files. Medicaid claim files added less than 1% to the prevalence of cancer treatment identified from Medicare files alone in Michigan. The prevalence of breast biopsy was elevated slightly (2.4%) by the use of Ohio Medicaid claim files. Cancer treatment incidence increased slightly, ranging from 0.1% to 2.4% in Ohio and never exceeding 1% in Michigan, when Medicare files were supplemented with Medicaid files.

DISCUSSION

Medicaid claim files added few comorbid conditions and treatments that was found in Medicare claim files alone. Researchers may want to carefully consider whether Medicaid claims are worth the investment in time, dollars, and effort to supplement Medicare inpatient, outpatient, and carrier claims. According to the Centers for Medicare and Medicaid Services website that addresses third party liability, “the Medicaid program by law is intended to be the payer of last resort; that is, all other available third party resources must

meet their legal obligation to pay claims before the Medicaid program pays for the care of an individual eligible for Medicaid.”²⁵ Furthermore, Medicaid reimbursement rates may be below 80% of allowable charges reimbursed by Medicare. Therefore, Medicaid reimbursement, in many cases, may not be high enough to offset the administrative cost to submit the claims.

Other researchers examining the quality of Medicaid claim files report that Medicaid inpatient files greatly under-report hospitalizations in patients age 45 years and older.^{26,27} These researchers strongly urge others to obtain supplementary Medicare data in addition to Medicaid data for studies of dually eligible persons age 45 years and older. Our study reinforces this recommendation.

Three limitations are noteworthy. First, we examined only 2 states and although our findings were fairly consistent across the states, there were some deviations. In particular, we note the higher prevalence of cancer treatments obtained from Ohio Medicaid claims data compared with the Michigan Medicaid data. An examination of other states’ Medicaid files would be expected to yield variable information beyond what is documented in the Medicare claim files. Second, a proportion of dually eligible beneficiaries was not qualified for full Medicaid benefits and instead, received assistance with Medicare copayments and premiums (10% of the Michigan sample fell in this category). Therefore, we would not expect Medicaid claims to supplement Medicare claims for these beneficiaries. Finally, our analysis was specific to dually eligible beneficiaries aged 66 or older.

Despite the evidence that Medicaid claim files adds little information to Medicare inpatient, outpatient, and physician claims, Medicaid is an important claim source for nursing home care among low-income beneficiaries. Medicaid enrollment files are essential for the identification of dually eligible beneficiaries^{28,29} and to construct their enrollment history in Medicaid relative to an index date. The ability to identify dually eligible patients is of considerable value because they are very poor and have significant comorbid conditions that burden the Medicare and Medicaid systems.⁶ In addition, studies have shown that dually eligible patients receive fewer cancer treatments and experience adverse outcomes relative to patients insured by Medicare alone.^{3,18}

Our analysis provides guidance to researchers who study the dually eligible population. This study suggests that, relative to identifying comorbidities and cancer treatments, the incremental value of Medicaid inpatient, outpatient, and physician claims is small over what can be obtained from Medicare claims alone.

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TABLE 1

Sample Characteristics, Dually Eligible Beneficiaries Diagnosed With Female Breast, Colorectal, or Prostate Cancer, N (%)

Characteristic	Michigan N = 2356	Ohio N = 3064
Age		
66–70 yr	680 (28.9)	629 (20.5)
71–75 yr	553 (23.5)	605 (19.8)
76–80 yr	434 (18.4)	586 (19.1)
≥80 yr	689 (29.2)	1244 (40.6)
Sex		
Male	880 (37.3)	844 (27.6)
Female	1476 (62.7)	2220 (72.5)
Race		
White	1429 (60.7)	2346 (76.6)
African American	819 (37.7)	661 (21.6)
Other	108 (4.6)	57 (1.9)
Medicare eligibility category *		
Aged	2330 (98.9)	2988 (97.5)
Disabled	0 (0.0)	70 (2.3)
End-stage renal disease †	26 (1.1)	6 (0.2)

ESRD indicates end-stage renal disease.

* Eligibility category in the first year of Medicare enrollment.

† Includes aged with ESRD.

TABLE 2

One Year Period Prevalence of Charlson Comorbidities Preceding Diagnosis of Colon, Prostate, and Female Breast Cancer in Medicare-Medicaid Dually Enrolled Individuals, N (%)

