Pneumoconiosis ICD-CM Diagnosis Codes on Medicare Claims for Federal Black Lung Program Beneficiaries

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To the Editor:

Respiratory disease (e.g., silicosis, chronic obstructive pulmonary disease) prevalence can be estimated using health insurance information, such as U.S. Centers for Medicare & Medicaid Services (CMS) claims data (1–3). In previous surveillance studies, cases of respiratory disease were defined by the presence of specific *International Classification of Diseases, Clinical Modification* (ICD-CM) diagnosis code(s) on health insurance claims (1–3). Defining respiratory disease cases without clinical information may lead to misclassification of disease status. To further explore this issue, the current study applies ICD-CM diagnosis-based case definitions to a subset of Federal Black Lung Benefits Program (FBLP) beneficiaries within Medicare data to determine the proportion with diagnosis codes for coal workers' pneumoconiosis (CWP), pneumoconiosis, and other respiratory diseases.

The FBLP originally provided financial compensation and medical benefits to qualifying coal miners with total disability due to pneumoconiosis. Because coal mine dust exposure can cause disabling respiratory impairment in the absence of radiographic evidence of pneumoconiosis, FBLP eligibility was extended to miners with totally disabling respiratory impairment as a result of their coal mine employment (4, 5). CMS Medicare data include claims for Medicare beneficiaries also in the FBLP. When a healthcare claim for these Medicare beneficiaries is related to their disabling lung disease, the FBLP (not Medicare) has primary responsibility for claim payment (4, 6, 7).

Methods

Among all CMS Medicare claims from 1999 to 2016 (.10 billion claims), we extracted 369,641 final action fee-for-service claims for which the FBLP was the primary payer, excluding denied claims (4, 6). A Medicare claim includes ICD-CM diagnosis codes (up to 11 codes through 2010 and up to 25 starting in 2011) populated using Ninth Revision ICD-

CM (ICD-9-CM) codes for claims through September, 2015 and Tenth Revision ICD-CM (ICD-10-CM) codes starting in October, 2015 (8).

For the purposes of this analysis, respiratory disease ICD-CM diagnosis-based case definitions were developed to represent specific conditions or a broader group of respiratory conditions among beneficiaries with an FBLP primary payer claim. For example, CWP was defined as a beneficiary with at least one FBLP primary payer claim including the ICD-CM CWP diagnosis code (ICD-9-CM code 500 or ICD-10-CM code J60) in any position (1–25). Pneumoconiosis was defined as a beneficiary with at least one FBLP primary payer claim including any ICD-CM pneumoconiosis diagnosis code (ICD-9-CM code 500 to 505 or ICD-10-CM code J60, J61, J62.8, J63, J64, or J66) in any position. Chronic lower respiratory diseases were defined as at least one FBLP primary claim including any ICD-9-CM code from 490 to 496 or ICD-10-CM code from J40 to J47 in any position. Claim year was determined as the year of the first day of services rendered listed on the claim.

Results

The FBLP was listed as the primary payer for 369,641 Medicare institutional provider claims (41,706 inpatient hospital, 32,357 outpatient, 848 skilled nursing facility, 594 home health agency, and 185 hospice) and noninstitutional provider (290,486 carrier [submitted by noninstitutional professional providers, e.g., physicians, nurse practitioners] and 3,465 durable medical equipment) claims during 1999 to 2016. Inpatient hospital claims included the highest percentage of CWP codes (46.0%), followed by skilled nursing facility (29.6%), durable medical equipment (20.9%), outpatient (14.0%), home health (7.7%), and hospice and carrier claims both with <5.0% CWP codes. These claims represented 28,003 unique beneficiaries. The number of FBLP primary payer Medicare beneficiaries per year decreased during the study period (Figure 1), and this decline is consistent with the annual decline in total FBLP beneficiaries (97,660 in 2007 to 27,593 in 2016) (9). Furthermore, FBLP primary payer ICD-CM diagnosis-based CWP cases per year decreased during the study period, and the annual percentage of beneficiaries with CWP ranged from 19.5% (2009) to 34.0% (2015) (Figure 1). From 1999 to 2016, 38.0% of beneficiaries ($n = 10,640$) met the ICD-CM diagnosis-based CWP definition, and 39.8% ($n = 11,132$) met the ICD-CM diagnosis-based pneumoconiosis definition (Table 1).

Discussion

Among 28,003 Medicare beneficiaries with at least one FBLP primary payer claim, 38.0% had an ICD-CM diagnosis-based case definition for CWP, 39.8% for pneumoconiosis, and 74.4% for diseases of the respiratory system. A miner's FBLP application includes a physician examination, chest radiograph, pulmonary function test, and arterial blood gas test (10). A study assessed chest radiograph results for 24,686 FBLP applicants (not necessarily recipients) from 2001 to 2013 and identified abnormal chest radiographs with at least a category 1 (1/0, 1/1, 1/2) International Labor Office small opacity profusion classification in 42% ($n = 10,442$) of applicants, indicative of CWP (11). However, among miners receiving FBLP benefits, the percentage with a chest radiograph classification indicative of CWP may differ from the 42% identified in FBLP applicants. Information summarizing the reasons for

FBLP eligibility (e.g., radiographic evidence of CWP, disabling lung function impairment) among beneficiaries has not been published, and miners receiving FBLP benefits may have more severe disease than FBLP applicants.

