

Assessing the Usability of MAX 2008 Encounter Data for Enrollees in Comprehensive Managed Care

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As growing numbers of Medicaid enrollees receive health benefits through comprehensive managed care, researchers and policymakers seeking to understand the service use of these enrollees must rely on encounter data that states receive from managed care plans. However, not all states report encounter data submitted by their plans into the Medicaid Statistical Information System (MSIS) and, until recently, little was known about the data's usability for research. In this issue brief, we report on the availability, completeness, and quality of encounter data for physician, clinic, and outpatient services for the first time and update a recent assessment of the inpatient and prescription drug files to judge the usability of the 2008 Medicaid Analytical eXtract (MAX) encounter data, which are derived from MSIS.

Background

As states expand their use of managed care arrangements to provide services to Medicaid enrollees, researchers and policymakers will need to analyze additional types of data to assess their service use. With 50 percent of all full-benefit Medicaid enrollees enrolled in comprehensive managed care in 2008, relying on fee-for-service (FFS) data to determine the service use of the Medicaid population is no longer sufficient (Borck et al. 2012). To capture the service use of comprehensive managed care enrollees, encounter data—that is, claims records that contain information on utilization but none on Medicaid expenditures—must be evaluated as well. To ensure that managed care enrollees receive the same level and quality of services as FFS enrollees, several states perform comprehensive checks on the data that they receive from managed care plans; however, the quality of the encounter data submitted by the states to the Medicaid Statistical Information System (MSIS) is not clear (Byrd et al. 2011). Encounter data do not undergo the same validation and quality checks in either MSIS or MAX processing that FFS data undergo.

About This Series

The MAX Medicaid policy issue brief series highlights the essential role MAX data can play in analyzing the Medicaid program. MAX is a set of annual, person-level data files on Medicaid eligibility, service utilization, and payments that are derived from state reporting of Medicaid eligibility and claims data into the Medicaid Statistical Information System (MSIS). MAX is an enhanced, research-friendly version of MSIS that includes final adjudicated claims based on the date of service, and data that have undergone additional quality checks and corrections. CMS produces MAX specifically for research purposes. For more information about MAX, please visit: <http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXGeneralInformation.asp>.

The MAX encounter data briefs are meant to inform researchers and policymakers as they decide whether and how to use encounter data for their research. MAX was designed to enable research on Medicaid enrollment, service utilization, and expenditures by calendar year at the enrollee level. Analysis by calendar year is particularly important with encounter data because some states that submit them do not do so in every quarterly MSIS submission (Byrd et al. 2011).

In a previous issue brief, we examined MAX 2007 data to assess the availability, completeness, and quality of encounter data for inpatient hospital (IP) and prescription drug (RX) data from health maintenance organization (HMO)/health insuring organization (HIO) plans (Dodd et al. 2012). This initial look at the usability of encounter data was focused on IP and RX claims because, according to actuaries and state Medicaid officials, encounter data for these services—which are provided by a relatively small number of providers—are typically easier

to collect and may be more complete than “other services” (OT) data. Most of the service use among Medicaid enrollees, however, including physician, clinic, and outpatient services, is captured in the OT file. Therefore, while the results of the initial assessment of the quality of the IP and RX encounter data were encouraging, the data analyzed would only cover a limited subset of enrollee service use.

In this brief, we use MAX 2008 data to update the IP and RX encounter data assessment, and we extend our analysis to physician, outpatient, and clinic services in the OT file. To be usable, the data needed to be of comparable completeness and quality to FFS data. The remainder of this issue brief explains how we conducted the analysis and elaborates on the results. We plan to assess the usability of 2009 MAX encounter data when they are available.

Methods

We constructed our analysis using the information in enrollees’ basis-of-eligibility (BOE) category—that is, each enrollee’s classification as adult, child, disabled, or aged—to facilitate more accurate state-by-state comparisons. The average 2008 capitation payment for enrollees in comprehensive managed care was much lower for adults and children than for aged and disabled beneficiaries, an indication that the expected level of service use, and therefore the expected volume of encounter claims, is lower among adults and children (Borck et al. 2011). As states vary widely in terms of the mixture of Medicaid populations enrolled in capitated managed care programs, examining the volume of encounter data submissions for all groups within a state could be misleading. Many states rolled out comprehensive managed care to children and adult enrollees first, and only some have enrolled the aged and disabled populations in it.

The proportion of aged and disabled enrollees with dual eligibility (that is, eligible for both Medicaid and Medicare) could also affect the claims for service utilization within a BOE. We excluded dual-eligible enrollees from our 2008 analysis because the volume of encounter data is lower than those for non-dual enrollees, since many services they receive are covered by Medicare (Young et al. 2012).

In MAX 2008, encounter data for comprehensive managed care enrollees were available for over half of the states in at least one type of file: IP, long-term care (LT), OT, or RX; and the number of states with data had increased in each file type from 2007 (Table 1). We limited our analysis to fully capitated (comprehensive) managed care arrangement HMO/HIO plans because they cover the widest range of services and because we anticipated they would have the highest quality encounter data.

Table 1. Overview of Encounter Data Available in MAX 2007 and 2008 for HMO/HIO Enrollees, by File Type

File Type	Number of States with Data, 2007 ^a	Number of States with Data, 2008 ^a	Number of Encounter Claims, 2008
IP	25	29	1,947,019
LT	18	22	560,201
OT	27	34	350,312,637
RX	18	20	87,573,721

Source: Mathematica’s analysis of MAX 2007 and 2008 data.

