



Comparison of Nursing Facility Acuity Adjustment Methods

Final Report

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1. Executive Summary

In October 2019, the Centers for Medicare & Medicaid Services (CMS) changed the method that it uses to classify patients in a covered Medicare Part A skilled nursing facility (SNF) stay from Resource Utilization Groups Version IV (RUG-IV) to the Patient-Driven Payment Model (PDPM). Many states currently use a RUG-based payment methodology for Medicaid-covered nursing facility stays. The implementation of PDPM led to some changes to the Minimum Data Set (MDS 3.0), which may mean that, at some point, it will be more difficult for states to use a RUG-based system. As a result, the implementation of PDPM is prompting states to assess whether they should change their methods of determining patient acuity for Medicaid payment.

To inform discussion about the implications of using PDPM for Medicaid-covered stays, this report uses the case-mix weights used for the Medicare prospective payment system (PPS) to examine the case-mix weights for Medicaid residents under both RUG-IV and PDPM and how they compare to case-mix weights for Medicare residents. In the analysis, we used MDS 3.0 data for the first three quarters of calendar year 2019. Because the MDS does not include all of the information needed to determine PDPM case-mix groups for Medicaid residents, we modified an existing set of PDPM case-mix grouper programs so that they would work with MDS data prior to the implementation of PDPM.

Although PDPM is designed to be budget neutral for Medicare payment for SNFs, we find that relative case-mix weights were higher for Medicaid residents under PDPM than under RUG-IV for each component of PDPM. As a result, use of PDPM with Medicare payment weights would result in higher acuity levels for Medicaid residents relative to RUG-IV. The differences in values for the therapy components of the two systems were particularly large. PDPM was designed to support the payment system for Medicare Part A SNF stays, which are limited up to 100 days, and we find that it is not a good predictor of therapy needs for non-Medicare residents with longer stays, including many who are covered by Medicaid. We find that the use of therapy services declines over time for long-stay residents, and this decline is not reflected in PDPM case-mix weights.

The finding that the current PDPM system is not a good measure of predicting care needs for Medicaid patients suggests that it cannot easily be applied to Medicaid-covered nursing facility stays. In order for states to develop new methods of adjusting for patient acuity when it is no longer possible to use a RUG-based system, further analysis will be required to assess whether some of the components of the PDPM system (such as the nursing-related component which is more similar to RUG-IV than other PDPM components) can be used for Medicaid payment, to develop payment case-mix weights that are appropriate for state Medicaid programs, and to examine how particular types of nursing facilities may be affected by changes to acuity adjustment methods.

2. Background

2.1 RUG-IV

From July 1998 to October 2019, the Medicare SNF PPS used a RUG-based classification system. RUG-based systems use information from an MDS assessment to classify residents into a series of groups representing the residents' relative direct care resource requirements. The analyses in this report use the RUG-IV 66-group model. Each RUG-IV group has an associated nursing and therapy component.

- **Nursing component:** The nursing component of the payment rate is intended to cover the costs of nursing services, social services, and non-therapy ancillary costs (i.e., respiratory therapy, equipment and supplies). CMS assigns each RUG-IV group a nursing index score based on the amount of staff time (weighted by salary levels) associated with caring for residents classified to that group. The nursing weight includes both resident specific time spent daily on behalf of each patient by RNs, LPNs, and nurse aides and other non-resident specific time spent on other necessary functions such as staff education, administrative duties, and other tasks.
- **Therapy component:** The therapy component is a measure of the amount of rehabilitation therapy time associated with caring for residents in each case-mix group. Therapy weights are based on the number and type of therapy minutes provided to a resident.

As of July 2019, 33 states and the District of Columbia use a RUG-based method to determine Medicaid base payment rates (MACPAC 2019). About half of these states use the RUG-IV method, which divides patients into 66 different groups, and about half use the RUG-III method, an earlier iteration that was previously used by Medicare and divides patients into either 34 or 44 groups. In addition, in fiscal year 2016, 33 states used a RUG-based system to calculate the Medicaid Upper Payment Limit (UPL) payments, an estimate of what Medicare would have paid in the aggregate for nursing facility services. The UPL is used to determine the amount of Medicaid supplemental payments that a state can make.

2.2 PDPM

On October 1, 2019, Medicare changed its method of case-mix adjusting payments from RUG-IV to PDPM. In contrast to the RUG-IV therapy component, for which payments vary based on the amount of therapy a patient received, PDPM bases payment on residents' care needs, which are determined using information on the patient's initial MDS PPS assessment. This change was intended to reduce incentives for nursing facilities to provide more therapy services in order to classify patients into higher case-mix groups and receive higher Medicare payments. This type of change has long been recommended by MedPAC and other stakeholders, and the specifics of PDPM were developed by CMS after over five years of analysis and stakeholder engagement (CMS 2020a, MedPAC 2008, OIG 2012). Although the payment change will affect the amount of Medicare payments that individual providers receive, it is intended to be budget neutral in the aggregate.

PDPM is designed to address several limitations in RUG-IV that had been identified by CMS, MedPAC, and others. Payments under RUG-IV were based primarily on the amount of therapy provided to a patient, regardless of the patient's characteristics, needs, and goals. PDPM is intended to improve the Medicare payment system by focusing on patient needs rather the volume of services provided and reducing the administrative burden on providers.

PDPM has five case-mix adjusted components: nursing, physical therapy (PT), occupational therapy (OT), speech-language pathology (SLP), and non-therapy ancillary (NTA). The PDPM nursing component is similar to the RUG-IV nursing component, with two main modifications:

- Functional scores are based on Section GG of the MDS 3.0 instead of Section G;
- Several nursing groups are collapsed, reducing the number of nursing groups from 43 to 25.

For the PT and OT components, two classifications are used under PDPM: clinical categories and functional scores.

- The PT and OT components are determined based on residents' primary reason for SNF care and functional status.¹
- The SLP component is based on primary reason for SNF care, cognitive status, presence of swallowing disorder or mechanically altered diet, and other SLP-related comorbidities.
- The NTA component is based on comorbidities and whether extensive services are received.

PDPM includes a variable per diem adjustment that adjusts the per diem rate for the PT, OT, and NTA components over the course of the stay. Relative to the first 20 days of a stay, the adjustment factor for PT and OT payments is 0.98 for days 21-27 and gradually declines to 0.76 for days 98-100.

