

# Using the Type of Bill to Classify Institutional Claims in 2017

October 2019

**Brief #5042**

**2017 TAF version 2**

**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

- In the T-MSIS Analytic Files, the type of bill field can be used to differentiate between institutional and professional claims, and to provide information about the type of facility and services being billed on institutional claims. This brief identifies states with concerning rates of missing or unexpected type of bill values in the IP, OT and LT files in 2017.
- The information in the type of bill field is complete and reliable in the IP file in 37 states. In Georgia and Virginia, however, the information captured in this field suggests that the states may have erroneously submitted outpatient claims in their IP file instead of in the OT file. Other states with unusable or highly concerning data in the IP file are listed in Table 2.
- Thirty-three states submitted nearly all LT records with a type of bill value for an expected provider type, such as nursing facilities and intermediate care facilities for individuals with intellectual or developmental disabilities. Missing and invalid type of bill values were a larger problem in the LT file than in the IP file. States with unusable or highly concerning data in the LT file are listed in Table 3.
- Because the OT file contains a mixture of institutional and professional claims, it is difficult to evaluate the completeness and quality of the information in the type of bill field in this file. However, California, Illinois, Washington, and Wyoming had high rates of unexpected or invalid type of bill values in their OT records, indicating problems in the quality of the data. Other states with unusable or highly concerning data in the other services file are listed in Table 4.

## Background

All medical claims fall into one of two categories: those submitted on an institutional claim form and those submitted on a professional claim form.<sup>1</sup> In general, facilities such as hospitals, nursing facilities, intermediate care facilities for individuals with intellectual or development disabilities, rehabilitation facilities, home health agencies, and clinics submit institutional

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<sup>1</sup> Institutional 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 referred to as “CMS-1500 claims” when submitted in paper form or “837P claims” when submitted in electronic form.

claims. Physicians (both individual and groups), other clinical professionals, freestanding laboratories and outpatient facilities,<sup>2</sup> ambulances, and durable medical equipment suppliers submit professional claims. It is important for users of the T-MSIS Analytic Files (TAF) to be able to distinguish between institutional and professional claims, as the standardized fields in each form—and hence the information available for each type of claim—differ slightly. One important field that is reported only on institutional claims is the type of bill. This field is used to report the type of facility that provides care. Because the type of bill field is used by most payers to determine the payment amount for the claim, it is often well-populated in claims data and is considered a reliable source of information. As a result, it is often the first and easiest data element used to differentiate among key settings and types of institutional care, such as inpatient hospital stays, outpatient hospital visits, or nursing facility care.<sup>3</sup>

This brief examines the completeness and quality of the type of bill field in the TAF for 2017 and whether the distribution of values within each medical claim file reflects the types of claims that states are expected to submit.<sup>4</sup>

## Methods

Using the 2017 TAF,<sup>5</sup> we examined the type of bill field (BILL\_TYPE\_CD) on header records in the inpatient (IP), long-term care (LT), and other services (OT) files. Since type of bill is not captured on pharmacy claims, we did not examine the pharmacy (RX) file. We included in the analysis fee-for-service (FFS) claims and managed care encounter records for both Medicaid and CHIP beneficiaries in 46 states, the District of Columbia, and Puerto Rico.<sup>6</sup> Mississippi,

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<sup>2</sup> Freestanding facilities are those not owned by a hospital or another institutional provider, such as independent ambulatory surgery centers.

<sup>3</sup> The national provider identifier or provider taxonomy can be used to differentiate among most settings of care, such as nursing facilities versus hospitals, but it requires outside data that can map a large number of potential values to provider type. As of 2017, not all states consistently reported these data elements. The revenue code can be used to differentiate types of care, such as inpatient versus outpatient services, but it does not provide information about the type of institution that delivered the care. Type of service is considered less reliable, but this field could be used when type of bill is missing or invalid.

<sup>4</sup> The inpatient file should primarily include institutional claims for inpatient hospital services, whereas the long-term care file should include institutional claims for overnight stays at nursing facilities, intermediate care facilities for individuals with intellectual or developmental disabilities, and residential treatment facilities. The other services file should include a mix of outpatient institutional claims and professional claims from all settings of care. We expect that a type of bill code will be populated only on institutional claims, and therefore that the type of bill code will be missing for a large share of claims in the other services file.

<sup>5</sup> 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 TAF Research Identifiable Files (RIFs).

<sup>6</sup> Claim type code (CLM\_TYPE\_CD) was used to determine which records to include and exclude. FFS records (claim type 1 or A) and managed care encounters (3 and C) were retained in the analysis. We excluded records with all other claim type values, including capitation payments, service tracking claims, and supplemental payments, none of which are expected to have a valid type of bill value since they are financial transaction records that are not submitted on an institutional claim form. We also excluded the “other” records that the state did not classify as either Medicaid or CHIP payment records; these may represent services that do not qualify for federal matching funds under Title XIX or Title XXI.

Missouri, Montana, and Nebraska were excluded from the analyses because of a very low volume of claims.

