EXHIBIT A

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ORIGINAL ARTICLE

First Case of 2019 Novel Coronavirus in the United States

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Summary

An outbreak of novel coronavirus (2019-nCoV) that began in Wuhan, China, has spread rapidly, with cases now confirmed in multiple countries. We report the first case of 2019-nCoV infection confirmed in the United States and describe the identification, diagnosis, clinical course, and management of the case, including the patient's initial mild symptoms at presentation with progression to pneumonia on day 9 of illness. This case highlights the importance of close coordination between clinicians and public health authorities at the local, state, and federal levels, as well as the need for rapid dissemination of clinical information related to the care of patients with this emerging infection.

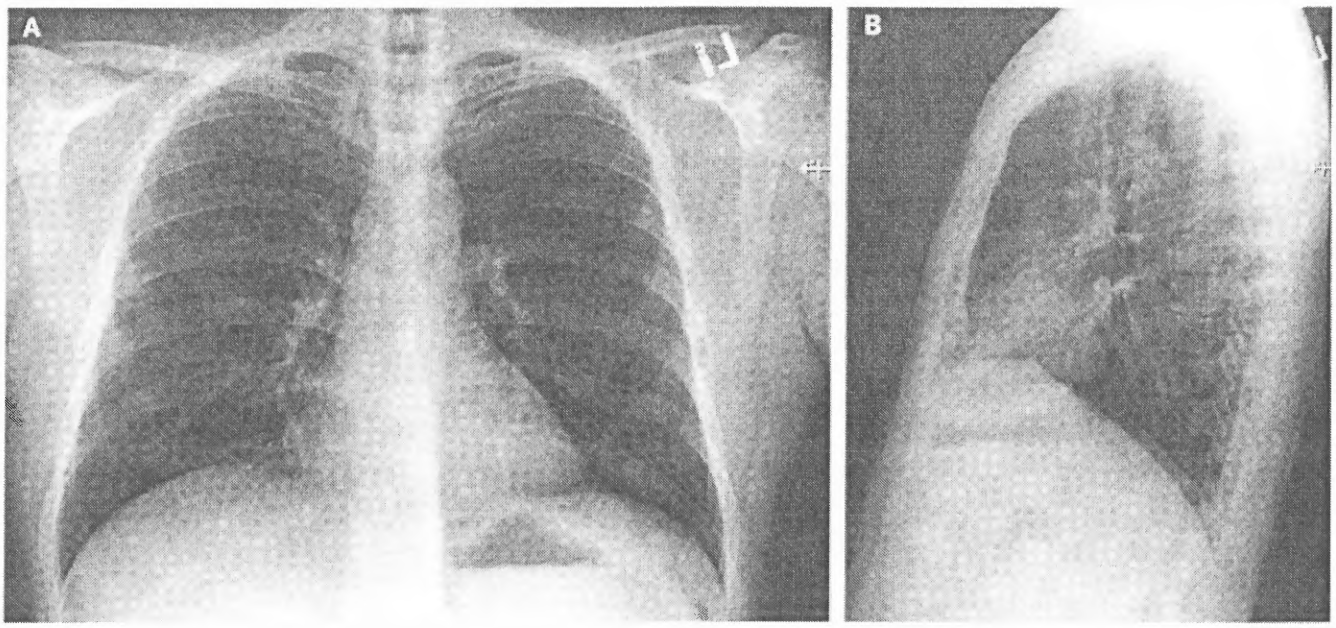
Introduction

On December 31, 2019, China reported a cluster of cases of pneumonia in people associated with the Huanan Seafood Wholesale Market in Wuhan, Hubei Province.[1] On January 7, 2020, Chinese health authorities confirmed that this cluster was associated with a novel coronavirus, 2019-nCoV.[2] Although cases were originally reported to be associated with exposure to the seafood market in Wuhan, current epidemiologic data indicate that person-to-person transmission of 2019-nCoV is occurring.[3-6] As of January 30, 2020, a total of 9976 cases had been reported in at least 21 countries,[7] including the first confirmed case of 2019-nCoV infection in the United States, reported on January 20, 2020. Investigations are under way worldwide to better understand transmission dynamics and the spectrum of clinical illness. This report describes the epidemiologic and clinical features of the first case of 2019-nCoV infection confirmed in the United States.

Case Report

On January 19, 2020, a 35-year-old man presented to an urgent care clinic in Snohomish County, Washington, with a 4-day history of cough and subjective fever. On checking into the clinic, the patient put on a mask in the waiting room. After waiting approximately 20 minutes, he was taken into an examination room and underwent evaluation by a provider. He disclosed that he had returned to Washington State on January 15 after traveling to visit family in Wuhan, China. The patient stated that he had seen a health alert from the U.S. Centers for Disease Control and Prevention (CDC) about the novel coronavirus outbreak in China and, because of his symptoms and recent travel, decided to see a health care provider.

