COVID-19 and the US Criminal Justice System: Evidence for Public Health Measures to Reduce Risk

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JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

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Authors from the Johns Hopkins Center for Health Security and the Johns Hopkins Bloomberg School of Public Health Department of Environmental Health and Engineering

Crystal Watson, DrPH, MPH, Senior Scholar, Johns Hopkins Center for Health Security, and Assistant Professor, Department of Environmental Health and Engineering

Kelsey Lane Warmbrod, MS, MPH, Analyst, Johns Hopkins Center for Health Security, and Research Associate, Department of Environmental Health and Engineering

Rachel A. Vahey, MHS, Analyst, Johns Hopkins Center for Health Security, and Research Associate, Department of Environmental Health and Engineering

Anita Cicero, JD, Deputy Director, Johns Hopkins Center for Health Security, and Senior Scientist, Department of Environmental Health and Engineering

Thomas V. Inglesby, MD, Director, Johns Hopkins Center for Health Security, and Professor, Department of Environmental Health and Engineering

Authors from the Center for Public Health and Human Rights, Johns Hopkins Bloomberg School of Public Health, and Johns Hopkins School of Medicine

Chris Beyrer, MD, MPH, Desmond M. Tutu Professor in Public Health and Human Rights and Director, Center for Public Health and Human Rights at the Johns Hopkins Bloomberg School of Public Health

Leonard Rubenstein, JD, LLM, Professor of the Practice, Center for Public Health and Human Rights at the Johns Hopkins Bloomberg School of Public Health

Gabriel Eber, JD, MPH, Senior Associate, Center for Public Health and Human Rights at the Johns Hopkins Bloomberg School of Public Health

Carolyn Sufrin, MD, PhD, Assistant Professor of Gynecology and Obstetrics, Johns Hopkins School of Medicine and Center for Public Health and Human Rights at the Johns Hopkins Bloomberg School of Public Health

Henri Garrison-Desany, PhD student, Johns Hopkins Bloomberg School of Public Health

Lauren Dayton, PhD student, Johns Hopkins Bloomberg School of Public Health

Rachel Strodel, medical student, Johns Hopkins School of Medicine

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Introduction

Since its recognition as a pandemic in early 2020, novel coronavirus disease 2019 (COVID-19) has touched nearly every corner of US society. However, some populations and environments have been affected far more severely than others. Vulnerable populations—especially those subject to structural racism, discrimination due to disability, and financial insecurity—tend also to be particularly susceptible to the economic consequences of and severe disease and death from COVID-19. In addition, the institutions, industries, and systems that are fundamentally important to our lives and our democracy have, in some cases, become places where severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spreads readily if allowed to gain a foothold. In these places, it can be difficult to prevent the introduction of the virus or control the spread of SARS-CoV-2 once it is introduced.

The US criminal justice system is highly susceptible to the spread of COVID-19 because of the structure of carceral facilities, which propagates the spread of respiratory infections, and the comorbidities of many incarcerated individuals. The criminal justice system in the United States is not unique in its vulnerability to COVID-19; other systems and industries—like nursing homes and long-term care facilities, manufacturing and meat processing facilities, and dormitories—are similarly affected. However, many factors converge in the criminal justice system that make viral transmission both more possible and, in some cases, more dangerous than in many other environments.

This report, from scholars at the Johns Hopkins Bloomberg School of Public Health and the Johns Hopkins School of Medicine, is intended to summarize the current state and future projections of the COVID-19 pandemic in the United States, detail the impact that the pandemic has already had on the US criminal justice system, and provide evidence-based recommendations on how to reduce COVID-19 risks to people in the system. This document was requested by the National Commission on COVID-19 and the Criminal Justice System to inform their discussion and deliberation on this topic.

Background on SARS-CoV-2, COVID-19, and the Current State of the Pandemic

The SARS-CoV-2 novel coronavirus is an enveloped RNA virus that shares about 80% of the gene sequence of SARS-CoV, which caused the 2002-2003 SARS outbreak.[1] The coronavirus family of viruses can infect both humans and other vertebrate animals. SARS-CoV-2 is approximately 96% similar genetically to the bat coronavirus BatCoV RaTG13.[2]

COVID-19 is the disease that results from infection with SARS-CoV-2. As of October 7, 2020, there were over 35.8 million confirmed cases of COVID-19 and more than 1 million deaths globally.[3] Due to asymptomatic cases, lack of access to testing and medical care, and false-negative tests, it is likely that the true number of cases

and deaths from COVID-19 is far greater than is being reported. From its series of seroprevalence studies across the United States, the US Centers for Disease Control and Prevention (CDC) estimates that actual infections could be 6 to 24 times higher than the number of cases detected and reported, depending on location in the country.[4] The CDC estimates suggest that there may be more than 75,000 excess deaths in 2020 thus far that are not accounted for in COVID-19 reporting. It is likely that a vast majority of those excess deaths are COVID-19 cases that were undiagnosed because of lack of testing or access to medical care.[5]

The United States remains the nation with the greatest number of confirmed COVID-19 cases, with almost 750,000 more cases than India and about 1.5 times the number in Brazil, the countries with the second and third most confirmed cases in the world, respectively.[3,6] There are similar trends in the number of deaths globally, with the United States leading the world in overall number of deaths.[3,6] Increases in deaths lag behind spikes in cases because some patients with COVID-19 spend extended periods in hospitals before succumbing to the disease.

Viral Transmission

SARS-CoV-2 is transmitted through direct or indirect contact with people already infected with the virus.[7] Respiratory droplets from the nose and mouth are thought to be the primary mode of transmission of SARS-CoV-2, although the CDC acknowledges that a single person may expel both droplets and smaller aerosols. These droplets spread virus from person to person through talking, coughing, and sneezing. Those in close contact with infected people can be directly infected when secretions enter the mouth, nose, or eyes, or they can be indirectly infected by touching objects or surfaces that the droplets may have landed on, then touching their mouth, nose, or eyes (fomite transmission).[7] Respiratory droplets fall quickly to the ground after they are expelled, typically within 3 feet (1 meter). Physical distancing guidance is based on this mode of transmission. The United States has adopted 6 feet of distance as a more conservative standard,[8] while some other parts of the world recommend 3 feet (1 meter).[9]

Aerosols are smaller respiratory secretions that can be suspended in the air and travel longer distances. The World Health Organization (WHO) estimates that while a majority of transmission occurs due to respiratory droplets, aerosols may be the source of transmission in some cases.[7] Aerosol spread has been hypothesized to be the cause of several super-spreading transmission events, such as choir practices, exercise classes, and restaurants and bars. Enclosed, poorly ventilated, small or densely populated environments in which people are concentrated, such as restaurants, bars, nightclubs, places of work or worship, nursing homes, office and school buildings, outdoor events without physical distancing or mask use, and carceral facilities, increase the risk of transmission generally.[7]