^a Includes all states that submitted encounter data regardless of the level of HMO/HIO participation in the state, the number of claims submitted, or whether prescriptions were covered as part of the comprehensive managed care program.

The OT file may contain up to 22 types of service, while IP may contain four, and RX two. For the OT analysis, we chose physicians (type of service = 08), outpatient hospital (type of service = 11), and clinic (type of service = 12) because these are services routinely sought and covered under Medicaid in all states, and managed care plans are accustomed to collecting and reporting these data for quality assurance, such as for the Healthcare Effectiveness Data and Information Set (HEDIS). We included “inpatient hospital” (type of service = 01) from the IP file because while the IP file may contain three other types of service, “inpatient hospital” represents the vast majority of claims and services in the inpatient setting. We included “prescribed drugs” (type of service = 16) from the RX file, but did not include durable medical equipment.

Since analyzing them both individually and together did not yield substantial differences, we decided to present physician, outpatient, and clinic services as a whole in this brief. Other types of services included in the OT file might not be as easily comparable across states or as complete. For example, the volume of rehabilitation or occupational therapy services relies heavily on how a state counts units of service, which can range on claims from 15-minute increments to hour-long visits. There were too few LT encounter claims for a cross-state analysis.¹

We considered a state to have managed care if at least one percent of enrollees participated in comprehensive managed care at some point during the year. For prescription drug services, we excluded 12 states whose managed care arrangements did not include prescription drug benefits. Because states with low managed care enrollment are less likely to devote resources to producing high-quality encounter data, we analyzed data for a particular BOE group only if 10 percent

or more of full-benefit² Medicaid enrollees within that group were enrolled in an HMO/HIO plan. We did not analyze data for a particular BOE group in a state if it had fewer than 200 claims because measures based on a small number of records could skew estimates.

Metrics

To be usable, encounter data needed to be both complete and of comparable quality to FFS data for our analysis. We conducted our analysis in two phases to account for these two characteristics. To judge completeness, we looked at two measures that assessed the volume of encounter data—the average number of claims and the percentage of enrollees with claims. To evaluate quality, we used metrics that assessed the amount or quality of information on the encounter itself. For the analysis of the OT encounter claims, we chose to use two quality measures for both the diagnosis code and procedure code fields—one indicating whether the field was filled and the second analyzing the format of the data in the field. For diagnosis code, we expected the field to be filled at a high rate because few physician, outpatient, and clinic services claims are paid without a diagnosis code. We wanted to determine, however, how the diagnosis codes on encounter claims compare in the level of specificity to those reported on FFS claims. The more characters in the diagnosis code (more than 3 characters), the more specific the diagnosis is on the claim or encounter. Similarly, we expected the procedure codes to be filled at a high rate, but the heavy reliance of some states on procedure codes specific to the state make a national analysis more complicated. We examined whether the procedure codes were filled and whether the reported data were in the standard national format. For the IP file, we created one quality measure for each of four fields that undergo scrutiny during the MSIS data quality and validation review process, and for the RX file, we created one quality measure for each of two fields that we expect to see routinely filled on FFS claims. The metrics used for evaluation of completeness and quality are shown in Table 2.

Because managed care coverage varies by state and type of enrollee, we evaluated the completeness and quality measures for OT, IP, and RX data separately for each BOE for each state. To create comparison metrics, we calculated the average 2008 value and standard deviation for each completeness and quality metric for each BOE using the full-benefit, non-dual FFS population across all states with substantial FFS participation. For each comparison metric, we used the average FFS value as the midpoint of our reference range. We set the top of the reference range at two standard deviations above the FFS average, and the bottom at two standard deviations below the FFS average. We considered the reference range to be the acceptable range of values for the 2008 encounter data for that metric. The state's encounter data value was considered “good” if it fell within the reference range. For certain measures, state values were highly skewed but typically either close to 100 percent or 0 percent for both FFS and encounter data. Rather than use the reference range based on the average value, we defined a “good” value as 90 percent or greater for these measures.

For each BOE that met the analysis criteria, we compared the state's value to the FFS reference metric to determine if it fell within the acceptable range; the ranges are presented in Table 2. The number of states that fell within the range is shown in parentheses for each measure. For example, 23 of the 24 states that met the thresholds for our analysis of OT data for adults had an average number of OT encounter claims per enrollee between 1.04 and 12.10, inclusively. For the OT, IP, and RX data, “complete” was defined as having values within the acceptable range for at least one of the two completeness metrics for that data type. For the OT data, “comparable quality” was defined as satisfying at least four of the five quality measures. For the IP data, “comparable quality” was defined as satisfying at least three of the four quality measures. For the RX data, “comparable quality” was defined as satisfying at least one of the two quality measures. A BOE within a state was considered to have “usable” data if the encounter data for that BOE met both the “complete” and “comparable quality” criteria.