With implementation of PDPM, CMS made reductions in the number of required MDS assessments for Medicare SNF beneficiaries, reducing the administrative burden to nursing homes. While RUG-IV required up to five scheduled PPS assessments (5-day, 14-day, 30-day, 60-day, 90-day) – plus Start of Therapy, End of Therapy, and Change of Therapy (COT) assessments. PDPM only requires an initial Medicare assessment and a discharge assessment. There is also an optional interim payment assessment for significant clinical changes.

2.3 Data Requirements for RUG-IV and PDPM

The components of RUGs and PDPM are calculated using different questions from the MDS (Exhibit 1). PDPM uses a new set of questions (MDS Section GG) that will ultimately replace the functional ability questions used to determine RUG-IV case-mix groups (MDS Section G). The Section GG items are only collected for Medicare PPS five-day assessments. In addition, under PDPM, SNF patients are classified into a clinical category based on the primary diagnosis for the SNF. This primary SNF diagnosis is a new MDS item that was added for use in PDPM.

As part of the change to PDPM, CMS plans to remove Section G from the MDS. While CMS had initially planned to eliminate MDS Section G from the MDS effective October 1, 2020, the agency has since postponed this action to an unspecified future date. When the Section G items are no longer included in the MDS, states now using RUGs will either need to change their Medicaid payment policies or begin collecting this information through a separate state assessment.

¹ The primary reason for SNF care is determined based on the ICD-10 diagnosis code recorded for MDS item I0020B.

Exhibit 1 Data Requirements for Different Nursing Facility Acuity Adjustment Methods

Acuity Adjustment Method	Component	Data Source
Resource Utilization Groups (RUGs)	Nursing	MDS Section G functional score
	Therapy	Number and type of therapy minutes provided, reassessed regularly throughout the nursing facility stay
Patient-Driven Payment Model (PDPM)	Nursing	MDS Section GG functional score
	Physical therapy	Primary diagnosis at admission and MDS Section GG functional score
	Occupational therapy	Primary diagnosis at admission and MDS Section GG functional score
	Speech-language pathology	Acute Neurologic clinical classification, cognitive status, presence of swallowing disorder or mechanically altered diet, and other SLP-related comorbidities at admission
	Non-therapy ancillary	Comorbidities present at admission

3. Data Sources and Methods

3.1 Data Sources

In this study, we use data from two sources. First, information including nursing home residents' case-mix classification and payment source was extracted from MDS 3.0 data from January 2018 to September 2019.² Second, case-mix weights were based on information published in the Federal Register. Case-mix weights for each PDPM group were determined based on information from Table 6 of the FY2020 Final Rule for the Medicare Prospective Payment System for Skilled Nursing Facilities (CMS 2019a). Case-mix weights for each RUG-IV group were extracted from Table 6 of the FY2019 Final Rule for the Medicare Prospective Payment System for Skilled Nursing Facilities. (CMS 2018).

3.2 Sample Selection

The analyses in this report are based on the most recent MDS assessment for individuals in a nursing facility as of September 30, 2019. To take account for the issue of over-representation of Medicare assessments in the MDS, we included one assessment for each nursing home resident who was active on September 30th of the calendar year.³ For each resident, we used the most recent MDS assessment which occurred prior to September 30 of the year that contained non-missing RUG-IV case-mix group information, as long as this assessment had an assessment reference date of April 3 or later (i.e., was within 180 days of September 30). Residents whose most recent MDS assessment was prior to April 3 (i.e., most than 180 days prior to September 30) were assumed to have left the nursing home prior to September 30.

We included all 50 states and the District of Columbia in our analyses, and also performed separate analyses on the subset of states that use a RUG-based system for determining their Medicaid payments. These states were identified based on MACPAC's review of States' Medicaid Fee-for-Service Nursing Facility Payment Policies (MACPAC 2019). Previous analyses of nursing home case-mix found that RUG-IV case-mix indices, especially those for Medicaid residents, are higher in states that use a RUG-based system for their Medicaid program (MedPAC 2013).

3.3 Methods

Because MDS assessments for the time period that we studied did not include all of the information needed to determine PDPM case-mix groups, we developed a new method to estimate the PDPM casemix based on available data. We also calculated RUG-IV case mix using information on RUG-IV group that is on MDS assessment data.

² Note that most of the analyses in this report only use 2019 data. This is because differences between 2018 and 2019 values tended to be small and may reflect MDS coding changes in anticipation of the implementation of PDPM rather than actual time trends.

³ Medicare residents have more frequent MDS assessments. For example, before the PDPM was implemented on October 1, 2019, within a 90-day period, Medicare residents could have up to five scheduled MDS assessments, while a typical active Medicaid resident without a SNF stay is only assessed quarterly and would have one assessment.

3.3.1 PDPM Case-Mix

To construct the PDPM case-mix group for each resident in the analytical sample, we used an existing set of grouper programs that assign MDS assessments to PDPM case-mix groups for each of the five components of the PDPM model (Nursing, PT, OT, SLP, and NTA). These programs had to be modified so that we could use them for the non-Medicare and pre-October 2019 data that we used for the study:

- **Lack of MDS Section GG data:** The MDS Section GG items that the PDPM grouper uses are only available for Medicare PPS 5-day assessments. In addition, the MDS Section GG items are not available for non-Medicare PPS assessments. This limited our ability to determine PDPM nursing and therapy groups (nursing index, PT and OT index) for non-Medicare residents.

To address this limitation, we implemented an approach using a crosswalk between the existing RUG-IV nursing groups and the PDPM nursing components. PDPM utilizes the same basic nursing classification structure as RUG-IV, with collapsed RUG-IV nursing groups. Appendix 1 shows the crosswalk between RUG-IV and PDPM nursing groups. RUG-IV uses MDS Section G instead of Section GG for the functional items, and the Section G items are completed for Medicare and non-Medicare assessments.

This approach accurately maps the RUG-IV nursing groups to PDPM nursing components for all MDS assessments with non-missing values in RUG-IV nursing groups. The analyses in this report used the Section G-based version of the functional score.

