

MILLIMAN REPORT

Milliman Qualified Entity Report

Detailed Methodology

July 2023

Carol Bazell, MD, MPH
Cherie Dodge, RN, MPH
Harsha Mirchandani, FSA, MAAA

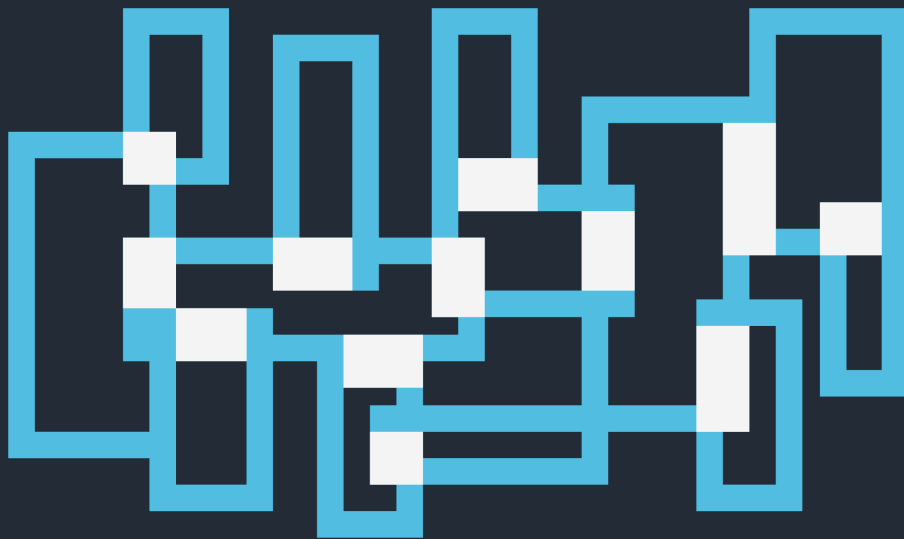


Table of contents

ABOUT THE QUALIFIED ENTITY PROGRAM	1
OVERVIEW	1
SDOH CHARACTERISTICS	2
MILLIMAN HEALTH DISPARITY RISK INDEX	3
VARIABLE SELECTION	3
MHDRI DEVELOPMENT	4
ASSIGNMENT OF BENEFICIARIES AND MEMBERS TO A GEOGRAPHIC AREA	5
STEP 1: ASSIGN EACH BENEFICIARY AND MEMBER TO A GEOGRAPHIC AREA	5
STEP 2: IDENTIFY SDOH CHARACTERISTICS OF A GEOGRAPHIC AREA	5
STEP 3: LINK GEOGRAPHIC AREA SDOH CHARACTERISTICS TO BENEFICIARIES AND MEMBERS ASSIGNED TO THE SAME GEOGRAPHIC AREA.....	6
STEP 4: EVALUATE AND REPORT QUALITY MEASURE PERFORMANCE FOR ALL BENEFICIARIES AND MEMBERS ASSIGNED TO THE SAME GEOGRAPHIC AREA	6
QUALITY MEASURES	6
QUALITY MEASURE OVERVIEW	6
QUALITY MEASURE TECHNICAL CLARIFICATIONS	8
CREDIBILITY & PAYER-MIX ADJUSTMENT	8
DATA REFRESH CADENCE	9
CAVEATS AND LIMITATIONS	9
ACKNOWLEDGEMENTS	11
APPENDIX	1
SDOH CHARACTERISTICS	1
Social Deprivation Index	1
Race and Ethnicity	1
Facility Density.....	1
Clinician Density	2
Urban/Rural Location.....	2
Insurance Coverage.....	3
DEFINITIONS FOR ELEMENTS NOT IDENTIFIED IN MEASURE SPECIFICATIONS	5
Inpatient Hospitalizations	5
SNF, Non-Acute Hospital Care, and Hospice	6
REFERENCE	9

About the Qualified Entity Program

The Centers for Medicare and Medicaid Services (CMS) Qualified Entity (QE) Program enables organizations approved as QEs to receive Medicare claims data under Parts A, B, and D for use in evaluating provider performance. As a QE receiving Medicare data for all 50 states and the District of Columbia, Milliman is required to combine the Medicare data with claims data from other sources to create public reports that evaluate provider performance in all geographic regions. Milliman's public report does not identify specific providers. To maintain QE status, QEs must publish a report at least annually after receiving the Medicare data. For more information about the Qualified Entity Program, see <https://www.qemedicaredata.org>.

Overview

Milliman has developed an interactive tool that allows users to explore healthcare system quality measure performance in the context of social determinants of health (SDoH) characteristics such as race and ethnicity, socioeconomic status, and provider supply, where variation in quality measure performance is not attributable to differences in disease burden.^{a,b}

As a certified QE, Milliman has created a combined dataset composed of claims data from 2018 through 2020 for over 50 million Medicare fee-for-service (FFS) beneficiaries, referred to as Medicare beneficiaries throughout this report, and over 100 million commercially-insured members¹. The interactive tool displays results calculated from this combined dataset for ten 10 quality measures that represent provider performance.^c For geographic regions, the measures show average performance by providers related to hospital-based acute care, including both inpatient and emergency department utilization, as well as during the period immediately following these encounters when health risk is elevated. Acute care services and services following discharge are major contributors to overall healthcare costs, and performance below benchmarks on these measures may reflect shortcomings in the provision of high-quality care during the acute care encounter itself, the follow-up period post-discharge, or more generally in ongoing health management over time in the community. Examining variation in provider quality measure performance in different geographic areas highlights potential gaps in care that may represent opportunities to improve quality and reduce healthcare costs.

It is important to acknowledge the impact of SDoH—safe housing, transportation, racism, education, income, and other individual and community factors—and the role they play in shaping individuals' health outcomes. Therefore, to supplement the claims-based quality measure results, the interactive tool displays key SDoH characteristics for geographic areas in order to present a more comprehensive, contextual view that may highlight opportunities to reduce health disparities observed in healthcare system performance. The SDoH characteristics reported in the interactive tool represent all beneficiaries living in the area (not limited to Medicare beneficiaries and commercially insured members in the combined data).

Included in the 2023 Milliman Qualified Entity Report is the **Milliman Health Disparity Risk Index (MHDRI)**. This factor aggregates multiple SDoH factors that are associated with health disparities into a single value. The MHDRI allows users to explore quality measure performance in the context of a collection of SDoH factors, instead of separately exploring quality measure performance in the context of individual SDoH factors.

^a Milliman uses race and ethnicity to identify historically marginalized racial and ethnic groups that may experience racism.

^b Risk adjustment was applied to six of the 10 measures where population health has an expected impact on quality measure performance. See [Figure 4: Quality Measures for additional details](#).

^c Two rates are reported for the quality measure Pharmacotherapy Management of COPD Exacerbation (PCE).

The interactive tool presents two primary map-based views:

- **Metrics by geography:** This view allows users to view results for a single metric on a map of the U.S.—either an SDoH characteristic or a quality measure result. Depending on the geographic area selected on the map, the SDoH characteristics and quality measure results for the area selected and a relevant comparison population are displayed in a table below the map.
- **Geographic comparison:** This view allows users to compare SDoH characteristics and quality measure results between a collection of small geographic areas in one U.S. census division and a collection of small areas in another census division. Users may select a range of values for select SDoH characteristics and the map and summaries update to reflect the collection of small areas that meet those criteria.

For detailed instructions on how to use the interactive tool, refer to the [Report User Guide](#).

SDoH characteristics

Milliman reviewed potential data sources that include variables that represent a variety of SDoH characteristics that have been associated with health disparities, collectively referred to as SDoH characteristics. SDoH characteristics are “the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks.”² Examples of such characteristics represented by specific variables include socioeconomic (income, education, employment, etc.), demographic (age, sex, race, ethnicity, etc.), urban/rural location, and provider density. Of those candidate characteristics where the relevant variables have sufficient geographic granularity in the data sources to support mapping, the following datasets were identified as national, robust, widely recognized as reputable, and reasonably recent sources of information for select SDoH characteristics as displayed in Figure 1. Note that all SDoH characteristics represent all individuals living in the area (not limited to Medicare beneficiaries and commercially insured members in the combined data).

FIGURE 1. SDOH CHARACTERISTICS

SDOH CHARACTERISTICS	DATA SOURCE, SPONSOR	LEVEL OF GEOGRAPHIC GRANULARITY
Socioeconomic status	Social Deprivation Index (SDI), Robert Graham Center ³	ZCTA
Race and ethnicity	American Community Survey (ACS), U.S. Census Bureau ⁴	ZCTA
Urban/rural location	Rural-Urban Commuting Area (RUCA) Codes, U.S. Department of Agriculture ⁵	ZCTA
Facility density	Provider of Services File, Centers for Medicare and Medicaid Services (CMS) ⁶	ZCTA; Reported at the County FIPS level
Clinician density	Area Health Resources Files, Health Resources & Services Administration (HRSA) ⁷	County FIPS

The level of geographic granularity refers to the smallest geographic area for which the data is available. Zip Code tabulation areas (ZCTAs) are generalized area representations of United States Postal Service (USPS) ZIP Code service areas. ZCTA is a trademark of the U.S. Census Bureau and ZIP Code is a trademark of USPS. In most instances, the ZCTA code is the same as the ZIP Code for an area.⁸ Facility density is reported at the county Federal Information Processing System (FIPS) level to better represent the boundary with which beneficiaries and members seek and receive care.