Researchers have shown that activities like speaking and coughing produce a mixture of respiratory droplets and aerosols, which makes the relative contribution of these modes

of transmission difficult to decipher.[10] The moist, warm air expelled from exhalations, like coughing and sneezing, allows droplets to evade evaporation longer than aerosols, thus expanding their lifetime and transmission potential.[10] Investigation of outbreak clusters in crowded indoor gatherings suggest that a combination of short-range aerosol transmission, respiratory droplets, and fomite transmission may play a role in these large transmission events. However, transmission via respiratory droplets is considered to be the primary route of transmission and believed to occur much more commonly than either fomite9 or aerosol transmission. The CDC recommends cleaning high-touch surfaces to reduce risk from fomite transmission and disinfecting indoor spaces where infectious people have spent time.[11] However, physical distancing, use of masks, and frequent handwashing with proper technique or use of alcohol-based sanitizers can help reduce the risk of transmission from each of these transmission modes.

Infected people who do not exhibit symptoms of COVID-19 can still spread the virus. Asymptomatic cases are not routinely tested, so the prevalence of asymptomatic infection and transmission remains unknown. However, the CDC currently estimates that 40% of COVID-19 cases are asymptomatic and that asymptomatic individuals are 75% as infectious as symptomatic individuals.[12] Early data indicated that the time between the development of symptoms of a case and the development of symptoms in a contact of that case (or the serial interval) was shorter than the incubation period (time between infection and development of symptoms in a case), indicating transmission was occurring before symptom onset.[12,13] The percent of infections attributed to presymptomatic spread ranges in the literature from about 6% in closely studied, small groups of infectee pairs to 80% in larger studies.[13-20] The reported mean time of peak infectiousness similarly ranges across studies from approximately 2 days before symptom onset to around 1.5 days following symptom onset.[18,20-23] For practical purposes, given that there are substantial numbers of asymptomatic persons who could spread the virus and that symptomatic people are contagious for as long as 2 days before their first symptoms present, it is important to presume that anyone who a person comes into close contact with is potentially contagious with SARS-CoV-2.

The risk of transmission is higher in indoor environments, particularly for those who are enclosed in a space with little opportunity for physical distancing. WHO recommends avoiding indoor gatherings when possible or using spaces with good ventilation.[24] The mechanics of indoor transmission are the subject of current research, including studies related to the role of ventilation/air circulation and relative humidity in disease transmission. Enclosed, poorly ventilated spaces with recirculating air are considered to be higher risk environments for SARS-CoV-2 transmission.[25] What this means in practical terms is that, as much as is possible, activities should be held outside where the risk of transmission is lower and should maintain appropriate physical distancing and mask-wearing protocols.

Optimum relative humidity for indoor spaces to reduce the risk of aerosol transmission of SARS-CoV-2 ranges from 40% to 60%.[26] Relative humidity below 40% creates a dry-air environment that may support longer range transmission of aerosol droplets.

Immunity

The durability and duration of immunity that occurs following infection is still unknown. Studies suggest that individuals who previously had severe cases of COVID-19 have a stronger and longer-lasting immunity to SARS-CoV-2 infection than individuals with milder illness. Current research suggests that COVID-19 immunity will last at least 3 months in most cases.[27,28] Other coronavirus infections, such as OC43 and HKU1, are not necessarily associated with long-lasting immunity, with reinfections possible.[29] Some, but not all people infected with SARS-CoV-1 and MERS-CoV have lasting immunity.[30,31]

Spectrum of Illness and Risk Factors for Severe Disease

The spectrum of illness for COVID-19 ranges from asymptomatic infection to severe pneumonia with acute respiratory distress syndrome and death, with a majority of cases classified as mild or moderate. In a cohort of more than 72,000 symptomatic cases, 81% of cases were reported to be mild/moderate, 14% were severe, and 5% were critical; critical cases included respiratory failure, septic shock, and/or multiple organ dysfunction or failure.[32] Mild/moderate cases generally do not need to seek medical care and can self-isolate at home to monitor symptoms. Hospitalized patients who clinically progress beyond the need for supplemental oxygen and fluid administration may require mechanical ventilation support.

COVID-19 is mainly characterized by, but is not limited to, symptoms such as fever, cough, shortness of breath or difficulty breathing, fatigue, runny nose, loss of taste or smell, headaches, sore throat, abdominal pain, diarrhea, and a reddish purple rash on the feet known as "COVID toe." A US report on more than 370,000 cases showed that about 70% of patients experienced fever, cough, or shortness of breath; 36% reported muscle aches; and 34% reported headaches.[33] Symptoms may appear between 2 and 14 days after exposure (average of 4 to 5 days), although asymptomatic infection is possible.

Age and underlying medical conditions, such as heart and lung disease and diabetes, are significant factors in severity of illness and likelihood of complications and/or death.[34] The risk of severe disease and death increases with age, with the highest risk for individuals aged 65 years or older. An analysis published in CDC's *Morbidity and Mortality Weekly Report* found that, overall, 47% of US adults are at increased risk of severe COVID-19 because of underlying health conditions.[35] In an analysis of 1.3 million US lab-confirmed cases between January and May 2020, the percentage of patients who died was 12 times higher and the proportion hospitalized was 6 times higher for those who reported underlying medical conditions compared to those who did not report medical conditions.[33]

COVID-19 epidemiological data from across the United States also demonstrates disparities in incidence and severity of outcomes among racial, ethnic, and socioeconomic groups. Latinx people have hospitalization rates that are 4 times higher

for COVID-19 than their white counterparts, while Black, Native American, and Alaska Native people have hospitalization rates that are 5 times higher than white people in the United States.[36] Mortality rates are also higher in nonwhite communities, especially in cities like Chicago and New York City, where there is more diversity and a smaller white population.[37,38] However, racial disparities in morbidity and mortality between white and nonwhite individuals are also seen in rural areas.[39,40]

