Overview of COVID-19

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Epidemiology

Individuals of all ages are at risk of SARS-CoV-2 infection. However, the probability of severe COVID-19 is higher in people aged ≥65 years, those living in nursing homes or long-term care facilities, those who are not vaccinated against COVID-19 or who have poor responses to COVID-19 vaccines, and those with certain chronic medical conditions. Data on comorbid health conditions among patients with COVID-19 indicate that patients with cardiovascular disease, chronic kidney disease, chronic obstructive pulmonary disease, diabetes with complications, neurocognitive disorders, and obesity are at increased risk of severe COVID-19. The risk appears to be higher in patients with multiple comorbid conditions. Other conditions that may lead to a high risk of severe COVID-19 include cancer, cystic fibrosis, immunocompromising conditions, liver disease (especially in patients with cirrhosis), pregnancy, and sickle cell disease. Transplant recipients and people who are taking immunosuppressive medications are also at high risk of severe COVID-19.[1] See Clinical Spectrum of SARS-CoV-2 Infection for a description of the clinical manifestations of SARS-CoV-2 infection and a discussion of the spectrum of disease.

Although COVID-19 vaccination does not eliminate the risk of SARS-CoV-2 infection, vaccination does significantly reduce the risk of COVID-19–related morbidity and mortality, particularly in individuals who are at high risk of progressing to severe disease.[2,3]

Racial and Ethnic Minorities and Other Marginalized Groups

Communities that have been historically marginalized or made socially vulnerable due to a lack of access to health care or an inability to socially isolate are at increased risk of SARS-CoV-2 acquisition, COVID-19–related hospitalization, and death. These communities include racial and ethnic minorities, essential non-health care workers, and some people with disabilities.

Key Considerations

- The COVID-19 Treatment Guidelines Panel recommends that health care providers, health care systems, and payers ensure equitable access to high-quality care and treatment for all patients, regardless of race, ethnic identity, or other minoritized identity or social status **(AIII)**. "Minoritized" refers to social groups that have been deprived of power and status by the dominant culture in society and encompasses not just racial identities but other identities as well, including gender identity and sexual orientation.[4]
- Promoting equitable care for these groups must include considering the full range of medical, demographic, and social factors that may negatively impact health outcomes.
- Clinicians should be aware that pulse oximeters may not accurately detect hypoxemia in people with darker skin pigmentation.[5,6] This may delay treatment and lead to worse clinical outcomes in patients with COVID-19.[7] See Clinical Spectrum of SARS-CoV-2 Infection for more information.
- Supporting equitable access to high-quality care and treatment for all patients is now an imperative for all health care organizations accredited by the Joint Commission, as well as a priority for the Centers for Disease Control and Prevention (CDC) and other public health agencies.

COVID-19–Related Health Outcomes

Historical structural inequities significantly contribute to the health disparities experienced by racial and ethnic minority groups (e.g., Black/African American people, Hispanic people, American Indian/Alaska Native people).[8] Some data have highlighted that select racial and ethnic minority groups experience higher rates of COVID-19, subsequent hospitalization, and death in relation to their share of the total U.S. population. Black/African American people, Hispanic people, and American Indian/Alaska Native people also experience rates of hospitalization that are more than 2 times higher and rates of COVID-19–related death that are approximately 2 times higher than those experienced by White people. The largest disparities were observed among American Indian/Alaska Native people, who experienced a rate of hospitalization almost 3 times higher and a rate of death 2.1 times higher than White people.[9]

The increased risk of severe COVID-19 among racial and ethnic minority groups may be partly attributed to higher rates of comorbid conditions in these populations (e.g., cardiovascular disease, diabetes, chronic kidney disease, hypertension, obesity, pulmonary disease).[9]

Disparities in Access to Care

Members of racial and ethnic minority groups have an increased risk of exposure to COVID-19 and decreased access to care. Large-scale mobility data reveals that people living in lower-income communities were less able to physically isolate during COVID-19 emergency declarations,[10] as members of these communities were frequently unable to work from home.[11] A 2020 study evaluating access to health care resources in New York City found that in areas of the city where the majority of the population was Black/African American and Hispanic, there were higher COVID-19 positivity rates and fewer licensed hospital beds and intensive care unit beds than in areas where the majority of the population was White.[12]