The following SDoH characteristics displayed in the tool were generated from the original data sources in one of three ways:

1. Drawn directly from the original data source:

- a. Socioeconomic status
- b. Race and ethnicity

2. Derived using numerical data from the original data source and grouped into categorical data:

- a. Urban/rural location

3. Derived using data from the original data source and reported on a per-capita basis for the geographic region:

- a. Facility density
- b. Clinician density

Milliman also includes the health insurance coverage distribution in the report to assist with interpretation of the quality measure results in the context of other SDoH characteristics.⁹ For example, if the user has selected an area with a majority Medicaid population, the quality measure results displayed will not entirely align with the SDoH characteristics displayed because the interactive tool only includes claims and enrollment data from Medicare FFS beneficiaries (excluding members of Medicare Advantage plans) and a sample of commercially insured members. The uninsured population and populations with other insurance coverage (such as Medicaid) are not represented in the claims-based quality measure results. The insurance coverage distribution was derived directly from the original data source (American Community Survey) and grouped into the following categories: Medicare, commercial, Medicaid, other insurance, uninsured. In addition, because the socioeconomic status and race and ethnicity variables were collected from a sample of the U.S. population rather than the whole population, summaries for these variables reflect estimates rather than exact values for each level of geography.

Please see the [SDoH Characteristics](#) section of the [Appendix](#) for additional details.

Milliman Health Disparity Risk Index

The Milliman Health Disparity Risk Index (MHDRI) is a composite index that aggregates multiple SDoH characteristics that are associated with health disparities into a single value. The MHDRI allows users to explore quality measure performance in the context of a collection of SDoH characteristics, instead of separately exploring quality measure performance in the context of individual SDoH characteristics.

VARIABLE SELECTION

Milliman identified the following SDoH characteristics shown to be associated with health disparities in the published literature:

- Race and ethnicity^{10,11}
- Socioeconomic status (income level, education, and occupation)¹²
- Food insecurity¹³
- Safe housing^{14,15,16}
- Language¹⁷
- Immigrant status¹⁸
- Family structure¹⁹
- Transportation access²⁰
- Internet access²¹
- Living in a rural area²²
- Climate risk^{23,24}

To support development of the composite index, Milliman identified several data sources that contain variables relevant to the SDoH characteristics identified in the list above. Data sources that were appropriate for use in the composite index development needed to meet the following data integrity criteria:

- Nationally representative
- Publicly available
- Available at the appropriate level of geographic granularity (i.e., ZCTA [preferred] or county level)
- Relatively recent to align with the combined dataset years

Of the data sources identified, Milliman proceeded with three data sources that (1) included variables relevant to the SDoH characteristics associated with health disparities and (2) met all data integrity criteria listed above. No data source for climate risk that met all data integrity criteria was identified, so this SDoH characteristic was dropped from consideration. The final variables displayed in Figure 2 are available at the ZCTA level, except for Food Insecurity, which is available only at the county level.

FIGURE 2. MHDRI VARIABLES & DATA SOURCES

SDOH CHARACTERISTIC	VARIABLE NAME	DATA SOURCE	2018 FACTOR LOADING
Living in a Rural Area	Primary Rural-Urban Commuting Area (RUCA)	RUCA Codes, U.S. Department of Agriculture	-
Food Insecurity	Percent of Population with Food Insecurity	Map the Meal Gap Data, Feeding America ²⁵	-
Race and Ethnicity	Percent of Population Black	American Community Survey (ACS), U.S. Census Bureau	0.459
Race and Ethnicity	Percent of Population Hispanic		0.707
Race and Ethnicity	Percent of Population white		-0.875
Race and Ethnicity	Percent of Population Other Race		-
Income Level	Percent of Population Less than 100% of the Federal Poverty Level (FPL)		0.713
Family Structure	Percent of Single Parent Families with Dependents < 18 Years		0.656
Education	Percent of Population 25 Years or More With < 12 Years of Education		0.776
Occupation	Percent of Population Unemployed		0.535
Transportation Access	Percent of Households with No Vehicle		0.525
Safe Housing: Renter-Occupied	Percent of Households Living in Renter-Occupied Housing Units		0.681
Safe Housing: Crowded Housing	Percent of Households Living in Crowded Housing Units		0.701
Language	Percent of Population Speaks Only English		-0.726
Immigrant Status	Percent of Population Foreign-Born		0.591
Internet Access	Percent of Households with Broadband Internet Subscription (i.e., high speed Internet access)		-0.464

MHDRI DEVELOPMENT

Milliman's development process used a linear combination of several of the 16 observed variables listed in Figure 2 in order to form a single value using factor analysis. The factor analysis used to develop the MHDRI is a rigorous statistical technique that reduces multiple variables into a smaller set of factors, which are ultimately consolidated into a single value (the underlying factor). The underlying factor represents the unobserved latent variable(s) that quantifies the correlation between the observed variables. SAS software was used to perform the factor analysis on our variable data.²⁶

Before performing the factor analysis, ZCTA population counts were winsorized at the 80th percentile, which means that the population count was set to the 80th percentile population count for ZCTAs with a population count above the 80th percentile. Given that the factor analysis uses a population-weighted approach when developing the factor loadings (a value that represents the correlation between observed variables and the underlying factor), this technique dampens the impact that high-population ZCTAs have on the factor loadings. Any variables that had a factor loading less than the chosen significance threshold of 0.4 on 2018 data were removed from the model.^{27,28,29} The larger the factor loading value for a particular variable, the higher the correlation was between that variable and the underlying factor.

For a given ZCTA, each variable's value was multiplied by its respective variable weight, and all remaining variables were summed together to obtain one value for the ZCTA to generate the aggregate score. Before multiplying each variable value by its respective variable weight, each variable was standardized such that they were all on a common scale. Standardizing all variables to a common scale helps to reduce the impact of variables with large variances

from being overly influential to the model due to the variables having different scales and units of measurement. The aggregate score was then standardized to be on a scale from 0 to 100. This standardized score is referred to as the MHDRI score. [Figure 2](#) displays all variables considered, their data sources, and their 2018 factor loadings, as applicable. To maintain continuity in the meaning of the MHDRI score across years, all variables included in the final 2018 factor analysis were retained in the factor analyses for 2019 and 2020, regardless of their factor loadings. Variables without weights were dropped from the model based on the chosen significance threshold.

MHDRI score interpretation

A lower MHDRI score (closer to 0) suggests that the average population in the area is at a lower risk of health disparities, and a higher MHDRI score (closer to 100) suggests that the average population in the area is at a higher risk of health disparities. Healthy People 2030 defines a health disparity as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage.”³⁰ The MHDRI should not be used to draw conclusions regarding individual beneficiary or member risk.

Assignment of beneficiaries and members to a geographic area

The interactive maps display results for quality measures of provider performance and SDoH characteristics at the following levels of geography in descending level of granularity: nation, census division, state county, and ZCTA.

Figure 3 shows a summary of the high-level steps to assign all beneficiaries and members in the combined dataset to a geographic location.



Step 1: Assign Each Beneficiary and Member to a Geographic Area



Step 2: Identify SDoH Characteristics of a Geographic Area



Step 3: Link Geographic Area SDoH Characteristics to Beneficiaries and Members Assigned to the Same Geographic Area



Step 4: Evaluate and Report Quality Measure Performance for All Beneficiaries and Members Assigned to the Same Geographic Area

FIGURE 3. ANALYSIS STEPS

STEP 1: ASSIGN EACH BENEFICIARY AND MEMBER TO A GEOGRAPHIC AREA

To assess providers' quality performance at each level of geography, each beneficiary and member from the combined data was attributed to a geographic area using their location of residence. Most beneficiaries and members (70%) were attributed to a single ZIP Code. When physical address and residence ZIP Code were unavailable (this only occurred for commercially insured members), members were attributed to their county code.

Quality measure results are reported at each level of geography using crosswalks from beneficiary and member residence (either ZIP Code or county code) to the various geographic levels reported.

STEP 2: IDENTIFY SDOH CHARACTERISTICS OF A GEOGRAPHIC AREA

Using the data sources displayed in [Figure 1](#), the SDoH characteristics were summarized at the most granular level of geography. Milliman also developed a composite index that aggregates multiple SDoH characteristics into a single value for each level of geography. See the [Milliman Health Disparity Risk Index](#) section for more information.

STEP 3: LINK GEOGRAPHIC AREA SDOH CHARACTERISTICS TO BENEFICIARIES AND MEMBERS ASSIGNED TO THE SAME GEOGRAPHIC AREA

Using the beneficiary-level and member-level geographic area assignment from Step 1 and the SDoH geographic area attribution from Step 2, each beneficiary and member of the combined data was linked to the SDoH characteristics of their geographic area of residence.

STEP 4: EVALUATE AND REPORT QUALITY MEASURE PERFORMANCE FOR ALL BENEFICIARIES AND MEMBERS ASSIGNED TO THE SAME GEOGRAPHIC AREA

For each of the quality measures, the measure specifications (as defined by the measure steward) were followed and results are summarized at all available levels of geography.

