# Estimates of SARS-CoV-2 Hospitalization and Fatality Rates in the Prevaccination Period, United States

## Appendix

## Council of State and Territorial Epidemiologists Case Definitions

The Council of State and Territorial Epidemiologists have updated the case definition for COVID-19 several times in response to new information about the disease, including during the period covered in this manuscript: Interim 20-ID-01 was in effect from April 5 to August 5, 2020, and Interim 20-ID-02 was in effect from August 5, 2020 through the end of the study period.

### Interim-20-ID-01

Clinical Criteria for Coronavirus Disease 2019 (COVID-19): At least two of the following symptoms: fever (measured or subjective), chills, rigors, myalgia, headache, sore throat, new olfactory and taste disorder(s) or at least one of the following symptoms: cough, shortness of breath, or difficulty breathing or severe respiratory illness with at least one of the following: clinical or radiographic evidence of pneumonia, or acute respiratory distress syndrome (ARDS) and no alternative more likely diagnosis. A confirmed case was defined as a case that meets confirmatory laboratory evidence. A probable case met the clinical criteria and epidemiologic linkage without confirmatory testing performed, or had presumptive laboratory evidence and either clinical or epidemiologic criteria, or met vital records criteria with no confirmatory laboratory testing performed. CSTE Position Statement Interim-20-ID-01, approved April 5, 2020. Retrieved from https://ndc.services.cdc.gov/case-definitions/coronavirus-disease-2019-2020/

### Interim-20-ID-02

Clinical criteria for Coronavirus Disease 2019 (COVID-19): In the absence of a more likely diagnosis: At least two of the following symptoms: fever (measured or subjective), chills,

rigors, myalgia, headache, sore throat, nausea or vomiting, diarrhea, fatigue, congestion or runny nose; -or any one of the following symptoms: cough, shortness of breath, difficulty breathing, new olfactory disorder, new taste disorder;-or severe respiratory illness with at least one of the following: clinical or radiographic evidence of pneumonia, acute respiratory distress syndrome (ARDS). A confirmed case was defined as a case that meets confirmatory laboratory illness. A probable case met the clinical criteria and epidemiologic linkage without confirmatory testing performed, or had presumptive laboratory evidence, or met vital records criteria without confirmatory laboratory evidence. CSTE Position Statement Interim-20-ID-02, approved August 5, 2020. Retrieved from: https://ndc.services.cdc.gov/case-definitions/coronavirus-disease-2019-2020-08-05.

**Applicable Federal Law and CDC Policy**

Department of Health and Human Services – 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq. Available from: https://www.hhs.gov/ohrp/sites/default/files/ohrp/policy/ohrpregulations.pdf. Accessed February 4, 2021. CDC Clearance STARS Project ID: 0900f3eb81c82100 and Accession ID: NCEZID-QBHS-1/23/21–82100.

See e.g., 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

**Appendix Table 1.** Comparison of demographic characteristics of 2019 U.S. Census population used to calculate hospitalization and fatality rates with study population subsets

| Characteristic | U.S., 2019 | | State subset used to calculate hospitalization rates including cases for which hospitalization status was not known* | | State subset used to calculate fatality rates including cases for which death status was not known[†] | |
|---|---|---|---|---|---|---|
| Population | 328,239,523 | 100.0% | 83,257,734 | 100.0% | 155,275,086 | 100.0% |
| Sex | | | | | | |
|   Male | 161,657,324 | 49.2% | 41,047,270 | 49.3% | 76,462,054 | 49.2% |
|   Female | 166,582,199 | 50.8% | 42,210,464 | 50.7% | 78,813,032 | 50.8% |
| Age group, y | | | | | | |
|   0 | 3,783,052 | 1.2% | 952,852 | 1.1% | 1,781,198 | 1.1% |
|   1–4 | 15,793,631 | 4.8% | 3,982,853 | 4.8% | 7,401,826 | 4.8% |
|   5–14 | 40,994,163 | 12.5% | 10,360,414 | 12.4% | 19,172,914 | 12.3% |
|   15–24 | 42,687,510 | 13.0% | 10,807,827 | 13.0% | 20,167,049 | 13.0% |
|   25–34 | 45,940,321 | 14.0% | 11,453,532 | 13.8% | 21,860,881 | 14.1% |
|   35–44 | 41,659,144 | 12.7% | 10,401,995 | 12.5% | 19,612,276 | 12.6% |
|   45–54 | 40,874,902 | 12.5% | 10,195,455 | 12.2% | 19,379,663 | 12.5% |
|   55–64 | 42,448,537 | 12.9% | 10,997,770 | 13.2% | 20,234,141 | 13.1% |
|   65–74 | 31,483,433 | 9.6% | 8,301,621 | 10.0% | 14,844,167 | 9.6% |
|   75–84 | 15,969,872 | 4.9% | 4,118,297 | 4.9% | 7,495,300 | 4.8% |
|   85+ | 6,604,958 | 2.0% | 1,685,181 | 2.0% | 3,235,671 | 2.1% |
| Race and ethnicity[‡,§] | | | | | | |
|   White, NH | 200,853,409 | 61.2% | 60,811,268 | 73.0% | 96,230,159 | 62.0% |
|   AA or Black, NH | 43,235,803 | 13.2% | 10,649,508 | 12.8% | 18,388,559 | 11.8% |
|   AI or AN, NH | 2,765,443 | 0.8% | 1,015,877 | 1.2% | 1,262,342 | 0.8% |
|   Asian or PI, NH | 20,819,191 | 6.3% | 3,373,615 | 4.1% | 11,884,296 | 7.7% |
|   Hispanic | 60,565,677 | 18.5% | 7,407,466 | 8.9% | 27,509,730 | 17.7% |
|   Other or Multiple races, NH[‖] | NA | NA | NA | NA | NA | NA |
|   Unknown[‖] | NA | NA | NA | NA | NA | NA |

*Data from 21 jurisdictions that met the study inclusion criteria, CDC line-level surveillance dataset, accessed 03/17/2021, based on responses to the CDC 2019 Novel Coronavirus Case Report Form for May 1 – December 1, 2020. Reports in which no response was provided about hospitalization were excluded.