On institutional claims, the type of bill should always be formatted as a four-digit number that starts with a zero.<sup>7</sup> The second and third digits can be used to identify the type of service and facility associated with the claim. The fourth digit provides information about the relationship of the claim to other claims for the same stay; for example, whether the claim covers the entire stay from admission through discharge, or whether it is a continuation claim for a stay that has already been partly billed.<sup>8</sup> For this analysis, we focused only on the second and third digits and allowed any value in the fourth position. We grouped each of the possible 55 values for the second and third digits in the type of bill into those that are expected or unexpected in each file (Table 1). We also tabulated the extent of missing and invalid values.

**Table 1. Mapping of type of bill values to expected file location**

Value	Description	Expected value in IP file	Expected value in OT file	Expected value in LT file
011x-012x	Inpatient hospital	Yes		
013x-014x	Outpatient hospital		Yes	
015x-018x	Hospital intermediate care and swing beds			Yes
021x-022x	Nursing facilities - inpatient			Yes
023x-024x	Nursing facilities - outpatient		Yes	
025x-028x	Nursing facilities - intermediate care, swing beds			Yes
031x-038x	Home health		Yes	
041x-042x	Religious nonmedical hospital - inpatient			Yes
043x-044x	Religious nonmedical hospital - outpatient		Yes	
045x-048x	Religious nonmedical hospital - intermediate care, swing beds			Yes
061x-068x	Intermediate care facilities			Yes
071x-079x	Clinics		Yes	
081x-084x	Other special facilities		Yes	
085x	Critical access hospital	Yes	Yes	
086x	Residential facility		Yes	Yes
089x	Other special facility		Yes	Yes

Source: TAF Data Dictionary.

We considered states where more than 90 percent of header records were reported with a valid type of bill code that was expected for the file type to present a low level of concern. We

<sup>7</sup> Appendix IP-3 in the TAF inpatient data dictionary includes a list of valid values for the second, third, and fourth digits in the type of bill field, and a description of each possible value.

<sup>8</sup> There is some variation across states in the coding of the type of bill field. In some states, most or all records had a type of bill value that was three digits long because the leading zero was dropped. We considered these three-digit values to be valid as long as they matched to a valid value once a leading zero was added. We did not consider type of bill codes of one or two digits, or three digits with a leading zero (i.e., missing a fourth digit) as valid.

categorized those states where 80 to 90 percent of header records were reported with an expected code as medium data quality concern, and states where only 50 to 80 percent of header records were reported with an expected code as high data quality concern for the type of bill field. In the IP and LT files, states where more than 50 percent of header records had a type of bill code that was invalid, missing, or unexpected for the file type were categorized as unusable. In the OT file, where “missing” is a valid value for professional claims, data from states where more than 50 percent of header records had an invalid or unexpected type of bill value were considered unusable. Additionally, data from states where 100 percent of header records had a missing value for type of bill in the OT file were considered unusable.

## Findings

The majority of states reported institutional claim records with a valid and expected type of bill value. Notable exceptions are presented below, by file.

**IP file.** The quality of the type of bill information in the IP file was high, with most records having an expected type of bill value indicating inpatient hospital or other overnight facility (Figure 1; Table 2). Two states had high rates of missing values in the IP file (South Carolina and Utah). One state (Wyoming) populated records exclusively with invalid values.<sup>9</sup> Two other states displayed an unusual pattern that suggests specific data quality issues in the IP file:

- More than 80 percent of the records in Georgia’s IP file had an unexpected type of bill code suggesting that they were outpatient hospital claims, which the state confirmed it had erroneously included in its IP submission (rather than in its OT submission) in 2017. These records should not be treated as inpatient stays despite their presence in the IP file. TAF users should identify and exclude these records from analyses of inpatient hospital care using the type of bill codes for outpatient services (‘013x’ and ‘014x’).
- Over 40 percent of the records in Virginia’s IP file had an unexpected type of bill value, primarily indicating clinics that are not likely to provide inpatient services.<sup>10</sup> It is not clear whether these records are for outpatient services that were erroneously included in the IP file or whether the type of bill field was incorrectly coded on inpatient claims. TAF users should consider removing these claims (identified by type of bill values of (‘071x’ through ‘079x’) from analyses of inpatient hospital care.

**LT file.** In 33 states, 90 percent or more of the LT records had an expected type of bill value indicating that care was provided at a nursing facility, intermediate care facility for individuals with intellectual or developmental disabilities, or other non-acute overnight facility (Figure 2; Table 3). Three states (New Hampshire, New Jersey, and South Carolina) had high rates of

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<sup>9</sup> Wyoming has confirmed that their Medicaid Management Information System does not store the type of bill information as reported on institutional claims. Although the information in the type of bill field often appears to match to a valid type of bill value on which both the leading zero and final digit were truncated, this pattern does not always hold true. As a result, users should not attempt to convert the information in the type of bill field in Wyoming’s data to valid values.