Several potential contributing factors have led to higher rates of nonwhite individuals hospitalized for COVID-19, including higher rates of underlying conditions that contribute to more severe disease and social factors that contribute not only to increased risk of COVID-19 transmission but also to underlying health conditions.[41-45] Obesity, diabetes, and cardiovascular disease are all risk factors for severe disease, and these conditions disproportionately affect Black, Latinx, Indigenous, and migrant populations.[46-48] Systemic racism and social inequalities contribute to conditions that precipitate these underlying health conditions and increase the risk of exposure to COVID-19. Minority and marginalized populations are more likely to fill essential jobs that require them to leave their homes for work, and, in many cases, these workers lack access to sufficient personal protective equipment (PPE), increasing their risk of exposure.[49,50] These jobs also typically offer less flexibility to take time off for illness, so sick individuals are more likely to go to work while symptomatic to avoid losing income.[42]

Minority populations are also more likely to experience homelessness, unstable, low-quality, or densely populated housing, all of which increase the risk for COVID-19 transmission.[42,46] People of color have, on average, less access to healthcare compared to white people for a variety of reasons, including lack of insurance coverage or underinsurance, lack of access to childcare and/or transportation, and inability to take time off work. Mistrust of the healthcare system, concerns about immigration status, language barriers, and closure or underfunding of healthcare facilities that primarily serve minority populations also contribute to decreased healthcare access, which may cause sick individuals to not receive care in a timely manner, thus increasing the likelihood of more severe outcomes.[42,45,51-53] Finally, it is clear that higher income and education levels are associated with a lower risk of severe outcomes and death from COVID-19.[39,43,54] The disparities described above not only increase COVID-19 risk for people of color generally, but they also increase the likelihood of people of color being incarcerated or arrested, thus compounding the risk of morbidity or mortality from COVID-19.[45,55,56]

Future Pandemic Trends

There is significant uncertainty regarding how the COVID-19 pandemic will unfold over the next 3 to 12 months. Currently, we see varied levels of viral transmission across the country and the world. In some countries, like New Zealand, transmission has been reduced to such a level that the virus has been virtually eliminated from the local population.[57] In other countries, like France, transmission has been occurring at a low but still ongoing level, with periodic outbreaks that emerge and are then quenched through a suite of rapid public health interventions. In still other countries, like the United States, efforts to slow viral spread through stay-at-home orders and business closures were initially undertaken, which improved the trajectory of the outbreak but did not bring it under control. US cases have resurged to much higher levels over the past few months, because as economic activity has resumed, viral transmission too has increased, and epidemics have accelerated.[3] Figure 1 and Figure 2 show the trends in daily case and death reporting in the United States over time.

Figure 1. Confirmed COVID-19 Cases in the United States by Day and 5-Day Moving Average, as of October 11, 2020

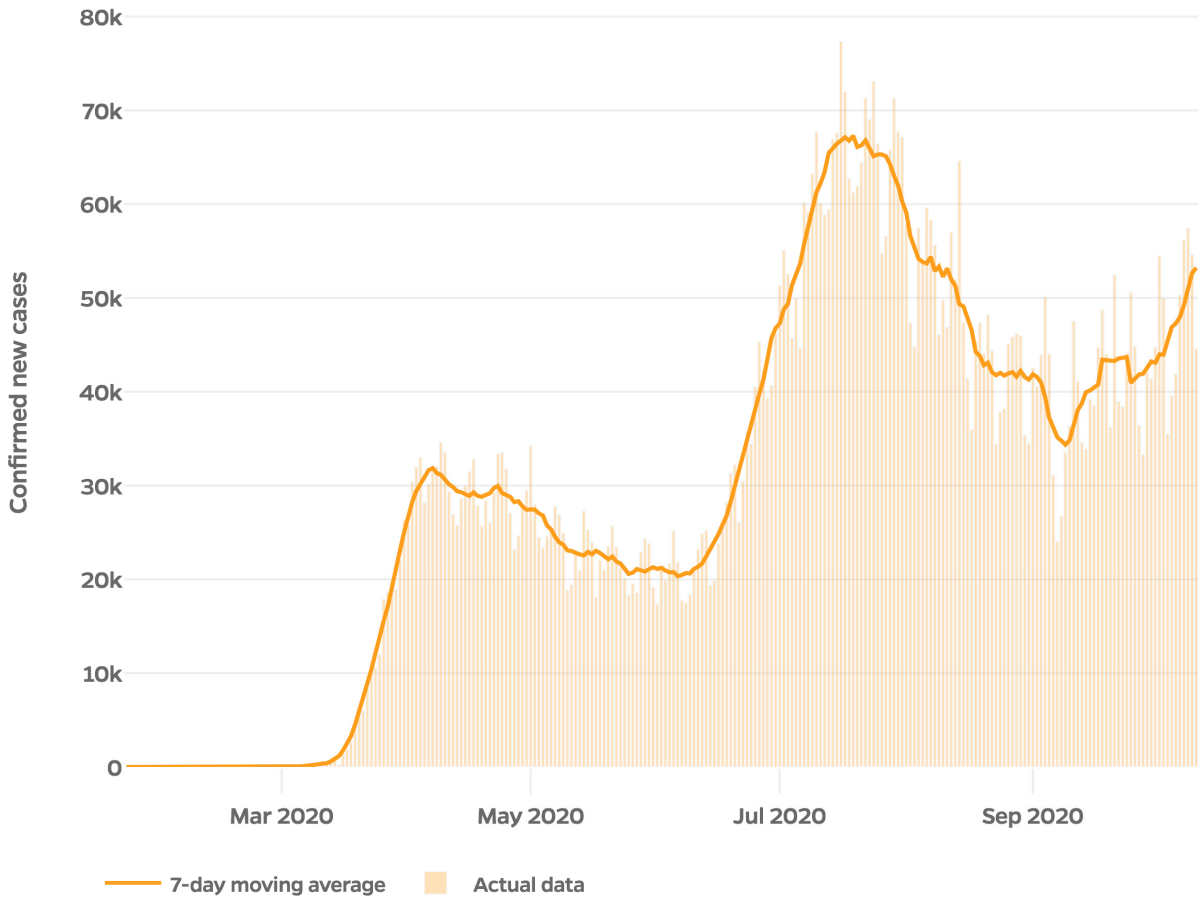
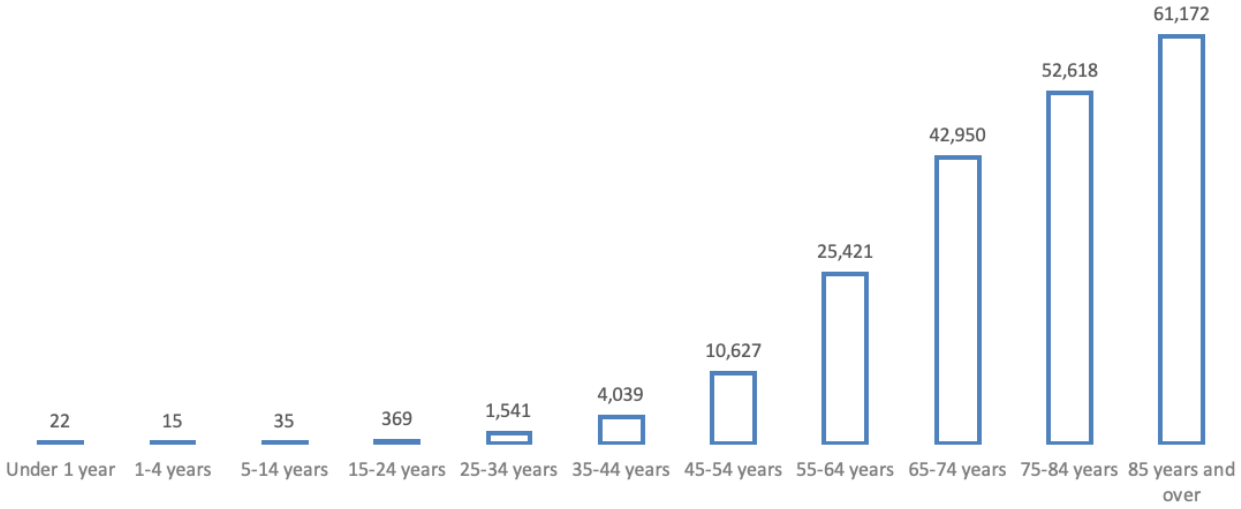