Disparities in Access to COVID-19 Treatments

Data from 41 U.S. health care systems reveal racial and ethnic disparities in the use of anti-SARS-CoV-2 monoclonal antibodies (mAbs) for the treatment of COVID-19.[13] Black/African American patients, Asian patients, and patients of other races were, respectively, 22.4%, 48.3%, and 46.5% less likely to receive anti-SARS-CoV-2 mAbs for the treatment of COVID-19 than White patients.[13,14] Disparities have also been observed in the dispensing rates for ritonavir-boosted nirmatrelvir (Paxlovid) and molnupiravir. One study reported that between April and July 2022, Black/African American patients were prescribed ritonavir-boosted nirmatrelvir 35.8% less often than White patients, and Hispanic patients were prescribed this drug 29.9% less often than White patients.[15] Despite a greater number of dispensing sites in neighborhoods with a higher social vulnerability, oral antivirals were prescribed at a lower rate for patients with COVID-19 who were living in these areas than in those with a lesser degree of social vulnerability.[16] These disparities are not limited to outpatient settings. One retrospective cohort study of veterans hospitalized with COVID-19 reported that Black veterans had lower odds of receiving COVID-19–specific treatments, including systemic steroids, remdesivir, and immunomodulators, than White veterans.[17]

Other Marginalized Groups

Other marginalized groups also experience worse outcomes for COVID-19. Hospitalization rates for COVID-19 among Medicare beneficiaries who were eligible for disability were approximately 50% higher than those among people who were eligible for Medicare based on age alone, and this discrepancy disproportionately affected Black/African American people, Hispanic people, and American Indian/Alaska Native people.[18]

Migrants, refugees, and essential non-health care workers (e.g., food supply, food service, public transportation, and agricultural workers) also have disproportionately high rates of COVID-19 cases and deaths. These high rates can be attributed to overcrowding, an inability to physically isolate, and inadequate access to health care.[19-21]

Given the pervasiveness of disparities in access to care and provision of treatment, it is imperative for clinicians, working with others on the patient care team, to assess the social factors that contribute to access and quality gaps and to strive to provide equitable treatment to all patients. These issues have been identified as a strategic priority by the Joint Commission and the CDC.

SARS-CoV-2 Variants

Like other RNA viruses, SARS-CoV-2 is constantly evolving through random mutations. New mutations can potentially increase or decrease infectiousness and virulence. In addition, mutations can increase the virus' ability to evade adaptive immune responses from previous SARS-CoV-2 infections or vaccination. This viral evolution may increase the risk of reinfection or decrease the efficacy of vaccines.[22] There is evidence that some SARS-CoV-2 variants have reduced susceptibility to plasma from people who were previously infected or immunized, as well as to anti-SARS-CoV-2 mAbs.[23-25]

Since December 2020, the World Health Organization has assigned Greek letter designations to several identified variants. A SARS-CoV-2 variant designated as a variant of concern displays certain characteristics, such as increased transmissibility or virulence. In addition, vaccines and therapeutics may have decreased effectiveness against variants of concern, and the mutations found in these variants may interfere with the targets of diagnostic tests. The variant of interest designation has been used for important variants that are not fully characterized; however, organizations do not use the same variant designations, and they may define their variant designations differently.[26,27]

In September 2021, the CDC added a new designation for variants: variants being monitored. The data on these variants indicate a potential or clear impact on approved or authorized medical countermeasures, or these variants are associated with cases of more severe disease or increased transmission rates. However, these variants are either no longer detected or are circulating at very low levels in the United States; therefore, they do not pose a significant and imminent risk to public health in the United States.

