Usability of Procedure Codes in 2017

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TAF data quality brief—Service use information
This analysis focused on 46 states, the District of Columbia, and Puerto Rico. Mississippi, Missouri, Montana and Nebraska were excluded from the analysis.

Key Findings

- Procedure codes are used to document services rendered and to bill for medical procedures provided to a patient. These codes are critical to research on service utilization and access to care. This brief examines how often the procedure codes fields in the other services (OT) and inpatient files (IP) were missing, and how often the non-missing values were valid national or state-specific codes in 2017.
- In the T-MSIS Analytic Files, states should have procedure codes in different fields depending on the claims file and type of claim (Table 1). For professional claims in the OT file, the majority of states fell into the low-concern category because less than 10 percent of claim lines had a missing or invalid procedure code.
- For outpatient institutional claims, which are found in the OT file, states should have procedure codes in the HCPCS rate field. Most states did not use the HCPCS rate field for procedure codes, but instead have valid procedure codes in the procedure codes field (Table 4).
- For inpatient institutional claims found in the IP file, nearly all states (46 states, the District of Columbia, and Puerto Rico) fell into the low-concern category; less than 10 percent of their claim headers with a procedure code were populated with an invalid value.

Background

Procedure codes are used to document services rendered and to bill for medical procedures provided to a patient. They represent the most detailed and specific information available in administrative claims data about the services delivered to patients. As such, they are critical to research on service utilization and access to care. Procedure codes are required on most—although not all—medical claims, including all professional claims and some institutional claims submitted by hospitals and other facilities.[1] Procedure codes are required on institutional

[1] All medical claims are submitted on either an institutional or a professional claim form, with slightly different information on each form. Institutional claims are submitted by facilities such as hospitals, nursing facilities, intermediate care facilities for individuals with intellectual or development disabilities, rehabilitation facilities, home health agencies, and clinics. These claims are often referred to as "UB-04 claims" when submitted in paper form or as "837I claims" when submitted in electronic form. Professional claims are submitted by physicians (both individual and group practices); other clinical professionals; free-standing laboratories and

claims only if a direct service, such as a surgical procedure, was provided during the visit or stay at the facility. Many institutional claims document only other charges, such as room and board or the use of equipment or supplies, for which a procedure code would appropriately be absent. States are required to use national procedure codes on claims for Medicaid services delivered to beneficiaries, but some Medicaid programs allow the use of state-specific procedure codes for certain services.[2]

In the T-MSIS Analytic Files (TAF), procedure codes should be in different fields depending on the claims file and type of claim (Table 1). The TAF Other Services (OT) file includes professional and outpatient institutional claims. For professional claims, procedure codes should be in the procedure code field (PRCDR_CD). On outpatient institutional claims, procedure codes should be in the HCPCS rate field (HCPCS_RATE). The inpatient (IP) file, consisting only of institutional claims, can include up to six procedure codes per claim in the procedure code fields (PRCDR_1_CD – PRCDR_6_CD).

Table 1. Expected reporting of procedure codes, by file type and type of claim

File	Type of claim form	Field in which procedure codes should be reported	Expected on all claims?
OT line[a]	Professional	PRCDR_CD	Yes
OT line	Institutional	HCPCS_RATE	No
IP header	Institutional	PRCDR_1_CD – PRCDR_6_CD	No

[a]A header record summarizes the services provided that are captured on the claim lines, which provide details on each service covered by the claim.

This brief examines the extent to which appropriate fields in the 2017 TAF OT and IP files were populated with valid procedure code values.

Methods

Using the 2017 TAF[3], we examined records in the other services (OT) and inpatient (IP) files. We did not examine records in the long-term care or the pharmacy files because these files do not capture procedure codes. The analysis included fee-for-service (FFS) claims and managed care encounter records for Medicaid beneficiaries in 46 states, the District of Columbia, and Puerto Rico.[4] Mississippi, Missouri, Montana, and Nebraska were excluded from the analysis

outpatient facilities; ambulances; and durable medical equipment suppliers. These claims are referred to as "CMS-1500 claims" when submitted in paper form or "837P" when submitted in electronic form.