Quality measures

QUALITY MEASURE OVERVIEW

The Milliman QE report includes annual results from the 2018 through 2020 combined data for the quality measures displayed in Figure 4 at all levels of geography. For select measures, results are not available for all three years due to the parameters of the measure specifications.

FIGURE 4. QUALITY MEASURES

NAME	STEWARD, SPECIFICATIONS	REPORTING YEARS	DESCRIPTION
Risk-Adjusted Hospital Utilization*			
Acute Hospital Utilization (AHU)	National Committee for Quality Assurance (NCQA), HEDIS Measurement Year (MY) 2021 ³⁰	2019, 2020 <i>2018 is not available due to 12-month enrollment requirement</i>	For beneficiaries and members 18 years of age and older, the risk-adjusted ratio of observed-to-expected acute inpatient and observation stay discharges during the measurement year. This measure is reported as a risk-adjusted rate of hospitalizations per 1,000 beneficiaries or members in the eligible population.
Emergency Department Utilization (EDU)	NCQA, HEDIS MY 2021 ³¹	2019, 2020 <i>2018 is not available due to 12-month enrollment requirement</i>	For beneficiaries and members 18 years of age and older, the risk-adjusted ratio of observed-to-expected emergency department (ED) visits during the measurement year. This measure is reported as a risk-adjusted rate of emergency department visits per 1,000 beneficiaries or members in the eligible population.
Risk-Adjusted Return to Hospital*			
Plan All-Cause Readmissions (PCR)	NCQA, HEDIS MY 2021 ³²	2019, 2020 <i>2018 is not available due to 12-month enrollment requirement</i>	For beneficiaries and members 18 years of age and older, the number of acute inpatient and observation stays during the measurement year that were followed by an unplanned acute readmission for any diagnosis within 30 days and the predicted probability of an acute readmission. This measure is reported as a risk-adjusted rate of unplanned acute readmissions per 1,000 discharges.
Excess Days in Acute Care (EDAC) After Hospitalization for Acute Myocardial Infarction (AMI)	CMS, 2022 Condition-Specific Excess Days in Acute Care Measures Updates and Specifications Report, May 2022 ³³	2019, July -December 2020 <i>2018 is not available due to 12-month enrollment requirement; January – June 2020 is excluded per the measure specifications</i>	The measure assesses days spent in acute care within 30 days of discharge from an inpatient hospitalization for acute myocardial infarction (AMI). Excess days include post-discharge ED visits, observation stays, and unplanned readmissions at any time during the 30 days post-discharge. This measure is reported as a risk-adjusted rate of excess days per 100 discharges.
EDAC After Hospitalization for Heart Failure (HF)	CMS, 2022 Condition-Specific Excess Days in Acute Care Measures Updates and Specifications Report, May 2022 ³⁴	2019, July -December 2020 <i>2018 is not available due to 12-month enrollment requirement; January – June 2020 is excluded per the measure specifications</i>	The measure assesses days spent in acute care within 30 days of discharge from an inpatient hospitalization for heart failure (HF). Excess days include post-discharge ED visits, observation stays, and unplanned readmissions at any time during the 30 days post-discharge. This measure is reported as a risk-adjusted rate of excess days per 100 discharges.

NAME	STEWARD, SPECIFICATIONS	REPORTING YEARS	DESCRIPTION
EDAC After Hospitalization for Pneumonia (PNA)	CMS, 2022 Condition-Specific Excess Days in Acute Care Measures Updates and Specifications Report, May 2022 ³⁵	2019, July -December 2020 <i>2018 is not available due to 12-month enrollment requirement; January – June 2020 is excluded per the measure specifications</i>	The measure assesses days spent in acute care within 30 days of discharge from an inpatient hospitalization for pneumonia. Excess days include post-discharge ED visits, observation stays, and unplanned readmissions at any time during the 30 days post-discharge. This measure is reported as a risk-adjusted rate of excess days per 100 discharges.
Follow-Up Visit**			
Timely Follow-Up After Acute Exacerbations for Chronic Conditions	IMPAQ International, Timely Follow-up After Acute Exacerbations of Chronic Conditions, October 2018 ³⁶	2018, 2019, 2020	Percentage of hospital visits (ED visit, observation stay or inpatient stay) for beneficiaries and members 18 years of age and older for one of the following six chronic conditions: hypertension, asthma, heart failure (HF), coronary artery disease (CAD), chronic obstructive pulmonary disease (COPD), or diabetes mellitus (Type I or Type II), and who received a follow-up visit within the timeframe recommended by clinical practice guidelines in a non-emergency outpatient setting.
Follow-Up Visit within 7 Days of Emergency Department Visit for Adults with Multiple High-Risk Chronic Conditions (FMC)	NCQA, HEDIS MY 2021 ³⁷	2019, 2020 <i>2018 is not available due to 12-month enrollment requirement</i>	Percentage of ED visits for beneficiaries and members 18 years of age and older who have multiple high-risk chronic conditions and who had a follow-up service within seven days of an ED visit.
Medication Management**			
Pharmacotherapy Management of COPD Exacerbation (PCE)	NCQA, HEDIS MY 2021 ³⁸	2018, 2019, 2020	The percentage of COPD exacerbations for beneficiaries and members 40 years of age and older who had an acute inpatient discharge or ED visit on or between January 1 and November 30 of the measurement year and who were dispensed appropriate medications. Two rates are reported: 1. Dispensed a systemic corticosteroid (or there was evidence of an active prescription) within 14 days of the event. 2. Dispensed a bronchodilator (or there was evidence of an active prescription) within 30 days of the event.
Persistence of Beta-Blocker Treatment After a Heart Attack (PBH)	NCQA, HEDIS MY 2021 ³⁹	2019, 2020 <i>2018 is not available due to the lookback requirement; July-December 2020 is not available due to the lookout requirement</i>	The percentage of beneficiaries and members 18 years of age and older during the measurement year who were hospitalized and discharged from July 1 of the year prior to the measurement year to June 30 of the measurement year with a diagnosis of AMI and who received persistent beta-blocker treatment for six months after discharge.

*Lower values indicate better provider performance

**Higher values indicate better provider performance

QUALITY MEASURE TECHNICAL CLARIFICATIONS

For select measures, the specifications did not include full operational definitions of all required elements for use with all Medicare beneficiaries and commercially insured members in the combined data. When this occurred, Milliman established definitions to fill gaps, as needed, based upon literature review and prior claims analysis experience. Figure 5 contains the definitions used for each applicable measure.

FIGURE 5. DEFINITIONS FOR ELEMENTS NOT IDENTIFIABLE FOR CERTAIN MEMBERS BY MEASURE SPECIFICATIONS

MISSING ELEMENT	MISSING ELEMENT & MILLIMAN DEFINITION	MEASURE
Inpatient Hospitalizations	Inpatient hospitalizations are not defined in the measure specifications for commercially insured members. Therefore, inpatient hospitalizations for commercially insured members are defined using revenue codes. Refer to the definitions for elements not identified in measure specifications section of the Appendix for a list of codes used to identify inpatient hospitalizations.	
Acute Care Hospitals	Acute care hospitals are not defined in the measure specifications for use for commercially insured members. Therefore, based on the CMS Certification number (CCN) acute care hospitals are defined as facilities with a CCN that meets one of the following criteria: <ul style="list-style-type: none"> Non-federal short-term acute care hospitals are identified as inpatient claims where the third digit of the CCN is a "0." Children's hospitals are identified as inpatient claims where the third and fourth digit of the CCN are "33." Transplant centers are identified as inpatient claims where the third and fourth digit of the CCN are "98." Critical Access Hospitals are identified as inpatient claims where the third and fourth digit of the CCN are "13." Veteran Affairs hospitals are identified as inpatient claims where the fifth digit of the CCN is "V." 	EDAC After Hospitalization for AMI, EDAC After Hospitalization for HF, EDAC After Hospitalization for PNA
Date of Death	Date of death is not available in the combined data for commercially insured members. Therefore, where date of death is required to confirm that commercially insured members did not die during the measure lookout period, the absence of ongoing enrollment is used as a proxy for death. If there is no evidence of enrollment in the calendar month following discharge, death is assumed and the member's encounter is excluded from the denominator.	
Skilled Nursing Facility (SNF), Non-Acute Hospital Care, Hospice	SNF, non-acute hospital care, and hospice are not defined in measure specifications. Therefore, these services are defined using revenue codes, HCPCS and CPT codes for Medicare beneficiaries and commercially insured members. Refer to the definitions for elements not identified in measure specifications section of the Appendix for a list of codes used to identify SNF, non-acute hospital care, and hospice services.	Timely Follow-Up After Acute Exacerbations for Chronic Conditions

CREDIBILITY & PAYER-MIX ADJUSTMENT

Milliman established credibility thresholds and applied a payer-mix adjustment (Medicare, commercial) to account for differences in typical age and healthcare utilization across these different populations. This adjustment allows provider performance to be reasonably evaluated and understood across populations residing in different geographic areas. The payer-mix adjustment is applied to the AHU, EDU, and Timely Follow-Up After Acute Exacerbations for Chronic Conditions measures. ZCTAs with a population less than 200 were deemed non-credible and excluded from reporting at the ZCTA level in the interactive tool. These ZCTAs appear blank in the interactive tool when the map displays boundaries at the ZCTA level, and SDoH characteristics and quality measure results are not populated. Note that no additional adjustment (beyond the risk adjustment that applies to certain measures) was made for differences in health status across different areas.

