

Preliminary Medicare COVID-19 Data Snapshot Methodology

Overview

The Medicare COVID-19 Data Snapshot presents information on Medicare beneficiaries who are diagnosed with COVID-19. All data presented in this update are preliminary and will continue to change as the Centers for Medicare & Medicaid Services (CMS) processes additional claims and encounters for the reporting period.

Note: Beginning with the snapshot that covers services between January 1, 2020 and February 20, 2021, we updated our COVID-19 case and hospitalization rates per 100,000 definitions; please see Appendix A and B for additional information.

Methodology

Data Source: Data are sourced from CMS's Integrated Data Repository (IDR) using final action Medicare Fee-for-Service claims data and Medicare Advantage encounter data. Medicare enrollment data and beneficiary characteristics are sourced from CMS's Chronic Conditions Warehouse (CCW).

Medicare Population: Beneficiaries enrolled in Medicare Fee-for-Service (i.e., Original Medicare) or Medicare Advantage at any time since January 1, 2020. For **Medicare COVID-19 hospitalizations**, the population is restricted to beneficiaries covered by hospital insurance (i.e., Part A).

Medicare COVID-19 Cases: A count of Medicare beneficiaries with a diagnosis of COVID-19 on a claim or encounter record for *any* healthcare setting (e.g., physician's office, inpatient hospital, laboratory). The following International Classification of Diseases (ICD), Tenth Revision (ICD-10), principal or secondary diagnosis codes are used to identify COVID-19 cases on claims and encounters:

- From January 1 to March 31, 2020: B97.29 (other coronavirus as the cause of diseases classified elsewhere) and
- From April 1, 2020 to current: U07.1 (2019 Novel Coronavirus, COVID-19).

Medicare beneficiaries are classified by the earliest claim or encounter record with a COVID-19 diagnosis.

Note: The Centers for Disease Control and Prevention (CDC) has published guidance for ICD-10 coding of COVID-19: <https://www.cdc.gov/nchs/data/icd/COVID-19-guidelines-final.pdf>. However, the accuracy of diagnosis codes may be influenced by the information recorded by the clinician (e.g., omitting information or using synonyms or abbreviations to describe a patient's condition), as well as the medical coder (e.g., experience and training can influence precision of coding). As a result, diagnosis information from claims/encounters is considered less reliable than clinical information collected through other methods (e.g., chart reviews). This type of clinical information is generally not necessary for CMS to run its programs, so it is only collected in limited circumstances (e.g., for program integrity purposes).

Medicare COVID-19 Cases per 100,000: The rate of Medicare COVID-19 cases per 100,000 is calculated by taking **Medicare COVID-19 Cases** divided by the average monthly **Medicare Population** during the pandemic period (01/01/2020 through the most recent service date in the latest snapshot), expressed as a rate per 100,000.

Note: In earlier snapshot releases, we calculated COVID-19 Cases per 100,000 using an ever-enrolled denominator – for more details see Appendix A.

Medicare COVID-19 Hospitalizations: A subset of **Medicare COVID-19 Cases** restricted to beneficiaries with an *inpatient* hospitalization claim or encounter record with a primary or secondary diagnosis code of B97.29 (1/1/2020-3/31/2020) or U07.1 (beginning 4/1/2020). These hospitalizations include data for the following hospital settings: Inpatient Prospective Payment System (IPPS), Critical Access Hospitals (CAH), inpatient rehabilitation facilities, long term care facilities and inpatient psychiatric facilities¹. Hospitalizations are based on a beneficiary's first hospitalization episode related to COVID-19.

An inpatient hospital episode represents consecutive days in an inpatient hospital setting including same day transfers to other inpatient facilities. For example, if a beneficiary is admitted to a CAH and then transferred to an IPPS hospital facility, the episode spans both facility inpatient hospitalizations. The inpatient hospital episode concludes with a break in inpatient hospital care.

Medicare COVID-19 Hospitalizations per 100,000: The rate of Medicare COVID-19 hospitalizations per 100,000 is calculated by taking **Medicare COVID-19 Hospitalizations** divided by the average **Medicare Population** with Part A insurance during the pandemic period (beginning 01/01/2020 through most recent monthly reporting), expressed as per 100,000.

Note: In earlier snapshot releases, we calculated COVID-19 Hospitalizations per 100,000 using an ever-enrolled denominator – for more details see Appendix B.

State: The state of the beneficiary is based on mailing address. The snapshot reports the 50 States, the District of Columbia, Puerto Rico, US Virgin Islands, and all other outlying areas of the US aggregated into a "Territories" category. If a beneficiary's state of residence is unknown, the beneficiary is assigned to the "Missing Data" category.