The Omicron variant was designated as a variant of concern in November 2021 and rapidly became the dominant variant across the globe. The Omicron subvariants BA.1, BA.1.1, and BA.2 emerged in early to mid-2022, followed by the subvariants BA.4, BA.5, BQ.1, BQ.1.1, XBB, EG.5, HV.1, and FL.1.5.1. The newer Omicron subvariants are generally more transmissible than previous variants and are not susceptible to any of the anti-SARS-CoV-2 mAbs that were previously authorized for the treatment and prevention of COVID-19.[24,25,28,29]

Data on the emergence, transmission, and clinical relevance of these new variants are rapidly evolving; this is especially true for research on how variants might affect transmission rates, disease progression, vaccine development, and the efficacy of current therapeutics. Because the research on variants is moving quickly and the classification of the different variants may change over time, websites such as the CDC's COVID Data Tracker, CoVariants.org, and the World Health Organization's Tracking SARS-CoV-2 Variants provide regular updates on data for SARS-CoV-2 variants.

References

1. Centers for Disease Control and Prevention. Underlying medical conditions associated with higher risk for severe COVID-19: information for healthcare professionals. 2023. Available at: https://www.cdc.gov/

coronavirus/2019-ncov/hcp/clinical-care/underlyingconditions.html. Accessed November 13, 2023.

2. Link-Gelles R, Weber ZA, Reese SE, et al. Estimates of bivalent mRNA vaccine durability in preventing COVID-19-associated hospitalization and critical illness among adults with and without immunocompromising conditions—VISION Network, September 2022–April 2023. *MMWR Morb Mortal Wkly Rep*. 2023;72(21):579-588. Available at: https://www.ncbi.nlm.nih.gov/pubmed/37227984.
3. Our World in Data. United States: COVID-19 weekly death rate by vaccination status. 2022. Available at: https://ourworldindata.org/grapher/united-states-rates-of-covid-19-deaths-by-vaccination-status-by-vaccine?country=12-17~12~12. Accessed November 13, 2023.
4. American Medical Association. Advancing health equity: a guide to language, narrative and concepts. 2021. Available at: https://ama-assn.org/equity-guide.
5. Valbuena VSM, Seelye S, Sjoding MW, et al. Racial bias and reproducibility in pulse oximetry among medical and surgical inpatients in general care in the Veterans Health Administration 2013–19: multicenter, retrospective cohort study. *BMJ*. 2022;378:e069775. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35793817.
6. Chesley CF, Lane-Fall MB, Panchanadam V, et al. Racial disparities in occult hypoxemia and clinically based mitigation strategies to apply in advance of technological advancements. *Respir Care*. 2022;67(12):1499-1507. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35679133.
7. Fawzy A, Wu TD, Wang K, et al. Racial and ethnic discrepancy in pulse oximetry and delayed identification of treatment eligibility among patients with COVID-19. *JAMA Intern Med*. 2022;182(7):730-738. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35639368.
8. National Academies of Sciences, Engineering, and Medicine. *Communities in Action: Pathways to Health Equity*. 2017. National Academies Press; 2017. Available at: https://www.ncbi.nlm.nih.gov/pubmed/28418632.
9. Mackey K, Ayers CK, Kondo KK, et al. Racial and ethnic disparities in COVID-19-related infections, hospitalizations, and deaths: a systematic review. *Ann Intern Med*. 2021;174(3):362-373. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33253040.
10. Weill JA, Stigler M, Deschenes O, Springborn MR. Social distancing responses to COVID-19 emergency declarations strongly differentiated by income. *Proc Natl Acad Sci U S A*. 2020;117(33):19658-19660. Available at: https://www.ncbi.nlm.nih.gov/pubmed/32727905.
11. Economic Policy Institute. Not everybody can work from home: Black and Hispanic workers are much less likely to be able to telework. 2020. Available at: https://www.epi.org/blog/black-and-hispanic-workers-are-much-less-likely-to-be-able-to-work-from-home. Accessed November 13, 2023.
12. Douglas JA, Subica AM. COVID-19 treatment resource disparities and social disadvantage in New York City. *Prev Med*. 2020;141:106282. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33035550.
13. Wiltz JL, Feehan AK, Molinari NM, et al. Racial and ethnic disparities in receipt of medications for treatment of COVID-19—United States, March 2020–August 2021. *MMWR Morb Mortal Wkly Rep*. 2022;71(3):96-102. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35051133.
14. Wu EL, Kumar RN, Moore WJ, et al. Disparities in COVID-19 monoclonal antibody delivery: a retrospective cohort study. *J Gen Intern Med*. 2022;37(10):2505-2513. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35469360.
15. Boehmer TK, Koumans EH, Skillen EL, et al. Racial and ethnic disparities in outpatient treatment of COVID-19—United States, January–July 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(43):1359-1365. Available at: https://www.ncbi.nlm.nih.gov/pubmed/36301738.
16. Gold JAW, Kelleher J, Magid J, et al. Dispensing of oral antiviral drugs for treatment of COVID-19 by ZIP code-level social vulnerability—United States, December 23, 2021–May 21, 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(25):825-829. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35737571.
17. Castro AD, Mayr FB, Talisa VB, et al. Variation in clinical treatment and outcomes by race among US veterans hospitalized with COVID-19. *JAMA Netw Open*. 2022;5(10):e2238507. Available at: https://www.