For ZCTAs with a population greater than 200, an additional payer-mix credibility threshold (applied separately to each covered population) of 30 denominator encounters for Medicare beneficiaries and 30 denominator encounters for commercially insured members was applied for the AHU, EDU, and Timely Follow-Up After Acute Exacerbations for Chronic Conditions quality measures. For all other measures, a credibility threshold of 30 denominator encounters in aggregate across both populations was applied. Given that the combined data includes 100% of Medicare beneficiaries and a population sample of commercially insured members across all 50 states and Washington, D.C., the quality measure results were adjusted for differences in payer mix by applying a weighted-average of national denominator counts of beneficiaries and members in the combined data to each payer-specific rate. The payer-mix adjustment is applied when national denominator counts for each population exceeds 15% of the combined data across both populations. This allows for comparison of results across geographic areas. For example, if the user selects a single county, the quality measure rate displayed is the weighted-average of the national distribution of Medicare beneficiaries and commercially insured members in the combined data and the Medicare-specific and commercial-specific results for that county. If the ZCTA population is greater than 200 but the payer-mix credibility threshold for each covered population is not met, only the SDoH characteristics are displayed in the report and quality measure results are not populated. Note, the ZCTA level of geography is only available when a minimum of 5 ZCTAs meet the credibility threshold for the selected measure.

Data refresh cadence

As a QE, Milliman receives 100% Medicare FFS claims and enrollment data on an annual basis. This interactive tool will be updated annually each summer.

Caveats and limitations

The interactive tool was developed using three key resources—claims and enrollment data, external data, and quality measure specifications from various measure stewards—each of which have limitations. The most significant limitations not already mentioned throughout the report are described below.

- SDoH characteristics are not generally captured for both the Medicare beneficiaries and commercially insured members in the health insurance claims and enrollment information that makes up the combined data. Medicare data includes the Beneficiary Race Code, but this information is not available in the data source for commercially insured members. The ICD-10-CM Official Guidelines for Coding and Reporting include SDoH-related Z codes, ranging from Z55 to Z65. While reporting of these diagnosis codes on claims is encouraged, historically, reporting has not been comprehensive, and a number of the diagnosis codes are new, so they were not available during the time period of analysis for this report (2018-2020). Therefore, in order to allow users to explore provider performance in the context of SDoH characteristics Milliman linked beneficiaries and members in the combined data to SDoH characteristics based on their geographic area of residence. However, the SDoH characteristics of a geographic area reported in the interactive tool do not directly represent the specific beneficiaries and members included in the combined data used to generate quality measure results. Other people living in the geographic area include individuals not represented in either the Medicare beneficiaries or the sample of the commercially insured members in the combined data (i.e., uninsured, covered by other payers or health benefit programs such as Medicaid or Medicare Advantage, commercially insured members not included in the combined data). Therefore, it is possible that the beneficiaries and members in the combined data residing in a geographic area do not have the same SDoH characteristics as the total population that resides in that area. Most beneficiaries and members in the combined data (70%) were attributed to a single ZIP Code; however, when ZIP Code was unavailable, commercially insured members were attributed to their county code. For beneficiaries and members attributed to a geographic area by their ZIP Code, Milliman assumes that their SDoH characteristics resemble those of the average person residing in the corresponding ZCTA. For commercially insured members attributed to a geographic area by their county code, Milliman assumes that their SDoH characteristics resemble those of the average person residing in that county. Given that counties are larger than ZCTAs, there may be larger variance between members' individual characteristics and the overall characteristics of the total population that live in the geographic area. This variance differs across geographies and impacts the validity of any potential relationship observed between quality measure results and SDoH characteristics.

- The MHDRI may not be an appropriate measure of the risk of health disparities for all geographic areas because of the differences in resources and infrastructure across neighborhoods. For example, a ZCTA in a major metropolitan city may have a high MHDRI score because most residents are renters and do not have access to a vehicle. These characteristics are known to be associated with health disparities. However, for larger cities with a high cost of living and widely used public transportation systems, renting and having no access to a vehicle may not be indicative of an increased risk in health disparities.
- The quality measure results are calculated based on claims paid by health insurance payers. There is variability in billing, coding, and claim-filing practices across providers and geographic areas that may impact the observed healthcare system performance.
- Beneficiaries and members attributed by ZIP Code are included in all levels of geography. Members attributed by county code are not included in the ZCTA level of reporting due to their lack of a ZIP Code. Therefore, the summary of quality measure results reported for all ZCTAs within a county may not equal quality measure results reported for the county.
- For certain quality measures, measure specifications lacked detail for defining key elements for all individuals included in the combined data. Milliman established specifications to fill gaps, as needed, based upon literature review and prior claims analysis experience. However, Milliman's results for these quality measures may vary from other published sources due to methodological differences in filling the gaps. Refer to [Figure 5](#) in the [quality measure technical clarifications](#) section above for more information.
- The U.S. Census Bureau establishes ZCTA geographic boundary files, which are updated on a regular basis to account for shifts in population or boundary names.⁴⁰ For reporting purposes, the most recent version of the 2010 ZCTA geographical boundary file was used because it represents the established boundaries relevant to the reporting years (2018, 2019, and 2020). Due to the frequent updates, there may be areas within the 50 states and District of Columbia that are not represented in the 2010 geographical boundary file. For these areas, the SDoH characteristics and quality measure results displayed may not entirely represent the area shown on the map for a county or ZCTA with boundaries that changed between 2010 and the reporting years (2018-2020).
- Percentile distributions were established for the Geographic Comparison view using results for individual ZCTAs to develop the distribution. To reduce the impact of outliers skewing the distribution, ZCTAs with a denominator encounter count less than 100 were deemed non-credible for the purposes of developing a percentile distribution and excluded from the creation of the percentile distribution.
- The results included in this report are based on historical data. Emerging and future results will differ from historical results.
- Milliman's interactive tool was developed to advance health equity by allowing users to explore healthcare system performance in the context of the SDoH characteristics for a geographic area. As explained herein, the SDoH characteristics for a geographic area do not directly represent the specific beneficiaries and members included in the combined data. All information displayed in the interactive tool, including the MHDRI, was developed for geographic areas, and should not be used to draw conclusions regarding individual member risk. Any interpretations, conclusions, and/or opinions reached as a result of the information displayed in the interactive tool do not constitute the findings, policies, or recommendations of Milliman.
- Milliman does not intend to benefit any third-party user of its work product.
- Milliman has developed certain models to estimate the values included in this report. The intents of the models were to estimate the results for 10 quality measures and to develop a composite index using SDoH characteristics. Milliman has reviewed the models, including their inputs, calculations, and outputs, for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practices (ASOP).
- In developing this interactive tool, Milliman relied on data maintained by third parties such as the ACS. Milliman has not audited or verified this data or the combined data. If the underlying information is inaccurate or incomplete, the content of our report may likewise be inaccurate or incomplete.

- Any user of this interactive tool should possess a certain level of expertise in areas relevant to this analysis to appreciate the significance of the limitations and the impact of these limitations on the results. The user should also be advised by their own qualified professionals competent to properly interpret the material.
- The information displayed in the interactive tool may not be appropriate for all uses. If users leverage information from the interactive tool for purposes beyond the Milliman website, Milliman requests that the information be distributed with a reference to Milliman's QE report.

Acknowledgements

Milliman would like to thank [Doug Norris*](#) and Milliman's QE Advisory Committee members for their thoughtful contributions: [Andrew Naugle](#), [Christal Morris](#), [Davis Burge](#), [Elyn Russo](#), [Erica Rode*](#), [Jeremy Engdahl-Johnson](#), [Kelsie Gosser](#), [Lynn Dong*](#), [Maria Becker*](#), [Pamela Pelizzari](#), [Robbie Richards](#), and [Stoddard Davenport](#).

This report was prepared with the assistance of many people. The following individuals provided valuable insights and support:

- | | | |
|--------------------|--------------------|-------------------|
| ▪ Maggie Alston | ▪ Hantao Jing | ▪ Joel Suelzle |
| ▪ Ritul Bakshi | ▪ Rebecca Johnson | ▪ Brian Sweatman* |
| ▪ Brandon Brill | ▪ Christopher Kim | ▪ Julia Weber* |
| ▪ William Coates | ▪ Hope Norris | ▪ Sumeet Vashista |
| ▪ Gregory Collins* | ▪ Pritam Pratihar | ▪ Nicole Zillox |
| ▪ Phil Ellenberg | ▪ Saurabh Saxena | |
| ▪ Dagny Grillis* | ▪ Ananya Sridharan | |

The American Academy of Actuaries requires its members to identify their credentials in their work product. Contributors with an asterisk are members of the American Academy of Actuaries and meet its relevant qualification requirements.