[2] State Medicaid programs may allow state-specific procedure codes for several reasons. For example, a state may use state-specific codes when its Medicaid program covers a service for which there is no national procedure code. State Medicaid programs often use state-specific codes for home and community-based services or for behavioral health services.

[3] This analysis used the same TAF data as the T-MSIS Substance Use Disorder Data Book, which is not the version of the data that will be released as Research Identifiable Files (RIFs).

[4] We used claim type code (CLM_TYPE_CD) to determine which records to include and which to exclude. We included FFS records (claim type 1 or A) and managed care encounters (3 and C). We excluded records with all other claim type values, including capitation payments, service tracking claims, and supplemental payments, none of which we expected to include procedure codes reflecting services provided.

because of a very low volume of claims in the OT and/or IP files. Illinois and Utah were excluded from analysis of institutional claims in the OT file, due to very low volume of claims.

For our analysis of the OT file, we first used an algorithm to classify each claim as either professional or institutional. The standardized fields in each claim form, and hence the information available for each type of claim, differ slightly. The algorithm relies on three fields: (1) place of service, which should only be populated on professional claims; (2) type of bill, which should only be populated on institutional claims; and (3) revenue code, which should only be populated on institutional claims.[5]

Professional claims (OT file)

Professional claims in the OT file should always have a non-missing procedure code reported in the procedure code field on all claim lines. To understand whether any states had problems with incomplete procedure code data, we examined the percentage of claim lines that had a missing value in the procedure code field. Next, we examined the percentage of claim lines that had a non-missing but invalid procedure code (that is, a value that did not match to either a national or state-specific code).[6] We classified states into categories of low concern, medium concern, high concern, and unusable based on the percentage of all professional line records that had a missing or invalid procedure code based on the following thresholds:

- Low concern: ≤10 percent of records had a missing or invalid value
- Medium concern: ≤20 and >10 percent of records had a missing or invalid value
- High concern: ≤30 and >20 percent of records had a missing or invalid value
- Unusable: >30 percent of records had a missing or invalid value

For informational purposes, we also examined the percentage of claim lines with a valid procedure code that took a national code value versus a state-specific code value. Although the presence of state-specific procedure codes does not indicate a data quality concern, researchers would need to account for these codes in many analyses.

[5] To be classified as a professional claim, the record had to meet one of the following criteria: (1) had a valid place of service code (SRVC_PLC_CD) and a missing, null, or invalid type of bill code (BILL_TYPE_CD); (2) had a valid type of bill code and place of service code but had a missing, null, or invalid revenue code (REV_CD); or (3) had a missing, null, or invalid type of bill code, place of service code, and revenue code. To be classified as an institutional claim, the record had to meet one of the following criteria: (1) had a valid type of bill code and a missing, null, or invalid place of service code; (2) had a valid type of bill code and place of service code, and at least one valid revenue code; or (3) had a missing, null, or invalid type of bill code; a missing, null, or invalid place of service code; and at least one valid revenue code.

[6] For a full list of valid national procedure codes in 2017, see https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Relative-Value-Files.html. If a state uses its own procedure codes, it is required to submit documentation of the valid procedure code value and a description of the code.

Outpatient institutional claims (OT file)

Institutional claims in the OT file are expected to have a procedure code only in certain circumstances, and these codes are supposed to be populated in the HCPCS rate field instead of the procedure code field. To understand the overall rate of outpatient claims with no usable procedure code information, we examined the percentage of claim lines that had missing or invalid procedure codes in both the HCPCS rate and procedure code fields.[7] To understand whether states were reporting procedure code information into the correct field, we then compared the percentage of claim lines with (1) missing values and (2) invalid values in the HCPCS rate and procedure code fields.