Comorbidity	Michigan N = 1107				Ohio N = 2435				Change in Estimated Prevalence Relative to Medicare Alone, % (95% CI)
	Medicare Only	Medicaid Only	Medicare and Medicaid	Change in Estimated Prevalence, % (95% CI)	Medicare Only	Medicaid Only	Medicare and Medicaid		
Cerebrovascular disease	115 (10.4)	55 (5)	128 (11.6)	1.2 (0.5–1.8)	365 (15.0)	221 (9.1)	414 (17.0)	2.0 (1.4–2.6)	
Chronic obstructive pulmonary disease	255 (23.0)	181 (16.4)	278 (25.1)	2.1 (1.2–2.9)	419 (17.2)	297 (12.0)	480 (19.7)	2.5 (1.9–3.1)	
Congestive heart failure	180 (16.3)	119 (10.7)	204 (18.4)	2.2 (1.3–3.0)	509 (21.0)	283 (11.6)	563 (23.1)	2.1 (1.5–2.7)	
Dementia	54 (4.9)	15 (1.4)	59 (5.3)	0.5 (0.1–0.9)	320 (13.0)	141 (5.8)	350 (14.4)	1.4 (0.9–1.9)	
Diabetes	209 (18.9)	94 (8.5)	225 (20.3)	1.5 (0.7–2.2)	666 (27.4)	386 (16.0)	711 (29.2)	1.8 (1.3–2.3)	
Diabetes with complications	15 (1.4)	6 (0.5)	16 (1.4)	0.1 (0–0.3)	102 (4.2)	33 (1.4)	107 (4.4)	0.2 (0–0.4)	
Hemiplegia or Paraplegia	18 (1.6)	2 (0.2)	18 (1.6)	0	65 (2.7)	35 (1.4)	80 (3.3)	0.6 (0.3–0.9)	
Mild liver disease	3 (0.3)	1 (0.1)	3 (0.3)	0	16 (0.7)	5 (0.2)	17 (0.7)	0 (0–0)	
Myocardial infarction	46 (4.2)	11 (1)	47 (4.2)	0.1 (0–0.3)	75 (3.1)	33 (1.4)	86 (3.5)	0.4 (0.1–0.7)	
Peptic ulcer disease	17 (1.5)	7 (0.6)	19 (1.7)	0.2 (0–0.4)	72 (3.0)	16 (0.7)	74 (3.0)	0.4 (0.1–0.7)	
Peripheral vascular disease	55 (5.0)	11 (1)	57 (5.1)	0.2 (0–0.4)	243 (10.0)	95 (3.9)	259 (10.6)	0.6 (0.3–0.9)	
Renal disease	25 (2.3)	12 (1.1)	26 (2.3)	0.1 (0–0.3)	84 (3.5)	41 (1.7)	93 (3.8)	0.3 (0.1–0.5)	
Rheumatologic disease	23 (2.1)	7 (0.6)	23 (2.1)	0	44 (1.8)	23 (1.0)	46 (1.9)	0.1 (0–0.2)	
Any comorbidity	645 (58.3)	472 (42.6)	709 (64)	5.8 (4.4–7.2)	1560 (64.1)	1053 (43.2)	1670 (68.6)	4.5 (3.7–5.3)	

TABLE 3
Treatment of Continuously Enrolled Dually Eligible Patients, 6 Months Following Diagnosis, N (%)

Comorbidity	Michigan			Ohio			Change in Estimated Prevalence Relative to Medicare Alone, % (95% CI)
	Medicare Only	Medicaid Only	Medicare and Medicaid	Medicare Only	Medicaid Only	Medicare and Medicaid	
	Breast N = 918			Breast N = 990			
Breast biopsy	313 (34.1)	24 (2.6)	316 (34.4)	385 (38.9)	330 (33.3)	409 (41.3)	2.4 (1.5–3.4)
Nodectomy	16 (1.7)	2 (0.2)	16 (1.7)	68 (6.9)	57 (5.8)	69 (7.0)	0.1 (30.1 to 0.3)
Lumpectomy	585 (63.7)	47 (5.1)	585 (63.7)	666 (67.3)	625 (63.1)	682 (68.9)	1.6 (0.8–2.4)
Mastectomy	429 (46.7)	213 (23.2)	437 (47.6)	456 (46.1)	391 (39.5)	463 (46.8)	0.7 (0.2–1.2)
Radiotherapy	197 (21.5)	8 (0.9)	198 (21.6)	266 (26.9)	259 (26.2)	273 (27.6)	0.7 (0.2–1.2)
Chemotherapy	97 (10.6)	17 (1.9)	98 (10.7)	136 (13.7)	122 (12.3)	143 (14.4)	0.7 (0.2–1.2)
	Colorectal N = 777			Colorectal N = 876			
Colorectal biopsy	404 (52)	87 (11.2)	406 (52.3)	486 (55.5)	294 (33.6)	492 (56.2)	0.7 (0.1–1.2)
Colorectal excision	249 (32)	32 (4.1)	252 (32.4)	311 (35.5)	257 (29.3)	323 (36.9)	1.4 (0.6–2.1)
Colorectal resection	541 (69.6)	223 (28.7)	547 (70.4)	649 (74.1)	500 (57.1)	661 (75.5)	1.4 (0.6–2.1)
Colorectal bypass	89 (11.5)	36 (4.6)	90 (11.6)	115 (13.1)	40 (4.6)	117 (13.4)	0.2 (30.1 to 0.5)
Radiotherapy	66 (8.5)	15 (1.9)	66 (8.5)	93 (10.6)	92 (10.5)	98 (11.2)	0.6 (0.1–1.1)
Chemotherapy	128 (16.5)	4 (0.5)	129 (16.6)	164 (18.7)	145 (16.6)	168 (19.2)	0.5 (0.0–0.9)
	Prostate N = 661			Prostate N = 400			
Prostate biopsy	402 (60.8)	12 (1.8)	402 (60.8)	262 (65.5)	231 (57.8)	265 (66.3)	0.8 (30.1 to 1.6)
Nodectomy	46 (7)	6 (0.9)	46 (7)	33 (8.3)	25 (6.3)	33 (8.3)	0
Prostatectomy	129 (19.5)	69 (10.4)	131 (19.8)	113 (28.3)	60 (15.0)	117 (29.3)	1.0 (0.0–2.0)
Prostatectomy, radical	53 (8)	6 (0.9)	53 (8)	30 (7.5)	25 (6.3)	31 (7.8)	0.3 (30.2 to 0.7)
Orchiectomy	29 (4.4)	0 (0)	29 (4.4)	35 (8.8)	34 (8.5)	37 (9.3)	0.3 (30.2 to 1.2)
Hormonal therapy	161 (24.4)	0 (0)	161 (24.4)	152 (38.0)	136 (34.0)	158 (39.5)	1.5 (0.3–2.7)
Radiotherapy	139 (21)	2 (0.3)	139 (21)	88 (22.0)	86 (21.5)	90 (22.5)	0.5 (30.2 to 1.2)
Chemotherapy	47 (7.1)	4 (0.6)	47 (7.1)	117 (29.3)	102 (25.5)	122 (30.5)	1.3 (0.2–2.3)