- **Imperfect Section G to GG Crosswalk:** PDPM uses two functional scores: one for the PT and OT components and the other for the nursing component, both of which are created using items from MDS Section GG. RUG-IV uses Section G to calculate functional score. As discussed above, the MDS Section GG items that the PDPM grouper program uses are only available for Medicare PPS 5-day assessments. Therefore, the PDPM grouper program cannot be used to calculate functional scores for non-Medicare assessments. To address this issue, we developed an approximation of the PDPM crosswalk that is based on Section G, which is available for all payer types. Appendix 1 shows the crosswalk between RUG-IV and PDPM nursing groups. The Section G and GG items used to determine the PDPM functional score are listed in Appendix 2. This crosswalk is not perfect—there are differences in how functional status is measured between Section GG and Section G, and there are some items in Section GG for which there are no appropriate Section G counterparts (e.g., the transfer and walking items). Also note that in the crosswalk, we included a Section G item for each Section GG item used in the functional score calculations even though that results in some Section G items being used more than once. This was to ensure comparability in the scoring in the crosswalk. Appendices 3A and 3B describe the scoring rules used to calculate the PDPM functional score (Appendix 3A) and the scoring rules used in the Section G version of the PDPM functional score (Appendix 3B).
- **Lack of Information on Patients' Primary Diagnosis:** The PDPM grouper programs for the therapy and non-therapy ancillary components of PDPM require an acceptable ICD-10 diagnosis code to be entered for MDS item I0020B or items MDS I8000A-J, which report the primary medical condition category that best describes the primary reason for admission. Item I0020B was added to the MDS in October 2019 and is only collected for Medicare PPS assessments. It is not available for the pre-PDPM time period used for this study.

To address this limitation, for this report, the primary diagnosis clinical category was determined using ICD-10-CM and ICD-10-PCS codes recorded in MDS item I0020B for analyses that used data from 2019Q4 and items I8000A through I8000J for analyses that used data from prior quarters. We used the PDPM clinical category mapping⁴ to map the primary diagnosis recorded in the MDS to the 10 PDPM primary diagnosis clinical categories. In addition, for records that are grouped as “Return to Provider” based on the first diagnosis reported (I8000A), we looked at the second diagnosis reported (I8000B) and used that diagnosis if it was not grouped as “Return to Provider.” We continued this process, searching all ten diagnosis codes that can be reported for one that is not grouped as “Return to Provider.”

- **Lack of Information on PDPM Clinical Categories:** Under the PDPM, some residents are mapped into a surgical clinical category. In the PPDM grouper program, this is determined based on MDS items J2100-J5000. Similar to the new MDS item I0020B that reports the primary diagnosis code, these are new items that were added to the MDS in October 2019. These items are used to capture any major surgical procedures that occurred during the inpatient hospital stay that immediately preceded the SNF admission (i.e., the qualifying hospital stay). To approximate the Section J items for data prior to 2019 Q4, we used the ICD-10-CM codes reported in MDS items I8000A through I8000J to identify residents who received a surgical procedure during the inpatient stay that relates to the primary reason for the Part A SNF stay. This is also the methodology that was used to develop PDPM since the MDS Section J items were not available (CMS 2019b).

3.3.2 Resident RUG-IV Case-Mix

RUG-IV uses information from the MDS assessments to classify SNF residents into a series of case-mix groups representing the residents’ relative direct care resource requirements. The RUG-IV related analyses in this report used the RUG-IV 66-group model. Each RUG-IV group had an associated nursing and therapy component. We used the RUG-IV case-mix group reported in the MDS data that we used for this report (C_MDR_RUG4_HIRCHCL_GRP_TXT). This variable contains the CMS-calculated RUG-IV Hierarchical Medicare RUG Group code.

3.3.3 Determining Payment Source using MDS 3.0 Data

Information on payment source was identified using the MDS 3.0 data. However, the MDS 3.0 data do not include an explicit payment source item. For the MDS 3.0 data, payment source was determined as follows:

- **Medicare residents:** Residents with a Medicare-covered stay were defined as those with a Medicare PPS assessment for a Medicare Part A Stay based on MDS items A0310B and A0310C. This includes assessments for which MDS item A0310B (PPS assessment) equals 1, 2, 3, 4, 5, which are the codes for a PPS scheduled assessment for a Medicare Part A stay, or 7, which is the code for a PPS unscheduled assessment for a Medicare Part A stay. It also includes assessments for which MDS item A0310C (PPS Other Medicare Required Assessment) equals 1, 2, 3, or 4.

⁴ www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/SNFPPS/therapyresearch.html

We also analyzed dually eligible Medicare residents. These were defined as residents with a Medicare-covered stay who also had a valid Medicaid number reported for MDS item A0700.⁵

- **Medicaid residents:** Residents with a Medicaid-covered stay were defined as residents not on a Medicare-covered stay who had a Medicaid number reported for MDS item A0700. Medicaid Dually eligible Medicaid residents were defined as residents on a Medicaid-covered stay who had a valid Medicare number reported for MDS item A0600B.
- **Other payment source residents:** Residents with a payment source other than Medicare or Medicaid are those not on a Medicare-covered stay who did not have a valid Medicaid number reported for MDS item A0600B.

⁵ To be classified as a dually eligible resident on a Medicare-covered stay, we required that MDS item A0700 filled in with valid information other than text such as “N”, “None”, “NA”, “NO”, “0” or “^”. Similarly, we required that valid information be filled in for MDS item A0600B for residents to be classified as a dually eligible resident on a Medicaid-covered stay.

4. Results

4.1 Sample Characteristics

The analytic sample includes 1,121,129 nursing home residents who were active on September 30, 2019. Medicaid was the most common primary payment source, accounting for 59.2 percent of residents (Exhibit 1). Most residents on a Medicaid-covered stay were dually eligible for Medicare and Medicaid and almost half of the sample consisted of dually eligible residents on a Medicaid-covered stay. Medicare was the payment source for 22.1 percent of residents. The proportion of residents classified as other payment source (i.e., not Medicare or Medicaid) was 18.7 percent. Overall, 63 percent of the residents in the sample were female and about 36 percent were over the age of 85. About 74 percent of the sample were White, while 15.1 percent were African American, 5.7 percent were Hispanic, and 2.2 percent were Asian. At the point at which acuity was measured, 39 percent had a length of stay of 21 days or less, 9.5 percent had a length of stay of 21-99 days, 16.9 percent of stay of 100-365 days, and 34.6 percent had a length of stay of more than one year.