We classified states into categories based on the percentage of all institutional line records that had missing or invalid procedure code information in both the HCPCS rate and procedure code fields. We considered a state to have unusable data if greater than 90 percent of claims lines had missing or invalid procedure code information on both fields.[8]

Inpatient institutional claims (IP file)

Records in the IP file are only expected to include a procedure code for inpatient stays that involve surgery or other procedures. To understand the completeness of procedure code information in the IP file, we first examined the percentage of claim headers with a missing primary procedure code (PRCDR_1_CD). Next, we examined the percentage of claim headers with any invalid procedure codes (PRCDR_1_CD through PRCDR_6_CD), as these codes are likely unusable for research purposes.

We classified states into categories based on two criteria. First, we examined the percentage of headers missing a primary procedure code. We considered a state to have a high data quality concern if no claims headers had a missing procedure code, as this is an unexpected pattern that likely indicates a data quality issue. We considered a state to have unusable data if greater than 90 percent of claims lines had a missing procedure code, as this indicates the procedure code data are incomplete. We then classified states based on the percentage of headers that had an invalid procedure code using the following thresholds:

- Low concern: ≤10 percent of headers had an invalid value
- Medium concern: ≤20 and >10 percent of headers had an invalid value
- High concern: ≤30 and >20 percent of headers had an invalid value

[7] Although states are not supposed to report procedure codes in the procedure code field for outpatient institutional claims, they have historically used this field to report this information in MSIS, the predecessor to T-MSIS. Since we expected some states may have failed to update their reporting method with the transition to T-MSIS, we examined the percentage of claims with a non-missing value in the procedure code field as well as the new HCPCS rate code field.

[8] This threshold was determined based on the internal consistency of TAF data across states and years. We examined the percentage of missing or invalid procedure codes across all states for 2016 and 2017. Based on these findings, we would not expect greater than 90 percent of claims lines to have missing or invalid procedure code information on both the HCPCS rate and procedure code fields.

- Unusable: >30 percent of records had a missing or invalid value

Findings

Overall, the majority of states had procedure codes that presented a low data quality concern in at least one field on claims in both the OT and IP files. However, states varied in whether they were reporting procedure code information into the expected field for institutional outpatient claims in the OT file.

Professional claims (OT file)

For professional claims, the majority of states (44 states, the District of Columbia, and Puerto Rico) fell into the low-concern category because less than 10 percent of claim lines had a missing or invalid procedure code (Table 2). Two states (Nevada and Vermont) fell into the medium-concern category because between 10 and 20 percent of claims lines had a missing or invalid procedure code. No states fell into the high-concern or unusable categories.

Twenty-two states used state-specific procedure codes that researchers would need to account for in their analyses. The use of state-specific codes ranged from less than 0.1 percent of professional claim lines in Florida, Indiana, Iowa, Kentucky, North Carolina, South Carolina, and Vermont to a high of 25 percent of claim lines in Connecticut (Table 3).

Outpatient institutional claims (OT file)

For outpatient institutional claims, which should have procedure codes populated in the HCPCS rate field on some but not all claims, we found that most states were incorrectly reporting procedure code information in the procedure code field (Table 4). Many states did not report any information in the HCPCS rate field; this data element had high rates of missing information across the states.

When we looked at both the HCPCS rate and procedure code fields, several states had an unexpected percentage of institutional claim lines with missing or invalid procedure code information across both fields (Table 4). Five states (Georgia, New York, Pennsylvania, Tennessee, and Texas) had unusable data because greater than 90 percent of institutional claim lines had missing or invalid procedure code information in both the HCPCS rate code and procedure code fields.

Thirty-eight states, Puerto Rico, and the District of Columba fell into the low data quality concern category. Of these, only four states (Connecticut, Nevada, South Carolina, and Wisconsin) were ever using the correct field (HCPCS rate) to report valid procedure code information.[9] Only one state (South Carolina) exclusively used the HCPCS rate field to report procedure code information. Connecticut, Nevada and Wisconsin had some claims where the procedure code was reported in the HCPCS rate field, and other claims where the procedure code was reported in the procedure code field. Nevada is the only state that reported

[9] Two other states—Texas and West Virginia—reported information in the HCPCS rate field on some OT records, but none of the information represented valid procedure codes.

procedure code information in both the HCPCS rate and procedure code fields on the same claims lines; in all cases, the state reported identical information in both places.