Appendix

SDOH CHARACTERISTICS

Social Deprivation Index

The Social Deprivation Index (SDI), representing socioeconomic status, is reported as a numeric percentile value from 1-100, where zero is the least deprived and 100 is the most deprived. SDI is available at multiple levels of geography including the ZCTA level. The SDI score is taken directly from the original data source, the Robert Graham Center.⁴¹ Milliman has an active license with the American Academy of Family Physicians (AAFP), which enables us to receive and report the most recent year of SDI data. For more information on the SDI, refer to the Robert Graham Center website, <https://www.graham-center.org/maps-data-tools/social-deprivation-index.html>.

Race and Ethnicity

Race and Ethnicity is reported as the percentage of people who are non-Hispanic Black, non-Hispanic white, Hispanic, or Other Race or Ethnicity, defined by the variables in Figure 6 sourced from the ACS's Table B03002: Hispanic or Latino Origin by Race.⁴² Race and ethnicity is available at the ZCTA level.

FIGURE 6. RACE AND ETHNICITY VARIABLE MAPPING

TABLE_FIELD NAME	VARIABLE NAME	MAPPING
B03002_001E	Estimate total	Total Population
B03002_003E	Estimate total Not Hispanic or Latino White alone	Non-Hispanic white
B03002_004E	Estimate total Not Hispanic or Latino Black or African American alone	Non-Hispanic Black
B03002_012E	Estimate total Hispanic or Latino	Hispanic

The Non-Hispanic white, Non-Hispanic Black, and Hispanic fields are populated using B03002_003E, B03002_004E, and B03002_012E, respectively. The Other Race or Ethnicity field is defined as the population that does not map to Non-Hispanic white, Non-Hispanic Black, or Hispanic. The Other Race or Ethnicity field encapsulates all non-Hispanic races. The ACS describes these fields as American Indian, Alaska Native, Asian, Native Hawaiian, Other Pacific Islander, other races, and two or more races. Historically Marginalized Racial and Ethnic Groups are defined as the populations that map to Non-Hispanic Black, Hispanic, and Other Race or Ethnicity.

Facility Density

Facility Density represents the number of facilities per 100,000 individuals within a given geographic area. The facility count was sourced from the CMS Provider of Services file and is available at the ZIP Code level, and subsequently mapped to ZCTA.⁴³ For more information on provider count, refer to the CMS website, <https://data.cms.gov/provider-characteristics/hospitals-and-other-facilities/provider-of-services-file-hospital-non-hospital-facilities>.

The facility types included in the facility count were identified by one of the following criteria:

1. A valid CMS Certification Number (CCN) in the PRVDR_NUM field, determined by having a value length of six digits
2. A PRVDR_CTGRY_CD (Provider Category Code) value of 1, which corresponds to hospitals
 - AND a PGM_TRMNTN_CD (Termination Code) not equal to 1, which corresponds to voluntary closures
 - AND a PRVDR_NUM (CCN) with the last 4 digits within the following ranges
 - 0001 and 0879, corresponding with short-term facilities
 - 1300 and 1399, corresponding with critical access facilities
 - 3300 and 3399, corresponding with children's hospitals
 - 9800 and 9899, corresponding with transplant centers

The total population of the given geographic area was sourced from the ACS's Table B03002: Hispanic or Latino Origin by Race, B03002_001E Estimate Total.⁴⁴ This total population is at the ZCTA level.

Facility density for a given county is calculated as follows:

$$\text{Facility Density per 100,000} = \frac{\text{Sum of facility count in the county}}{\text{Sum of ZCTA population in the county}} \times 100,000$$

Clinician Density

Clinician Density represents the number of clinicians per 100,000 individuals within a given geographic area. The clinician count was sourced from HRSA's Area Health Resources Files and is available at the county level.⁴⁵ For more information on clinician count, refer to the HRSA website, <https://data.hrsa.gov/topics/health-workforce/ahrf>.

The clinician types included in the clinician count were identified using the following fields from each annual file, where YY denotes the final two digits of the corresponding data year for 2018, 2019, and 2020:

- F00002 (FIPS St & City Code)
- F12129-YY (Total Active M.D.s Non-Federal & Federal)
- F13882-YY (Total Active D.O.s Non-Federal & Federal)
- F14641-YY (Physician Assistants w/NPI)
- F14646-YY (Advanced Practice Registered Nurse w/NPI)
- F14642-YY (Nurse Practitioners w/NPI)
- F14643-YY (Clinical Nurse Specialist w/NPI)
- F14644-YY (Certified Registered Nurse Anesthetists w/NPI)
- F14645-YY (Advanced Practitioner Nurse Midwives w/NPI)

The total population of the given geographic area was sourced from the ACS's Table B03002: Hispanic or Latino Origin by Race, B03002_001E Estimate Total.⁴⁶ This total population is at the ZCTA level.

Clinician density for a given county is calculated as follows:

$$\text{Clinician Density per 100,000} = \frac{\text{Sum of Clinician Count in the County}}{\text{Sum of ZCTA population in the County}} \times 100,000$$

Urban/Rural Location

Urban/Rural Location is populated using a categorization of the primary RUCA code, sourced from the U.S. Department of Agriculture.⁴⁷ Figure 7 displays the mapping of each Primary RUCA code to one of four categories: Metropolitan, Micropolitan, Small Town, or Rural. The categorization is assigned based upon the population weighted average. For more information on RUCA codes, refer to the U.S. Department of Agriculture website, <https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx>.

FIGURE 7. PRIMARY RUCA VARIABLE MAPPING

PRIMARY RUCA CODES	DESCRIPTION	MAPPING
1	Metropolitan area core: primary flow within an urbanized area (UA)	Metropolitan
2	Metropolitan area high commuting: primary flow 30% or more to a UA	Metropolitan
3	Metropolitan area low commuting: primary flow 10% to 30% to a UA	Metropolitan
4	Micropolitan area core: primary flow within an Urban Cluster of 10,000 to 49,999 (large UC)	Micropolitan
5	Micropolitan high commuting: primary flow 30% or more to a large UC	Micropolitan
6	Micropolitan low commuting: primary flow 10% to 30% to a large UC	Micropolitan
7	Small town core: primary flow within an Urban Cluster of 2,500 to 9,999 (small UC)	Small Town
8	Small town high commuting: primary flow 30% or more to a small UC	Small Town
9	Small town low commuting: primary flow 10% to 30% to a small UC	Small Town
10	Rural areas: primary flow to a tract outside a UA or UC	Rural
99	Not coded: Census tract has zero population and no rural-urban identifier information	N/A

Insurance Coverage

Insurance Coverage is reported as the percentage of people with one of the following sources of health insurance coverage: Commercial, Medicare, Medicaid, Other Insurance, or Uninsured. Variable estimates were sourced from the ACS's Table B27010: Types of Health Insurance Coverage by Age.⁴⁸ Fields indicating Medicare coverage in combination with other insurance coverage were mapped to Medicare because not enough information is known in order to discern the primary payer. For more information on health insurance coverage estimates, refer to the ACS website, <https://www.census.gov/data/tables/time-series/demo/health-insurance/acs-hi.html>.

FIGURE 8. INSURANCE COVERAGE VARIABLE MAPPING

TABLE_FIELD NAME	VARIABLE NAME	MAPPING
B27010_001E	Estimate total	Total Population
B27010_004E	Estimate total under 19 years with one type of health insurance coverage with employer-based health insurance only	Commercial
B27010_011E	Estimate total under 19 years with two or more types of health insurance coverage with employer-based and direct-purchase coverage	Commercial
B27010_020E	Estimate total 19 to 34 years with one type of health insurance coverage with employer-based health insurance only	Commercial
B27010_027E	Estimate total 19 to 34 years with two or more types of health insurance coverage with employer-based and direct-purchase coverage	Commercial
B27010_036E	Estimate total 35 to 64 years with one type of health insurance coverage with employer-based health insurance only	Commercial
B27010_043E	Estimate total 35 to 64 years with two or more types of health insurance coverage with employer-based and direct-purchase coverage	Commercial
B27010_053E	Estimate total 65 years and over with one type of health insurance coverage with employer-based health insurance only	Commercial
B27010_059E	Estimate total 65 years and over with two or more types of health insurance coverage with employer-based and direct-purchase coverage	Commercial
B27010_007E	Estimate total under 19 years with one type of health insurance coverage with Medicaid/means-tested public coverage only	Medicaid
B27010_023E	Estimate total 19 to 34 years with one type of health insurance coverage with Medicaid/means-tested public coverage only	Medicaid
B27010_039E	Estimate total 35 to 64 years with one type of health insurance coverage with Medicaid/means-tested public coverage only	Medicaid
B27010_006E	Estimate total under 19 years with one type of health insurance coverage with Medicare coverage only	Medicare
B27010_012E	Estimate total under 19 years With two or more types of health insurance coverage with employer-based and Medicare coverage	Medicare
B27010_013E	Estimate total under 19 years with two or more types of health insurance coverage with Medicare and Medicaid/means-tested public coverage	Medicare
B27010_022E	Estimate total 19 to 34 years with one type of health insurance coverage with Medicare coverage only	Medicare
B27010_028E	Estimate total 19 to 34 years with two or more types of health insurance coverage with employer-based and Medicare coverage	Medicare
B27010_029E	Estimate total 19 to 34 years with two or more types of health insurance coverage with Medicare and Medicaid/means-tested public coverage	Medicare
B27010_038E	Estimate total 35 to 64 years with one type of health insurance coverage with Medicare coverage only	Medicare
B27010_044E	Estimate total 35 to 64 years with two or more types of health insurance coverage with employer-based and Medicare coverage	Medicare
B27010_045E	Estimate total 35 to 64 years with two or more types of health insurance coverage with direct-purchase and Medicare coverage	Medicare
B27010_046E	Estimate total 35 to 64 years with two or more types of health insurance coverage with Medicare and Medicaid/means-tested public coverage	Medicare
B27010_055E	Estimate total 65 years and over with one type of health insurance coverage with Medicare coverage only	Medicare
B27010_060E	Estimate total 65 years and over with two or more types of health insurance coverage with employer-based and Medicare coverage	Medicare
B27010_061E	Estimate total 65 years and over with two or more types of health insurance coverage with direct-purchase and Medicare coverage	Medicare