Figure 1.



Posteroanterior and Lateral Chest Radiographs, January 19, 2020 (Illness Day 4).

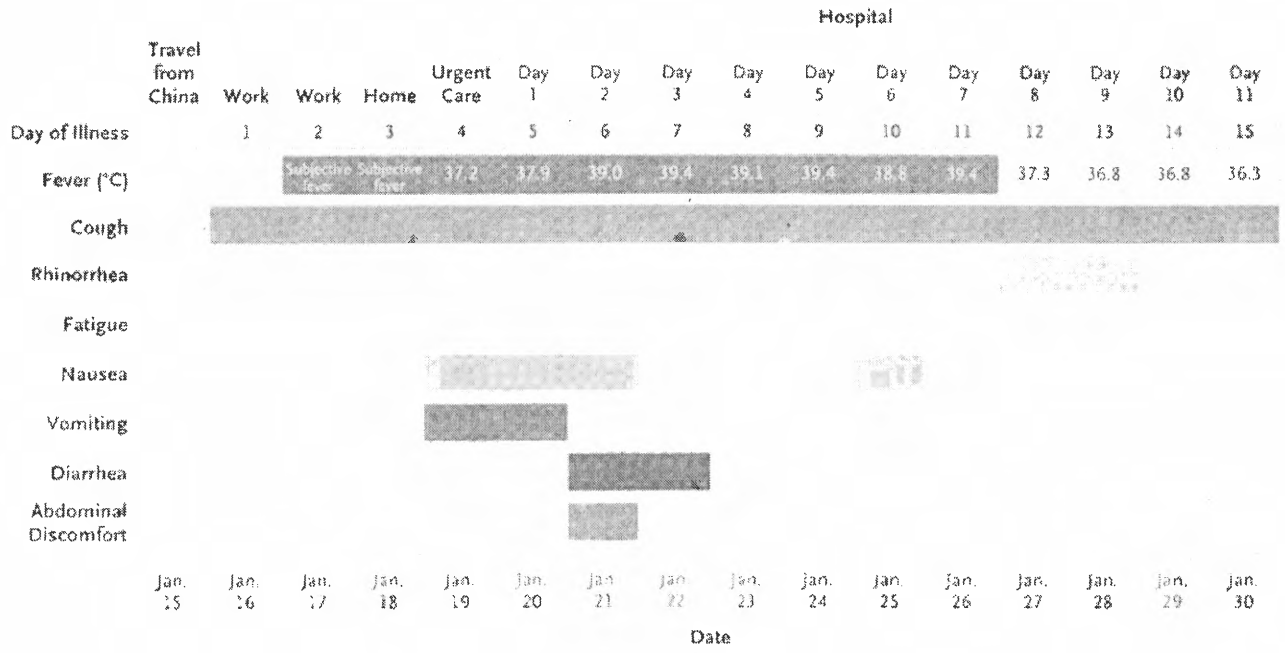
Apart from a history of hypertriglyceridemia, the patient was an otherwise healthy nonsmoker. The physical examination revealed a body temperature of 37.2°C, blood pressure of 134/87 mm Hg, pulse of 110 beats per minute, respiratory rate of 16 breaths per minute, and oxygen saturation of 96% while the patient was breathing ambient air. Lung auscultation revealed rhonchi, and chest radiography was performed, which was reported as showing no abnormalities (Figure 1). A rapid nucleic acid amplification test (NAAT) for influenza A and B was negative. A nasopharyngeal swab specimen was obtained and sent for detection of viral respiratory pathogens by NAAT; this was reported back within 48 hours as negative for all pathogens tested, including influenza A and B, parainfluenza, respiratory syncytial virus, rhinovirus, adenovirus, and four common coronavirus strains known to cause illness in humans (HKU1, NL63, 229E, and OC43).

Given the patient's travel history, the local and state health departments were immediately notified. Together with the urgent care clinician, the Washington Department of Health notified the CDC Emergency Operations Center. Although the patient reported that he had not spent time at the Huanan seafood market and reported no known contact with ill persons during his travel to China, CDC staff concurred with the need to test the patient for 2019-nCoV on the basis of current CDC "persons under investigation" case definitions.[8] Specimens were collected in accordance with CDC guidance and included serum and nasopharyngeal and oropharyngeal swab specimens. After specimen collection, the patient was discharged to home isolation with active monitoring by the local health department.