Exhibit 1: Characteristics of Analytic Sample

Characteristic	Total	Medicaid			Medicare			Other
		Total	Dually Eligible	Medicaid-only	Total	Dually Eligible	Medicare-only	
N (thousands)	1121.1	663.8	557.6	106.2	247.5	102.4	145.1	209.8
% of total residents	100%	59.2%	49.7%	9.5%	22.1%	12.9%	9.1%	18.7%
Gender								
Female	63.2%	60.1%	59.8%	60.3%	64.5%	67.2%	50.5%	62.4%
Male	36.8%	39.9%	40.2%	39.7%	35.5%	32.8%	49.5%	37.6%
Age								
Age < 65	16.5%	10.8%	18.9%	5.1%	21.1%	12.4%	65.7%	8.7%
Age 65-74	20.0%	23.6%	27.9%	20.6%	20.5%	21.7%	14.3%	14.7%
Age 75-84	27.6%	31.7%	28.3%	34.1%	26.1%	29.1%	10.1%	28.1%
Age 85+	35.8%	33.9%	25.0%	40.1%	32.4%	36.7%	9.9%	48.5%
Race and ethnicity								
African American	15.1%	12.5%	18.1%	8.6%	18.3%	16.3%	28.5%	8.2%
Asian	2.2%	2.0%	3.3%	1.1%	2.5%	2.4%	3.3%	1.3%
Hispanic	5.7%	4.9%	8.4%	2.3%	6.8%	6.2%	10.0%	2.9%
Native American	0.5%	0.4%	0.6%	0.3%	0.6%	0.5%	1.0%	0.3%
Pacific Islander	0.4%	0.3%	0.4%	0.2%	0.4%	0.4%	0.7%	0.3%
White	73.5%	76.1%	66.0%	83.3%	69.2%	72.3%	53.5%	84.2%
No race reported	3.0%	4.0%	3.6%	4.4%	2.5%	2.3%	3.7%	3.2%
Length of Stay								
< 21 days	39.0%	16.5%	13.8%	30.6%	95.3%	93.3%	96.7%	47.8%
21-99 days	9.5%	10.7%	10.2%	13.4%	4.5%	6.4%	3.1%	11.3%
100-365 days	16.9%	22.3%	22.9%	19.2%	N/A	N/A	N/A	N/A
> 1 year	34.6%	50.4%	53.1%	36.7%	N/A	N/A	N/A	N/A

Notes: Race total do not sum to 100% because multiple race categories can be reported. Length of stay is based on the number of days between entry and the target date of the MDS assessments used in the analyses (not the discharge date for the stay). Medicare does not cover stays beyond 100 days. There is a per day co-pay (\$176 in 2020) for days 21-100.

N=1,121,129

Source: Abt Associates analysis of 2019 Minimum Data Set

4.2 Average Acuity Levels

To understand the implications of using different case-mix adjustment methods for residents whose primary payment source was Medicaid, we examined how acuity levels for Medicaid residents differ between RUG-IV and PDPM using 2019 MDS assessments. To standardize our findings, we compared the resulting case-mix weights for residents whose primary payment source was Medicaid to residents whose primary payment source was Medicare. Exhibit 2 summarizes the main findings. Because PDPM was designed to be budget neutral for Medicare, the average Medicare case-mix weights are similar between RUG-IV and PDPM. Unadjusted findings are provided in Appendix 4, and findings based on the 2018 sample are reported in Appendix 5.

The average RUG-IV therapy index for Medicaid residents was 13 percent of that for Medicare residents, but the average PDPM physical therapy and occupational therapy indices for Medicaid residents were nearly identical to those for Medicare residents. The difference in case-mix weights for the nursing components of RUGs and PDPM for Medicaid and Medicare residents were smaller.

Overall, we found that relative case-mix weights were higher under PDPM than under RUG-IV for Medicaid residents. We observed the largest differences between the RUG-IV therapy component and the therapy-related components of PDPM.

- **Nursing index:** The average nursing index for Medicaid residents standardized as a ratio to Medicare was 0.89 under PDPM and 0.83 under RUG-IV (Exhibit 2).
- **Therapy index:** The average RUG-IV therapy index value for Medicaid residents was only 13 percent of that for Medicare residents, but the average PDPM physical therapy and occupational therapy indices for Medicaid residents were very similar to those for Medicare residents. Under the PDPM, the SLP index was marginally higher for Medicaid residents than for Medicare residents, while the NTA index was slightly lower.

Exhibit 2: Average Case-Mix Weights for Nursing Facility Residents Standardized as a Ratio to Average Medicare Case-Mix Weights, by Payment Source 2019

Case-mix components	Total	Medicaid			Medicare			Other payer
		Total	Dually eligible	Medicaid-only	Total	Dually eligible	Medicare-only	
Number of residents (thousands)	1121.1	663.8	557.6	106.2	247.5	102.4	145.1	209.8
Share of total residents	100%	61%	51%	10%	20%	11%	9%	19%
Share of residents using therapy services	39%	21%	21%	25%	93%	89%	96%	85%
Average nursing-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV nursing weight	0.87	0.83	0.83	0.85	1.00	1.00	1.00	0.86
PDPM nursing weight	0.92	0.89	0.89	0.93	1.00	1.02	0.99	0.91
Average therapy-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV therapy weight	0.36	0.13	0.13	0.16	1.00	0.96	1.03	0.30
PDPM PT weight	0.99	0.97	0.97	0.96	1.00	0.98	1.01	0.99
PDPM OT weight	1.01	0.98	0.98	0.97	1.00	0.99	1.01	0.99
PDPM SLP weight	1.06	1.09	1.10	1.03	1.00	1.07	0.95	1.02
PDPM NTA weight	0.95	0.94	0.93	0.99	1.00	1.04	0.97	0.90

Notes: Share of residents using therapy services measured as a non-zero score RUG-IV therapy weight.