Table 2. Metrics Developed to Analyze Medicaid Encounter Data in MAX 2008

Data Element	Reference Range (Number of States Meeting Metric)			
	Adults	Children	Disabled	Aged
OT–Physician, Clinic, and Outpatient Visits				
Completeness Measures				
Average number of OT encounter claims per enrollee	1.04–12.10 (23 of 24)	1.23–9.46 (22 of 25)	8.35–27.96 (15 of 20)	0.91–19.54 (13 of 16)
Percentage of enrollees with OT encounter claims	34.33–92.45 (22 of 24)	36.15–93.40 (23 of 25)	66.35–92.39 (14 of 20)	19.57–92.26 (15 of 16)
Quality Measures				
Percentage of OT encounter claims with place of service code	83.87–100 (23 of 24)	76.16–100 (25 of 25)	81.89–100 (20 of 20)	84.22–100 (16 of 16)
Percentage of OT encounter claims with primary diagnosis code	98.17–100 (24 of 24)	86.09–100 (25 of 25)	94.84–100 (20 of 20)	97.02–100 (16 of 16)
Percentage of OT encounter claims with a primary diagnosis code length greater than 3 characters	90.85–98.81 (23 of 24)	80.92–100 (25 of 25)	88.08–100 (20 of 20)	89.16–99.41 (16 of 16)
Percentage of OT encounter claims with a procedure (service) code	71.47–100 (20 of 24)	82.13–100 (21 of 25)	78.78–100 (17 of 20)	82.68–100 (13 of 16)
Percentage of OT encounter claims with a procedure code in CPT-4 or HCPCS format	60.77–100 (21 of 24)	64.32–100 (22 of 25)	66.88–100 (18 of 20)	70.41–100 (15 of 16)
IP–Inpatient Hospital				
Completeness Measures				
Average number of IP encounter claims per enrollee	0.00–0.40 (22 of 24)	0.02–0.15 (18 of 24)	0.10–0.54 (16 of 20)	0.00–0.44 (14 of 15)
Percentage of enrollees with IP encounter claims	0.21–32.51 (23 of 24)	1.06–13.08 (20 of 24)	7.55–25.39 (15 of 20)	3.62–22.39 (11 of 15)
Quality Measures				
Average length of stay	2.01–3.90 (23 of 24)	2.04–6.48 (22 of 24)	5.35–8.61 (9 of 20)	3.32–10.49 (14 of 15)
Average number of diagnosis codes	2.42–6.43 (20 of 24)	1.89–4.38 (20 of 24)	3.09–9.76 (16 of 20)	3.19–10.72 (12 of 15)
Percentage of IP claims with procedure codes	48.17–100.00 (18 of 24)	18.72–76.39 (23 of 24)	30.70–71.13 (15 of 20)	25.05–73.55 (13 of 15)
Percentage of IP claims with UB accommodation codes	Values of ≥ 90% (20 of 24)	Values of ≥ 90% (20 of 24)	Values of ≥ 90% (13 of 20)	Values of ≥ 90% (11 of 15)
RX–Prescription Drugs				
Completeness Measures				
Average number of RX encounter claims per enrollee	1.86–12.95 (13 of 14)	1.80–7.22 (14 of 15)	17.27–50.09 (8 of 10)	0–48.22 (8 of 8)
Percentage of enrollees with RX encounter claims	26.79–88.04 (13 of 14)	31.46–80.84 (14 of 15)	68.14–89.30 (9 of 10)	12.21–89.82 (7 of 8)
Quality Measures				
Percentage of RX claims with date prescribed	Values of ≥ 90% (13 of 14)	Values of ≥ 90% (14 of 15)	Values of ≥ 90% (9 of 10)	Values of ≥ 90% (7 of 8)
Percentage of RX claims with quantity	Values of ≥ 90% (8 of 14)	Values of ≥ 90% (9 of 15)	Values of ≥ 90% (6 of 10)	Values of ≥ 90% (4 of 8)

Source: Mathematica’s analysis of the MAX 2008 IP, RX, OT, and Person Summary (PS) files.

Note: The parenthetical data show the number of states that had values within the acceptable range, out of the total number of states that had sufficient participation and encounter claims submitted for analysis.

UB = uniform billing, CPT-4 = Current Procedural Terminology, 4th Edition, HCPCS = Healthcare Common Procedure Coding System.

Findings

OT Encounter Data

Table 3 summarizes the availability, completeness, and quality of the OT encounter data for each state by BOE. Figure 1 illustrates how the criteria applied at each step of the analysis eliminated states from meeting the usability criteria. For example, 35 states had comprehensive managed care at some point during 2008. At least 10 percent of adult enrollees participated in comprehensive managed care in 32 of these 35 states. Of these 32 states, 24 (75 percent) submitted OT encounter claims for adults. The completeness of the adult OT encounter data was high, with 23 of 24 states submitting complete data. The quality of the encounter data was high as well, with 21 of 24 states submitting data of comparable quality to the FFS data. Because they met the criteria for both completeness and quality, the OT encounter data for adult enrollees are considered usable for 21 states (88 percent) that submitted data.

Data can also be considered usable for 22 of the 25 states (88 percent) submitting data for children. Fifteen of the 20 states submitting data for disabled enrollees (75 percent) met both completeness and quality thresholds, and of the 16 states submitting encounter claims for the aged, 14 submitted data that can be considered usable.

The OT encounter data were considered usable for at least one BOE category for 24 (96 percent) of the 25 states that submitted these data. Eighteen states (72 percent) provided usable encounter data for all the BOE categories for which they submitted data (Arizona, Delaware, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Michigan, Missouri, Nebraska, New Jersey, New Mexico, New York, Oregon, Tennessee, Texas, and Virginia). Only one state (Maryland) submitted OT encounter data that did not meet the usability

criteria for any BOE. The remaining 6 states met the criteria for some BOEs but not others.