Rural/ Urban: Rural/ Urban status is defined using the Rural Urban Commuting Area Crosswalk (RUCA). The RUCA crosswalk relies on commuting data from the US Census, as well as ZIP Codes. A beneficiary's mailing ZIP code is used to define rural and urban locations. Due to the changing nature of ZIP Code data, there is a small subset of beneficiaries that cannot be classified into a rural area or urban area.

Medicare Entitlement: Medicare entitlement is available to three basic groups of "insured individuals" - the *Aged*, the *Disabled*, and those with *end stage renal disease (ESRD)*. Medicare entitlement can change over time for beneficiaries that were initially entitled to Medicare because of disability or ESRD before the age of 65. For purposes of this reporting, beneficiaries who have ESRD, are Aged with ESRD or are Disabled with ESRD are classified as ESRD; otherwise beneficiaries are classified as Disabled or Aged.

Medicare Eligibility Status: A beneficiary can be eligible for Medicare and/or Medicaid. Beneficiaries enrolled in both Medicare and Medicaid simultaneously are considered *Dual Medicare and Medicaid*. A beneficiary enrolled in Medicare alone is *Medicare Only*. Please note that for beneficiaries enrolled in both Medicare and Medicaid, only claims and encounters covered by Medicare are included in this reporting.

¹ Inpatient settings include Original Medicare (fee-for-service) claims with claim type '60' and Medicare Advantage encounters with claim types '4011' and '4012'.

Age: A beneficiary's age is measured at the end of 2020.

Race/ Ethnicity: In the snapshot, a beneficiary's race/ ethnicity is created by taking the beneficiary race code that has historically been used by the Social Security Administration (and is in turn used in CMS's enrollment database) and applying an algorithm that improves the race/ethnicity classification, particularly for those who are Hispanic or Asian/Pacific Islander. This algorithm, developed by the Research Triangle Institute (RTI) and is thus often referred to as the "RTI race code", uses Census surname lists for Hispanic and Asian/Pacific Islander origin as well as geography². The race/ethnicity classifications are: American Indian/Alaska Native (AI/AN), White, Black/African American, Asian/ Pacific Islander, Hispanic, and Other/Unknown. For more information on the RTI race algorithm, see <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4195038/>.

Beneficiary Sex: A beneficiary's sex is available from the CMS enrollment database and is classified as Male/Female.

Hospitalization Discharge Status: A hospital discharge status reported on claims and encounter records that identifies where the patient is at the conclusion of the beneficiary's first COVID-19 inpatient hospital episode as described above in **Medicare COVID-19 hospitalizations**. Beneficiaries who do not need follow-up care related to the hospitalization are generally discharged to *Home* or other place of residence such as *Assisted Living/Nursing Home*. Some beneficiaries require post-acute care in the form of *Skilled Nursing* or *Home Health* services while other beneficiaries may require more acute care and are transferred to *Another Health Care Facility*. In other cases, a beneficiary *Expires* during the hospitalization or may be terminally ill and is discharged to *Hospice*.

Hospitalization Length of Stay: A hospital length of stay is based on the number of consecutive days in an inpatient episode including same day transfers.

Total Fee-for-Service COVID-19 Hospitalizations: A subset of **Medicare COVID-19 hospitalizations** restricted to Medicare beneficiaries with a *fee-for-service* inpatient hospitalization claim.

Chronic Condition Prevalence Among Fee-for-Service COVID-19 Hospitalized Beneficiaries: Chronic conditions are identified using preliminary Medicare *fee-for-service* administrative claims data through calendar year 2020. Prevalence figures are based on beneficiaries who have a COVID-19 diagnosis on a fee-for-service inpatient claim during the reporting period and who have continuous enrollment in fee-for-service Part A and Part B in 2020. Additional information on chronic condition algorithms can be found [here](#).

Medicare Payments for Fee-for-Service COVID-19 Hospitalizations: Medicare payments represent total payments made by Medicare for **Total Fee-for-Service COVID-19 Hospitalizations**. Beneficiary cost-sharing (i.e. coinsurance and deductible) and third-party payment amounts are not included.

² Eicheldinger, C and Bonito, A. Health Care Financing Review/Spring 2008/Volume 29, Number 3

Appendix A: COVID-19 Case Rates per 100,000: Ever-Enrolled vs. Average Monthly Enrollment

For snapshot releases only covering services that occurred in 2020, we calculated COVID-19 cases per 100,000 using an “ever-enrolled” denominator (i.e., any beneficiary with Part A or B coverage in any month since January 2020). Beginning with the snapshot that covers services between January 1, 2020 and February 20, 2021, we have updated this definition to use average monthly enrollment during the reporting period as the denominator. We made this change to better account for beneficiaries who do not have coverage for the entire study period – primarily beneficiaries who are new to Medicare and deceased beneficiaries. The table below illustrates the differences between using “ever-enrolled” and “average monthly enrollment” when calculating COVID-19 Cases per 100,000.