On January 20, 2020, the CDC confirmed that the patient's nasopharyngeal and oropharyngeal swabs tested positive for 2019-nCoV by real-time reverse-transcriptase–polymerase-chain-reaction (rRT-PCR) assay. In coordination with CDC subject-matter experts, state and local health officials, emergency medical services, and hospital leadership and staff, the patient was admitted to an airborne-isolation unit at Providence Regional Medical Center for clinical observation, with health care workers following CDC recommendations for contact, droplet, and airborne precautions with eye protection.[9]

On admission, the patient reported persistent dry cough and a 2-day history of nausea and vomiting; he reported that he had no shortness of breath or chest pain. Vital signs were within normal ranges. On physical examination, the patient was found to have dry mucous membranes. The remainder of the examination was generally unremarkable. After admission, the patient received supportive care, including 2 liters of normal saline and ondansetron for nausea.

Figure 2.



Symptoms and Maximum Body Temperatures According to Day of Illness and Day of Hospitalization, January 16 to January 30, 2020.

On days 2 through 5 of hospitalization (days 6 through 9 of illness), the patient's vital signs remained largely stable, apart from the development of intermittent fevers accompanied by periods of tachycardia (Figure 2). The patient continued to report a nonproductive cough and appeared fatigued. On the afternoon of hospital day 2, the patient passed a loose bowel movement

and reported abdominal discomfort. A second episode of loose stool was reported overnight; a sample of this stool was collected for rRT-PCR testing, along with additional respiratory specimens (nasopharyngeal and oropharyngeal) and serum. The stool and both respiratory specimens later tested positive by rRT-PCR for 2019-nCoV, whereas the serum remained negative.

Treatment during this time was largely supportive. For symptom management, the patient received, as needed, antipyretic therapy consisting of 650 mg of acetaminophen every 4 hours and 600 mg of ibuprofen every 6 hours. He also received 600 mg of guaifenesin for his continued cough and approximately 6 liters of normal saline over the first 6 days of hospitalization.

Table 1.