IP Encounter Data

Table 4 summarizes the availability, completeness, and quality of the IP encounter data for each state by BOE. Figure 2 illustrates how the criteria applied at each step of the analysis eliminated states from meeting the usability criteria. The completeness and the quality of the IP encounter data were high. They were considered usable for at least one BOE category for 22 of the 25 states that submitted these data (88 percent). Thirteen states (52 percent) provided usable data for all of the BOE categories for which they submitted data (Arizona, Hawaii, Indiana, Kansas, Kentucky, Missouri, Nebraska, New Jersey, New Mexico, Oregon, Virginia, Washington, and Wisconsin). This is the same number as in 2007; however, Minnesota, which met this threshold in 2007, did not meet it in 2008, while Virginia met the threshold in 2008, but not in 2007 (data not shown). Of the 25 states that submitted suitable IP encounter data for the analysis, three states did not meet the criteria for usability for any BOE. The remaining 9 states met the criteria for some BOEs but not others.

RX Encounter Data

Table 5 summarizes the availability, completeness, and quality of the RX encounter data for each state by BOE. Figure 3 illustrates how the criteria applied at each step of the analysis eliminated states from meeting the usability criteria. Almost every state that submitted RX encounter data submitted data that were complete and of comparable quality to FFS data for every BOE group. Thirteen states provided usable data for every BOE group for which they submitted data (Arizona, California, Georgia, Indiana, Kansas, Kentucky, Maryland, Michigan, Missouri, New Mexico, Rhode Island, Virginia, and Washington).

Table 3. Summary of the 2008 MAX Encounter OT Claims

	State Has Comprehensive Managed Care (CMC) ^a	Percentage of CMC Enrollees Met Threshold ^b				State Submitted OT Encounter Claims ^c				OT Encounter Records Are Complete ^d				OT Encounter Records Are of Comparable Quality to FFS Data ^e				OT Encounter Data Are Usable for Research ^f			
		A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E
Alabama																					
Alaska																					
Arizona	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arkansas																					
California	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X		
Colorado	X	X	X	X	X	X	X	X	X			X			X	X	X				X
Connecticut																					
Delaware	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
District of Columbia	X	X	X																		
Florida	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X			X
Georgia	X	X	X			X	X			X	X			X	X			X	X		
Hawaii	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X	
Idaho																					
Illinois	X		X				X				X				X				X		
Indiana	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X	
Iowa	X																				
Kansas	X	X	X			X	X			X	X			X	X			X	X		
Kentucky	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Louisiana																					
Maine																					
Maryland	X	X	X	X		X	X	X		X	X	X									
Massachusetts	X	X	X	X																	
Michigan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Minnesota	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X
Mississippi																					
Missouri	X	X	X			X	X			X	X			X	X			X	X		
Montana																					
Nebraska	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nevada	X	X	X																		
New Hampshire																					
New Jersey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New Mexico	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New York	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
North Carolina																					
North Dakota																					
Ohio	X	X	X	X	X																
Oklahoma																					
Oregon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pennsylvania	X	X	X	X	X																
Rhode Island	X	X	X	X		X	X	X		X	X			X	X	X		X	X		
South Carolina	X	X	X	X																	
South Dakota																					
Tennessee	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Texas	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Utah																					
Vermont	X																				
Virginia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Washington	X	X	X																		
West Virginia	X	X	X																		
Wisconsin	X	X	X			X	X			X	X				X				X		
Wyoming																					
Total	35	32	33	25	18	24	25	20	16	23	23	16	15	21	24	19	15	21	22	15	14

(continued)

Table 3. (continued)

Source: Mathematica’s analysis of the MAX 2008 PS and OT files. Note: A=Adults, C=Children, D=Disabled, E=Aged.

^a At least one percent of enrollees participated in HMO/HIO at some point during 2008.

^b At least 10 percent of enrollees in the BOE participated in HMO/HIO at some point during the year.

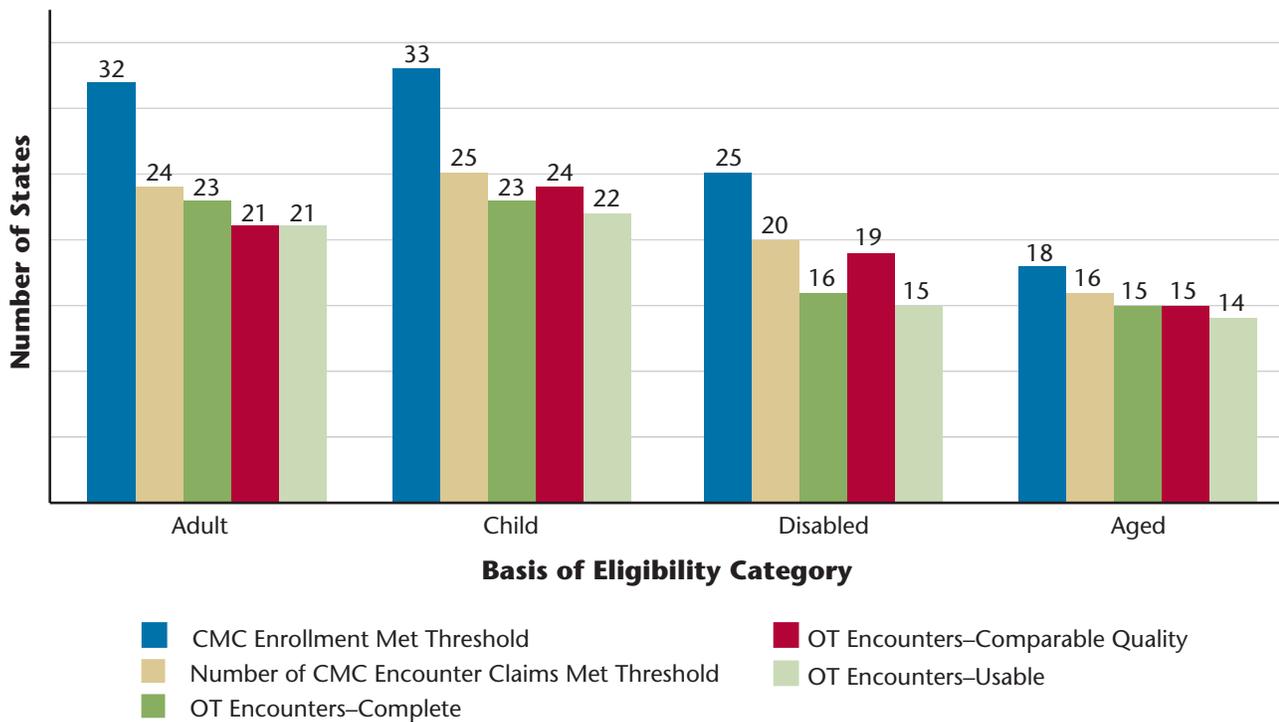
^c In addition to having at least 10 percent HMO/HIO participation, the state submitted at least 200 encounter claims for the BOE.