Image from Johns Hopkins Coronavirus Resource Center: https://coronavirus.jhu.edu/data/new-cases

Figure 2. Reported US COVID-19 Deaths by Age Group, as of October 11, 2020



Data Source: US CDC Provisional COVID-19 Death Counts
https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Sex-Age-and-S/9bhg-hcku/data

The future of the COVID-19 pandemic depends heavily on the willingness of political leaders at the national and subnational levels to control transmission through a series of interventions. This will require a combination of population-level social distancing interventions, including business closures and stay-at-home orders, and public health measures to identify cases through rigorous testing, isolation of cases, contact tracing, and quarantine of contacts of cases to break chains of transmission. Control of this pandemic will also depend on the adherence of the population to public health measures like masking and physical distancing.

Of the 15 major models that are regularly updated to forecast COVID-19 deaths, the Los Alamos model is the most optimistic, forecasting that there will have been about 230,000 COVID deaths in the United States by November 14.[58] The IHME model is the most pessimistic, forecasting that there will have been about 255,000 deaths by November 14.[58] Using those 2 models suggests that there would be from 16,000 to 41,000 more deaths over the next 4 weeks. While these models provide short-term predictions, there are no reliable models that tell us what will happen many months from now.

Current State of the Science for Prevention and Treatment

Prevention

Masking

The public health benefits of correct and consistent mask wearing (facial covering) by the general public to reduce onward transmission of respiratory pathogens, including the SARS-CoV-2 virus, are becoming better understood. In this pandemic, mask wearing has been widely recommended for the purpose of protecting others from infection if an individual has COVID-19, whether the individual is symptomatic or asymptomatic.

Until recently, data have been less available on the benefits of cloth mask wearing for the general public. Data from animal, epidemiologic, and ecologic studies consistently show that the most commonly used masks (eg, cloth face coverings, surgical masks) provide some but not full protection from infection, given a SARS-CoV-2 exposure. These data do show that lowering the number of viral particles in an exposure (the inoculum or dose of exposure) via mask use can reduce the severity of disease if COVID-19 is acquired.[59]

In an animal study using hamsters and mask material partitions between infected and uninfected animals, those animals that were infected by COVID-19, but protected by mask materials, had significantly milder symptoms of infection. Recent epidemiologic data from cruise ship exposures and hair salons found that when universal mask wearing was mandated, people were far more likely to develop asymptomatic infection, compared to symptomatic disease, with asymptomatic rates of rates of over 80%. In contrast, on the Diamond Princess Cruise Ship, where mask wearing was mandated much later in the outbreak, only 18% of those exposed had asymptomatic infection. Finally, ecologic data from a number of countries where mask wearing rates have been high and/or mandated, including the Czech Republic, Hong Kong, Japan, Singapore, South Korea, Taiwan, and Thailand, have consistently reported low case fatality rates from COVID-19. This has held true even as several of these countries have seen more recent spikes in infections. Taken together, the evidence suggests that the level of COVID-19 exposure plays a crucial role in whether an exposure leads to asymptomatic infection, mild disease, more serious disease, or death. Correct and consistent mask wearing both reduces onward transmission and protects the wearer from larger dose exposures. Since we know that the great majority of SARS-CoV-2 infections are acquired indoors and in congregate settings, cloth mask wearing should be vigorously promoted (or better, mandated) whenever groups gather.[59]

In addition to the substantial evidence showing the benefit to the general public of wearing cloth masks, there is also evidence that surgical masks provide even greater protection to the wearer,[60] which is why surgical masks are worn by healthcare workers when they are not wearing the even more protective N95 masks. Given the shortages of masks in the United States during the early months of the COVID-19 pandemic, surgical

masks were largely reserved for those working in healthcare settings, given the critical importance of protecting healthcare staff from contracting COVID-19. However, should the national surgical mask supply be sufficient to cover all healthcare staff and other groups of people at high risk, incarcerated individuals and prison staff should be among the priority groups to receive those masks. A recent National Academies of Sciences, Engineering, and Medicine report on schools and COVID-19 similarly recommended that teachers be supplied surgical masks due to the high level of risk of transmission within schools.[61]

Vaccines

Vaccines are the best way to prevent COVID-19. While no vaccines have yet demonstrated adequate safety and efficacy, an unprecedented global development effort is underway to find a viable vaccine. According to WHO, 151 SARS-CoV-2 vaccine candidates are currently in preclinical evaluation and 42 in clinical trials.[62] In addition, the US government has initiated its own rapid research and development effort, named Operation Warp Speed. Operation Warp Speed is funding the rapid development of several candidate vaccines and has a stated goal of providing 300 million doses of vaccine by January 2021.[63] While it is difficult to predict whether any of its candidate vaccines will translate into products that are either licensed or authorized for use, some experts expect that a limited number of vaccines will begin to become available in the winter of 2020 and that that supply will subsequently scale up.