Table 1. Clinical Laboratory Results.*

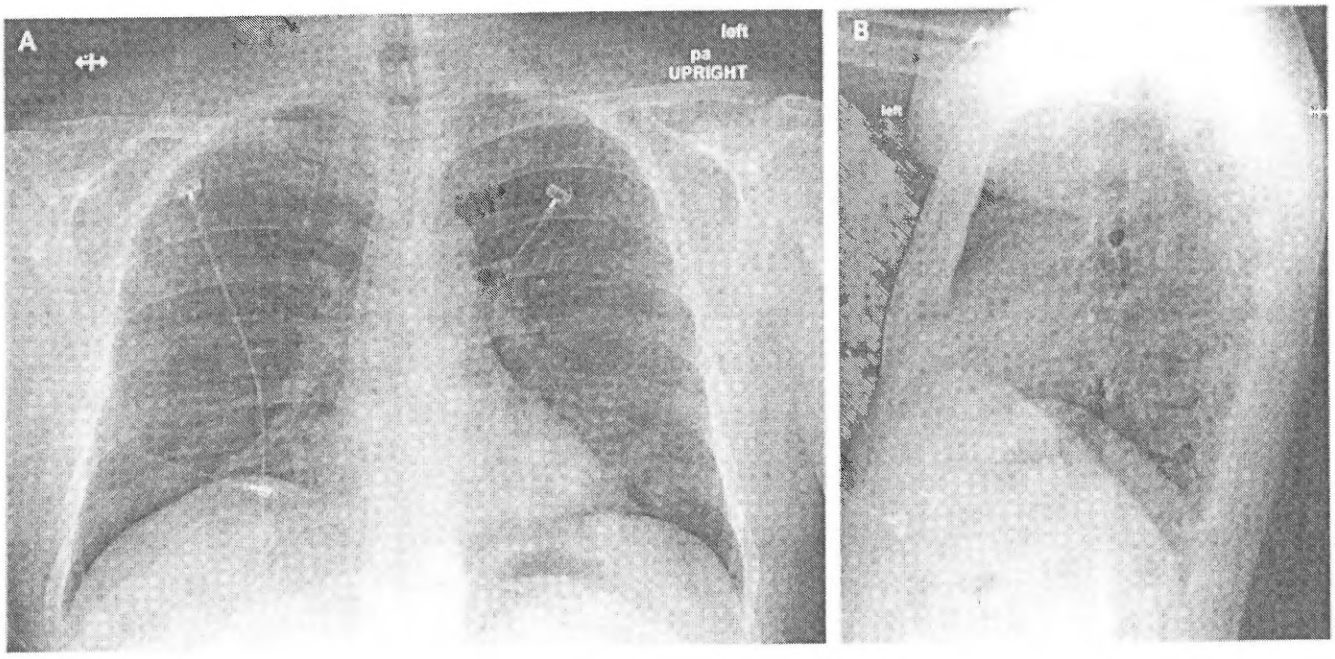
Measure	Reference Range	Illness Day 6, Hospital Day 2†	Illness Day 7, Hospital Day 3	Illness Day 9, Hospital Day 5	Illness Day 11, Hospital Day 7	Illness Day 13, Hospital Day 9	Illness Day 14, Hospital Day 10
White-cell count (per μl)	3800–11,000	"Slight decrease"	3120§	3300§	5400	5600	6500
Red-cell count (per μl)	4,200,000–5,700,000		4,870,000	5,150,000	5,010,000	4,650,000	5,010,000
Absolute neutrophil count (per μl)	1900–7400	—	1750§	1700§	3700	3800	3200
Absolute lymphocyte count (per μl)	1000–3900	—	1070§	1400	1400	1400	2100
Platelet count (per μl)	150,000–400,000	"Adequate"	132,000§	132,000§	151,000	150,000	239,000
Hemoglobin (g/dl)	13.7–17.0	12.2§	14.2	14.8	14.8	13.5	14.2
Hematocrit (%)	39.0–50.0	36.0§	42.0	43.0	43.0	39.3	42.0
Sodium (mmol/liter)	136–145	134§	136	138	138	135§	138
Potassium (mmol/liter)	3.5–5.1	5.3§	3.6	3.4	3.6	4.2	3.9
Chloride (mmol/liter)	98–107	99	101	105	100	100	103
Calcium (mg/dl)	8.7–10.4	—	8.5§	9.3	9.0	8.6§	9.3
Carbon dioxide (mmol/liter)	20–31		26	24	29	23	26§
Anion gap (mmol/liter)	5–16		9	9	7	12	9
Glucose (mmol/liter)	65–140	104	103	120	96	148§	104
Blood urea nitrogen (mg/dl)	9–23	15	10	13	13	23§	18
Creatinine (mg/dl)	0.7–1.3	1.0	1.06	1.06	0.85	1.08	0.84
Total protein (g/dl)	5.7–8.2		6.9	7.1	6.8	6.9	6.8
Albumin (g/dl)	3.2–4.8		4.2	4.3	4.5	2.9§	4.4
Total bilirubin (mg/dl)	0.3–1.2	—	1.0	1.1	1.3	0.8	1.0
Procalcitonin (ng/ml)	<0.05			0.05	0.05		
Alanine aminotransferase (U/liter)	10–49		68§	104§	114§	210§	203§
Aspartate aminotransferase (U/liter)	<33		37§	77§	85§	129§	88§
Alkaline phosphatase (U/liter)	46–116		50	68§	88§	137§	161§
Fibrinogen (mg/dl)	150–450		477§				
Lactate dehydrogenase (U/liter)	120–246		259§	465§			388§
Prothrombin time (sec)	12.7–15.4		11.9	12.5			12.7
International normalized ratio	0.9–1.1		0.9	0.9			1.0
Creatine kinase (U/liter)	52–325		353§	147§			
Venous lactate (mmol/liter)	0.4–2.0		1.3	1.2			

* To convert the values for calcium to millimoles per liter, multiply by 0.250. To convert the values for blood urea nitrogen to millimoles per liter of urea, multiply by 0.357. To convert the values for creatinine to micromoles per liter, multiply by 88.4. To convert the values for total bilirubin to micromoles per liter, multiply by 17.1.
† Results are from point-of-care blood analyzer (iStat) testing.
‡ The value in the patient was below normal.
§ The value in the patient was above normal.

Clinical Laboratory Results.