^d The BOE-specific metric was met for at least one of the two completeness measures: (1) percentage of enrollees with OT encounter claims (TOS = 08, 11, 12) and (2) average number of OT encounter claims per enrollee.

^e The BOE-specific metric was met for at least four of the five quality measures: (1) percentage of OT claims with place of service, (2) percentage of OT claims with a primary diagnosis code, (3) percentage of claims with a primary diagnosis code with a character length greater than 3, (4) percentage of claims with a procedure (service) code, and (5) percentage of claims with a procedure code in CPT-4 or HCPCS format.

^f Both the completeness and quality standards were met for the BOE.

Figure 1. Summary of the MAX 2008 OT Encounter Claims by Basis of Eligibility Category^a



^a See Table 3 footnotes for data category definitions.

Table 4. Summary of the 2008 MAX Encounter IP Claims

	State Has Comprehensive Managed Care (CMC) ^a	Percentage of CMC Enrollees Met Threshold ^b				State Submitted IP Encounter Claims ^c				IP Encounter Records Are Complete ^d				IP Encounter Records Are of Comparable Quality to FFS Data ^e				IP Encounter Data Are Usable for Research ^f				
		A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E	
Alabama																						
Alaska																						
Arizona	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arkansas																						
California	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X		
Colorado	X	X	X	X	X	X		X		X		X										
Connecticut																						
Delaware	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X				X
District of Columbia	X	X	X	X																		
Florida	X	X	X	X	X	X	X	X	X	X		X	X	X		X		X				X
Georgia	X	X	X																			
Hawaii	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		
Idaho																						
Illinois	X		X				X								X							
Indiana	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		
Iowa	X																					
Kansas	X	X	X			X	X			X	X			X	X			X	X			
Kentucky	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Louisiana																						
Maine																						
Maryland	X	X	X	X		X	X	X		X	X	X		X	X			X	X			
Massachusetts	X	X	X	X																		
Michigan	X	X	X	X	X	X	X	X	X	X		X	X	X	X			X				
Minnesota	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X	X			X
Mississippi																						
Missouri	X	X	X			X	X			X	X			X	X			X	X			
Montana																						
Nebraska	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Nevada	X	X	X																			
New Hampshire																						
New Jersey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New Mexico	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New York	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	
North Carolina																						
North Dakota																						
Ohio	X	X	X	X	X																	
Oklahoma																						
Oregon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pennsylvania	X	X	X	X	X																	
Rhode Island	X	X	X	X		X	X	X		X	X	X										
South Carolina	X	X	X	X																		
South Dakota																						
Tennessee	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X			
Texas	X	X	X	X	X	X	X	X	X		X		X	X	X		X		X			X
Utah																						
Vermont	X																					
Virginia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Washington	X	X	X			X	X			X	X			X	X			X	X			
West Virginia	X	X	X																			
Wisconsin	X	X	X			X	X			X	X			X	X			X	X			
Wyoming																						
Total	35	32	33	25	18	24	24	20	15	23	20	16	15	21	23	12	12	20	19	10	12	

(continued)

Table 4. (continued)

Source: Mathematica’s analysis of the MAX 2008 PS and IP files.

Note: A=Adults, C=Children, D=Disabled, E=Aged.

^a At least one percent of enrollees participated in HMO/HIO at some point during 2008.

^b At least 10 percent of enrollees in the BOE participated in HMO/HIO at some point during the year.