TABLE_FIELD NAME	VARIABLE NAME	MAPPING
B27010_062E	Estimate total 65 years and over with two or more types of health insurance coverage with Medicare and Medicaid/means-tested public coverage	Medicare
B27010_005E	Estimate total Under 19 years with one type of health insurance coverage with direct-purchase health insurance only	Other Insurance
B27010_008E	Estimate total Under 19 years with one type of health insurance coverage with TRICARE/military health coverage only	Other Insurance
B27010_009E	Estimate total under 19 years with one type of health insurance coverage with VA healthcare only	Other Insurance
B27010_014E	Estimate total under 19 years with two or more types of health insurance coverage other private only combinations	Other Insurance
B27010_015E	Estimate total under 19 years with two or more types of health insurance coverage other public only combinations	Other Insurance
B27010_016E	Estimate total under 19 years with two or more types of health insurance coverage other coverage combinations	Other Insurance
B27010_021E	Estimate total 19 to 34 years with one type of health insurance coverage with direct-purchase health insurance only	Other Insurance
B27010_024E	Estimate total 19 to 34 years with one type of health insurance coverage with TRICARE/military health coverage only	Other Insurance
B27010_025E	Estimate total 19 to 34 years with one type of health insurance coverage with VA healthcare only	Other Insurance
B27010_030E	Estimate total 19 to 34 years with two or more types of health insurance coverage other private only combinations	Other Insurance
B27010_031E	Estimate total 19 to 34 years with two or more types of health insurance coverage other public only combinations	Other Insurance
B27010_032E	Estimate total 19 to 34 years with two or more types of health insurance coverage other coverage combinations	Other Insurance
B27010_037E	Estimate total 35 to 64 years with one type of health insurance coverage with direct-purchase health insurance only	Other Insurance
B27010_040E	Estimate total 35 to 64 years with one type of health insurance coverage with TRICARE/military health coverage only	Other Insurance
B27010_041E	Estimate total 35 to 64 years with one type of health insurance coverage with VA healthcare only	Other Insurance
B27010_047E	Estimate total 35 to 64 years with two or more types of health insurance coverage other private only combinations	Other Insurance
B27010_048E	Estimate total 35 to 64 years with two or more types of health insurance coverage other public only combinations	Other Insurance
B27010_049E	Estimate total 35 to 64 years with two or more types of health insurance coverage other coverage combinations	Other Insurance
B27010_054E	Estimate total 65 years and over with one type of health insurance coverage with direct-purchase health insurance only	Other Insurance
B27010_056E	Estimate total 65 years and over with one type of health insurance coverage with TRICARE/military health coverage only	Other Insurance
B27010_057E	Estimate total 65 years and over with one type of health insurance coverage with VA healthcare only	Other Insurance
B27010_058E	Estimate total 65 years and over with two or more types of health insurance coverage	Other Insurance
B27010_063E	Estimate total 65 years and over with two or more types of health insurance coverage other private only combinations	Other Insurance
B27010_064E	Estimate total 65 years and over with two or more types of health insurance coverage other public only combinations	Other Insurance
B27010_065E	Estimate total 65 years and over with two or more types of health insurance coverage other coverage combinations	Other Insurance
B27010_017E	Estimate total under 19 years with no health insurance coverage	Uninsured
B27010_033E	Estimate total 19 to 34 years with no health insurance coverage	Uninsured
B27010_050E	Estimate total 35 to 64 years with no health insurance coverage	Uninsured
B27010_066E	Estimate total 65 years and over with no health insurance coverage	Uninsured

DEFINITIONS FOR ELEMENTS NOT IDENTIFIED IN MEASURE SPECIFICATIONS**Inpatient Hospitalizations**

Figure 9 includes revenue codes used to identify Inpatient Hospitalizations for the commercially insured members for the following measures: EDAC After Hospitalization for AMI, EDAC After Hospitalization for HF, and EDAC After Hospitalization for PNA.

FIGURE 9. INPATIENT REVENUE CODES

CODE TYPE	CODE	DESCRIPTION
UBREV	0100	ALL INCLUSIVE RATE-ALL-INCLUSIVE ROOM AND BOARD PLUS ANCILLARY
UBREV	0101	ALL INCLUSIVE RATE-ALL-INCLUSIVE ROOM AND BOARD
UBREV	0110	ROOM & BOARD-PRIVATE (ONE BED)-GENERAL CLASSIFICATION
UBREV	0111	ROOM & BOARD-PRIVATE (ONE BED)-MEDICAL/SURGICAL/GYN
UBREV	0112	ROOM & BOARD-PRIVATE (ONE BED)-OBSTETRICS (OB)
UBREV	0113	ROOM & BOARD-PRIVATE (ONE BED)-PEDIATRIC
UBREV	0114	ROOM & BOARD-PRIVATE (ONE BED)-PSYCHIATRIC
UBREV	0116	ROOM & BOARD-PRIVATE (ONE BED)-DETOXIFICATION
UBREV	0117	ROOM & BOARD-PRIVATE (ONE BED)-ONCOLOGY
UBREV	0118	ROOM & BOARD-PRIVATE (ONE BED)-REHABILITATION
UBREV	0119	ROOM & BOARD-PRIVATE (ONE BED)-OTHER
UBREV	0120	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-GENERAL CLASSIFICATION
UBREV	0121	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-MEDICAL/SURGICAL/GYN
UBREV	0122	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-OBSTETRICS (OB)
UBREV	0123	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-PEDIATRIC
UBREV	0124	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-PSYCHIATRIC
UBREV	0126	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-DETOXIFICATION
UBREV	0127	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-ONCOLOGY
UBREV	0128	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-REHABILITATION
UBREV	0129	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-OTHER
UBREV	0130	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-GENERAL CLASSIFICATION
UBREV	0131	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-MEDICAL/SURGICAL/GYN
UBREV	0132	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-OBSTETRICS (OB)
UBREV	0133	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-PEDIATRIC
UBREV	0134	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-PSYCHIATRIC
UBREV	0136	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-DETOXIFICATION
UBREV	0137	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-ONCOLOGY
UBREV	0138	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-REHABILITATION
UBREV	0139	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-OTHER
UBREV	0140	ROOM & BOARD-DELUXE PRIVATE-GENERAL CLASSIFICATION
UBREV	0141	ROOM & BOARD-DELUXE PRIVATE-MEDICAL/SURGICAL/GYN
UBREV	0142	ROOM & BOARD-DELUXE PRIVATE-OBSTETRICS (OB)
UBREV	0143	ROOM & BOARD-DELUXE PRIVATE-PEDIATRIC
UBREV	0144	ROOM & BOARD-DELUXE PRIVATE-PSYCHIATRIC
UBREV	0146	ROOM & BOARD-DELUXE PRIVATE-DETOXIFICATION
UBREV	0147	ROOM & BOARD-DELUXE PRIVATE-ONCOLOGY
UBREV	0148	ROOM & BOARD-DELUXE PRIVATE-REHABILITATION
UBREV	0149	ROOM & BOARD-DELUXE PRIVATE-OTHER
UBREV	0150	ROOM & BOARD-WARD-GENERAL CLASSIFICATION
UBREV	0151	ROOM & BOARD-WARD-MEDICAL/SURGICAL/GYN
UBREV	0152	ROOM & BOARD-WARD-OBSTETRICS (OB)
UBREV	0153	ROOM & BOARD-WARD-PEDIATRIC
UBREV	0154	ROOM & BOARD-WARD-PSYCHIATRIC
UBREV	0156	ROOM & BOARD-WARD-DETOXIFICATION
UBREV	0157	ROOM & BOARD-WARD-ONCOLOGY
UBREV	0158	ROOM & BOARD-WARD-REHABILITATION
UBREV	0159	ROOM & BOARD-WARD-OTHER
UBREV	0160	ROOM & BOARD-OTHER-GENERAL CLASSIFICATION
UBREV	0164	ROOM & BOARD-OTHER-STERILE ENVIRONMENT