The majority of states (37 states, the District of Columbia, and Puerto Rico) exclusively used the incorrect field (procedure code field) to report procedure code information. Although procedure codes were reported in the wrong field for the majority of states, few states used invalid codes in the procedure code field, which indicates that procedure code data are still usable in most states as long as TAF users take into account where the data are reported.

The use of state-specific codes on outpatient institutional claims was uncommon (results not shown). Only three states used state-specific procedure codes: less than one percent of claims had a state-specific procedure code in Arkansas and Rhode Island, and three percent of claims had a state-specific procedure code in California.

Given these findings, we recommend that TAF users employ a state-specific approach to using the procedure code and HCPCS rate fields for analyses including outpatient institutional claims.

Inpatient institutional claims (IP file)

For the IP file, all states fell into the low-concern category based on missingness. Nearly all states (43 states, the District of Columbia, and Puerto Rico) had less than 10 percent of their claim headers with invalid procedure codes (results not shown). We found the following exceptions:

- In Maryland, all procedure codes were invalid values because the state used the national ICD-9 procedure codes,[10] which were retired as of October 2015.
- In Kentucky, 98 percent of procedure codes were invalid values. It appears that the codes included just the first six of seven digits of valid ICD-10 codes[11]. In some cases, researchers may be able to append the non-specific seventh-digit Z to these codes to make them usable for grouper software or for analyses that require valid procedure codes.[12]
- In Texas, 20 percent of procedure codes were invalid values. Its error pattern was the same as Kentucky's, with the codes including the first six of seven valid ICD-10 codes.

[10] ICD-9 stands for International Statistical Classification of Diseases Clinical Modification-9th edition.

[11] ICD-10 stands for International Statistical Classification of Diseases Clinical Modification-10th edition

[12] A "Z" at the end of an ICD-10-PCS code indicates that the specific qualifier does not apply to the procedure.

Table 2. Percentage of professional claims in the OT file with missing or invalid procedure codes

State	Number professional claim lines	Percentage of claim lines with missing or invalid procedure code	Percentage of claim lines with a missing procedure code	Percentage of claim lines with an invalid procedure code
Low data quality concern (*n* = 46 states)				
West Virginia	13,784,886	0.0	0.0	0.0
Maine	13,201,634	0.0	0.0	0.0
Arizona	70,603,620	0.0	0.0	0.0
Kentucky	52,658,073	0.0	0.0	0.0
Idaho	5,003,922	0.0	0.0	0.0
Virginia	22,389,444	0.0	0.0	0.0
Rhode Island	11,008,744	0.0	0.0	0.0
Florida	140,627,317	0.0	0.0	0.0
Michigan	79,271,404	0.0	0.0	0.0
New Mexico	25,341,945	0.0	0.0	0.0
Kansas	16,866,574	0.0	0.0	0.0
Colorado	29,891,762	0.0	0.0	0.0
Georgia	56,844,529	0.0	0.0	0.0
Delaware	8,197,469	0.0	0.0	0.0
Hawaii	7,756,354	0.0	0.0	0.0
District of Columbia	8,102,994	0.0	0.0	0.0
Connecticut	41,763,056	0.0	0.0	0.0
Indiana	43,759,277	0.0	0.0	0.0
Tennessee	47,496,500	0.0	0.0	0.0
Washington	44,634,418	0.0	0.0	0.0
Alaska	8,195,606	0.0	0.0	0.0
Iowa	21,338,582	0.0	0.0	0.0
New Hampshire	7,191,409	0.0	0.0	0.0
North Dakota	2,208,423	0.0	0.0	0.0
North Carolina	83,554,942	0.0	0.0	0.0
Wyoming	2,599,856	0.0	0.0	0.0
Arkansas	32,338,404	0.1	0.1	0.0
Alabama	27,983,915	0.1	0.1	0.0
Puerto Rico	35,110,486	0.1	0.0	0.1
Louisiana	47,422,309	0.1	0.0	0.1
Wisconsin	35,265,713	0.2	0.1	0.2
New Jersey	74,340,730	0.3	0.2	0.1
Massachusetts	88,319,831	0.3	0.0	0.3
Ohio	133,421,974	0.4	0.0	0.4