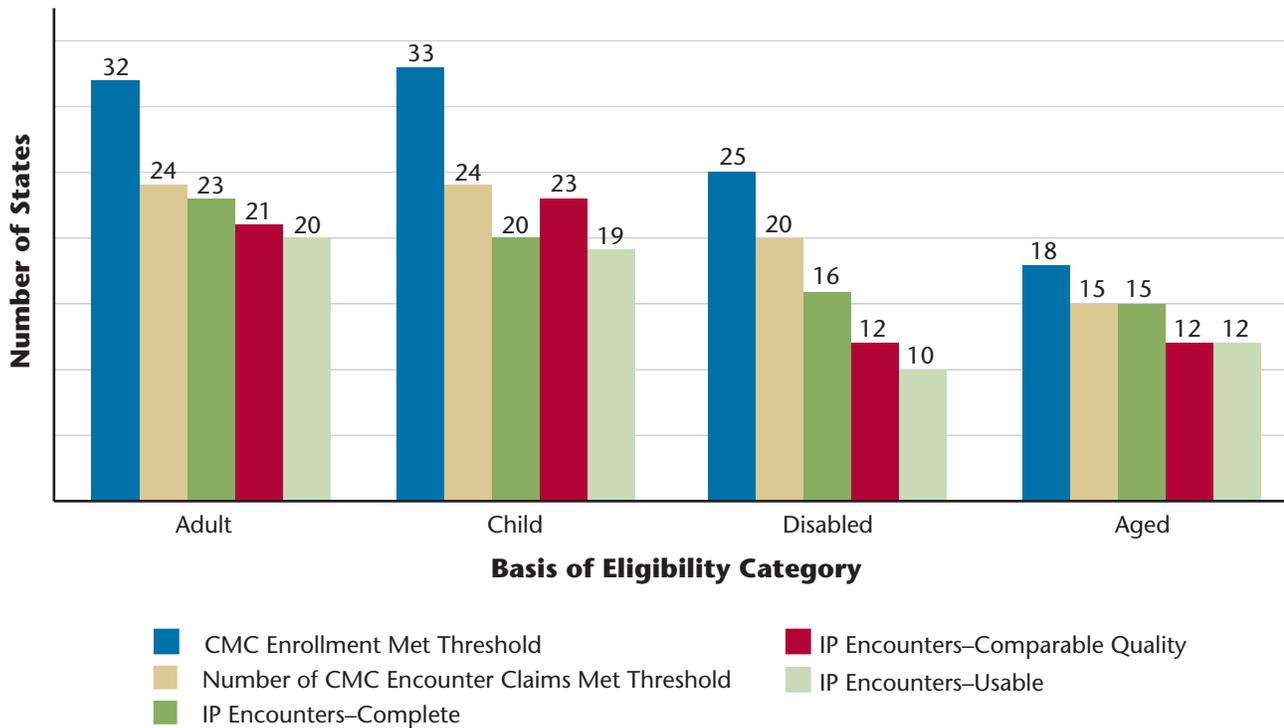
^c In addition to having at least 10 percent HMO/HIO participation, the state submitted at least 200 encounter claims for the BOE.

^d The BOE-specific metric was met for at least one of the two completeness measures: (1) percentage of enrollees with IP encounter claims and (2) average number of IP encounter claims per enrollee.

^e The BOE-specific metric was met for at least three of the four quality measures: (1) average length of stay, (2) average number of diagnosis codes, (3) percentage of claims with procedure code, and (4) percentage of claims with UB accommodation codes.

^f Both the completeness and quality standards were met for the BOE.

Figure 2. Summary of the MAX 2008 IP Encounter Claims by Basis of Eligibility Category^a



^a See Table 4 footnotes for data category definitions.

Table 5. Summary of the 2008 MAX Encounter RX Claims

	State Has Comprehensive Managed Care (CMC) ^a	Percentage of CMC Enrollees Met Threshold ^b				State Submitted RX Encounter Claims ^c				RX Encounter Records Are Complete ^d				RX Encounter Records Are of Comparable Quality to FFS Data ^e				RX Encounter Data Are Usable for Research ^f				
		A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E	A	C	D	E	
Alabama																						
Alaska																						
Arizona	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arkansas																						
California	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Colorado	X	X	X	X	X																	
Connecticut																						
Delaware																						
District of Columbia	X	X	X	X																		
Florida	X	X	X	X	X	X	X		X				X	X	X		X					X
Georgia	X	X	X			X	X			X	X			X	X					X	X	
Hawaii	X	X	X	X																		
Idaho																						
Illinois																						
Indiana	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		
Iowa																						
Kansas	X	X	X			X	X			X	X			X	X			X	X			
Kentucky	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Louisiana																						
Maine																						
Maryland	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		
Massachusetts	X	X	X	X																		
Michigan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Minnesota	X	X	X	X	X	X	X	X	X	X	X		X									
Mississippi																						
Missouri	X	X	X			X	X			X	X			X	X			X	X			
Montana																						
Nebraska																						
Nevada	X	X	X																			
New Hampshire																						
New Jersey ^g																						
New Mexico	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New York ^g																						
North Carolina																						
North Dakota																						
Ohio	X	X	X	X	X																	
Oklahoma																						
Oregon ^g																						
Pennsylvania	X	X	X	X	X																	
Rhode Island	X	X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		
South Carolina	X	X	X	X																		
South Dakota																						
Tennessee																						
Texas																						
Utah																						
Vermont	X																					
Virginia	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Washington	X	X	X				X				X				X				X			
West Virginia																						
Wisconsin ^g																						
Wyoming																						
Total	24	23	23	18	11	14	15	10	8	13	14	9	8	13	14	9	7	12	13	9	7	

(continued)

Table 5. (continued)

Source: Mathematica’s analysis of the MAX 2008 PS and RX files.

Note: A=Adults, C=Children, D=Disabled, E=Aged.

^a At least one percent of enrollees participated in HMO/HIO/PACE at some point during 2008. There were 12 states in which MC plans did not provide a pharmacy benefit: CT, DE, IA, IL, NE, NJ, NY, OR, TN, TX, WI, and WV (Bagchi et al. 2012).

^b At least 10 percent of enrollees in the BOE participated in HMO/HIO at some point during the year.

^c In addition to having at least 10 percent HMO/HIO participation, the state submitted at least 200 encounter claims for the BOE.