CODE TYPE	CODE	DESCRIPTION
UBREV	0167	ROOM & BOARD-OTHER-SELF CARE
UBREV	0169	ROOM & BOARD-OTHER-OTHER
UBREV	0170	NURSERY-GENERAL CLASSIFICATION
UBREV	0171	NURSERY-NEWBORN-LEVEL I
UBREV	0172	NURSERY-NEWBORN-LEVEL II
UBREV	0173	NURSERY-NEWBORN-LEVEL III
UBREV	0174	NURSERY-NEWBORN-LEVEL IV
UBREV	0179	NURSERY-OTHER NURSERY
UBREV	0190	SUBACUTE CARE-GENERAL CLASSIFICATION
UBREV	0191	SUBACUTE CARE-SUBACUTE CARE-LEVEL I
UBREV	0192	SUBACUTE CARE-SUBACUTE CARE-LEVEL II
UBREV	0193	SUBACUTE CARE-SUBACUTE CARE-LEVEL III
UBREV	0194	SUBACUTE CARE-SUBACUTE CARE-LEVEL IV
UBREV	0199	SUBACUTE CARE-OTHER SUBACUTE CARE
UBREV	0200	INTENSIVE CARE UNIT-GENERAL CLASSIFICATION
UBREV	0201	INTENSIVE CARE UNIT-SURGICAL
UBREV	0202	INTENSIVE CARE UNIT-MEDICAL
UBREV	0203	INTENSIVE CARE UNIT-PEDIATRIC
UBREV	0204	INTENSIVE CARE UNIT-PSYCHIATRIC
UBREV	0206	INTENSIVE CARE UNIT-INTERMEDIATE ICU
UBREV	0207	INTENSIVE CARE UNIT-BURN CARE
UBREV	0208	INTENSIVE CARE UNIT-TRAUMA
UBREV	0209	INTENSIVE CARE UNIT-OTHER INTENSIVE CARE
UBREV	0210	CORONARY CARE UNIT-GENERAL CLASSIFICATION
UBREV	0211	CORONARY CARE UNIT-MYOCARDIAL INFARCTION
UBREV	0212	CORONARY CARE UNIT-PULMONARY CARE
UBREV	0213	CORONARY CARE UNIT-HEART TRANSPLANT
UBREV	0214	CORONARY CARE UNIT-INTERMEDIATE CCU
UBREV	0219	CORONARY CARE UNIT-OTHER CORONARY CCU
UBREV	1000	BEHAVIORAL HEALTH ACCOMMODATIONS-GENERAL CLASSIFICATION
UBREV	1001	BEHAVIORAL HEALTH ACCOMMODATIONS-RESIDENTIAL-PSYCHIATRIC (TITLE EFFECTIVE 10/1/13)
UBREV	1002	BEHAVIORAL HEALTH ACCOMMODATIONS-RESIDENTIAL-CHEMICAL DEPENDENCY (TITLE EFFECTIVE 10/1/13)

SNF, Non-Acute Hospital Care, and Hospice

Figure 10 includes revenue codes used to identify SNF services for both Medicare beneficiaries and commercially insured members for the Timely Follow-Up After Acute Exacerbations for Chronic Conditions measure.

FIGURE 10. SNF REVENUE CODES

CODE TYPE	CODE	DEFINITION
UBREV	0022	HEALTH INSURANCE-PROSPECTIVE PAYMENT SYSTEM (HIPPS)-SKILLED NURSING FACILITY PPS
UBREV	0524	FREESTANDING CLINIC-VISIT BY RHC/FQHC PRACTITIONER TO A MEMBER IN A SNF OR SKILLED SWING BED IN A COVERED PART A STAY
UBREV	0525	FREESTANDING CLINIC-VISIT BY RHC/FQHC PRACTITIONER TO A MEMBER IN A SNF (NOT IN A COVERED PART A STAY) OR NF OR ICF MR OR OTHER RESIDENTIAL FACILITY
UBREV	0550	SKILLED NURSING-GENERAL CLASSIFICATION
UBREV	0551	SKILLED NURSING-VISIT CHARGE
UBREV	0552	SKILLED NURSING-HOURLY CHARGE
UBREV	0559	SKILLED NURSING-OTHER SKILLED NURSING

Figure 11 includes revenue codes used to identify non-acute hospital care for both Medicare beneficiaries and commercially insured members for the Timely Follow-Up After Acute Exacerbations for Chronic Conditions measure.

FIGURE 11. NON-ACUTE HOSPITAL CARE REVENUE CODES

CODE TYPE	CODE	DEFINITION
UBREV	0024	HEALTH INSURANCE-PROSPECTIVE PAYMENT SYSTEM (HIPPS)/INPATIENT REHAB FACILITY PPS
UBREV	0118	ROOM & BOARD-PRIVATE (ONE BED)-REHABILITATION
UBREV	0128	ROOM & BOARD-SEMI-PRIVATE TWO BEDS-REHABILITATION
UBREV	0138	ROOM & BOARD-SEMI-PRIVATE-THREE AND FOUR BEDS-REHABILITATION
UBREV	0148	ROOM & BOARD-DELUXE PRIVATE-REHABILITATION
UBREV	0158	ROOM & BOARD-WARD-REHABILITATION
UBREV	0190	SUBACUTE CARE-GENERAL CLASSIFICATION
UBREV	0191	SUBACUTE CARE-SUBACUTE CARE-LEVEL I
UBREV	0192	SUBACUTE CARE-SUBACUTE CARE-LEVEL II
UBREV	0193	SUBACUTE CARE-SUBACUTE CARE-LEVEL III
UBREV	0194	SUBACUTE CARE-SUBACUTE CARE-LEVEL IV
UBREV	0199	SUBACUTE CARE-OTHER SUBACUTE CARE
UBREV	0660	RESPIRE CARE-GENERAL CLASSIFICATION
UBREV	0661	RESPIRE CARE-HOURLY CHARGE-NURSING
UBREV	0662	RESPIRE CARE-HOURLY CHARGE-AIDE/HOMEMAKER/COMPANION
UBREV	0663	RESPIRE CARE-DAILY RESPIRE CHARGE
UBREV	0669	RESPIRE CARE-OTHER RESPIRE CARE
UBREV	1000	BEHAVIORAL HEALTH ACCOMMODATIONS-GENERAL CLASSIFICATION
UBREV	1001	BEHAVIORAL HEALTH ACCOMMODATIONS-RESIDENTIAL-PSYCHIATRIC (TITLE EFFECTIVE 10/1/13)
UBREV	1002	BEHAVIORAL HEALTH ACCOMMODATIONS-RESIDENTIAL-CHEMICAL DEPENDENCY (TITLE EFFECTIVE 10/1/13)

Figure 12 includes HCPCS, CPT, and revenue codes used to identify hospice services for both the Medicare beneficiaries and commercially insured members for the Timely Follow-Up After Acute Exacerbations for Chronic Conditions measure.

FIGURE 12. HOSPICE HCPCS, CPT AND REVENUE CODES

CODE TYPE	CODE	DEFINITION
HCPCS	G9473	Services performed by chaplain in the hospice setting, each 15 minutes (G9473)
HCPCS	G9474	Services performed by dietary counselor in the hospice setting, each 15 minutes (G9474)
HCPCS	G9475	Services performed by other counselor in the hospice setting, each 15 minutes (G9475)
HCPCS	G9476	Services performed by volunteer in the hospice setting, each 15 minutes (G9476)
HCPCS	G9477	Services performed by care coordinator in the hospice setting, each 15 minutes (G9477)
HCPCS	G9478	Services performed by other qualified therapist in the hospice setting, each 15 minutes (G9478)
HCPCS	G9479	Services performed by qualified pharmacist in the hospice setting, each 15 minutes (G9479)
HCPCS	Q5003	Hospice care provided in nursing long term care facility (ltc) or non-skilled nursing facility (nf) (Q5003)
HCPCS	Q5004	Hospice care provided in skilled nursing facility (SNF) (Q5004)
HCPCS	Q5005	Hospice care provided in inpatient hospital (Q5005)
HCPCS	Q5006	Hospice care provided in inpatient hospice facility (Q5006)
HCPCS	Q5007	Hospice care provided in long term care facility (Q5007)
HCPCS	Q5008	Hospice care provided in inpatient psychiatric facility (Q5008)
HCPCS	Q5010	Hospice home care provided in a hospice facility (Q5010)
HCPCS	S9126	Hospice care, in the home, per diem (S9126)
HCPCS	T2042	Hospice routine home care; per diem (T2042)
HCPCS	T2043	Hospice continuous home care; per hour (T2043)
HCPCS	T2044	Hospice inpatient respite care; per diem (T2044)
HCPCS	T2045	Hospice general inpatient care; per diem (T2045)
HCPCS	T2046	Hospice long term care, room and board only; per diem (T2046)
UBREV	0115	Private medical or general-hospice
UBREV	0125	Semi-private 2 bed (medical or general)-hospice
UBREV	0135	Semi-private 3 and 4 beds-hospice