<sup>10</sup> The most common unexpected type of bill values observed in Virginia’s IP data were ‘77x’, indicating a federally qualified health center; ‘72x’, indicating an end-stage renal disease clinic; ‘22x’, indicating inpatient services provided at a skilled nursing facility; and ‘71x’, indicating a rural health clinic.

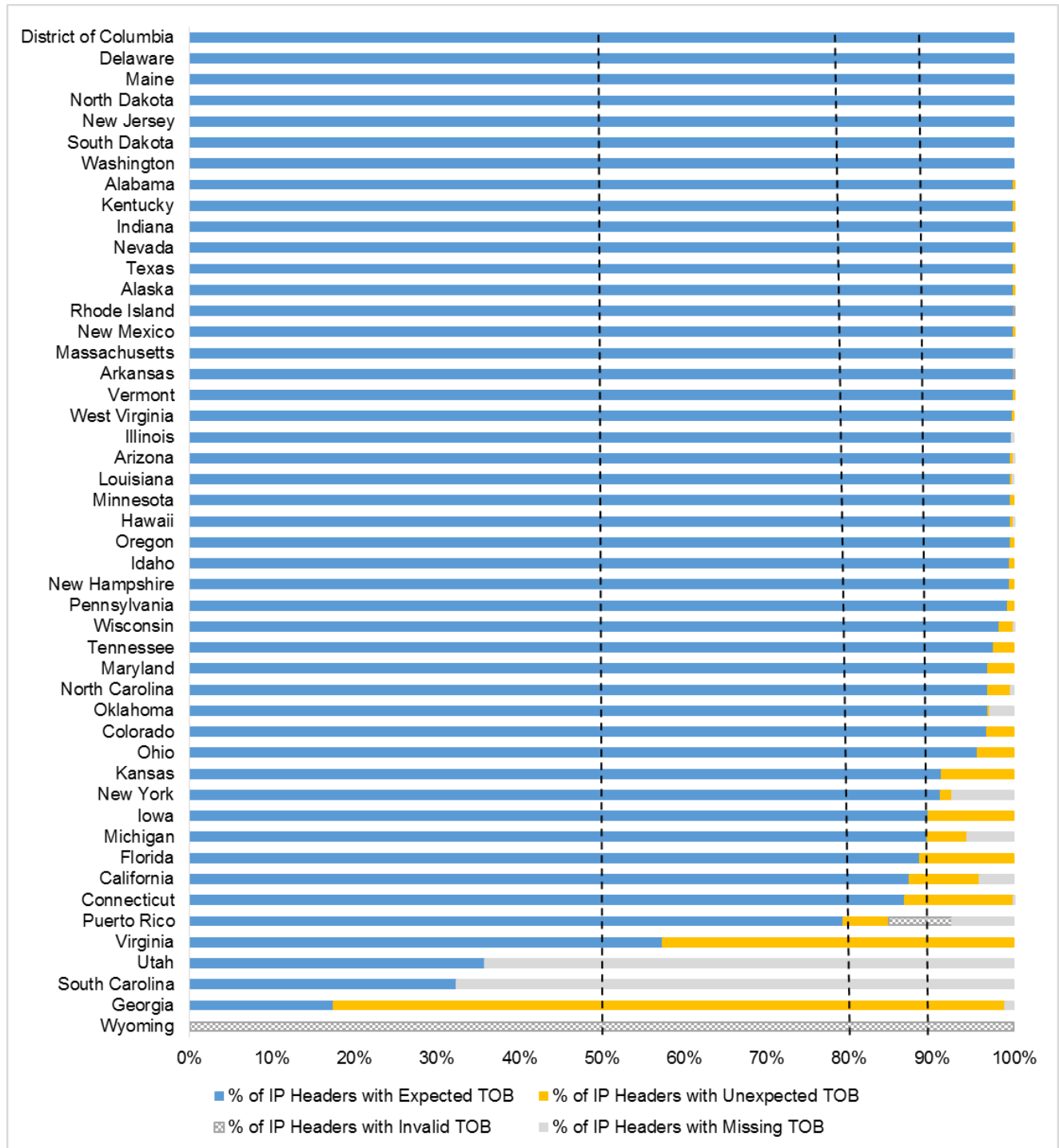
missing values in the type of bill on LT records. Four states (Arkansas, Louisiana, New Mexico, and Wyoming) had invalid values on 10 percent or more of LT records. Five states (Alaska, California, Delaware, Massachusetts, and West Virginia) had unexpected values on more than 10 percent of LT records, which may represent records reported into the wrong file or miscoded information in the type of bill field:

- In four of the states (Alaska, Delaware, Massachusetts, and West Virginia), most of the unexpected type of bill values represented inpatient hospital services ('011x' and '012x'), which is an expected value in only the IP file.
- In Massachusetts, about a third of the unexpected type of bill values represented an outpatient hospital ('013x') value, which is an expected value only in the OT file.
- In California, most of the unexpected type of bill values were for outpatient services at a nursing facility ('023x' and '024x').