Table 2 *(continued)*

State	Number professional claim lines	Percentage of claim lines with missing or invalid procedure code	Percentage of claim lines with a missing procedure code	Percentage of claim lines with an invalid procedure code
South Dakota	3,064,814	0.5	0.3	0.2
Oregon	30,079,471	0.6	0.0	0.6
Minnesota	65,918,146	0.7	0.0	0.7
Illinois	95,011,419	0.8	0.8	0.0
Maryland	56,861,661	2.7	0.0	2.7
New York	210,777,090	3.5	3.5	0.0
Utah	6,872,444	3.5	3.5	0.0
Pennsylvania	105,437,821	5.5	3.9	1.6
Texas	222,076,921	6.3	0.0	6.3
Oklahoma	27,888,605	6.4	6.4	0.0
California	312,730,666	6.5	0.1	6.4
South Carolina	38,315,658	7.4	7.4	0.0
Medium data quality concern (*n* = 2 states)				
Vermont	3,450,197	11.1	11.1	0.0
Nevada	12,705,481	16.9	16.9	0.0
Excluded from analysis (*n* = 4 states)				
Mississippi	DQ	DQ	DQ	DQ
Missouri	DQ	DQ	DQ	DQ
Montana	DQ	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ	DQ

Source: 2017 TAF as of May 2019.

Note: States are sorted in ascending order by the percentage of claims lines with missing or invalid procedure codes.

DQ = Not reported because of concerns about the low volume of claims in the OT file.

Table 3. Percentage of professional claims in the OT file with valid procedure codes, by type of coding system (national or state-specific)

State	Number professional claim lines	Percentage of claims lines with a valid value (national or state-specific code)	Percentage of claims lines with a valid national code	Percentage of claim lines with a valid state-specific procedure code
Alabama	27,983,915	99.9	99.9	0.0
Alaska	8,195,606	100.0	100.0	0.0
Arizona	70,603,620	100.0	100.0	0.0
Arkansas	32,338,404	99.9	96.4	3.5
California	312,730,666	93.5	85.5	8.0
Colorado	29,891,762	100.0	100.0	0.0
Connecticut	41,763,056	100.0	75.1	24.9
Delaware	8,197,469	100.0	100.0	0.0
District of Columbia	8,102,994	100.0	100.0	0.0
Florida	140,627,317	100.0	100.0	<0.1
Georgia	56,844,529	100.0	99.9	0.1
Hawaii	7,756,354	100.0	100.0	0.0
Idaho	5,003,922	100.0	100.0	0.0
Illinois	95,011,419	99.2	98.8	0.4
Indiana	43,759,277	100.0	100.0	<0.1
Iowa	21,338,582	100.0	100.0	<0.1
Kansas	16,866,574	100.0	100.0	0.0
Kentucky	52,658,073	100.0	100.0	<0.1
Louisiana	47,422,309	99.9	99.3	0.6
Maine	13,201,634	100.0	100.0	0.0
Maryland	56,861,661	97.3	81.1	16.2
Massachusetts	88,319,831	99.7	99.7	0.0
Michigan	79,271,404	100.0	99.0	1.0
Minnesota	65,918,146	99.3	99.3	0.0
Mississippi	908,754	100.0	100.0	0.0
Montana	170,564	88.0	88.0	0.0
Nevada	12,705,481	83.1	83.1	0.0
New Hampshire	7,191,409	100.0	100.0	0.0
New Jersey	74,340,730	99.7	99.7	0.0
New Mexico	25,341,945	100.0	100.0	0.0
New York	210,777,090	96.5	96.5	0.0
North Carolina	83,554,942	100.0	100.0	<0.1
North Dakota	2,208,423	100.0	92.9	7.1
Ohio	133,421,974	99.6	81.3	18.3