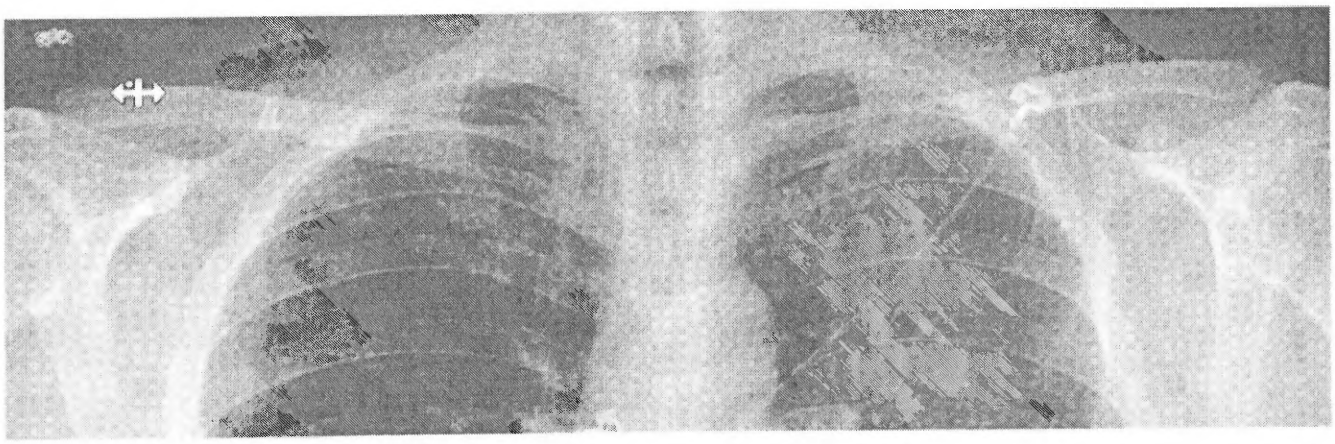
The nature of the patient isolation unit permitted only point-of-care laboratory testing initially; complete blood counts and serum chemical studies were available starting on hospital day 3. Laboratory results on hospital days 3 and 5 (illness days 7 and 9) reflected leukopenia, mild thrombocytopenia, and elevated levels of creatine kinase (Table 1). In addition, there were alterations in hepatic function measures: levels of alkaline phosphatase (68 U per liter), alanine aminotransferase (105 U per liter), aspartate aminotransferase (77 U per liter), and lactate dehydrogenase (465 U per liter) were all elevated on day 5 of hospitalization. Given the patient's recurrent fevers, blood cultures were obtained on day 4; these have shown no growth to date.

Figure 3.



Posteroanterior and Lateral Chest Radiographs, January 22, 2020 (Illness Day 7, Hospital Day 3).

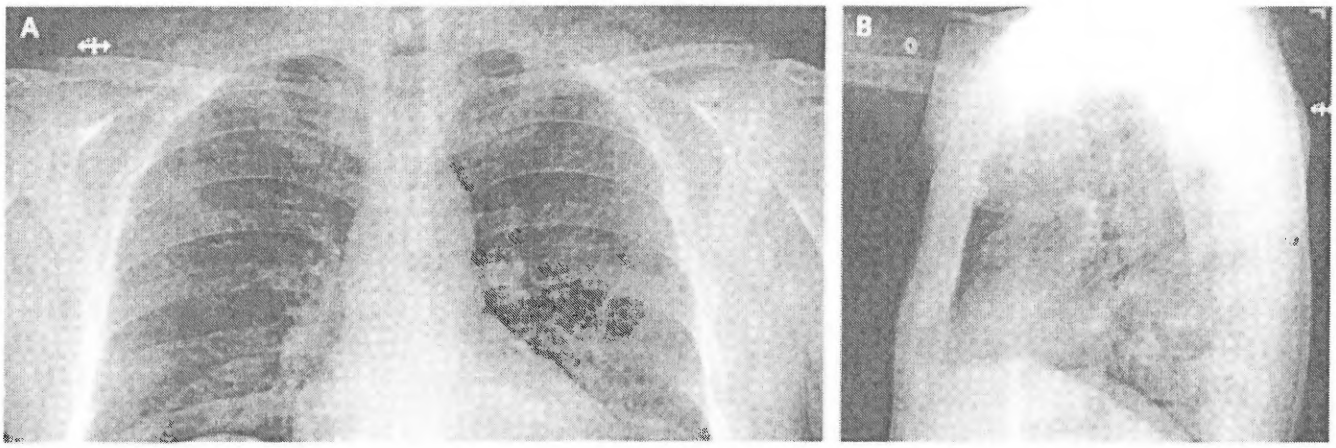
Figure 4.



Posteroanterior Chest Radiograph, January 24, 2020 (Illness Day 9, Hospital Day 5).

A chest radiograph taken on hospital day 3 (illness day 7) was reported as showing no evidence of infiltrates or abnormalities (Figure 3). However, a second chest radiograph from the night of hospital day 5 (illness day 9) showed evidence of pneumonia in the lower lobe of the left lung (Figure 4). These radiographic findings coincided with a change in respiratory status starting on the evening of hospital day 5, when the patient's oxygen saturation values as measured by pulse oximetry dropped to as low as 90% while he was breathing ambient air. On day 6, the patient was started on supplemental oxygen, delivered by nasal cannula at 2 liters per minute. Given the changing clinical presentation and concern about hospital-acquired pneumonia, treatment with vancomycin (a 1750-mg loading dose followed by 1 g administered intravenously every 8 hours) and cefepime (administered intravenously every 8 hours) was initiated.