**OT file.** The OT file includes records for all medical services other than overnight institutional claims, including both institutional claims for outpatient services and professional claims. In the former, the type of bill field should always be coded with a valid value. In the latter, the field should always be blank. Because a high proportion of records in the OT file represent professional claims, we expect high rates of missingness in the type of bill field for this file. As expected, we observed that between 5 and 25 percent of OT records had a non-missing type of bill value (Figure 3; Table 4). When the type of bill information appears on an OT record, it almost always indicates an expected provider type, including hospital outpatient facility, clinic, or other outpatient facility. However, a few states have unusual patterns in the type of bill field that indicate data quality problems:

- In Washington, 89 percent of OT records are coded with the invalid value '099x', and no records have a missing type of bill value, which we would expect to see on all professional claims. It is possible that the state is erroneously populating professional claims with the invalid '099x' value rather than leaving that field blank.
- In California, about one-third of OT records have a type of bill value that maps to an inpatient or other overnight facility stay. In addition, the proportion of OT records with a missing type of bill value is substantially lower than all other states. It is not clear whether the state reported overnight facility claims in the wrong file or whether the type of bill value was incorrectly coded on OT records.
- In Illinois, the type of bill field was blank on virtually all OT records. It is very unlikely that the state did not process any institutional outpatient claims.
- In Wyoming, the type of bill field was populated exclusively with missing or invalid values.

Figure 1. Type of bill values in the IP file, 2017



Source: 2017 TAF as of January 2019.

Notes: The values in the type of bill field were categorized as noted in Table 1. States are ordered based on the proportion of header records using a specific code that is expected for the IP file. States where more than 90 percent of header records had an expected type of bill code were categorized as low data quality concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern. States where more than 50 percent of header records had a type of bill code that was invalid, missing, or unexpected were categorized as unusable. The vertical dotted black lines indicate these thresholds in the figure. The data used for this figure are shown in Table 2.

**Table 2. Percentage of IP header records in each type of bill category, 2017**

State	Number of IP records	Percentage of IP records			
		Expected type of bill code	Unexpected type of bill code	Invalid value	Missing
<b>Low data quality concern (n = 37 states)</b>					
District of Columbia	37,751	100.0	0.0	0.0	0.0
Delaware	27,081	100.0	0.0	0.0	0.0
Maine	27,731	100.0	0.0	0.0	0.0
North Dakota	11,406	100.0	0.0	0.0	0.0
New Jersey	244,607	100.0	0.0	0.0	0.0
South Dakota	21,924	100.0	0.0	0.0	0.0
Washington	187,393	100.0	0.0	0.0	0.0
Alabama	161,322	100.0	0.0	0.0	0.0
Kentucky	201,319	100.0	0.0	0.0	0.0
Indiana	225,805	100.0	0.0	0.0	0.0
Nevada	114,943	100.0	0.0	0.0	0.0
Texas	812,450	100.0	0.0	0.0	0.0
Alaska	24,502	100.0	0.0	0.0	0.0
Rhode Island	23,362	100.0	0.0	0.0	0.0
New Mexico	91,681	100.0	0.0	0.0	0.0
Massachusetts	1,414,093	100.0	0.0	0.0	0.0
Arkansas	119,222	99.9	0.1	0.0	0.0
Vermont	19,427	99.9	0.1	0.0	0.0
West Virginia	78,057	99.8	0.2	0.0	0.0
Illinois	443,988	99.7	0.0	0.0	0.3
Arizona	268,054	99.6	0.4	0.0	0.0
Louisiana	207,085	99.6	0.2	0.0	0.1
Minnesota	181,015	99.6	0.4	0.0	0.0
Hawaii	42,206	99.6	0.4	0.0	0.0
Oregon	110,326	99.5	0.5	0.0	0.0
Idaho	35,804	99.5	0.5	0.0	0.0
New Hampshire	13,678	99.5	0.5	0.0	0.0
Pennsylvania	448,776	99.3	0.7	0.0	0.0
Wisconsin	199,995	98.3	1.7	0.0	0.1
Tennessee	245,917	97.5	2.5	0.0	0.0
Maryland	256,436	96.9	3.1	0.0	0.0
North Carolina	330,199	96.9	2.7	0.0	0.4
Oklahoma	141,346	96.8	0.3	0.0	2.9
Colorado	129,763	96.7	3.3	0.0	0.0

Table 2 (continued)

