Identifying Service Setting in 2017

October 2019

Brief #5192
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

- Users of the T-MSIS Analytic Files (TAF) who investigate service use in the Medicaid program will often need to determine the setting where services were delivered. This brief describes the extent to which TAF users will have the information they need to determine service setting in the OT file.
- The OT file contains both institutional and professional claims for services delivered in a variety of settings. The type of bill code should be used to determine service setting on institutional claims, while the place of service code should be used to determine service setting on professional claims. When neither or both of these variables are available, TAF users can identify the service setting indirectly.
- For 33 states, the level of data quality concern with respect to identifying the service setting is low. For 10 states, the level of concern is medium. For 5 states, it is high (Table 2).
- Among the claims for which service setting could only be identified indirectly, the most frequently occurring data quality issues were a missing or invalid type of bill code and a missing or invalid place of service code (Table 3). In most cases, there was no valid revenue center code on these claims, which means TAF users will be unable to determine the service setting.

Background

Users of the T-MSIS Analytic Files (TAF) who investigate service use in the Medicaid program will often need to determine the setting where services were delivered. The structure of the TAF can be used to identify service setting for many service use records: the inpatient (IP) file should only include records for stays at inpatient hospitals, the long-term care (LT) file should only include records for stays at institutional long-term care facilities such as nursing homes and intermediate care facilities, and the pharmacy (RX) file should only include records for prescription drugs and durable medical equipment filled by pharmacies or durable medical equipment suppliers.[1] However, the largest TAF—the other services (OT) file—contains both

[1] In some cases, states incorrectly submit claims in the wrong file. For example, Georgia is known to be submitting outpatient facility claims in its IP file when those claims belong in the OT file. See TAF DQ Brief #5111: “Volume of Claims in 2016, by File”.

institutional and professional claims from across all settings of care. OT records include claims for outpatient facilities and for professional services provided in inpatient settings, emergency departments, outpatient settings, offices, and home- and community-based settings.[2]

On medical claims, different fields are used on different types of claims to identify the service setting.[3] The type of bill code should be used to determine the service setting on institutional claims, while the place of service code should be used to determine the service setting on professional claims. Both of these data elements are found in the TAF header record.[4] Each service use record should have only one of the fields populated, depending on what type of claim form was used to submit the claim. Sometimes, information in the header record is problematic: the type of bill and place of service codes may both be missing or invalid, or they may both be valid. If this occurs on an institutional claim, revenue center codes in the line records can be used to determine service setting in the absence of the bill type code. Professional claims should have only missing values in the revenue center field. This brief describes the extent to which TAF users can determine service setting in the OT file for each state.

Methods

Using the 2017 TAF, we examined header and line records in the OT file.[5] Records in the IP, LT, and RX files have a known service setting based on file type and thus were not included in the analysis. We included fee-for-service (FFS) claims and managed care encounter records for Medicaid and Children's Health Insurance Program beneficiaries in 46 states, the District of Columbia, and Puerto Rico.[6] Mississippi, Missouri, Montana, and Nebraska were excluded from the analysis because of a very low volume of claims. We further excluded claims that were not expected to have a valid type of bill code (BILL_TYPE_CD) or a place of service code (SRVC_PLC_CD), including transportation claims, dental claims, and claims for home- and

[2] Not all claims for home- and community-based services are required to include the information necessary to identify the service setting. These claims were therefore excluded from the analysis presented in this brief.

[3] Institutional claims are submitted on an institutional claim form by hospitals, nursing facilities, intermediate care facilities for individuals with intellectual or developmental 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 on a professional claim form by physicians (both individuals and groups), other clinical professionals, freestanding laboratories and outpatient facilities, ambulances, and durable medical equipment suppliers. They are referred to as CMS-1500 claims, when submitted in paper form, or as 837P, when submitted in electronic form.

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

[5] 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).

[6] We used the claim type code (CLM_TYPE_CD) to determine which records to include and exclude. We retained FFS records (claim types 1 and A) and managed care encounters (claim types 3 and C). We excluded records with all other claim type values, including capitation payments, service tracking claims, and supplemental payments—all of which are financial transaction records and thus are not expected to include information that reflects services provided to an individual.

community-based services (HCBS).[7] Claims for these services are often submitted on nonstandard forms; therefore, it is not straightforward to identify the setting of care.