N=1,121,129

Source: Abt Associates analysis of 2019 Minimum Data Set

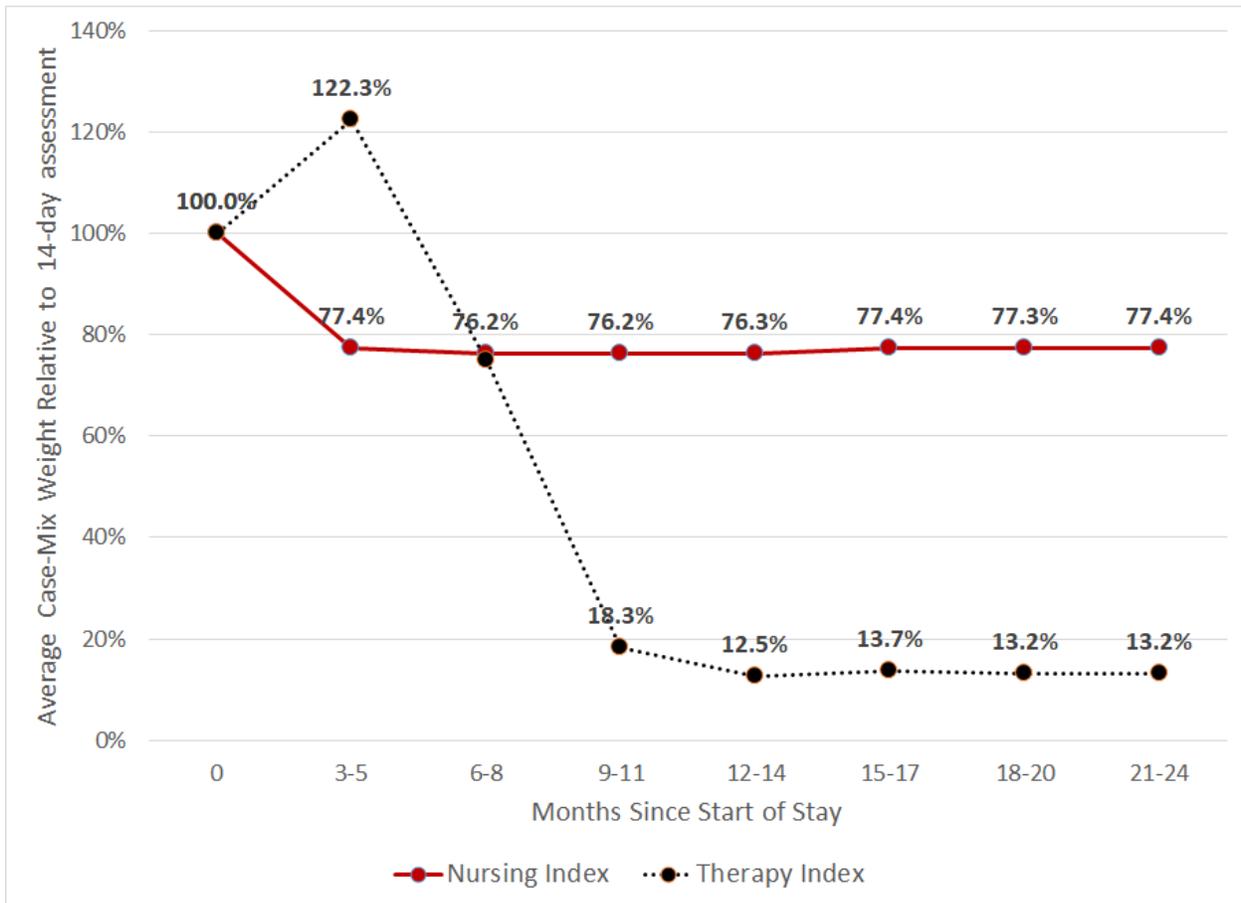
The differences in therapy index values between PDPM and RUG-IV are striking, but they make sense when one examines the share of Medicaid-covered residents using therapy services. Overall, about 77 percent of Medicaid-covered stays do not report skilled therapy services, resulting in a zero value for the RUG-IV therapy index. In contrast, all residents have a non-zero weight for the therapy-related components in PDPM, which has less variation in therapy case-mix weights than RUG-IV. We note that the PDPM system is not designed to measure therapy utilization for non-Medicare PPS assessments, so the low therapy utilization of non-Medicare residents indicated by their low RUG-IV therapy weight is not reflected in PDPM therapy weights.

A main reason for the higher therapy index values in PDPM relative to RUG-IV among Medicaid residents is the fact that use of therapy declines over time for long-stay residents, and this decline is not reflected in PDPM therapy weights.⁶ PDPM uses information from the resident’s initial assessment to

⁶ The PDPM does include a variable per diem adjustment to the physical therapy, outpatient therapy, and non-therapy ancillary components of the payment rate. For example, at day 100, the payment for a patient with the

project care needs for a Medicare-covered stay, which cannot exceed 100 days. However, for long-stay residents, the initial assessment is not very predictive of their care needs. To understand the implications of not reassessing acuity for long-stay residents, we examined how patient acuity as measured by RUG-IV case-mix weights changed over time for a cohort of nursing facility residents that had been in a nursing facility for two years as of September 30, 2019. After one year, their use of therapy services, measured by RUG-IV therapy index, was less than 14 percent of what it was at admission (Exhibit 3). In contrast, the average RUG-IV nursing index values changed little after the first three months.

Exhibit 3: Average RUG-IV Case-Mix Weight as a Share of Case-Mix Weight at Initial Assessment for Long-Stay Nursing Facility Residents



Notes: Analysis based on a cohort of residents admitted between October 1, 2017 and December 31, 2017 who were still in the same facility as of September 30, 2019 with no discharges or readmissions.

N=6,461

Source: Abt Associates analysis of 2018 and 2019 Minimum Data Set.

physical therapy needs is 76 percent of what it was at day 1 (from admission). However, the PDPM does not include an adjustment schedule for payments beyond 100 days.

5. Discussion

Relative to case-mix levels for Medicare residents, we found that relative case-mix weights were higher for Medicaid residents under PDPM than under RUG-IV for each component of PDPM. The differences in values between the RUG-IV therapy component and the therapy-related components of PDPM were particularly large because of the fact that use of therapy services declines over time for long-stay patients. The difference in values for the PDPM and RUG-IV nursing components was smaller because the underlying methods for calculating nursing case-mix weights are similar in PDPM and RUG-IV.

Because CMS has delayed the phase out of Section G items from the MDS, states that use RUGs to determine their base Medicaid payments to nursing facilities will have more time than originally anticipated to assess whether they should change their methods of determining patient acuity for Medicaid payments. CMS is now allowing states the option to collect Section GG items on Medicaid nursing facility assessments, which will enable more analysis of how functional scores differ using these different assessments (CMS 2020b). This will allow states to do a more accurate comparison of case mix under RUGs and PDPM than what we were able to do in this study, addressing the limitation in this study of needing to use a Section G to GG crosswalk to be able to calculate functional scores. Such analyses could inform the development of payment weights that are more accurate for the Medicaid population and other Medicaid-specific adjustments to better measure acuity levels for Medicaid-covered nursing facility residents.