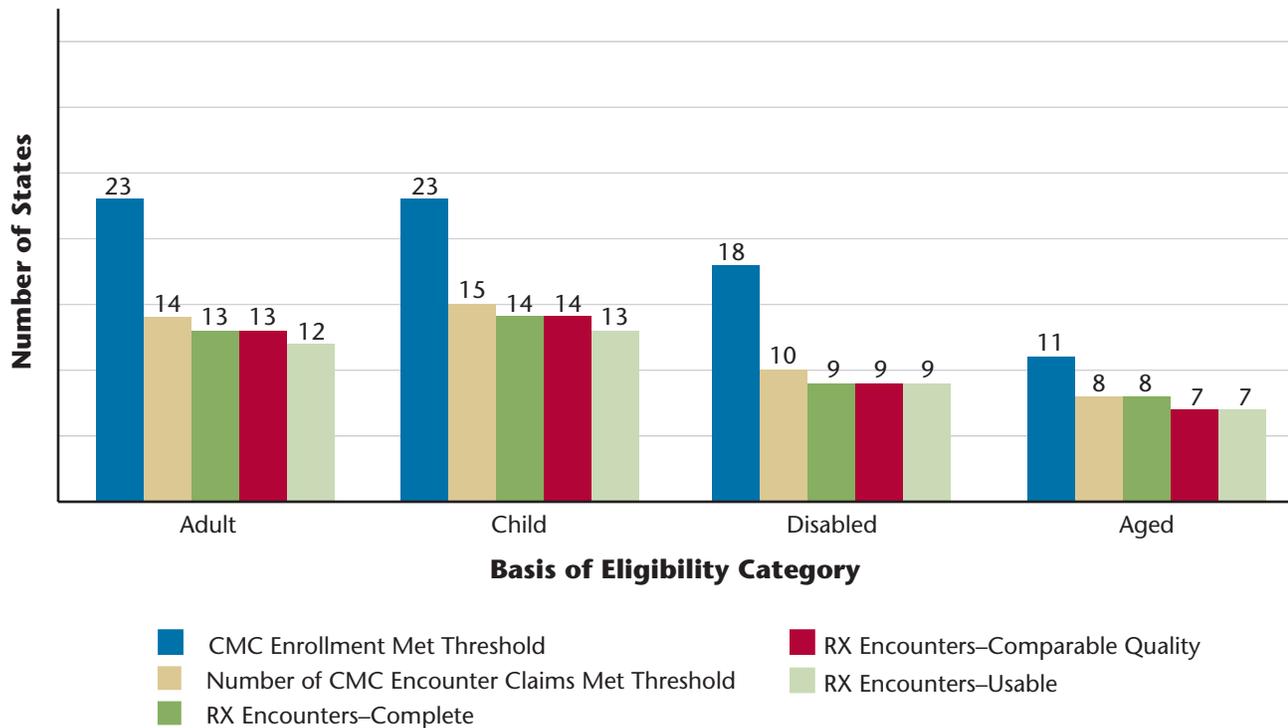
^d The BOE-specific metric was met for at least one of the two completeness measures: (1) percentage of enrollees with RX encounter claims and (2) average number of RX encounter claims per enrollee.

^e The BOE-specific metric was met for at least one of the two quality measures: (1) percentage of RX claims with date prescribed and (2) percentage of RX claims with quantity.

^f Both the completeness and quality standards were met for the BOE.

^g NJ, NY, OR, and WI submitted RX encounter data even though prescription drugs were not included in the HMO benefit package.

Figure 3. Summary of the MAX 2008 RX Encounter Claims by Basis of Eligibility Category^a



^a See Table 5 footnotes for data category definitions.

Changes in IP and RX Encounter Data from 2007 to 2008

From 2007 to 2008, the number of states with at least 10 percent of enrollees participating in comprehensive managed care at some point during the year and that submitted IP encounter claims increased for all four BOE categories (Table 6). The number of states with complete IP encounter data increased for all groups between 2007 and 2008. The number of states with complete RX encounter data increased for only the aged between 2007 and 2008. These increases were due both to an increase in the number of states with at least 10 percent participation in comprehensive managed care and to more states submitting encounter data. Given states’ increasing reliance on

managed care, the increase in the volume of data and its quality is expected and promising.

As noted earlier, our analysis of MAX 2008 encounter data excluded dual-eligible Medicaid enrollees, while our previous analysis of MAX 2007 data did not. This change affected the number of states enrolling the disabled and aged in comprehensive managed care, and likewise the encounters included in our analysis. The number of states meeting our threshold of enrolling at least one percent of disabled and aged non-dual enrollees in 2008 was greater than the number enrolling at least one percent of disabled and aged (dual- and non-dual) enrollees in 2007, which was expected, given that dual-eligible enrollees are often excluded from managed care enrollment in most

Table 6. Summary of IP and RX Encounter Claims by BOE for MAX 2007 and 2008

	2007				2008			
	A	C	D	E	A	C	D	E
IP Encounter Claims								
CMC Enrollment Met Threshold ^a	33	33	22	9	32	33	25	18
CMC Encounter Claims Met Threshold ^b	22	22	15	6	24	24	20	15
IP Encounter Claims–Complete ^c	19	19	12	6	23	20	16	15
IP Encounter Claims–Quality ^d	20	21	10	5	21	23	12	12
IP Encounter Claims–Usable ^e	17	18	8	5	20	19	10	12
RX Encounter Claims								
CMC Enrollment Met Threshold ^a	27	27	18	6	23	23	18	11
CMC Encounter Claims Met Threshold ^b	17	17	11	3	14	15	10	8
RX Encounter Claims–Complete ^f	17	17	10	3	13	14	9	8
RX Encounter Claims–Quality ^g	16	16	11	2	13	14	9	7
RX Encounter Claims–Usable ^e	16	16	10	2	12	13	9	7

Source: Mathematica’s analysis of the MAX 2008 PS, IP, and RX files.