Our analysis assessed whether the fields for service setting that we would expect to be populated were in fact populated. More specifically, we examined the percentage of claims with either a valid type of bill code[8] or a valid place of service code.[9] We also evaluated unexpected combinations of type of bill and place of service codes—that is, the percentage of claims with both a valid type of bill code and a valid place of service code and the percentage of claims without a valid type of bill code or a valid place of service code. On claims with these unexpected combinations, the service setting can often be identified indirectly by using the revenue center code (REV_CD),[10] when present, using the method outlined in Table 1. If all three key data elements (type of bill, place of service, and revenue center code) are missing, TAF users will be unable to determine the service setting.

Table 1. Identifying the service setting on claims indirectly

Unexpected pattern	Revenue center code is populated	Revenue center code is not populated
Both type of bill and place of service codes are populated	Assume that the claim is institutional, and use the type of bill to determine the service setting	Assume that the claim is professional, and use the place of service to determine the service setting
Neither type of bill nor place of service code is populated	Assume that the claim is institutional, and use the revenue center code to identify service setting	Unable to determine service setting

We organized states according to the level of concern about their data quality based on the percentage of claims on which either the type of bill code or place of service code (the expected combination of service setting fields) were populated. The level of data quality concern is low if 80 percent or more of claims were appropriately populated, medium if between 50 percent and 80 percent of claims were appropriately populated, and high if less

[7] Using the type of service code variable (TOS_CD), we excluded claims for transportation services; dental services; personal care services; HCBS; home health services; medical equipment and supplies (including eyeglasses, dentures, and hearing aids); capitated payments; care coordination services; and medications and drug rebates. We excluded these claims because they are not typically submitted on standardized claim forms; thus, the setting of care would not be easily identifiable. Although the American Dental Association claim form has a standard field for place of service, some states process dental claims on their own forms, which do not include this field or require it to be populated. The most frequently occurring types of services that we removed from the analysis were 56 (transportation services), 29 (dental services), and 51 (personal care services)—which represented 13.2 percent, 12.1 percent, and 5.0 percent, respectively, of the claims excluded. In some states, using the type of service code may not have fully identified and removed all HCBS from the analysis.

[8] Valid type of bill codes begin with a leading zero and are four digits long. They are listed in Appendix 1 of the OT Data Dictionary. We considered three-digit values to be valid as long as they matched to a valid value when a leading zero was added. We did not consider type of bill codes that had one or two digits or that had three digits with a leading zero (that is, missing a fourth digit) as valid. We focused only on the second and third digits and allowed any value in the fourth position.

[9] Valid place of service values are listed in Chapter 26 of CMS's Medicare Claims Processing Manual, which is available at https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/clm104c26.pdf.

[10] Valid values for revenue center codes are listed in CMS's Claims Processing Manual for the UB-04, which is available at https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/r167cp.pdf.

than 50 percent of claims were appropriately populated. We did not include an "unusable" category because, when necessary, variables other than the type of bill code and place of service code can be used to identify the service setting indirectly.

Findings

Thirty-three states populated 80 percent or more of their claims appropriately, indicating a low level of concern about their data quality (Table 2). Ten states populated between 50 percent and 80 percent of their claims appropriately (a medium data quality concern), while five states populated less than 50 percent of their claims appropriately (a high data quality concern). Although most states had the expected combination of type of bill and place of service codes on the majority of claims, more than 375 million claims had an unexpected combination of type of bill and place of service codes. California, New York, and Michigan each had more than 30 million claim headers with unexpected combinations (Table 3).

Among claims with unexpected combinations of type of bill and place of service codes and for which the service setting could only be identified indirectly, the most frequently occurring data quality issues were missing or invalid type of bill and null/missing/invalid place of service (Table 3). Most of these records had no valid revenue center code on any line. As a result, a TAF user would be unable to determine service setting. Less frequently, records had a valid type of bill code and a valid place of service code on the same claim. The majority of these records had a revenue center code on at least one line, suggesting that the claims were institutional and that the type of bill code should be used to identify the service setting. California, Utah, and Washington were the three exceptions in which a large share of claims had both a valid type of bill code and a place of service code but no revenue code, suggesting that the claims were professional and that the place of service code should be used to identify the service setting.