Comparison of COVID-19 Case Rates per 100,000 Beneficiaries Using an Ever-Enrolled vs. Average Monthly Enrollment Denominator, Services 1/1/2020 – 2/20/2021

Category	Subcategory	Case Rate Using Ever-Enrolled	Case Rate using Average Enrollment	Percent Change
Overall	-	5,830	6,144	5%
Rural/Urban	Rural	6,087	6,414	5%
	Unknown	1,430	1,487	4%
	Urban	5,823	6,138	5%
Age Group	Less than 65	5,995	6,311	5%
	65-74	4,715	5,031	7%
	75-84	6,165	6,314	2%
	85 and over	9,136	9,826	8%
Race	American Indian / Alaska Native	9,098	9,490	4%
	Asian / Pacific Islander	4,023	4,235	5%
	Black / African American	7,207	7,626	6%
	Hispanic	7,985	8,413	5%
	Other/Unknown	4,190	4,418	5%
	White	5,477	5,770	5%
Medicare Status	Aged	5,741	6,047	5%
	Disabled	5,770	6,067	5%
	ESRD	16,847	19,492	16%
Dual Status	Dual Medicare and Medicaid	10,843	11,568	7%
	Medicare Only	4,681	4,919	5%

Appendix B: COVID-19 Hospitalization Rates per 100,000: Ever-Enrolled vs. Average Monthly Enrollment

For snapshot releases only covering services that occurred in 2020, we calculated COVID-19 hospitalizations per 100,000 using an “ever-enrolled” denominator (i.e., any beneficiary with Part A coverage in any month since January 2020). Beginning with the snapshot that covers services between January 1, 2020 and February 20, 2021, we have updated this definition to use average monthly enrollment during the reporting period as the denominator. We made this change to better account for beneficiaries who do not have coverage for the entire study period – primarily beneficiaries who are new to Medicare and deceased beneficiaries. The table below illustrates the differences between using “ever-enrolled” and “average monthly enrollment” when calculating COVID-19 Hospitalizations per 100,000.

Comparison of COVID-19 Hospitalization Rates per 100,000 Beneficiaries Using an Ever-Enrolled vs. Average Monthly Enrollment Denominator, Services 1/1/2020 – 2/20/2021

Category	Subcategory	Hospitalization Rate Using Ever Enrolled	Hospitalization Rate using Average Enrollment	Percent Change
Overall	-	1,607	1,694	5%
Rural/Urban	Rural	1,610	1,696	5%
	Unknown	429	446	4%
	Urban	1,622	1,710	5%
Age Group	Less than 65	1,531	1,612	5%
	65-74	1,107	1,181	7%
	75-84	1,911	1,958	2%
	85 and over	2,898	3,118	8%
Race	American Indian / Alaska Native	3,630	3,785	4%
	Asian / Pacific Islander	1,253	1,322	6%
	Black / African American	2,667	2,821	6%
	Hispanic	2,337	2,463	5%
	Other/Unknown	1,007	1,062	5%
	White	1,387	1,461	5%
Medicare Status	Aged	1,577	1,662	5%
	Disabled	1,381	1,453	5%
	ESRD	8,809	10,191	16%
Dual Status	Dual Medicare and Medicaid	3,189	3,407	7%
	Medicare Only	1,252	1,316	5%

Appendix C: Other Respiratory Infections

For the first 3 months of 2020, the COVID-19 data file includes the count of distinct Medicare beneficiaries each week that have a claim or encounter record for any healthcare setting with the presence of any of the following ICD-10 principal or secondary diagnosis codes and without the presence of B97.29 ICD-10 code.

- J80 Acute respiratory distress syndrome
- J22 Unspecified acute lower respiratory infection
- J988 Other specified respiratory disorders
- J1289 Other viral pneumonia

Note: Other respiratory infections are provided for illustrative purposes only and provide users with information on other respiratory infections occurring during the first three months of 2020. We monitored these codes before the new COVID-19 diagnosis code (U07.1) was available to look for possible COVID-19 diagnoses.

The trend in other respiratory infections for 2020 is consistent with the trend in other respiratory infections in 2019 as shown below in Table 2.

Comparison of Select Other Respiratory Infection Cases by Week, 2019 and 2020

Week	1	2	3	4	5	6	7	8	9	10	11	12	13
2019	14,677	19,993	17,687	16,297	17,150	17,202	16,911	16,654	18,637	16,964	17,438	16,756	16,287
2020	12,245	22,837	19,429	17,916	19,454	18,094	18,238	17,822	19,318	18,379	18,037	16,222	15,392
Ratio 2019 to 2020	1.2	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9	1.0	1.0	1.1