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Appendices

Appendix 1: Crosswalk between RUG-IV Nursing Groups and PDPM Nursing Groups

RUG-IV Group	RUG-IV Case-Mix Index	PDPM Group	PDPM Case-Mix Index
ES3	3.58	ES3	4.06
ES2	2.67	ES2	3.07
ES1	2.32	ES1	2.93
HE2	2.22	HDE2	2.4
HD2	2.04		
HE1	1.74	HDE1	1.99
HD1	1.6		
HC2	1.89	HBC2	2.24
HB2	1.86		
HC1	1.48	HBC1	1.86
HB1	1.46		
LE2	1.96	LDE2	2.08
LD2	1.86		
LE1	1.54	LDE1	1.73
LD1	1.46		
LC2	1.56	LBC2	1.72
LB2	1.86		
LC1	1.22	LBC1	1.43
LB1	1.14		
CE2	1.68	CDE2	1.87
CD2	1.56		
CE1	1.5	CDE1	1.62
CD1	1.38		
CC2	1.29	CBC2	1.55
CB2	1.15		
CA2	0.88	CA2	1.09
CC1	1.15	CBC1	1.34
CB1	1.02		
CA1	0.78	CA1	0.94
BB2	0.97	BAB2	1.04
BA2	0.7		
BB1	0.9	BAB1	0.99
BA1	0.64		
PE2	1.5	PDE2	1.57
PD2	1.38		
PE1	1.4	PDE1	1.47
PD1	1.28		
PC2	1.1	PBC2	1.22
PB2	0.84		
PA2	0.59	PA2	0.71
PC1	1.02	PBC1	1.13
PB1	0.78		
PA1	0.54	PA1	0.66

Sources: CMS (2018), CMS (2019a)

Appendix 2: MDS Section GG and Section G Items Used to Determine PDPM Functional Score

MDS Section GG Item	MDS Section G Item
Eating: The ability to use suitable utensils to bring food and/or liquid to the mouth and swallow food and/or liquid before the meal is placed before the resident. (GG0130A1_EATG_SELF_ADMSN_CD)	Eating: how resident eats and drinks, regardless of skill. Do not include eating/drinking during medication pass. Includes intake of nourishment by other means (e.g., tube feeding, total parenteral nutrition, IV fluids administered for nutrition or hydration). (G0110H1_EATG_SELF_CD)
Oral hygiene: The ability to use suitable items to clean teeth. Dentures (if applicable): The ability to insert and remove dentures into and from the mouth, and manage denture soaking and rinsing with use of equipment (GG0130B1_ORAL_HYGNE_ADMSN_CD)	Personal hygiene: how resident maintains personal hygiene, including combing hair, brushing teeth, shaving, applying makeup, washing/drying face and hands (excludes baths and showers). (G0110J1_PRSNL_HYGNE_SELF_CD)
Toileting hygiene: The ability to maintain perineal hygiene, adjust clothes before and after voiding or having a bowel movement. If managing an ostomy, include wiping the opening but not managing equipment (GG0130C1_TOILT_HYGNE_ADMSN_CD)	Toilet use: how resident uses the toilet room, commode, bedpan, or urinal; transfers on/off toilet; cleanses self after elimination; changes pad; manages ostomy or catheter; and adjusts clothes. Do not include emptying of bedpan, urinal, bedside commode, catheter bag or ostomy bag. (G0110I1_TOILTG_SELF_CD)
Toilet transfer: The ability to safely get on and off a toilet or commode (GG0170f1_toilt_trnsf_ADMSN_CD)	
Lying to sitting on side of bed: The ability to safely move from lying on the back to sitting on the side of the bed with feet flat on the floor, and with no back support (GG0170C1_LYNG_ADMSN_CD)	Bed mobility: how resident moves to and from lying position, turns side to side, and positions body while in bed or alternate sleep furniture (G0110A1_BED_MBLTY_SELF_CD)
Sit to lying: The ability to move from sitting on side of bed to lying flat on the bed (GG0170B1_SIT_ADMSN_CD)	Transfer: how resident moves between surfaces including to or from: bed, chair, wheelchair, standing position (excludes to/from bath/toilet) (G0110B1_TRNSFR_SELF_CD)
Sit to stand: The ability to safely come to a standing position from sitting in a chair or on the side of the bed (GG0170D1_STAND_ADMSN_CD)	Balance During Transitions and Walking: Moving from seated to standing position (G0300A_BAL_SEAT_STNDG_CD)
Chair/bed-to-chair transfer: The ability to safely transfer to and from a bed to a chair (or wheelchair). (GG0170E1_CHR_TRNSF_ADMSN_CD)	Balance During Transitions and Walking: Surface-to-surface transfer (transfer between bed and chair or wheelchair) (G0300E_BAL_SRFC_TRNSFR_CD)
Walk 10 feet: Once standing, the ability to walk at least 10 feet in a room or similar space (GG0170I1_WLK_10_ADMSN_CD)	Walk in room: how resident walks between locations in his/her room (G0110C1_WLK_ROOM_SELF_CD)
Walk 50 feet with two turns: Once standing, the ability to walk at least 50 feet and make two turns (GG0170J1_WLK_50_ADMSN_CD)	Walk in corridor: how resident walks in corridor on unit (G0110D1_WLK_CRDR_SELF_CD)
Walk 150 feet: Once standing, the ability to walk at least 150 feet in a corridor or similar space (GG0170J1_WLK_150_ADMSN_CD)	Locomotion off unit: how resident moves to and returns from off-unit locations (e.g., areas set aside for dining, activities or treatments). If facility has only one floor, how resident moves to and from distant areas on the floor. (G0110F1_LOCOMTN_OFF_SELF_CD)

Notes: Relevant MDS items are shown in parenthesis.

Source: Developed by Abt Associates.

Appendix 3A: Scoring Rules Used for Section GG Items Used in PDPM Functional Score

Item Response	Description	Score
05,06	Set-up assistance, Independent	4
04	Supervision or touching assistance	3
03	Partial/moderate assistance	2
02	Substantial/maximal assistance	1
01,07,09,10,88,missing	Dependent, Refused, not applicable, not attempted due to environmental limitations, not attempted due to medical condition or safety concerns	0

Source: CMS (2018b)

Appendix 3B: Scoring Rules Used for Section G Items Used in Section G to GG Functional Score Crosswalk

Item Response	Description	Score
00	Independent	4
01	Supervision	3
02	Limited assistance	1.7
03	Extensive assistance	1
04,07,08	Total dependence, Activity occurred only once or twice, Activity did not occur	0

Source: Developed by Abt Associates.

Appendix 4: Average Acuity Levels by Payment Source, Unadjusted (2019)

Case-mix components	Total	Medicaid			Medicare			Other payer
		Total	Dually eligible	Medicaid-only	Total	Dually eligible	Medicare-only	
Number of residents (thousands)	1121.1	663.8	557.6	106.2	247.5	102.4	145.1	209.8
Average nursing-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV nursing weight	1.21	1.15	1.14	1.18	1.38	1.38	1.38	1.19
PDPM nursing weight	1.38	1.35	1.33	1.40	1.50	1.53	1.49	1.37
Average therapy-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV therapy weight	0.47	0.18	0.17	0.22	1.33	1.27	1.37	0.40
PDPM PT weight	1.49	1.48	1.48	1.46	1.52	1.49	1.54	1.51
PDPM OT weight	1.51	1.49	1.49	1.48	1.53	1.51	1.54	1.52
PDPM SLP weight	1.74	1.79	1.81	1.70	1.65	1.76	1.57	1.68
PDPM NTA weight	0.96	0.95	0.94	1.00	1.02	1.06	0.99	0.92

Notes: Share of residents using therapy services measured as a non-zero score RUG-IV therapy weight.