State	Number of IP records	Percentage of IP records			
		Expected type of bill code	Unexpected type of bill code	Invalid value	Missing
Ohio	513,712	95.6	4.4	0.0	0.0
Kansas	81,153	91.3	8.7	0.0	0.0
New York	1,452,740	91.1	1.3	0.0	7.6
<b>Medium data quality concern (n = 5 states)</b>					
Iowa	122,745	89.6	10.4	0.0	0.0
Michigan	332,735	89.5	4.8	0.0	5.7
Florida	844,589	88.6	11.4	0.0	0.0
California	1,395,832	87.3	8.5	0.0	4.2
Connecticut	148,839	86.7	13.3	0.0	0.0
<b>High data quality concern (n = 2 states)</b>					
Puerto Rico	185,968	79.3	5.4	7.7	7.5
Virginia	281,883	57.4	42.6	0.0	0.0
<b>Unusable type of bill code (n = 4 states)</b>					
Utah	59,980	35.8	0.0	0.0	64.2
South Carolina	153,384	32.4	0.0	0.0	67.6
Georgia	1,794,631	17.5	81.4	0.0	1.1
Wyoming	11,851	0.0	0.0	100.0	0.0
<b>Excluded from analysis (n = 4 states)</b>					
Mississippi	DQ	DQ	DQ	DQ	DQ
Missouri	DQ	DQ	DQ	DQ	DQ
Montana	DQ	DQ	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ	DQ	DQ

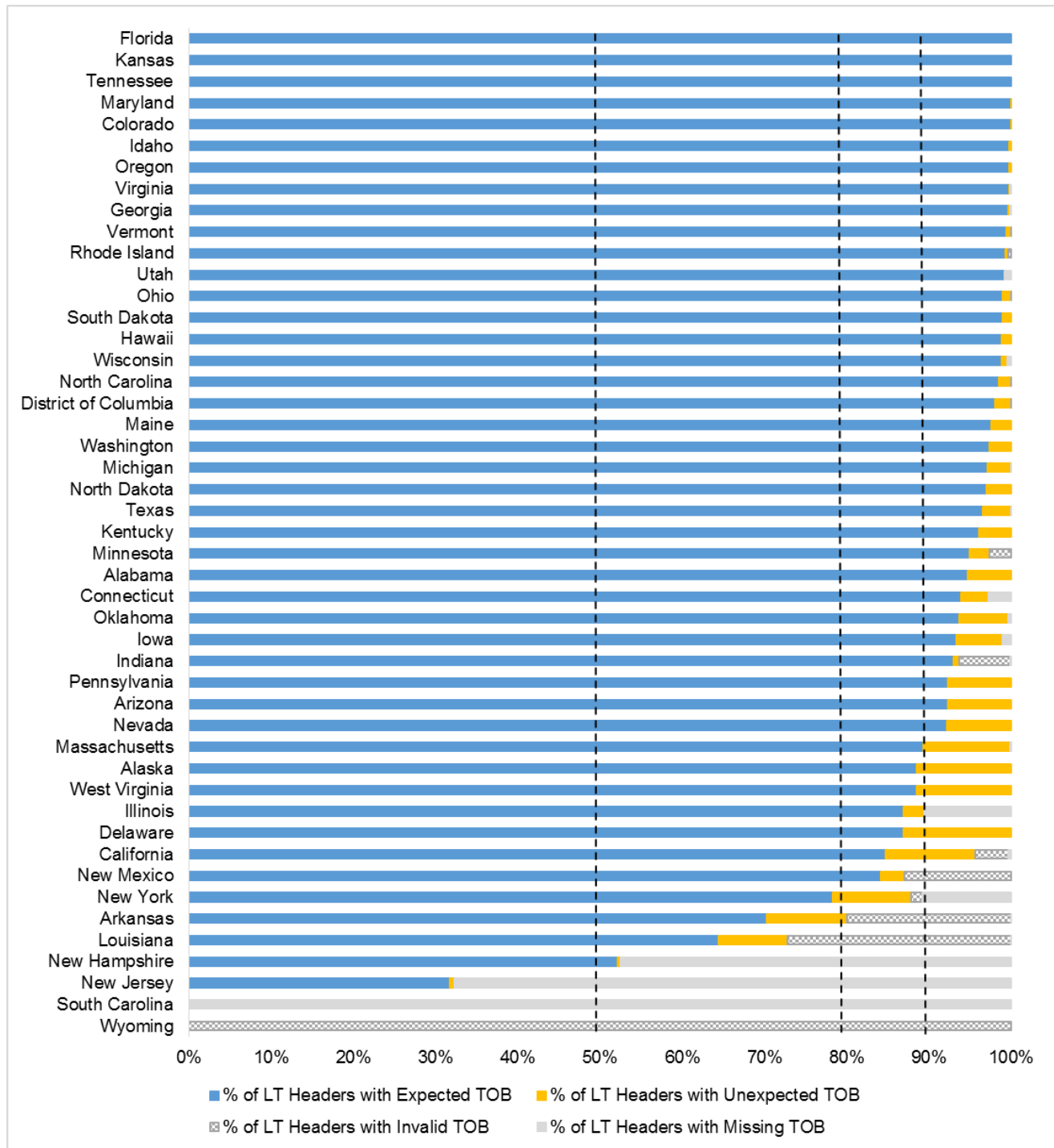
Source: 2017 TAF as of January 2019.