ncbi.nlm.nih.gov/pubmed/36282499.

18. Yuan Y, Thierry JM, Bull-Otterson L, et al. COVID-19 cases and hospitalizations among Medicare beneficiaries with and without disabilities—United States, January 1, 2020–November 20, 2021. *MMWR Morb Mortal Wkly Rep*. 2022;71(24):791-796. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35709015.
19. Hayward SE, Deal A, Cheng C, et al. Clinical outcomes and risk factors for COVID-19 among migrant populations in high-income countries: a systematic review. *J Migr Health*. 2021;3:100041. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33903857.
20. Lewnard JA, Mora AM, Nkwocha O, et al. Prevalence and clinical profile of severe acute respiratory syndrome coronavirus 2 infection among farmworkers, California, USA, June–November 2020. *Emerg Infect Dis*. 2021;27(5):1330-1342. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33657340.
21. Heinzerling A, Vergara XP, Gebreegziabher E, et al. COVID-19 outbreaks and mortality among public transportation workers—California, January 2020–May 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(33):1052-1056. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35980867.
22. Walensky RP, Walke HT, Fauci AS. SARS-CoV-2 variants of concern in the United States—challenges and opportunities. *JAMA*. 2021;325(11):1037-1038. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33595644.
23. Wang P, Nair MS, Liu L, et al. Antibody resistance of SARS-CoV-2 variants B.1.351 and B.1.1.7. *Nature*. 2021;593(7857):130-135. Available at: https://www.ncbi.nlm.nih.gov/pubmed/33684923.
24. Cameroni E, Bowen JE, Rosen LE, et al. Broadly neutralizing antibodies overcome SARS-CoV-2 Omicron antigenic shift. *Nature*. 2022;602(7898):664-670. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35016195.
25. Liu L, Iketani S, Guo Y, et al. Striking antibody evasion manifested by the Omicron variant of SARS-CoV-2. *Nature*. 2022;602(7898):676-681. Available at: https://www.ncbi.nlm.nih.gov/pubmed/35016198.
26. World Health Organization. Tracking SARS-CoV-2 variants. 2023. Available at: https://www.who.int/en/activities/tracking-SARS-CoV-2-variants. Accessed November 13, 2023.
27. Centers for Disease Control and Prevention. SARS-CoV-2 variant classifications and definitions. 2023. Available at: https://www.cdc.gov/coronavirus/2019-ncov/variants/variant-classifications.html. Accessed November 13, 2023.
28. Food and Drug Administration. Fact sheet for healthcare providers: Emergency Use Authorization for Evusheld (tixagevimab co-packaged with cilgavimab). 2023. Available at: https://www.fda.gov/media/154701/download.
29. Food and Drug Administration. Fact sheet for healthcare providers: Emergency Use Authorization for bebtelovimab. 2022. Available at: https://www.fda.gov/media/156152/download.