It is anticipated that if and when a safe and effective vaccine is approved, the number of doses will initially be limited. Because of this scarcity, the US government will need to develop an allocation strategy to determine which populations will be prioritized for immunization. This strategy will be based on a CDC pandemic influenza allocation strategy. The National Academies of Sciences, Engineering, and Medicine has been asked by the National Institutes of Health and the CDC to provide rapid, expert input into the allocation of an eventual COVID-19 vaccine.[64] Similarly, researchers at the Johns Hopkins Center for Health Security and the Johns Hopkins Berman Institute of Bioethics have issued a report intended to guide the vaccine allocation process.[65] Ultimately, the optimal strategy will depend on the characteristics of the vaccine(s) available for use and the COVID-19 pandemic's epidemiology at that point.

While it is currently unclear how the US government will prioritize inmates and institutional staff in its COVID-19 vaccine allocation strategy, in the interest of protecting those at high risk of exposure and infection, incarcerated individuals and prison workers should receive high priority, given the risks incurred by congregate living within the prison system.

Coronavirus Testing

Diagnostic testing for COVID-19 is a rapidly evolving field. The US Food and Drug Administration has issued 278 Emergency Use Authorizations for tests used in

diagnosis and recognition of SARS-CoV-2 infection; these include 217 molecular tests (eg, reverse transcription polymerase chain reaction [RT-PCR]), 55 antibody tests, and 6 antigen tests.[66] An Emergency Use Authorization allows for the use of an unlicensed, developmental countermeasure (or diagnostic test) for which sufficient safety and efficacy data exist to support a regulatory designation.

Molecular-based tests can diagnose active infections by detecting genetic material or unique markers of SARS-CoV-2 through testing of nasopharyngeal or oropharyngeal specimens. Molecular-based tests are relied on as the most accurate type of test for SARS-CoV-2 infection. However, these tests are still not 100% accurate, and their accuracy depends on the timing of testing. These tests also take time to run, and results may not be available for 24 hours or more depending on the throughput of the laboratory running the test.[67]

Antigen tests can diagnose active infections by detecting viral proteins. These tests are less expensive and faster than RT-PCR tests; they can be used at point of care and provide results in about 15 minutes. However, antigen tests are generally less accurate than molecular-based tests and may result in higher numbers of both false negatives and false positives. Antigen tests are indicated more for screening of asymptomatic individuals, and the CDC urges confirmatory testing using molecular-based diagnostics if an antigen test has a positive result. CDC guidance states that "rapid antigen tests can be used for screening testing in high-risk congregate settings in which repeat testing could quickly identify persons with a SARS-CoV-2 infection to inform infection prevention and control measures, thus preventing transmission throughout the congregate setting."[68] In this type of setting, providing immediate results and frequent repeat testing may make antigen tests more useful than RT-PCR even if antigen tests are less accurate.

Serology/antibody tests detect antibodies that are produced by our immune systems in response to SARS-CoV-2 infection. Antibody tests cannot reliably diagnose a current infection, but they can detect a past infection.[69] Antibody tests can be used to understand history of infection for an individual and how many people may have been recently infected in a community. While there is still uncertainty regarding what the presence of antibodies means for immunity, the emerging consensus is that antibodies are a good indication of at least temporary immunity for most people.[32]

Intensive Care

Since the beginning of the COVID-19 pandemic, clinical management of suspected or confirmed cases has been primarily supportive in nature, potentially including the provision of oxygen by either traditional means or with the use of high-flow nasal cannulas. For patients who become critically ill, mechanical ventilation, including the use of prone positioning, and extracorporeal membrane oxygenation (ECMO) may be indicated.[69] Factors that increase the risk of intensive care unit (ICU) admission include advanced age, male sex, and the presence of comorbidities.[70] Importantly, as the

pandemic has progressed, the global mortality rate for patients in an ICU has decreased from over 50% to about 40%, indicating an increasing ability to successfully manage the sickest patients.[71] However, in areas with low ICU capacity overall, these important services may not be available. A study published in June estimates more than 300 counties will experience the use of more than 90% ICU capacity during the pandemic.[72]

Treatment

The development of COVID-19 medical countermeasures has progressed rapidly and may be helpful in reducing severe illness and deaths in the future. As of October 8, 2020, 318 treatments were in development at various stages.[73] On May 1, 2020, the US Food and Drug Administration granted the first Emergency Use Authorization for a COVID-19 treatment for remdesivir, an antiviral that targets SARS- CoV-2 and inhibits viral synthesis.[74] On July 1, the Department of Health and Human Services announced that it had contracted to purchase 500,000 doses of remdesivir.[75] The National Institutes of Health *Coronavirus Disease 2019 (COVID-19) Treatment Guidelines*[76] includes differing care recommendations that depend on patient status and presence or possibility of complications, with each assigned a rating based on strength of the recommendation and strength of supporting evidence. In addition to hemodynamic and ventilatory support, pharmacological interventions—including remdesivir, dexamethasone, and glucocorticoids, subject to patient-specific criteria—are recommended that have improved patient outcomes.

COVID-19 Impact on the Criminal Justice System

COVID-19 has disproportionately affected people who are incarcerated or detained in the United States. As of June 6, 2020, the COVID-19 case rate in prisons was 5.5 times higher and the age-adjusted death rate was 3 times higher than that of the overall US population.[77] COVID-19 outbreaks are also growing faster in carceral facilities: The average daily growth rate of cases between March 1, 2020, and June 6, 2020, was 8.3% in prisons compared to 3.4% in the general US population.[77] A modeling study of Immigration and Customs Enforcement detention centers predicts that once SARS-CoV-2 enters a detention facility, 72% to 100% of individuals housed in that facility will be infected within 3 months.[78]

People who are incarcerated often experience poor health, and many of the health conditions they face place them at high risk of COVID-19 complications and death. The prevalence of chronic health conditions for individuals in prisons and jails is 24.5% to 42.8% higher than in the general population.[79-82] This is, in part, due to the racial and ethnic disparities that are magnified in the criminal justice system. People of color are more likely to have the comorbidities mentioned above and are also much more likely to be incarcerated than white individuals.[83] Incarcerated populations are also at increased risk for acquiring other transmissible diseases, including HIV, tuberculosis, hepatitis C, and methicillin-resistant *Staphylococcus aureus* (MRSA).[84]

In addition to their high burden of comorbidities, people behind bars are also increasingly vulnerable to COVID-19 due to aging. Although incarcerated people are often younger than the general population, older incarcerated individuals represent the fastest-growing demographic in the US prison system. By 2030, over one-third of the prison population is projected to be 55 years old or older.[85]

According to the Marshall Project, which has been tracking COVID-19 cases in incarcerated individuals, there have been at least 143,243 prisoners who have tested positive for COVID-19 and 1,211 deaths as of October 6, 2020.[86] More than 31,249 prison staff have tested positive, and 85 have died. The top 10 largest clusters of COVID-19 cases in the United States have been in prisons, jails, or correctional facilities,[6] and those clusters do not only affect carceral facilities. They can also have a significant impact on incidence in surrounding communities. One study from Chicago's Cook County Jail, suggests that as of April 19, about 15.9% of all cases in Chicago were associated with cycling through Cook county jail alone.[87]

The Bureau of Prisons reported as of August that because of the risks related to COVID-19, more than 7,000 inmates have been moved to home confinement for the COVID-19 pandemic.[88] In the early months of the pandemic, some correctional facilities delayed reporting COVID-19 cases in their populations.[89] These delays in both recognizing and reporting the disease likely led to uncontrolled spread, as public health officials were unable to appropriately respond and early interventions were not implemented.