Notes: States where more than 90 percent of header records had an expected type of bill code were categorized as low data quality concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern. States where more than 50 percent of header records had a type of bill code that was invalid, missing, or unexpected were categorized as unusable.

DQ = Not reported because of concerns about a low volume of claims.



Figure 2. Type of bill values in the LT file, 2017



Source: 2017 TAF as of January 2019.

Notes: The values in the type of bill field were categorized as noted in Table 1. States are ordered based on the proportion of header records using a specific code that is expected for the LT file. States where more than 90 percent of header records had an expected type of bill code were categorized as low data quality concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern. States where more than 50 percent of header records had a type of bill code that was invalid, missing, or unexpected were categorized as unusable. These thresholds are displayed in the figure with the vertical dotted black lines. The data used for this figure are shown in Table 3.

**Table 3. Percentage of LT header records in each type of bill category, 2017**

State	Number of LT records	Percentage of LT records			
		Expected type of bill code	Unexpected type of bill code	Invalid value	Missing
<b>Low data quality concern (n = 33 states)</b>					
Florida	835,843	100.0	0.0	0.0	0.0
Kansas	276,375	100.0	0.0	0.0	0.0
Tennessee	349,672	100.0	0.0	0.0	0.0
Maryland	227,729	100.0	0.0	0.0	0.0
Colorado	290,566	100.0	0.0	0.0	0.0
Idaho	66,686	99.8	0.2	0.0	0.0
Oregon	72,842	99.8	0.2	0.0	0.0
Virginia	287,835	99.8	0.1	0.0	0.2
Georgia	1,115,216	99.7	0.2	0.0	0.1
Vermont	40,474	99.4	0.6	0.0	0.0
Rhode Island	81,084	99.3	0.4	0.3	0.0
Utah	129,072	99.2	0.0	0.0	0.8
Ohio	510,036	98.9	1.1	0.0	0.0
South Dakota	43,821	98.9	1.1	0.0	0.0
Hawaii	32,408	98.9	1.1	0.0	0.0
Wisconsin	163,454	98.8	0.7	0.0	0.5
North Carolina	1,107,221	98.5	1.5	0.0	0.0
District of Columbia	90,962	98.0	2.0	0.0	0.0
Maine	65,227	97.6	2.4	0.0	0.0
Washington	335,258	97.3	2.7	0.0	0.0
Michigan	377,161	97.1	2.9	0.0	0.0
North Dakota	45,043	97.0	3.0	0.0	0.0
Texas	2,688,361	96.5	3.5	0.0	0.0
Kentucky	309,490	96.1	3.9	0.0	0.0
Minnesota	194,372	94.9	2.4	2.6	0.0
Alabama	291,215	94.7	5.3	0.0	0.0
Connecticut	149,028	93.9	3.3	0.0	2.8
Oklahoma	713,120	93.7	6.0	0.0	0.3
Iowa	197,302	93.3	5.6	0.0	1.0
Indiana	833,763	93.0	0.7	6.2	0.1
Pennsylvania	794,377	92.3	7.7	0.0	0.0
Arizona	229,051	92.3	7.7	0.0	0.0
Nevada	78,390	92.2	7.8	0.0	0.0

Table 3 (continued)