CODE TYPE	CODE	DEFINITION
UBREV	0145	Private (deluxe)-hospice
UBREV	0155	Room&Board ward (medical or general)-hospice
UBREV	0235	Incremental Nursing Charge-Hospice
UBREV	0650	Hospice Service-General Classification
UBREV	0651	Hospice Service-Routine Home Care
UBREV	0652	Hospice Service-Continuous Home Care
UBREV	0655	Hospice Service-Inpatient Respite Care
UBREV	0656	Hospice Service-General Inpatient Care Non-Respite
UBREV	0657	Hospice Service-Physician Services
UBREV	0658	Hospice Service-Hospice Room & Board-Nursing Facility
UBREV	0659	Hospice Service-Other Hospice Service
CPT	99377	Hospice care supervision
CPT	99378	Hospice care supervision
HCPCS	G0182	Physician supervision of a patient under a Medicare-approved hospice (patient not present) requiring complex and multidisciplinary care modalities involving regular physician development and/or revision of care plans, review of subsequent reports of patient status, review of laboratory and other studies, communication (including telephone calls) with other healthcare professionals involved in the patient's care, integration of new information into the medical treatment plan, and/or adjustment of medical therapy, within a calendar month, 30 minutes or more (G0182)

Reference

- ¹ Centers for Medicare and Medicaid Services (September 2022). Qualified Entity Program. Available at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Monitoring-Programs/QEMedicareData>
- ² U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Social Determinants of Health. Available at: <https://health.gov/healthypeople/priority-areas/social-determinants-health>
- ³ Robert Graham Center. Social Deprivation Index (ADI). Available at: <https://www.graham-center.org/maps-data-tools/social-deprivation-index.html>
- ⁴ U.S. Census Bureau. American Community Survey (ACS). Available at: <https://www.census.gov/programs-surveys/acs>
- ⁵ U.S. Department of Agriculture. Rural-Urban Commuting Area Codes. Available at: <https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/>
- ⁶ <https://data.cms.gov/provider-characteristics/hospitals-and-other-facilities/provider-of-services-file-hospital-non-hospital-facilities>
- ⁷ Health Resources and Services Administration. Area Health Resources Files. Available at: <https://data.hrsa.gov/topics/health-workforce/ahrf>
- ⁸ U.S. Census Bureau. ZIP Code Tabulation Areas (ZCTAs). Available at: <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html>
- ⁹ U.S. Census Bureau. American Community Survey (ACS).
- ¹⁰ Bridges, K.M. Implicit Bias and Racial Disparities in Health Care. American Bar Association. Available at: https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/the-state-of-healthcare-in-the-united-states/racial-disparities-in-health-care/
- ¹¹ Hoyert, Donna L. (2023). Maternal mortality rates in the United States, 2021.
- ¹² Adler, N.E., & Newman, K. (March/April 2002). Socioeconomic Disparities in Health: Pathways and Policies. *Health Affairs*. Available at: <https://doi.org/10.1377/hlthaff.21.2.60>
- ¹³ Gundersen, C. & Ziliak, J.P. (November 2015). Food Insecurity and Health Outcomes. *Health Affairs*. Available at: <https://www.healthaffairs.org/doi/10.1377/hlthaff.2015.0645>
- ¹⁴ Kushel, M.B., Gupta, R., Gee, L. & Haas, J.S. (2006). Housing instability and food insecurity as barriers to health care among low-income Americans. *Journal of General Internal Medicine*. Available at: <https://link.springer.com/article/10.1111/j.1525-1497.2005.00278.x>
- ¹⁵ Becker Cutts, D., Meyers, A.F., Black, M.M., et al. (October 2011). US Housing Insecurity and the Health of Very Young Children. *American Journal of Public Health*. Available at: <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2011.300139>
- ¹⁶ Meltzer, R. & Schwartz, A (April 2015). Housing Affordability and Health: Evidence From New York City. Available at: <https://www.tandfonline.com/doi/full/10.1080/10511482.2015.1020321>
- ¹⁷ Foiles Sifuentes, A.M., Robledo Comejo, M., Chen Li, N., et al. (December 2020). The Role of Limited English Proficiency and Access to Health Insurance and Health Care in the Affordable Care Act Era. *Health Equity*. 509-517.
- ¹⁸ KFF (December 2022). Health Coverage and Care of Immigrants. Available at: <https://www.kff.org/racial-equity-and-health-policy/fact-sheet/health-coverage-and-care-of-immigrants/>
- ¹⁹ Anderson J. (2014). The impact of family structure on the health of children: Effects of divorce. *The Linacre Quarterly*, 81(4), 378–387. Available at: <https://doi.org/10.1179/0024363914Z.00000000087>
- ²⁰ Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling towards disease: transportation barriers to health care access. *Journal of Community Health*, 38(5), 976–993. Available at: <https://doi.org/10.1007/s10900-013-9681-1>
- ²¹ Turcios, Y (March 2023). Digital Access: A Super Determinant of Health. Substance Abuse and Mental Health Services Administration. Available at: <https://www.samhsa.gov/blog/digital-access-super-determinant-health>
- ²² Rural Health Information Hub. Rural Health Disparities. Available at: <https://www.ruralhealthinfo.org/topics/rural-health-disparities>
- ²³ Centers for Disease Control and Prevention. Climate Effects on Health. Available at: <https://www.cdc.gov/climateandhealth/effects/default.htm>
- ²⁴ World Health Organization (October 2021). Climate Change and Health. Available at: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
- ²⁵ Feeding America. Food Insecurity Among Overall (All Ages) Population in the United States. Available at: <https://map.feedingamerica.org/>
- ²⁶ The data analysis for the MHDRI was generated using SAS software, Version 9.4 of the SAS System for Windows. Copyright © 2002-2012 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.
- ²⁷ SAS Support. Principal Component Analysis. Available at: <https://support.sas.com/publishing/pubcat/chaps/55129.pdf>
- ²⁸ Tavakol, M. & Wetzel, A. Factor Analysis: A Means for Theory and Instrument Development in Support of Construct Validity. *International Journal of Medical Education*. Available at: <https://www.ijme.net/archive/11/factor-analysis/>
- ²⁹ Williams, B., Onsmann, A. & Brown, T. Exploratory Factor Analysis: A Five-Step Guide for Novices. *Paramedicine*. Available at: <https://journals.sagepub.com/doi/10.33151/ajp.8.3.93>
- ³⁰ National Committee for Quality Assurance. Acute Hospital Utilization (AHU). Available at: <https://www.ncqa.org/hedis/measures/acute-hospital-utilization/>
- ³¹ National Committee for Quality Assurance. Emergency Department Utilization (EDU). Available at: <https://www.ncqa.org/hedis/measures/emergency-department-utilization/>

-
- ³² National Committee for Quality Assurance. Plan All-Cause Readmissions (PCR). Available at: <https://www.ncqa.org/hedis/measures/plan-all-cause-readmissions/>
- ³³ Centers for Medicare and Medicaid Services. Archived Measure Methodology. Available at: <https://qualitynet.cms.gov/inpatient/measures/edac/resources#tab2>
- ³⁴ Ibid.
- ³⁵ Ibid.
- ³⁶ IMPAQ International. Timely Follow-up After Acute Exacerbations of Chronic Conditions (NQF# 3455). Available at: <https://www.qualityforum.org/qps/>
- ³⁷ National Committee for Quality Assurance. Follow-Up After Emergency Department Visit for People With High-Risk Multiple Chronic Conditions (FMC). Available at: <https://www.ncqa.org/hedis/measures/follow-up-after-emergency-department-visit-for-people-with-high-risk-multiple-chronic-conditions/>
- ³⁸ National Committee for Quality Assurance. Pharmacotherapy Management of COPD Exacerbation (PCE). Available at: <https://www.ncqa.org/hedis/measures/pharmacotherapy-management-of-copd-exacerbation/>
- ³⁹ National Committee for Quality Assurance. Persistence of Beta-Blocker Treatment After a Heart Attack (PBH). Available at: <https://www.ncqa.org/hedis/measures/persistence-of-beta-blocker-treatment-after-a-heart-attack/>
- ⁴⁰ U.S. Census Bureau. Changes to Counties or County Equivalent Entities: 2010s. Available at: <https://www.census.gov/programs-surveys/geography/technical-documentation/county-changes.2010.html#list-tab-957819518>
- ⁴¹ Robert Graham Center. Social Deprivation Index (SDI).
- ⁴² U.S. Census Bureau. American Community Survey (ACS).
- ⁴³ <https://data.cms.gov/provider-characteristics/hospitals-and-other-facilities/provider-of-services-file-hospital-non-hospital-facilities>
- ⁴⁴ U.S. Census Bureau. American Community Survey (ACS).
- ⁴⁵ Health Resources and Services Administration. Area Health Resources Files.
- ⁴⁶ U.S. Census Bureau. American Community Survey (ACS).
- ⁴⁷ U.S. Department of Agriculture. Rural-Urban Commuting Area Codes.
- ⁴⁸ U.S. Census Bureau. American Community Survey (ACS).



Milliman is among the world's largest providers of actuarial, risk management, and technology solutions. Our consulting and advanced analytics capabilities encompass healthcare, property & casualty insurance, life insurance and financial services, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

[milliman.com](https://www.milliman.com)

CONTACT

Carol Bazell
carol.bazell@milliman.com

Cherie Dodge
cherie.dodge@milliman.com

Harsha Mirchandani
harsha.mirchandani@milliman.com