N=1,121,129

Source: Abt Associates analysis of 2018 Minimum Data Set

Appendix 5: Average Case-Mix Weights for Nursing Facility Residents Standardized as a Ratio to Average Medicare Case-Mix Weights, by Payment Source, 2018

Case-mix components	Total	Medicaid			Medicare			Other payer
		Total	Dually eligible	Medicaid-only	Total	Dually eligible	Medicare-only	
Number of residents (thousands)	992.6	601.8	502.8	99.0	202.8	112.9	89.8	188.1
Share of total residents	100%	61%	51%	10%	20%	11%	9%	19%
Share of residents using therapy services	39%	21%	21%	25%	93%	89%	96%	0.85
Average nursing-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV nursing weight	0.86	0.82	0.99	0.84	1.00	0.99	1.01	0.85
PDPM nursing weight	0.92	0.89	0.89	0.93	1.00	1.01	0.93	0.91
Average therapy-related case-mix index, standardized as a ratio to Medicare acuity levels								
RUG-IV therapy weight	0.32	0.12	0.92	0.15	1.00	0.92	1.07	0.99
PDPM PT weight	0.98	0.97	0.98	0.96	1.00	0.98	0.96	0.99
PDPM OT weight	0.99	0.98	0.98	0.97	1.00	0.99	0.97	1.02
PDPM SLP weight	1.05	1.08	1.09	1.03	1.00	1.06	1.03	0.92
PDPM NTA weight	0.96	0.96	0.95	1.01	1.00	1.04	1.01	0.92

Notes: Share of residents using therapy services measured as a non-zero score RUG-IV therapy weight.

N=992,644

Source: Abt Associates analysis of 2018 Minimum Data Set

Appendix 6: Sample Size by Payment Source and State, 2019

State	Total	Medicaid			Medicare			Other payer
		Total	Dually-eligible, Medicaid-covered stay	Medicaid-only	Total	Dually-eligible, Medicare-covered stay	Medicare-only	
Total	1,121,129	663,828	557,622	106,206	247,486	102,403	145,083	209,815
Alabama	19,004	11,976	9,943	2,033	3,756	1,541	2,215	3,272
Alaska	539	360	273	87	104	45	59	75
Arizona	9,857	6,170	4,525	1,645	1,980	423	1,557	1,707
Arkansas	14,985	9,036	8,151	885	3,181	1,406	1,775	2,768
California	88,566	55,260	41,932	13,328	23,655	14,897	8,758	9,651
Colorado	15,264	9,474	8,037	1,437	2,441	797	1,644	3,349
Connecticut	18,150	12,027	9,633	2,394	3,422	1,697	1,725	2,701
D.C.	2,091	1,478	1,150	328	472	263	209	141
Delaware	3,530	2,026	1,786	240	890	294	596	614
Florida	65,220	36,623	33,002	3,621	18,431	8,129	10,302	10,166
Georgia	27,257	17,732	15,220	2,512	5,614	2,504	3,110	3,911
Hawaii	3,103	1,801	1,463	338	392	75	317	910
Idaho	3,738	2,275	1,992	283	867	271	596	596
Illinois	54,310	30,791	23,396	7,395	12,693	4,660	8,033	10,826
Indiana	33,303	20,066	17,168	2,898	7,067	2,970	4,097	6,170
Iowa	19,979	9,271	8,511	760	3,506	1,094	2,412	7,202
Kansas	14,570	7,182	6,367	815	3,144	1,004	2,140	4,244
Kentucky	18,558	10,925	9,299	1,626	4,392	1,885	2,507	3,241
Louisiana	21,244	12,983	10,918	2,065	4,786	2,521	2,265	3,475
Maine	4,548	2,747	2,467	280	932	444	488	869
Maryland	21,182	11,848	9,924	1,924	5,728	1,670	4,058	3,606
Massachusetts	32,446	20,151	17,298	2,853	7,289	3,052	4,237	5,006
Michigan	32,925	20,712	18,241	2,471	7,519	3,490	4,029	4,694
Minnesota	19,752	11,152	9,898	1,254	3,314	942	2,372	5,286
Mississippi	12,598	8,303	7,303	1,000	3,397	1,986	1,411	898
Missouri	28,878	17,050	13,736	3,314	5,516	2,590	2,926	6,312
Montana	3,281	1,807	1,593	214	667	222	445	807
Nebraska	9,569	4,597	3,986	611	2,173	635	1,538	2,799
Nevada	4,546	2,445	1,831	614	1,297	536	761	804
New Hampshire	5,746	3,326	3,158	168	1,322	446	876	1,098
New Jersey	35,937	19,519	16,213	3,306	9,068	2,786	6,282	7,350
New Mexico	4,725	3,117	2,551	566	917	377	540	691
New York	85,601	51,942	40,964	10,978	17,762	7,483	10,279	15,897
North Carolina	30,824	18,481	16,259	2,222	7,178	2,914	4,264	5,165
North Dakota	4,571	2,189	2,060	129	836	254	582	1,546
Ohio	63,232	40,000	32,370	7,630	10,416	3,787	6,629	12,816
Oklahoma	15,077	8,806	7,455	1,351	3,342	1,441	1,901	2,929
Oregon	6,201	3,578	2,830	748	1,344	435	909	1,279
Pennsylvania	64,507	38,964	34,397	4,567	10,723	3,309	7,414	14,820
Rhode Island	6,359	3,974	3,025	949	852	216	636	1,533
South Carolina	14,435	8,218	7,371	847	3,340	1,124	2,216	2,877

State	Total	Medicaid			Medicare			Other payer
		Total	Dually-eligible, Medicaid-covered stay	Medicaid-only	Total	Dually-eligible, Medicare-covered stay	Medicare-only	
South Dakota	4,782	2,343	2,164	179	1,006	347	659	1,433
Tennessee	22,770	12,740	10,698	2,042	5,513	1,879	3,634	4,517
Texas	78,102	44,316	38,748	5,568	17,713	7,363	10,350	16,073
Utah	4,940	2,835	2,275	560	1,044	271	773	1,061
Vermont	2,138	1,125	1,079	46	628	241	387	385
Virginia	25,159	14,776	12,651	2,125	6,268	1,919	4,349	4,115
Washington	13,589	7,854	6,828	1,026	3,564	1,258	2,306	2,171
West Virginia	8,553	6,227	5,365	862	1,689	951	738	637
Wisconsin	18,880	10,117	9,084	1,033	3,892	1,412	2,480	4,871
Wyoming	2,008	1,113	1,034	79	444	147	297	451