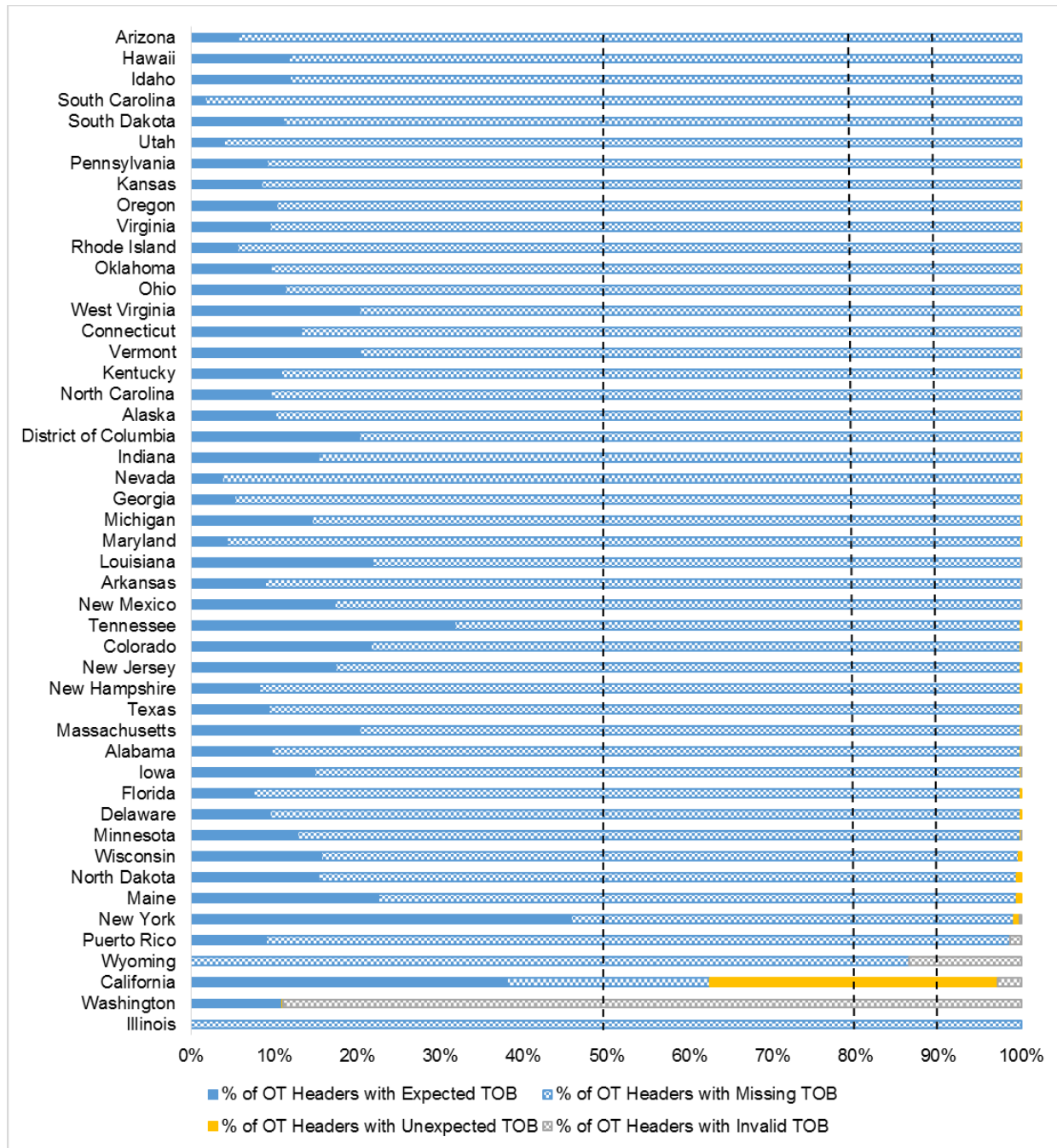
State	Number of LT records	Percentage of LT records			
		Expected type of bill code	Unexpected type of bill code	Invalid value	Missing
<b>Medium data quality concern (n = 7 states)</b>					
Massachusetts	675,313	89.4	10.6	0.0	0.1
Alaska	15,062	88.6	11.4	0.0	0.0
West Virginia	116,406	88.5	11.5	0.0	0.0
Illinois	430,623	86.9	2.6	0.0	10.6
Delaware	48,874	86.9	13.1	0.0	0.0
California	3,468,096	84.7	10.8	4.0	0.4
New Mexico	79,043	84.1	2.9	13.0	0.0
<b>High data quality concern (n = 4 states)</b>					
New York	8,934,779	78.3	9.5	1.4	10.8
Arkansas	912,524	70.3	9.7	19.9	0.0
Louisiana	383,366	64.5	8.3	27.2	0.0
New Hampshire	126,492	52.2	0.3	0.0	47.5
<b>Unusable (n = 3 states)</b>					
New Jersey	498,556	31.8	0.6	0.0	67.7
South Carolina	155,365	0.0	0.0	0.0	100.0
Wyoming	31,958	0.0	0.0	100.0	0.0
<b>Excluded from analysis (n = 5 states)</b>					
Mississippi	DQ	DQ	DQ	DQ	DQ
Missouri	DQ	DQ	DQ	DQ	DQ
Montana	DQ	DQ	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ	DQ	DQ
Puerto Rico	0	—	—	—	—

Source: 2017 TAF as of January 2019.

Notes: States where more than 90 percent of header records had an expected type of bill code were categorized as low data quality concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern. States where more than 50 percent of header records had a type of bill code that was invalid, missing, or unexpected were categorized as unusable. Puerto Rico was not classified into any group because its Medicaid program does not cover institutional long-term care as a benefit and as a result it does not submit any records into the LT file.

DQ = Not reported because of concerns about a low volume of claims.

Figure 3. Type of bill values in the OT file, 2017



Source: 2017 TAF as of January 2019.

Notes: The values in the type of bill field were categorized as noted in Table 1. States where more than 90 percent of header records had an expected type of bill code were considered to present a low level of concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern for the type of bill field. “Missing” is a valid value for professional claims in the OT file; therefore, states with more than 50 percent of header records with an invalid or unexpected type of bill were considered unusable. Additionally, states where 100 percent of header records had missing type of bill in the OT file were also considered unusable; these unexpected data patterns are indicated using red borders in the figure. The data used for this figure are shown in Table 4.