Note: A=Adults, C=Children, D=Disabled, E=Aged.

^a At least 10 percent of enrollees in the BOE participated in HMO/HIO at some point during the year.

^b In addition to having at least 10 percent HMO/HIO participation, the state submitted at least 200 encounter claims for the BOE.

^c The BOE-specific metric was met for at least one of the two completeness measures: (1) percentage of enrollees with IP encounter claims and (2) average number of IP encounter claims per enrollee.

^d The BOE-specific metric was met for at least three of the four quality measures: (1) average length of stay, (2) average number of diagnosis codes, (3) percentage of claims with procedure code, and (4) percentage of claims with UB accommodation codes.

^e Both the completeness and quality standards were met for the BOE.

^f The BOE-specific metric was met for at least one of the two completeness measures: (1) percentage of enrollees with RX encounter claims and (2) average number of RX encounter claims per enrollee.

^g The BOE-specific metric was met for at least one of the two quality measures: (1) percentage of RX claims with date prescribed and (2) percentage of RX claims with quantity.

states. For disabled enrollees, 22 states met the 2007 threshold for IP encounter data, and 25 met the 2008 threshold for the same, a small difference. Eighteen states included IP services for non-dual aged enrollees in comprehensive managed care in MAX 2008, compared to 9 in 2007. Given that our 2008 analysis includes enrollees receiving their medical services from Medicaid only, we expected to see more states meeting the thresholds for completeness, and this is particularly true for the aged population.

The volume of encounter data in the RX file meeting the thresholds for analysis dropped because more states provided pharmacy benefits with FFS arrangements, increasing from 8 in 2007 to 12 in 2008 (See footnote a in Table 5). The completeness, quality, and usability of the data, however, remained very high.

Caveats

Because FFS data are not without completeness and quality issues, we did not require a state’s encounter data to meet all completeness and quality measures to be considered usable. If we had, the number of states with usable data for at least one BOE would have dropped. Among the 24 states that had comprehensive managed care participation of 10 percent

or more for adults and that submitted encounter claims, the number with usable data for research on OT encounters would fall from 21 (88 percent) to 17 (71 percent) if all criteria for FFS completeness and quality had to be met. Among the 24 states that had comprehensive managed care participation of 10 percent or more for adults and that submitted encounter claims, the number with usable data for research on IP encounters would fall from 20 (83 percent) to 12 (50 percent) if all criteria for FFS completeness and quality had to be met. Among the 14 states that had comprehensive managed care participation of 10 percent or more for adults and that submitted encounter claims, the number with usable data for research on RX encounters would fall from 12 (86 percent) to 7 (50 percent) if all criteria for FFS completeness and quality had to be met.

In this brief, we used selected FFS-based metrics to make a preliminary judgment about the quality and completeness of the data for inpatient hospitalization, physician services, outpatient hospital services, clinic services, and prescription medication. This approach has been useful because it illustrates that a reasonable quantity of encounter data is available in MAX and that they appear to be of good quality on basic measures. We assume that, like the FFS data, the MAX data that fall within

acceptable ranges accurately depict what is happening in the state. This analysis is limited, however, by its assumption that FFS data provide a reasonable benchmark for judging the encounter data, which may not be the case, depending on the particular populations a state chooses to enroll in managed care. While populations receiving services through comprehensive managed care plans are likely to differ from FFS populations in important ways, we used metrics within two standard deviations to account for differences in utilization patterns that may reflect differences in populations or inherent differences between the FFS and managed care delivery systems. Additionally, it may be difficult to extend our analysis of selected OT measures to other types of services in the OT file. It will depend on the type of service, whether the type of service is covered by managed care arrangements, and how consistently services are billed across states or within plan arrangements.

Conclusions

This brief provides an assessment of selected OT, IP, and RX encounter data included in the MAX 2008 data files. The results are encouraging. More states submitted encounter data in 2008 than in 2007, reflecting an increase in the provision of data for existing plans, as well as an increase in the percentage of enrollees in comprehensive managed care, particularly among aged enrollees. Most states that have comprehensive managed care plans are reporting selected OT, IP, and RX encounter data. Of those data, the majority are complete and of comparable quality to the FFS data for adults, children, the disabled, and aged populations. Although several actuaries and state officials involved in Medicaid administration at the state level have hypothesized that IP and RX data might be more complete and of higher quality than OT data because they are collected from fewer providers (Byrd et. al 2011), our analysis did not confirm that hypothesis. The data for physician, outpatient, and clinic services appear to be complete and of about the

same quality as FFS data for more states than the IP data. This analysis will aid researchers in determining which states with notable comprehensive managed care enrollment may be reasonable to analyze. By knowing the usability of the encounter data for physician and clinic encounters, inpatient and outpatient visits, and prescription drugs, researchers and policymakers can reasonably consider adding the analysis of encounter data when assessing Medicaid service utilization in states with substantial enrollment in comprehensive managed care.

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Endnotes

- ¹ Encounter claims in the LT file are clustered among very few states in MAX 2008 data. After imposing our analysis criteria, there were too few encounters for a cross-state analysis of LT data.
- ² A full-benefit Medicaid enrollee is defined here as an enrollee with a restricted benefits flag equal to one for any month of enrollment in the calendar year, meaning the individual is eligible for Medicaid or CHIP and entitled to the full scope of Medicaid or CHIP benefits.

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