Figure 5.



Anteroposterior and Lateral Chest Radiographs, January 26, 2020 (Illness Day 10, Hospital Day 6).

On hospital day 6 (illness day 10), a fourth chest radiograph showed basilar streaky opacities in both lungs, a finding consistent with atypical pneumonia (Figure 5), and rales were noted in both lungs on auscultation. Given the radiographic findings, the decision to administer oxygen supplementation, the patient's ongoing fevers, the persistent positive 2019-nCoV RNA at multiple sites, and published reports of the development of severe pneumonia[3,4] at a period consistent with the development of radiographic pneumonia in this patient, clinicians pursued compassionate use of an investigational antiviral therapy. Treatment with intravenous remdesivir (a novel nucleotide analogue prodrug in development[10,11]) was initiated on the evening of day 7, and no adverse events were observed in association with the infusion. Vancomycin was discontinued on the evening of day 7, and cefepime was discontinued on the following day, after serial negative procalcitonin levels and negative nasal PCR testing for methicillin-resistant *Staphylococcus aureus*.

On hospital day 8 (illness day 12), the patient's clinical condition improved. Supplemental oxygen was discontinued, and his oxygen saturation values improved to 94 to 96% while he was breathing ambient air. The previous bilateral lower-lobe rales were no longer present. His appetite improved, and he was asymptomatic aside from intermittent dry cough and rhinorrhea. As of January 30, 2020, the patient remains hospitalized. He is afebrile, and all symptoms have resolved with the exception of his cough, which is decreasing in severity.

Methods

SPECIMEN COLLECTION

Clinical specimens for 2019-nCoV diagnostic testing were obtained in accordance with CDC guidelines.[12] Nasopharyngeal and oropharyngeal swab specimens were collected with synthetic fiber swabs; each swab was inserted into a separate sterile tube containing 2 to 3 ml of viral transport medium. Serum was collected in a serum separator tube and then centrifuged in accordance with CDC guidelines. The urine and stool specimens were each collected in sterile specimen containers. Specimens were stored between 2°C and 8°C until ready for shipment to the CDC. Specimens for repeat 2019-nCoV testing were collected on illness days 7, 11, and 12 and included nasopharyngeal and oropharyngeal swabs, serum, and urine and stool samples.

DIAGNOSTIC TESTING FOR 2019-NCOV

Clinical specimens were tested with an rRT-PCR assay that was developed from the publicly released virus sequence. Similar to previous diagnostic assays for severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), it has three nucleocapsid gene targets and a positive control target. A description of this assay[13] and sequence information for the rRT-PCR panel primers and probes[14] are available on the CDC Laboratory Information website for 2019-nCoV.[15]

GENETIC SEQUENCING

On January 7, 2020, Chinese researchers shared the full genetic sequence of 2019-nCoV through the National Institutes of Health GenBank database[16] and the Global Initiative on Sharing All Influenza Data (GISAID)[17] database; a report about the isolation of 2019-nCoV was later published.[18] Nucleic acid was extracted from rRT-PCR–positive specimens (oropharyngeal and nasopharyngeal) and used for whole-genome sequencing on both Sanger and next-generation sequencing platforms (Illumina and MinIon). Sequence assembly was completed with the use of Sequencher software, version 5.4.6 (Sanger); minimap software, version 2.17 (MinIon); and freebayes software, version 1.3.1 (MiSeq). Complete genomes were compared with the available 2019-nCoV reference sequence (GenBank accession number NC_045512.2).

Results

SPECIMEN TESTING FOR 2019-NCOV

Table 2.

Table 2. Results of Real-Time Reverse-Transcriptase–Polymerase-Chain-Reaction Testing for the 2019 Novel Coronavirus (2019-nCoV).*

Specimen	Illness Day 4	Illness Day 7	Illness Day 11	Illness Day 12
Nasopharyngeal swab	Positive (Ct, 18–20)	Positive (Ct, 23–24)	Positive (Ct, 33–34)	Positive (Ct, 37–40)
Oropharyngeal swab	Positive (Ct, 21–22)	Positive (Ct, 32–33)	Positive (Ct, 36–40)	Negative
Serum	Negative	Negative	Pending	Pending
Urine	NT	Negative	NT	NT
Stool	NT	Positive (Ct, 36–38)	NT	NT

* Lower cycle threshold (Ct) values indicate higher viral loads. NT denotes not tested.

Results of Real-Time Reverse-Transcriptase–Polymerase-Chain-Reaction Testing for the 2019 Novel Coronavirus (2019-nCoV).