Table 2. Expected and unexpected combinations of type of bill and place of service codes

State	Number of claim headers	Percentage of claim headers with expected combination of type of bill code and place of service code	Percentage of claim headers with unexpected combination of type of bill code and place of service code
Low data quality concern (*n* = 33 states)			
Hawaii	3,855,630	99.5	0.5
New Mexico	10,275,438	99.5	0.5
Virginia	21,127,780	99.0	1.0
District of Columbia	3,413,690	98.9	1.1
Tennessee	20,536,732	98.6	1.4
Wisconsin	18,975,795	98.4	1.6
Oklahoma	13,893,251	97.3	2.8
Kansas	5,633,278	96.8	3.2
Massachusetts	61,940,969	96.7	3.3

Table 2 (*continued*)

State	Number of claim headers	Percentage of claim headers with expected combination of type of bill code and place of service code	Percentage of claim headers with unexpected combination of type of bill code and place of service code
Nevada	8,977,995	96.1	3.9
Idaho	4,156,534	95.4	4.6
Delaware	3,698,310	94.9	5.1
Illinois	40,986,852	94.8	5.2
Louisiana	45,361,480	94.7	5.3
Maryland	43,860,413	92.6	7.4
Texas	87,458,077	92.5	7.5
Utah	2,575,275	92.0	8.0
Minnesota	26,310,856	91.3	8.7
Arizona	51,475,695	91.0	9.1
Puerto Rico	17,541,138	90.3	9.7
Alabama	13,894,415	87.3	12.7
Indiana	23,034,349	87.2	12.9
Florida	65,554,750	87.0	13.0
Pennsylvania	54,173,749	86.6	13.4
Iowa	12,253,991	86.3	13.7
Connecticut	13,760,694	85.9	14.1
Georgia	21,954,590	85.5	14.5
South Carolina	15,400,182	85.3	14.7
Oregon	14,959,892	85.3	14.7
North Carolina	31,648,524	85.3	14.7
South Dakota	2,580,547	83.5	16.5
Alaska	2,796,849	82.1	17.9
Rhode Island	10,525,836	81.8	18.2
Medium data quality concern (*n* = 10 states)			
Kentucky	26,898,958	79.9	20.1
North Dakota	1,244,850	79.3	20.8
Wyoming	1,128,435	79.2	20.8
Maine	9,391,241	77.5	22.6
West Virginia	8,802,158	75.9	24.2
New Jersey	61,704,610	74.2	25.8
New York	126,547,562	70.3	29.7
Ohio	86,646,005	67.7	32.3
New Hampshire	4,031,792	66.3	33.7
Vermont	2,637,659	57.4	42.6

Table 2 (*continued*)

State	Number of claim headers	Percentage of claim headers with expected combination of type of bill code and place of service code	Percentage of claim headers with unexpected combination of type of bill code and place of service code
High data quality concern (*n* = 5 states)			
Colorado	13,034,803	32.2	67.8
California	172,811,654	21.2	78.8
Washington	26,743,769	13.2	86.8
Arkansas	15,445,968	11.6	88.4
Michigan	36,646,141	1.9	98.1
Excluded from analysis (*n* = 4 states)			
Mississippi	DQ	DQ	DQ
Missouri	DQ	DQ	DQ
Montana	DQ	DQ	DQ
Nebraska	DQ	DQ	DQ

Source: 2017 TAF as of January 2019.

Note: States are ordered according to the percentage of claim headers with an expected combination of type of bill code and place of service code.

DQ = Excluded from the analysis because of a very low volume of claims.