Several US facilities have gone into lockdown during the pandemic in an attempt to reduce viral transmission—often with unintended consequences. Many detention facilities and prisons have stopped visitations without adequately providing virtual means for prisoners to communicate with loved ones, which may harm the mental and emotional health of inmates and their families.[90,91] Similarly, in-person access to lawyers has been curtailed by both federal and state facilities, while email correspondence with incarcerated people continues to be monitored by facility staff, threatening their right to attorney–client privilege.[90-92] Other interventions implemented to decrease transmission between inmates include canceling activities,[93] closing common spaces, and, in juvenile facilities, canceling school.[94]

In some cases, carceral facilities do not have spaces appropriate for quarantining or isolating inmates who are ill or have been exposed to someone with COVID-19. In other facilities, the only usable spaces for quarantine or isolation are segregation cells that are typically used for solitary confinement.[95] However, these spaces lack the medical capacity and supervision necessary for medical isolation. Solitary confinement is a punitive measure that severely restricts access to recreation and contact with friends and family, and there is little transparency in the process.[96] Many incarcerated people will not report potential COVID-19 symptoms for fear of being placed in such a situation.

There have been riots in some carceral facilities related to COVID-19. A riot broke out in Ware State Prison in Georgia on August 2, 2020—a lack of medical care has been implicated as a factor contributing to the uprising.[97] Fifteen other countries have also had prison riots related to COVID-19.[98] Bolivia,[99] Colombia,[100] Iran,[101] Italy,[102] and South Africa,[103] and have all had rebellions stemming from inmates protesting COVID-19 responses or lack of responses. Some of these riots have resulted in fatalities and others led to prison breakouts.

Carceral facilities are not the only branches of the criminal justice system to be affected by COVID-19. Already-backlogged courts have been further clogged as a result of shutdowns and closures related to COVID-19.[104] Since courts have begun to reopen, there have also been struggles implementing practices that maintain social distancing in courthouses. Although some courts are able to function virtually, others still require in-person meetings.[105] The most common interventions implemented in courts so far have included suspending jury trials, restricting entrances to courthouses, encouraging or requiring teleconferencing over in-person hearings, granting extensions to court deadlines, and generally suspending in-person proceedings.[106] Even the US Supreme Court held virtual arguments for the first time in its history because of this pandemic.[107] Some jurisdictions have restarted jury trials, which many feel cannot be held virtually, with new interventions, including plexiglass between jurors and attorneys or holding court in local gyms in order to increase physical distancing between those present.[108]

Law enforcement has also been affected by COVID-19. In the United States, law enforcement officers have implemented public health measures during the pandemic in an inconsistent and unequal fashion. In New York City, for example, Black and Latinx people represented 39 of the 40 individuals arrested for social distancing violations between March 17 and May 4, 2020.[109] In some cases, police in the United States have implemented measures antithetical to preventing the spread of COVID-19. For example, 2 Black men were escorted out of a Walmart in Illinois by an officer with his hand on his gun after being told that they could not wear masks inside the store.[110] In addition, during protests against the murders of George Floyd, Breonna Taylor, and other Black Americans at the hands of law enforcement, police crowded arrested protesters in confined spaces such as public transit buses, sometimes for hours at a time.[111,112] These tactics hinder the progress by public health officials in combating COVID-19 misinformation, encouraging mask use, and promoting social distancing.

Several countries have seen high numbers of police officers infected with COVID-19 as they carry out their duties.[113,114] In some places, law enforcement personnel do not have sufficient PPE, like masks and gloves. In the United States, the Fraternal Order of Police reports that as of October 11, 238 officers have died from COVID-19.[115] The Department of Homeland Security has initiated several public–private partnerships to address the shortage of PPE for first responders, including police.[116] COVID-19 illness or exposure and quarantine could lead to staff shortages for police departments. The CDC has provided guidance for law enforcement concerning the minimum PPE recommendations and guidelines for interacting with potential COVID-19 cases.[117] Law

enforcement personnel exhibiting symptoms of COVID-19 are currently considered a high priority for COVID-19 testing.[118]

Negative Impact of Carceral Facilities on SARS-CoV-2 Transmission Risk

Even before the current COVID-19 pandemic, carceral facilities were known to be reservoirs propagating respiratory disease within their walls, as well as to the community at large.[119] Carceral facilities are often hotspots for infectious diseases for several reasons.[84,119,120]

First, carceral facilities often struggle with overcrowding. According to the World Prison Brief, the US prison system is at 99.8% capacity.[121] In crowded living conditions, incarcerated individuals are in close contact with others, and physical distancing among infected or exposed people is nearly impossible. Overcrowding is a known risk factor for infection, and high-density prisons can more than double the risk of major infections, such as tuberculosis.[119] Although the United States accounts for just 5% of the world's population, it represents 25% of the world's prison population. This is attributable to a rise in both admissions to carceral facilities and lengths of sentences beginning in the 1970s. Major policy drivers of this change include mandatory minimum sentences for drug offenses, "3 strikes" laws requiring long sentences after 3 felonies, and restrictions on parole. As a consequence, the size of the incarcerated population has increased by 700% since 1970.[122] Another report estimates that if states fail to reduce jail populations, COVID-19 deaths may increase by 100,000.[123] This estimate, looks at current prison populations, infection rates, and death rates, modeling the potential contribution of carceral facilities to overall numbers of deaths. The analysis projects deaths in carceral facilities for different possible scenarios, depending on the stringency of mitigation measures that are put in place to prevent introduction and spread of COVID-19.[123]

Second, carceral facilities are dynamic environments that intermix incarcerated people and correctional custody, healthcare, and other staff. Correctional staff can become infected in the community and bring COVID-19 into facilities. For example, incarcerated people are required to interact with numerous correctional staff members daily to receive food, obtain medication, and get access to outside recreational facilities. One infected correctional officer or detainee can spread infections between many different areas of the prison. Incarcerated individuals can transmit the SARS-CoV-2 virus through interaction with other incarcerated people in the facility or through transfers. For example, a transfer between prisons in California seeded the outbreak at San Quentin Prison that had affected more than 2,100 inmates as of July 23, 2020.[124,125] Further, correctional staff and returning citizens can become infected in correctional facilities, which often have high rates of infection, and spread the virus back into the community.