Table 4. Percentage of OT header records in each type of bill category, 2017

State	Number of OT records	Percentage of OT records				
		Any expected value (including missing)	Non-missing, expected value	Missing value (expected in OT file)	Unexpected value	Invalid value
<b>Low data quality concern (n = 44 states)</b>						
Arizona	63,379,124	100.0	5.7	94.3	0.0	0.0
Hawaii	4,684,430	100.0	11.8	88.2	0.0	0.0
Idaho	5,515,312	100.0	11.8	88.2	0.0	0.0
South Carolina	23,515,634	100.0	1.7	98.3	0.0	0.0
South Dakota	3,444,896	100.0	11.0	89.0	0.0	0.0
Utah	3,278,483	100.0	4.0	96.0	0.0	0.0
Pennsylvania	72,849,384	100.0	9.1	90.9	0.0	0.0
Kansas	9,397,252	100.0	8.4	91.6	0.0	0.0
Oregon	19,920,736	100.0	10.2	89.8	0.0	0.0
Virginia	25,938,166	100.0	9.4	90.6	0.0	0.0
Rhode Island	11,492,819	100.0	5.6	94.4	0.0	0.0
Oklahoma	17,424,520	100.0	9.6	90.4	0.0	0.0
Ohio	90,936,866	100.0	11.3	88.7	0.0	0.0
West Virginia	10,968,335	100.0	20.3	79.7	0.0	0.0
Connecticut	22,595,023	100.0	13.3	86.7	0.0	0.0
Vermont	3,490,738	100.0	20.3	79.7	0.0	0.0
Kentucky	33,735,138	100.0	10.8	89.2	0.0	0.0
North Carolina	41,214,748	100.0	9.6	90.4	0.0	0.0
Alaska	4,457,360	100.0	10.1	89.9	0.0	0.0
District of Columbia	5,082,782	100.0	20.3	79.7	0.0	0.0
Indiana	29,899,059	100.0	15.3	84.6	0.0	0.0
Nevada	16,160,304	100.0	3.8	96.2	0.0	0.0

Table 4 (continued)

State	Number of OT records	Percentage of OT records				
		Any expected value (including missing)	Non-missing, expected value	Missing value (expected in OT file)	Unexpected value	Invalid value
Georgia	31,794,554	100.0	5.3	94.7	0.0	0.0
Michigan	46,304,627	100.0	14.5	85.4	0.0	0.0
Maryland	57,617,956	100.0	4.3	95.7	0.0	0.0
Louisiana	60,744,083	100.0	21.9	78.1	0.0	0.0
Arkansas	19,890,030	99.9	8.8	91.1	0.0	0.0
New Mexico	14,404,710	99.9	17.2	82.7	0.1	0.0
Tennessee	34,060,350	99.9	31.7	68.2	0.1	0.0
Colorado	18,598,757	99.9	21.6	78.3	0.1	0.0
New Jersey	90,136,808	99.9	17.4	82.5	0.1	0.0
New Hampshire	5,708,926	99.9	8.2	91.7	0.1	0.0
Texas	121,135,208	99.9	9.3	90.5	0.1	0.0
Massachusetts	89,878,638	99.9	20.3	79.6	0.1	0.0
Alabama	16,695,454	99.8	9.7	90.2	0.2	0.0
Iowa	13,525,490	99.8	14.9	85.0	0.2	0.0
Florida	77,097,309	99.8	7.5	92.3	0.2	0.0
Delaware	4,899,354	99.8	9.5	90.3	0.2	0.0
Minnesota	35,794,997	99.8	12.8	87.0	0.2	0.0
Wisconsin	35,299,810	99.6	15.6	84.0	0.4	0.0
North Dakota	1,411,322	99.4	15.3	84.1	0.6	0.0
Maine	10,218,045	99.3	22.5	76.8	0.7	0.0
New York	201,052,984	99.0	45.8	53.2	0.7	0.3
Puerto Rico	18,685,285	98.6	9.1	89.5	0.1	1.4
<b>High data quality concern (n = 4 states)</b>						
Wyoming	1,608,916	86.4	0.0	86.4	0.0	13.6
California	217,539,717	62.5	38.0	24.5	34.6	2.9

Table 4 (continued)

State	Number of OT records	Percentage of OT records				
		Any expected value (including missing)	Non-missing, expected value	Missing value (expected in OT file)	Unexpected value	Invalid value
Washington	29,643,103	11.0	11.0	0.0	0.1	88.9
Illinois	65,611,174	100.0	0.0	100.0	0.0	0.0
<b>Excluded from analysis (n = 4 states)</b>						
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

Source: 2017 TAF as of January 2019.

Notes: States where more than 90 percent of header records had an expected type of bill code were considered to present a low level of concern. States where 80 to 90 percent of header records had an expected code were categorized as medium data quality concern, and states where only 50 to 80 percent of header records had an expected code were categorized as high data quality concern for the type of bill field. "Missing" is a valid value for professional claims in the OT file; therefore, states with more than 50 percent of header records with an invalid or unexpected type of bill were considered unusable. Additionally, states where 100 percent of header records had missing type of bill in the OT file were also considered unusable. The values in the type of bill field were categorized as noted in Table 1. Missing values are expected in the OT file and represent professional claims.

DQ = Not reported because of concerns about a low volume of claims.

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