Table 3 *(continued)*

State	Number professional claim lines	Percentage of claims lines with a valid value (national or state-specific code)	Percentage of claims lines with a valid national code	Percentage of claim lines with a valid state-specific procedure code
Oklahoma	27,888,605	93.6	93.6	0.0
Oregon	30,079,471	99.4	97.0	2.4
Pennsylvania	105,437,821	94.5	78.2	16.3
Puerto Rico	35,110,486	99.9	99.9	0.0
Rhode Island	11,008,744	100.0	99.5	0.5
South Carolina	38,315,658	92.6	92.6	<0.1
South Dakota	3,064,814	99.5	99.5	0.0
Tennessee	47,496,500	100.0	100.0	0.0
Texas	222,076,921	93.7	93.4	0.3
Utah	6,872,444	96.5	96.5	0.0
Vermont	3,450,197	88.9	88.9	<0.1
Virginia	22,389,444	100.0	100.0	0.0
Washington	44,634,418	100.0	100.0	0.0
West Virginia	13,784,886	100.0	100.0	0.0
Wisconsin	35,265,713	99.8	98.8	1.0
Wyoming	2,599,856	100.0	100.0	0.0
Excluded from analysis (*n* = 4 states)				
Mississippi	DQ	DQ	DQ	DQ
Missouri	DQ	DQ	DQ	DQ
Montana	DQ	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ	DQ

Source: 2017 TAF as of May 2019.

Note: States are sorted in alphabetical order.

DQ = Not reported because of concerns about the low volume of professional claims in the OT file.

Table 4. Percentage of institutional outpatient claims (OT file) with a missing or invalid procedure code, overall and by reporting location (HCPCS rate or procedure code field)

	Number of institutional claim lines	Percentage of claim lines with missing or invalid values in both the procedure code and HCPCS rate fields	Percentage of claim lines with a missing value in the HCPCS rate field	Percentage of claim lines with an invalid value in HCPCS rate field	Percentage of claim lines with a missing value in the procedure code field	Percentage of claim lines with an invalid value in the procedure code field
Low data quality concern (*n* = 41 states)						
Puerto Rico	3,665,133	4.30	100.00	0.00	4.29	0.01
Connecticut	16,065,402	5.08	29.46	0.01	75.61	0.00
Rhode Island	2,135,488	5.30	100.00	0.00	5.21	0.10
Alaska	2,059,756	6.04	100.00	0.00	6.04	0.01
West Virginia	10,250,425	7.11	32.40	67.60	7.11	0.00
Michigan	26,349,154	7.40	100.00	0.00	7.40	0.00
Oregon	9,731,264	7.61	99.90	0.10	7.59	0.01
Iowa	10,502,620	7.73	100.00	0.00	7.71	0.03
Massachusetts	35,271,288	7.98	100.00	0.00	6.46	1.52
District of Columbia	4,122,199	8.34	99.97	0.03	8.32	0.01
Wisconsin	17,180,974	8.35	29.83	0.00	78.51	0.00
Minnesota	19,191,657	8.40	0.00	99.99	8.35	0.06
Maine	7,606,723	8.94	100.00	0.00	8.79	0.16
Washington	16,008,904	9.22	100.00	0.00	9.22	0.00
North Carolina	21,834,147	9.37	100.00	0.00	9.31	0.06
Kansas	4,206,467	9.77	100.00	0.00	9.77	0.00
Ohio	51,006,074	9.96	100.00	0.00	9.96	0.00
New Jersey	16,162,447	10.18	100.00	0.00	0.28	9.89
Hawaii	3,291,964	10.59	100.00	0.00	10.57	0.02
South Carolina	7,852,647	11.03	11.03	0.00	100.00	0.00
California	111,259,337	11.72	100.00	0.00	2.34	9.38