Third, carceral facilities generally lack the laboratory capacity, medical personnel, testing supply, and quality control to effectively prevent and respond to a respiratory

disease outbreak such as COVID-19.120 This can lead to delayed case detection, poor contact tracing, and inadequate treatment of infectious cases.[120] This fact has been well documented in studies of tuberculosis, one of which found that 21% of prisons lacked organized healthcare systems allowing for timely testing.[119] In addition, individuals infected with COVID-19 can quickly deteriorate, and current sick call protocols can make it difficult to receive timely care in the event of worsening symptoms. During an outbreak, limited medical staff may not be able to respond to other chronic and routine medical conditions in a facility.[126]

Fourth, while there is a constitutional mandate to provide healthcare services in carceral facilities,[127] there is no set of basic, universally required healthcare standards that facilities must provide. Thus, there is high variability among facilities in access to and quality of provision of clinical services and little or no oversight or accountability.[128] Additionally, there are no mandatory standards to ensure that even basic patient protections are in place. These factors place the rights, health, and lives of incarcerated people at risk. People who are incarcerated are further limited in their ability to obtain appropriate medical care and relief due to the Prison Litigation Reform Act, which routinely prevents courts from ordering the release of medically vulnerable individuals and implementing measures to prevent the transmission of the SARS-CoV-2 virus.[129,130]

The consequences of failing to enact nationally mandated standards for healthcare in carceral facilities have become strikingly apparent during the COVID-19 pandemic. While some facilities may have been quick to adopt sound infection mitigation measures, many other facilities only test incarcerated people if they develop symptoms. In a report published in May from the CDC, only 69% of jurisdictions reported any data on COVID-19 in their prisons or jails.[131] In addition, the report noted that many correctional facilities do not provide testing to their staff and assume they will receive testing at outside medical systems—such as at the local hospital or community testing site.[122]

Such inconsistencies continue to be seen across other infection control efforts. Access to hygiene supplies and SARS-CoV-2 testing in carceral facilities overall varies widely from week to week and facility to facility. While prison and jail facilities state they provide a range of COVID-19 prevention materials, such as clean masks and sufficient handwashing materials (eg, soap, clean towels, hand sanitizer with 60% alcohol), this is at odds with many anecdotal reports from incarcerated people.[132-134] Overall, these policies require national standardization and accountability systems to ensure actual implementation and compliance.

How Courts Increase the Risk of SARS-CoV-2 Infection

Courthouses are environments where many people congregate. A number of features of courthouses and courtrooms can heighten risks for exposure, acquisition, transmission, and clinical complications of infectious diseases.

First, courthouses pose physical and mechanical risks, such as close confinement, insufficient ventilation, shared toilet space for detainees while in lockup, and shared eating environments, as well as limited access to hygiene (eg, sinks) and PPE (eg, masks and gloves) in some courthouses.

Second, people in a courthouse are at heightened risk of exposure and infection because of the need to protect attorney–client privilege, which, in turn, requires close-quarter communication and contact. Additionally, the passing of physical exhibits poses a risk of spreading infection.

Third, in-person hearings and trials in courts require incarcerated people, jurors, lawyers, and courtroom staff to travel to the courthouse. Transfers of incarcerated people require contact, such as during putting on or removing handcuffs, and have been linked to several COVID-19 outbreaks. A number of reports state that correctional staff often wear insufficient or no masks during these transfers, which may include long drives of greater than 1 hour in length in a small, confined space with officers and other incarcerated people.[135] These transfers pose a risk to incarcerated people and increase their likelihood of infection. Lawyers may arrive from out of state and require air travel and hotel stays to represent their clients. Even when participants in the court system live nearby, they may need to take public transportation to travel to the courthouse. As maintaining social distancing and other precautions is often difficult during travel, in-person appearances in courtrooms can further expose individuals to COVID-19 infection.

Fourth, jurors are at risk for infection because of their movement as a unit: taking breaks in rooms that do not permit social distancing, sitting in a jury box designed for optimal visual and auditory observation and not social distancing, conferring in jury rooms where outside ventilation is uncommon and physical distancing may not be possible, and even traveling in communal transportation from parking lots to the courthouse, if that is used.

Fifth, courthouses can create opportunities for SARS-CoV-2 to spread from the community into carceral facilities and vice versa. Courtroom security officers are in close proximity and contact with the detainees when they place restraints on them each day as they enter or leave the courtroom. Defense attorneys and paralegals also interact with detainees for several hours each day while in trial. Because asymptomatic and presymptomatic individuals can spread SARS-CoV-2, screening or monitoring fever of staff and detainees may not detect when a detainee or staff member has become infected.

Finally, it is possible that virtual court proceedings and measures like face coverings may have some as yet unknown effect on rulings or jury trial outcomes. It is important to keep this in mind and conduct research to better understand the impact of COVID-19 measures on how justice is served.

How Police and Nongovernmental Organizations Can Increase Risks of Transmission of SARS-CoV-2

Police and nongovernmental organizations working with the justice system interact with individuals who come into contact with the system on a regular basis. These interactions can carry risks not only for the police and nongovernmental organizations but also for members of the public. Practices like crowding individuals together can increase those risks.

Recommendations for Jails, Prisons, and Detention Centers

1. **Reduce population density of carceral facilities**

    - Reduce admissions into carceral facilities. Pretrial detention should be considered only under rare circumstances, such as when an individual has made credible, serious threats of violence or flight from prosecution.[136] Do not detain people held for nonpayment of fines or fees, insufficient funds for bail, or parole or probation violations.
    - Expedite release or parole for all older incarcerated individuals and those with chronic conditions that predispose them to severe COVID-19 disease—including, but not limited to, lung disease, heart disease, diabetes, hypertension, obesity, pregnancy, and immunocompromised states.[137-143]
    - Consider reduction in carceral facility populations to levels at which facilities can safely socially distance with staff and remaining incarcerated individuals.[96]

2. **Reexamine the relationship between health and incarceration in decisions of bail, sentencing, and release**

    - Implement policies and procedures that incorporate the defendant's COVID-related health risks into decisions related to incarceration, bail, sentencing, and release.
    - Account for the risk of COVID-19 infection in destination carceral facilities during sentencing and consider alternatives to incarceration on health grounds. Provide judges with bench cards to remind them to weigh the impact of COVID-19 when sentencing.
    - Enhance use of alternatives to incarceration to reduce COVID-19 risk. Reconsider and reduce reliance on incarceration for purposes related to mental health and substance use treatment. Redirect funding from carceral settings to wraparound community-based services to address these issues in order to reduce COVID-19 transmission risk.