N=1,121,129

Source: Abt Associates analysis of 2019 Minimum Data Set

Appendix 7: Average Medicaid Case-Mix Weight Standardized as a Ratio to the Average Medicare Case-Mix Weight, by State, 2019

State	Uses RUGs in Medicaid payment	N	Nursing Component		Other Case-Mix Components				
			RUG-IV Nursing Index	PDPM Nursing Index	RUG-IV Therapy	PDPM PT Index	PDPM OT Index	PDPM SLP Index	PDPM NTA Index
Total		911,334	0.83	0.89	0.13	0.97	0.98	1.09	0.94
Alabama	No	15,732	0.81	0.89	0.05	0.96	0.97	1.09	0.95
Alaska	No	464	0.89	0.90	0.03	0.94	0.95	1.26	0.92
Arizona	No	8,150	0.88	0.93	0.09	0.95	0.97	1.20	0.99
Arkansas	No	12,217	0.78	0.84	0.03	0.97	0.98	1.06	0.93
California	No	78,915	0.83	0.93	0.06	0.97	0.97	1.07	0.95
Colorado	Yes	11,915	0.78	0.84	0.07	0.96	0.97	1.12	0.94
Connecticut	No	15,449	0.78	0.84	0.07	0.96	0.97	1.10	0.92
D.C.	Yes	1,950	0.86	0.92	0.13	0.97	0.98	1.15	0.94
Delaware	No	2,916	0.84	0.90	0.05	0.96	0.97	1.13	0.94
Florida	No	55,054	0.80	0.88	0.07	0.96	0.97	1.11	0.94
Georgia	Yes	23,346	0.85	0.89	0.13	0.97	0.98	1.07	0.96
Hawaii	Yes	2,193	0.90	0.98	0.10	0.94	0.95	1.31	0.95
Idaho	No	3,142	0.85	0.88	0.09	0.96	0.97	1.15	0.94
Illinois	Yes	43,484	0.86	0.94	0.11	0.98	0.98	1.06	0.94
Indiana	Yes	27,133	0.92	0.96	0.18	0.98	0.98	1.12	0.94
Iowa	Yes	12,777	0.80	0.84	0.06	0.95	0.96	1.08	0.95
Kansas	Yes	10,326	0.78	0.83	0.08	0.96	0.97	1.02	0.93
Kentucky	Yes	15,317	0.88	0.92	0.21	0.97	0.98	1.08	0.95
Louisiana	Yes	17,769	0.83	0.90	0.13	0.98	0.98	0.99	0.94
Maine	No	3,679	0.89	0.92	0.10	0.97	0.98	1.16	0.93
Maryland	Yes	17,576	0.87	0.93	0.16	0.96	0.97	1.14	0.93
Massachusetts	No	27,440	0.82	0.87	0.06	0.97	0.97	1.11	0.93
Michigan	No	28,231	0.82	0.88	0.07	0.98	0.98	1.12	0.91
Minnesota	Yes	14,466	0.84	0.89	0.11	0.96	0.97	1.09	0.92
Mississippi	Yes	11,700	0.81	0.88	0.10	0.97	0.98	1.03	0.94
Missouri	No	22,566	0.74	0.81	0.03	0.96	0.96	1.04	0.92
Montana	Yes	2,474	0.80	0.84	0.04	0.96	0.97	1.08	0.93

State	Uses RUGs in Medicaid payment	N	Nursing Component		Other Case-Mix Components				
			RUG-IV Nursing Index	PDPM Nursing Index	RUG-IV Therapy	PDPM PT Index	PDPM OT Index	PDPM SLP Index	PDPM NTA Index
Nebraska	Yes	6,770	0.86	0.89	0.07	0.96	0.97	1.14	0.95
Nevada	Yes	3,742	0.85	0.93	0.11	0.97	0.98	1.03	0.93
New Hampshire	Yes	4,648	0.84	0.88	0.08	0.97	0.98	1.12	0.92
New Jersey	Yes	28,587	0.77	0.85	0.04	0.97	0.97	1.08	0.94
New Mexico	No	4,034	0.79	0.86	0.07	0.97	0.98	1.13	0.93
New York	Yes	69,704	0.83	0.89	0.30	0.97	0.98	1.07	0.95
North Carolina	Yes	25,659	0.86	0.93	0.19	0.97	0.98	1.11	0.95
North Dakota	Yes	3,025	0.86	0.87	0.03	0.97	0.98	1.05	0.95
Ohio	Yes	50,416	0.87	0.90	0.21	0.97	0.98	1.08	0.93
Oklahoma	No	12,148	0.74	0.80	0.02	0.96	0.97	1.05	0.92
Oregon	No	4,922	0.87	0.91	0.11	0.96	0.97	1.21	0.96
Pennsylvania	Yes	49,687	0.85	0.90	0.23	0.98	0.98	1.09	0.93
Rhode Island	Yes	4,826	0.83	0.89	0.12	0.97	0.97	1.10	0.94
South Carolina	No	11,558	0.84	0.91	0.07	0.96	0.97	1.12	0.94
South Dakota	Yes	3,349	0.81	0.85	0.06	0.97	0.98	1.14	0.92
Tennessee	Yes	18,253	0.88	0.93	0.13	0.97	0.97	1.11	0.95
Texas	Yes	62,029	0.81	0.88	0.19	0.98	0.98	1.09	0.94
Utah	Yes	3,879	0.87	0.94	0.21	0.96	0.97	1.17	0.95
Vermont	Yes	1,753	0.87	0.91	0.13	0.97	0.98	1.11	0.94
Virginia	Yes	21,044	0.85	0.89	0.11	0.96	0.97	1.12	0.94
Washington	Yes	11,418	0.89	0.93	0.11	0.97	0.97	1.15	0.96
West Virginia	Yes	7,916	0.84	0.88	0.27	0.97	0.98	1.09	0.91
Wisconsin	Yes	14,009	0.86	0.90	0.12	0.96	0.97	1.16	0.93
Wyoming	Yes	1,557	0.80	0.84	0.07	0.96	0.97	1.10	0.90

Notes: MACPAC (2019) is the source of information for which states use RUGs for Medicaid payment. Table excludes residents with a payment source other than Medicare or Medicaid
N=911,134

Source: Abt Associates analysis of 2019 Minimum Data Set