The initial respiratory specimens (nasopharyngeal and oropharyngeal swabs) obtained from this patient on day 4 of his illness were positive for 2019-nCoV (Table 2). The low cycle threshold (Ct) values (18 to 20 in nasopharyngeal specimens and 21 to 22 in oropharyngeal specimens) on illness day 4 suggest high levels of virus in these specimens, despite the patient's initial mild symptom presentation. Both upper respiratory specimens obtained on illness day 7 remained positive for 2019-nCoV, including persistent high levels in a nasopharyngeal swab specimen (Ct values, 23 to 24). Stool obtained on illness day 7 was also positive for 2019-nCoV (Ct values, 36 to 38). Serum specimens for both collection dates were negative for 2019-nCoV. Nasopharyngeal and oropharyngeal specimens obtained on illness days 11 and 12 showed a trend toward decreasing levels of virus. The oropharyngeal specimen tested negative for 2019-nCoV on illness day 12. The rRT-PCR results for serum obtained on these dates are still pending.

GENETIC SEQUENCING

The full genome sequences from oropharyngeal and nasopharyngeal specimens were identical to one another and were nearly identical to other available 2019-nCoV sequences. There were only 3 nucleotides and 1 amino acid that differed at open reading frame 8 between this patient's virus and the 2019-nCoV reference sequence (NC_045512.2). The sequence is available through GenBank (accession number MN985325).[16]

Discussion

Our report of the first confirmed case of 2019-nCoV in the United States illustrates several aspects of this emerging outbreak that are not yet fully understood, including transmission dynamics and the full spectrum of clinical illness. Our case patient had traveled to Wuhan, China, but reported that he had not visited the wholesale seafood market or health care facilities or had any sick contacts during his stay in Wuhan. Although the source of his 2019-nCoV infection is unknown, evidence of person-to-person transmission has been published. Through January 30, 2020, no secondary cases of 2019-nCoV related to this case have been identified, but monitoring of close contacts continues.[19]

Detection of 2019-nCoV RNA in specimens from the upper respiratory tract with low Ct values on day 4 and day 7 of illness is suggestive of high viral loads and potential for transmissibility. It is notable that we also detected 2019-nCoV RNA in a stool specimen collected on day 7 of the

patient's illness. Although serum specimens from our case patient were repeatedly negative for 2019-nCoV, viral RNA has been detected in blood in severely ill patients in China.[4] However, extrapulmonary detection of viral RNA does not necessarily mean that infectious virus is present, and the clinical significance of the detection of viral RNA outside the respiratory tract is unknown at this time.

Currently, our understanding of the clinical spectrum of 2019-nCoV infection is very limited. Complications such as severe pneumonia, respiratory failure, acute respiratory distress syndrome (ARDS), and cardiac injury, including fatal outcomes, have been reported in China.[4,18,20] However, it is important to note that these cases were identified on the basis of their pneumonia diagnosis and thus may bias reporting toward more severe outcomes.

Our case patient initially presented with mild cough and low-grade intermittent fevers, without evidence of pneumonia on chest radiography on day 4 of his illness, before having progression to pneumonia by illness day 9. These nonspecific signs and symptoms of mild illness early in the clinical course of 2019-nCoV infection may be indistinguishable clinically from many other common infectious diseases, particularly during the winter respiratory virus season. In addition, the timing of our case patient's progression to pneumonia on day 9 of illness is consistent with later onset of dyspnea (at a median of 8 days from onset) reported in a recent publication.[4] Although a decision to administer remdesivir for compassionate use was based on the case patient's worsening clinical status, randomized controlled trials are needed to determine the safety and efficacy of remdesivir and any other investigational agents for treatment of patients with 2019-nCoV infection.

We report the clinical features of the first reported patient with 2019-nCoV infection in the United States. Key aspects of this case included the decision made by the patient to seek medical attention after reading public health warnings about the outbreak; recognition of the patient's recent travel history to Wuhan by local providers, with subsequent coordination among local, state, and federal public health officials; and identification of possible 2019-nCoV infection, which allowed for prompt isolation of the patient and subsequent laboratory confirmation of 2019-nCoV, as well as for admission of the patient for further evaluation and management. This case report highlights the importance of clinicians eliciting a recent history of travel or exposure to sick contacts in any patient presenting for medical care with acute illness symptoms, in order to ensure appropriate identification and prompt isolation of patients who may be at risk for 2019-nCoV infection and to help reduce further transmission. Finally, this report highlights the need to determine the full spectrum and natural history of clinical disease, pathogenesis, and duration of viral shedding associated with 2019-nCoV infection to inform clinical management and public health decision making.