3. **Make SARS-CoV-2 testing results and prevention strategies public**

    - Mandate that all facilities report testing schedules and results for incarcerated individuals and staff. These data should include date, type, and number of tests as well as the number of positive and negative test results. Data should be reported separately for staff and incarcerated individuals.
    - Require correctional facility administrators to make their plans for prevention and management of COVID-19 in their institutions publicly available, as the San Francisco sheriff's department and others have done. Protocols should be in line with national CDC guidance in closed and shared settings. Frequently updated recommendations and model protocols are available from the National Commission on Correctional Health Care[144] and Amend at UCSF.[145]

4. **Conduct widespread and continuous SARS-CoV-2 viral testing**

    - Undertake antibody testing of incarcerated populations in order to better understand how much of the US incarcerated population, and staff working with this population, has been infected to date.
    - Implement routine diagnostic testing of incarcerated individuals and staff. This should include testing upon a being admitted or transferred to the facility, including new staff and workers. It should include testing for anyone with any of the CDC-defined COVID-19 symptoms.
    - Routine institution-wide diagnostic testing should also take place for asymptomatic individuals, given the frequency of asymptomatic infection and the importance of early recognition of COVID-19 outbreaks in carceral facilities. Where feasible and available, these facilities should consider using rapid antigen tests to test both inmates and staff on a regular basis, perhaps weekly, to identify outbreaks early and prevent onward transmission.
    - Very inexpensive paper-based rapid antigen tests that are intended for home use may become available in the coming months. If so, it may be cost effective and feasible to test incarcerated individuals and staff on an even more frequent basis with these tests, further diminishing the chances of COVID-19 outbreaks within facilities.

5. **Implement quarantine and medical isolation strategies to respond to active SARS-CoV-2 cases**

    - Implement a comprehensive plan to quarantine those who have been exposed to COVID-19 and medically isolate confirmed COVID-19 cases. It is important to note that quarantine and medical isolation, which are public health measures, are not equivalent to solitary confinement, which is a punitive measure and harmful to physical and mental health (Table 1). Those in medical isolation or quarantine should be provided means to make physical separation from others bearable, including enhanced communication with loved ones.

- People in medical isolation or quarantine should have easy access to healthcare providers who offer daily monitoring and updates on how long they can expect to remain in isolation.
- If facilities have no option but to repurpose units typically reserved for solitary confinement for medical isolation and quarantine, they should use explicit messaging to distinguish the purpose of this physical separation from disciplinary measures.[96]

Table 1. Comparing Solitary Confinement, Medical Isolation, and Quarantine[96]

	Solitary Confinement	Quarantine	Medical Isolation
Mechanism	Separation of people from population as a means of punishment	Separation of people exposed to contagious disease from population	Separation of people with a contagious disease from population
Purpose	Punitive	Reduce spread of disease	Reduce spread of disease
Duration	Determined by custody	Determined by medical staff, until incubation period passes or status is changed to medical isolation if patient develops disease	Determined by medical staff, until person is deemed no longer contagious

6. Modify facility practices and procedures to prevent SARS-CoV-2 spread

- Implement prevention policies as outlined in CDC interim guidance on management of COVID-19 in correctional and detention facilities.[131] As outlined in this report, policies should be implemented to promote social distancing policies in communal areas, enforce cleaning and disinfecting practices, and ensure the availability of personal hygiene materials, including sufficient soap, and hand sanitizer with at least 60% alcohol.
- If the national supply of surgical masks is sufficient to protect healthcare workers, with excess supply that can be provided to other priority groups, then provide surgical masks to all staff and incarcerated individuals and ensure that masks are replaced regularly. If surgical masks are not available for use, then cloth masks should be used for all incarcerated individuals and criminal justice system staff. No gators, bandanas, or masks with valves should be allowed because they do not provide appropriate protection for the wearer and/or persons coming into contact with the wearer. Cloth masks should be in accord with CDC guidelines.[146]

- Move activities outdoors as much as possible.
- Cease any collection of fees or copays for medical care.
- If visitation and group activities are discontinued, ensure communication channels are available at no cost for family and friends. Identify alternative forms of activity to support the mental health of incarcerated people.

7. **Standardize healthcare services in carceral facilities to ensure incarcerated people have access to standard care for COVID-19**
    - Mandate a national set of basic standards of care for COVID-19 for healthcare operations and develop strategies to ensure compliance.
    - Remove the Medicaid "inmate exclusion clause," which prohibits billing services for any individual who is incarcerated unless the individual is treated in a hospital or medical institution outside the facility for 24 hours or more.
    - Urge Congress to amend or repeal the Prison Litigation Reform Act in order to facilitate the release of medically vulnerable individuals who will be at particularly high risk of COVID-19 and allow courts to mandate the implementation measures to prevent SARS-CoV-2 transmission.
    - Implement an independent oversight board to examine the implementation of standards of care for carceral settings.
    - If and when safe and effective therapeutics for treatment of COVID-19 become available, infected incarcerated individuals should have equal access to such treatment as nonincarcerated infected individuals.
8. **When a safe and effective SARS-CoV-2 vaccine becomes available, prioritize vaccination access to incarcerated individuals and staff working in carceral facilities, equivalent to prioritizing vaccination in other high-risk congregate care settings (ie, nursing homes).**

Recommendations for Courts

1. Implement alternatives to in-person court appearances when possible.[147]
2. Provide adequate access to technology in carceral facilities for virtual court appearances.
3. When in-person court proceedings must occur, they should be conducted in a way that ensures adequate physical distancing for staff, defendants, and juries. All parties should wear masks. In some places, this work should be moved to larger facilities (eg, gyms) where people can maintain adequate spacing.

Concluding Statement

COVID-19 poses a great threat to incarcerated individuals, staff members who work at detention facilities, and the broader criminal justice system. The current justice system, particularly the operations of facilities of incarceration, are not able to protect incarcerated individuals from COVID-19. Changes are urgently needed to diminish the risk of transmission and provide the standard of care to those who have been infected with this disease.

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