Other respiratory and cardiovascular comorbidities often contribute to an FBLP beneficiary's symptoms and need to seek health care, and an ICD-CM pneumoconiosis code may not be included on claims directly related to these other comorbidities. Furthermore, a physician or healthcare professional may not include ICD-CM pneumoconiosis codes on claims for FBLP beneficiaries when they lack access to medical records indicating radiographic CWP or are unaware of a miner's occupational history. Medicare claims data are generated for billing purposes, not public health surveillance, and because inclusion of an ICD-CM diagnosis code on a claim cannot be considered a clinical diagnosis, misclassification of disease status may occur. Although the study population is limited to Medicare beneficiaries with at least one FBLP primary payer claim, results may not be representative of all FBLP beneficiaries or coal miners with disabling lung disease. However, in the absence of clinical data, health insurance claim data may be a useful surveillance tool for occupational respiratory diseases by providing an understanding of a portion of the overall burden and cost of occupational respiratory diseases.
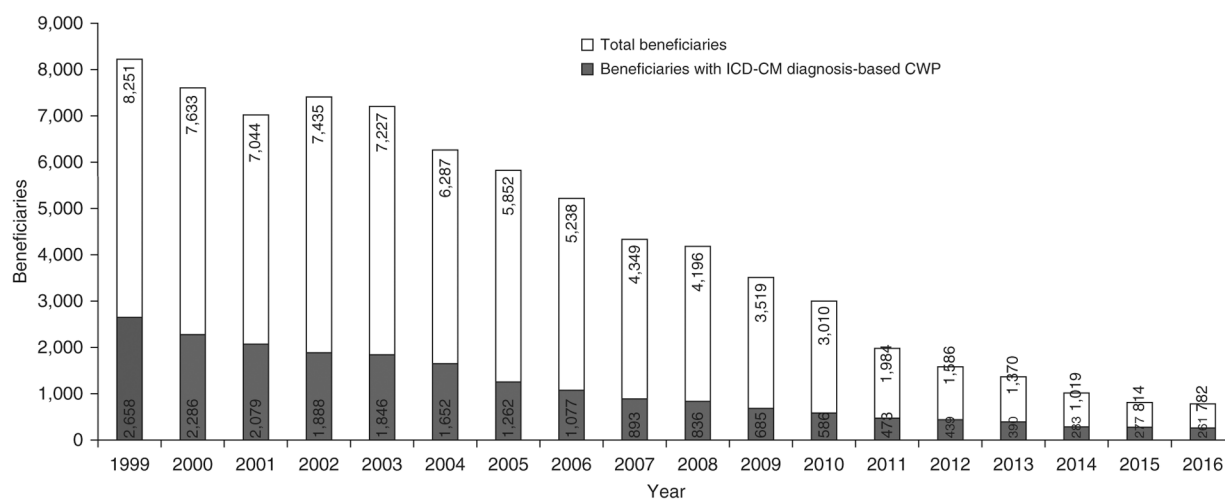
Acknowledgment:

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Figure 1.

Federal Black Lung Benefits Program primary payer beneficiaries and *International Classification of Diseases, Clinical Modification* (ICD-CM) diagnosis-based coal workers' pneumoconiosis (CWP) cases per year, 1991–2016. There were 159 claims for 159 beneficiaries where the first day of the claim billing statement was in 1998, but services rendered on these claims covered multiple days that spanned into 1999.

Table 1.

Total number of FBLP primary payer beneficiaries meeting ICD-CM diagnosis-based definitions for specific respiratory conditions, 1999–2016

	ICD-9-CM Code(s)	ICD-10-CM Code(s)	Beneficiaries [*n* (%)]	Beneficiaries with ICD-CM Diagnosis-based CWP [*n* (%)]
FBLP primary payer claim			28,003	10,640
Respiratory condition				
Diseases of the respiratory system	460–519	J00–J99	20,847 (74.4)	10,640 (100.0)
Chronic lower respiratory diseases	490–496	J40–J47	17,348 (62.0)	8,378 (78.7)
Pneumoconiosis	500, 501, 502, 503, 504, 505	J60, J61, J62.8, J63, J64, J66	11,132 (39.8)	10,640 (100.0)
Coal workers' pneumoconiosis	500	J60	10,640 (38.0)	NA
Asbestosis	501	J61	116 (0.4)	36 (0.3)
Pneumoconiosis due to other silica or silicates	502	J62.8	232 (0.8)	68 (0.6)
Pneumoconiosis, unspecified	505	J64	1,289 (4.6)	35 (0.3)

Definition of abbreviations: CWP = coal workers' pneumoconiosis; FBLP = Federal Black Lung Benefits Program; ICD-9-CM = *International Classification of Diseases, Clinical Modification, Ninth Revision;* ICD-10-CM = *International Classification of Diseases, Clinical Modification, Tenth Revision;* NA = not applicable.

Each of the following conditions were examined but not included in Table 1 because of cell size <50 beneficiaries: Pneumoconiosis due to other inorganic dusts (ICD-9-CM 503/ICD-10-CM J63), Pneumonopathy due to inhalation of other dust/Airway disease due to specific organic dust (ICD-9-CM 504/ICD-10-CM J66), Respiratory conditions due to chemical fumes and vapors/Respiratory conditions due to inhalation of chemicals, gases, fumes, and vapors (ICD-9-CM 506/ICD-10-CM J68), Respiratory conditions due to other and unspecified external agents/Respiratory conditions due to other external agents (ICD-9-CM 508/ICD-10-CM J70), and Other specified inflammatory polyarthropathies (including rheumatoid lung)/Rheumatoid lung disease with rheumatoid arthritis (ICD-9-CM 714.8/ICD-10-CM M05.1).