Table 3. Unexpected combinations of type of bill and place of service codes

State	Number of claim headers with unexpected combinations	Valid type of bill and place of service codes		Missing or invalid type of bill and place of service codes	
		At least one valid revenue code	No valid revenue code	At least one valid revenue code	No valid revenue code
Alabama	1,767,147	90.1	0.0	0.0	9.9
Alaska	501,369	89.9	0.0	0.0	10.1
Arizona	4,658,796	0.0	0.0	0.0	100.0
Arkansas	13,649,765	3.8	0.0	0.0	96.2
California	136164124	13.3	83.2	0.0	3.5
Colorado	8,840,527	0.0	0.0	0.0	100.0
Connecticut	1,942,609	89.4	0.0	0.0	10.6
Delaware	189,780	0.0	0.0	0.0	100.0
District of Columbia	38,500	0.0	0.0	0.0	100.0
Florida	8,507,815	69.5	0.1	0.0	30.5
Georgia	3,178,105	52.6	0.0	0.0	47.4
Hawaii	18,278	0.0	0.0	0.0	100.0
Idaho	190,086	0.0	0.0	0.0	100.0
Illinois	2,130,163	0.0	0.0	0.0	100.0
Indiana	2,960,205	80.4	0.0	0.0	19.6

Table 3 (*continued*)

State	Number of claim headers with unexpected combinations	Valid type of bill and place of service codes		Missing or invalid type of bill and place of service codes	
		At least one valid revenue code	No valid revenue code	At least one valid revenue code	No valid revenue code
Iowa	1,683,731	0.0	0.0	0.0	100.0
Kansas	182,166	0.0	0.0	0.0	100.0
Kentucky	5,410,468	64.6	0.0	0.0	35.4
Louisiana	2,406,090	0.0	0.0	0.1	100.0
Maine	2,117,361	0.0	0.0	0.0	100.0
Maryland	3,231,258	0.0	0.0	0.0	100.0
Massachusetts	2,028,511	0.0	0.0	0.2	99.8
Michigan	35,934,971	14.5	0.0	0.0	85.5
Minnesota	2,284,923	0.0	0.0	0.0	100.0
Nevada	351,849	64.5	0.0	0.0	35.5
New Hampshire	1,359,971	0.0	0.0	0.0	100.0
New Jersey	15,937,950	96.8	0.0	0.0	3.2
New Mexico	49,144	0.0	0.0	0.1	99.9
New York	37,600,216	96.0	0.9	1.1	2.0
North Carolina	4,666,437	77.1	0.0	0.0	22.9
North Dakota	258,285	0.0	0.0	0.0	100.0
Ohio	28,006,086	0.0	0.0	0.0	100.0
Oklahoma	381,764	0.0	0.0	12.7	87.4
Oregon	2,201,430	91.8	0.0	0.0	8.2
Pennsylvania	7,262,810	1.8	0.0	0.0	98.3
Puerto Rico	1,694,782	76.8	0.3	15.3	7.6
Rhode Island	1,914,696	0.0	0.0	0.0	100.0
South Carolina	2,260,330	0.0	0.0	60.3	39.7
South Dakota	426,391	67.7	0.0	0.0	32.3
Tennessee	290,071	0.0	0.0	0.0	100.0
Texas	6,589,300	0.0	0.0	0.0	100.0
Utah	205,310	22.5	37.8	0.0	39.7
Vermont	1,123,492	46.6	3.5	0.0	49.9
Virginia	213,293	0.0	0.0	0.0	100.0
Washington	23,211,517	0.0	100.0	0.0	0.0
West Virginia	2,125,592	99.2	0.0	0.0	0.8
Wisconsin	302,390	0.0	0.0	0.0	100.0
Wyoming	234,581	0.0	0.0	91.7	8.3
Excluded from analysis (*n* = 4 states)					
Mississippi	DQ	DQ	DQ	DQ	DQ

Table 3 (*continued*)

State	Number of claim headers with unexpected combinations	Valid type of bill and place of service codes		Missing or invalid type of bill and place of service codes	
		At least one valid revenue code	No valid revenue code	At least one valid revenue code	No valid revenue code
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.

Note: States are ordered alphabetically.

DQ = Excluded from the analysis because of a very low volume of claims.

Laura Nolan[1], Julia Baller[1], Kimberly Proctor[2], and Jessie Parker[2]. "Identifying Service Setting in 2017." TAF DQ Brief #5192. Baltimore, MD: CMS, 2019.

Reviewers: Keith Branham[2]; Jeffrey Galecki[2]; Carol V. Irvin[1]; Brian Johnston[1]; Allison Barrett[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