APPENDIX

Codes Used to Identify Treatments and Conditions

Treatments and Conditions	ICD-9 Diagnosis Code	ICD-9 Procedure Code	CPT HCPCS
Chemotherapy	V581, V662, V672	9929	96400–96549, J9090–J9097, C8953, C8955, G0355, G0359, G0361, J9000, J9001, J9010, J9070, J9080, J9190, J9250, J9260, J9999, Q0083, Q0085
Radiation	V580, V661, V671	9221–9229, 9232, 9233, 9241	55860, 55862, 55865, 76965, C9725, G0256, G0261, 77300–77799
Breast biopsy		8511, 8512	19100, 19101
Breast lumpectomy		8520–8525	19120, 19125, 19126, 19160, 19162
Breast mastectomy		8541–8548	19180–19240
Breast nodectomy		4030–1039, 4050, 4051, 4059	
Colorectal biopsy		4525, 4526, 4824, 4825	44100, 44389, 45305, 45331
Colorectal excision		4541–4549, 4831–4835	44392–44394, 45160–45180, 45383–45385, 44110, 45308, 45309, 45315, 45320, 45333, 45338, 45339
Colorectal resection		4571–4576, 4861–4869, 4580–4589, 4850–4859, 4579, 4841, 4849	44140–44160, 45110–45121
Colorectal bypass		460, 4600–4629	44300, 44310, 44320
Prostate biopsy		6011, 6012, 6018, 6061, 6091, 9130–9139	55700–55705, 76942, 76872
Prostatectomy		6020–6049	55801–55865
Prostatectomy radical		6050–6059	55810–55815, 55840–55845
Prostate nodectomy		4030–4039, 4050–4059, 4050, 4052, 4053, 4059	38570–38572, 38760–38765, 38562, 38564, 38747, 38770, 51575, 51585, 51595, 54130, 54135, 55845, 55865
Prostate orchiectomy		6240–6249	54520, 54521, 54522, 54530, 54535
Prostate hormone		9924	11980, C9216, C9430, J0970, J1000, J1056, J1380, J1390, J1410, J3315, J1950, J9202, J9217, J9218, J9219, S0165
Prostate monoclonal			79403
Myocardial infarction	410, 412		
Congestive heart failure	428		
Peripheral vascular disease	4439, 7854, V434, 441		
Cerebral vascular disease	430–438		
Dementia	290		
Chronic pulmonary disease	490–496, 500–505, 506.4		
Rheumatologic disease	710.0, 710.1, 710.4, 714.0, 714.1, 714.2, 714.81, 725		

Treatments and Conditions	ICD-9 Diagnosis Code	ICD-9 Procedure Code	CPT HCPCS
Peptic ulcer disease	531-534, 531.4-531.7, 532.4-532.7, 533.4-533.7, 534.4-534.7		
Mild liver disease	571.2, 571.4-571.6		
Diabetes	250.0-250.3, 250.7		
Diabetes with chronic complications	250.4-250.6		
Hemiplegia or Paraplegia	344.1, 342		
Renal disease	582, 585, 586, 588, 583.0-583.7		
Moderate or severe liver disease	572.2-572.8		
Metastatic solid tumor	196-198, 199.0-199.1		
AIDS	042-044		

CPT indicates current procedural terminology; HCPCS, healthcare common procedural coding.