[†]Data from 22 jurisdictions that met the study inclusion criteria, CDC line-level surveillance dataset, accessed 03/17/2021, based on responses to the CDC 2019 Novel Coronavirus Case Report Form for May 1 – December 1, 2020. Reports in which no response was provided about death were excluded.

[‡]AI or AN, NH = American Indian or Alaska Native, not Hispanic or Latino; Asian or PI, NH = Pacific Islander, not Hispanic or Latino; AA or Black, NH = African American or Black, not Hispanic or Latino; Hispanic = Hispanic; Other or Multiple races, NH = Multiple or other, not Hispanic or Latino; White, NH = White, not Hispanic or Latino. Other or Multiple races category includes not Hispanic or Latino persons whose race was reported as other or for whom more than one race was reported and persons whose record had both a racial designation and "racial information unknown" selected. The Unknown category includes cases who have a known ethnicity of not Hispanic or Latino, but either unknown or missing race; have a known race but either unknown or missing ethnicity; or have both unknown or missing race and unknown or missing ethnicity.

[§]The jurisdictions used for the hospitalization calculation had a smaller percentage of Black, not Hispanic or Latino; Asian or Pacific Islander, not Hispanic or Latino; and Hispanic persons, and a larger percentage of White, not Hispanic or Latino and American Indian or Alaska Native, not Hispanic or Latino persons than the U.S. 2019 population.

[‖] NA = Not available; 2019 U.S. Census does not have Race/Ethnicity data on "Unknown" or "Other or Multiple Races, NH"

**Appendix Table 2.** Demographic description of all reported COVID-19 cases, May 1 - December 1, 2020, United States

| Characteristic | No. cases | % |
|---|---|---|
| Overall | 10,332,323 | 100.0% |
| **Sex** | | |
|     Male | 4,866,732 | 47.1% |
|     Female | 5,356,123 | 51.8% |
|     Other | 209 | 0.0% |
|     Missing [†] | 22,123 | 0.2% |
|     Unknown | 87,136 | 0.8% |
| **Age group, y** | | |
|     0 | 47,101 | 0.5% |
|     1–4 | 144,632 | 1.4% |
|     5–14 | 578,870 | 5.6% |
|     15–24 | 1,864,002 | 18.0% |
|     25–34 | 1,860,091 | 18.0% |
|     35–44 | 1,584,888 | 15.3% |
|     45–54 | 1,515,156 | 14.7% |
|     55–64 | 1,289,692 | 12.5% |
|     65–74 | 761,792 | 7.4% |
|     75–84 | 401,749 | 3.9% |
|     85+ | 238,978 | 2.3% |
|     Missing [†] | 45,372 | 0.4% |
| **Race and ethnicity[‡]** | | |
|     AI or AN, NH | 76,579 | 0.7% |
|     Asian or PI, NH | 183,924 | 1.8% |
|     AA or Black, NH | 701,304 | 6.8% |
|     Hispanic | 1,331,989 | 12.9% |
|     Other or Multiple races, NH | 281,893 | 2.7% |
|     White, NH | 3,202,049 | 31.0% |
|     Unknown | 4,554,585 | 44.1% |
| **Hospitalized [Π]** | | |
|     Yes | 484,436 | 4.7% |
|     No | 4,221,863 | 40.9% |
|     Unknown | 1,373,215 | 13.3% |
|     Missing[†] | 4,252,809 | 41.2% |
| **Hospitalized/Intensive Care Unit[#]** | | |
|     Hospitalized in ICU | 44,847 | 0.4% |
|     Hospitalized, not ICU | 440,365 | 4.3% |
| Not hospitalized | 4,221,087 | 40.9% |
| Unknown/Missing | 5,626,024 | 54.5% |
| **Symptom status** | | |
|     Symptomatic | 4,763,116 | 46.1% |
|     Asymptomatic | 188,924 | 1.8% |
|     Missing[†] | 4,030,090 | 39.0% |
|     Unknown | 1,350,193 | 13.1% |
| **Death** | | |
|     Yes | 175,669 | 1.7% |
|     No | 5,360,160 | 51.9% |
|     Unknown | 1,025,955 | 10.0% |
|     Missing[†] | 3,770,539 | 36.5% |

[†]Missing indicates that the field was left blank.

[‡]AI or AN, NH = American Indian or Alaska Native, not Hispanic or Latino; Asian or PI, NH = Pacific Islander, not Hispanic or Latino; AA or Black, NH = African American or Black, not Hispanic or Latino; Hispanic = Hispanic; Other or Multiple races, NH = Multiple or other, not Hispanic or Latino; White, NH = White, not Hispanic or Latino. Other or Multiple races category includes not Hispanic or Latino persons whose race was reported as other or for whom more than one race was reported and persons whose record had both a racial designation and "racial information unknown" selected. The Unknown category includes cases who have a known ethnicity of not Hispanic or Latino, but either unknown or missing race; have a known race but either unknown or missing ethnicity; or have both unknown or missing race and unknown or missing ethnicity.

[Π] Hospitalized status (yes/no) collected in a separate variable from Hospitalized/ICU and numbers of hospitalized patients may not match.

[#] Known to have been admitted to an intensive care unit. The dataset contained separate variables for "hospitalized" and for "hospitalized in an ICU." The two variables differed in the number not hospitalized and number hospitalized not in an ICU differ by fewer than 800 persons.