Table 4 *(continued)*

	Number of institutional claim lines	Percentage of claim lines with missing or invalid values in both the procedure code and HCPCS rate fields	Percentage of claim lines with a missing value in the HCPCS rate field	Percentage of claim lines with an invalid value in HCPCS rate field	Percentage of claim lines with a missing value in the procedure code field	Percentage of claim lines with an invalid value in the procedure code field
Louisiana	17,130,801	11.75	100.00	0.00	4.48	7.27
New Mexico	8,754,182	11.94	100.00	0.00	11.93	0.01
New Hampshire	2,298,901	11.95	100.00	0.00	11.95	0.00
North Dakota	967,272	12.47	100.00	0.00	12.41	0.06
Florida	35,406,267	12.48	100.00	0.00	12.47	0.00
Indiana	24,335,558	12.62	100.00	0.00	12.62	0.00
Delaware	2,826,827	13.31	0.00	100.00	13.31	0.00
Wyoming	994,980	13.44	100.00	0.00	13.42	0.02
Alabama	9,704,353	13.68	100.00	0.00	13.67	0.00
Nevada	3,353,344	14.19	81.88	0.02	13.99	0.19
Virginia	7,175,277	15.18	100.00	0.00	15.16	0.02
Kentucky	20,770,088	18.86	100.00	0.00	18.86	0.00
Arkansas	6,887,262	18.88	6.13	93.87	18.88	0.00
Arizona	18,039,865	21.30	100.00	0.00	21.29	0.00
Maryland	11,330,207	21.74	100.00	0.00	21.72	0.02
South Dakota	1,394,458	23.74	100.00	0.00	23.72	0.02
Colorado	18,226,720	24.95	100.00	0.00	24.95	0.00
Idaho	807,036	27.69	100.00	0.00	27.68	0.01
Oklahoma	8,273,462	42.26	99.99	0.00	42.27	0.00
Vermont	2,219,681	69.65	100.00	0.00	69.65	0.00
Unusable (*n* = 5 states)						
Pennsylvania	26,162,081	98.44	100.00	0.00	98.42	0.02
New York	157,240,411	99.99	100.00	0.00	99.99	0.00
Georgia	13,682,819	100.00	100.00	0.00	100.00	0.00

Table 4 *(continued)*

	Number of institutional claim lines	Percentage of claim lines with missing or invalid values in both the procedure code and HCPCS rate fields	Percentage of claim lines with a missing value in the HCPCS rate field	Percentage of claim lines with an invalid value in HCPCS rate field	Percentage of claim lines with a missing value in the procedure code field	Percentage of claim lines with an invalid value in the procedure code field
Tennessee	28,552,176	100.00	100.00	0.00	100.00	0.00
Texas	51,652,580	100.00	0.37	99.63	100.00	0.00
Excluded from analysis (*n* = 6 states)						
Illinois	DQ	DQ	DQ	DQ	DQ	DQ
Mississippi	DQ	DQ	DQ	DQ	DQ	DQ
Missouri	DQ	DQ	DQ	DQ	DQ	DQ
Montana	DQ	DQ	DQ	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ	DQ	DQ	DQ
Utah	DQ	DQ	DQ	DQ	DQ	DQ

Source: 2017 TAF as of May 2019.

Note: States are sorted in ascending order by the percentage of claims lines with missing procedure codes in both the HCPCS rate and procedure code fields. States with a high data quality concern include those where all claims lines had a procedure code populated and those where all or nearly all claims lines had a missing procedure code.

DQ = Not reported because of concerns about the low volume of institutional claims in the OT file.

Julia Baller[1], Kimberly Proctor[2], and Jessie Parker[2]. "Usability of Procedure Codes in 2017." TAF DQ Brief #5202. Baltimore, MD: CMS, 2019.

Reviewers: Keith Branham[2]; Jeffrey Galecki[2]; Carol V. Irvin[1]; Kayshin Chan[1]; Allison Barret[1]

[1]Mathematica, [2]Centers for Medicare & Medicaid Services, Center for Medicaid and CHIP Services, Data and Systems Group, Division of Business and Data Analytics

Correspondence should be addressed to MACBISData@cms.hhs.gov