Funding and Disclosures

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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A full list of the members of the Washington State 2019-nCoV Case Investigation Team is provided in the Supplementary Appendix, available at NEJM.org.

Supplementary Material

Supplementary Appendix	PDF	113KB

Disclosure Forms	PDF	480KB

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EXHIBIT B

WORLD | ASIA | CHINA

New Virus Discovered by Chinese Scientists Investigating Pneumonia Outbreak

Latest tally of people sickened in Wuhan is 59, with seven in critical condition

By Natasha Khan
Updated Jan. 8, 2020 8:30 pm ET

HONG KONG—Chinese scientists investigating a mystery illness that has sickened dozens in central China have discovered a new strain of coronavirus, a development that will test the country's upgraded capabilities for dealing with unfamiliar infectious diseases.

The novel coronavirus was genetically sequenced from a sample from one patient and subsequently found in some of the others affected in the city of Wuh[illegible]le familiar

EXHIBIT C

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

CDC Newsroom

CDC Confirms Person-to-Person Spread of New Coronavirus in the United States

Press Release

For Immediate Release: Thursday, January 30, 2020
Contact: Media Relations
(404) 639-3286

The Centers for Disease Control and Prevention (CDC) today confirmed that the 2019 Novel Coronavirus (2019-nCoV) has spread between two people in the United States, representing the first instance of person-to-person spread with this new virus here.

Previously, all confirmed U.S. cases had been associated with travel to Wuhan, China, where an outbreak of respiratory illness caused by this novel coronavirus has been ongoing since December 2019. However, this latest 2019-nCoV patient has no history of travel to Wuhan, but shared a household with the patient diagnosed with 2019-nCoV infection on January 21, 2020.

Recognizing early on that the 2019-nCoV could potentially spread between people, CDC has been working closely with state and local partners to identify close contacts of confirmed 2019-nCoV cases. Public health officials identified this Illinois resident through contact tracing. Both patients are in stable condition.

"Given what we've seen in China and other countries with the novel coronavirus, CDC experts have expected some person-to-person spread in the US," said CDC Director Robert R. Redfield, M.D. "We understand that this may be concerning, but based on what we know now, we still believe the immediate risk to the American public is low."

Limited person-to-person spread with 2019-nCoV has been seen among close contacts of infected travelers in other countries where imported cases from China have been detected. The full picture of how easily and sustainably the 2019-nCoV spreads is still unclear. Person-to-person spread can happen on a continuum, with some viruses being highly contagious (like measles) and other viruses being less so.

MERS and SARS, the other two coronaviruses that have emerged to cause serious illness in people, have been known to cause some person-to-person spread. With both those viruses, person-to-person spread most often occurred between close contacts, such as healthcare workers and those caring for or living with an infected person. CDC has been proactively preparing for the introduction of 2019-nCoV in the U.S. for weeks, including:

- First alerting clinicians on January 8 to be on the look-out for patients with respiratory symptoms and a history of travel to Wuhan, China.
- Developing guidance for preventing 2019 novel coronavirus (2019-nCoV) from spreading to others in homes and communities.
- Developing guidance for clinicians for testing and management of 2019-nCoV, as well as guidance for infection control of patients hospitalized or being evaluated by a health care provider.

CDC is working closely with Illinois health officials and other local partners. A CDC team has been on the ground since the first 2019-nCoV-positive case was identified and is supporting an ongoing investigation to determine whether further spread with this virus has occurred.

It is likely there will be more cases of 2019-nCoV reported in the U.S. in the coming days and weeks, including more person-to-person spread. CDC will continue to update the public as we learn more about this coronavirus. The best way to prevent infection is to avoid being exposed to this virus. Right now, 2019-nCoV has not been found to be spreading widely in the United States, so CDC deems the immediate risk from this virus to the general public to be low. However, risk is dependent on exposure, and people who are in contact with people with 2019-nCoV are likely to be at greater risk of infection and should take the precautions outlined in CDC's guidance for preventing spread in homes and communities.

For the general public, no additional precautions are recommended at this time beyond the simple daily precautions that everyone should always take. It is currently flu and respiratory disease season, and CDC recommends getting vaccinated, taking everyday preventive actions to stop the spread of germs, and taking flu antivirals if prescribed. Right now, CDC recommends travelers avoid all nonessential travel to China.

For more information about the current outbreak in China, visit https://www.cdc.gov/coronavirus/2019-ncov/index.html. For travel health information, visit https://wwwnc.cdc.gov/travel/notices/watch/pneumonia-china.

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

CDC works 24/7 protecting America's health, safety and security. Whether disease start at home or abroad, are curable or preventable, chronic or acute, or from human activity or deliberate attack, CDC responds to America's most pressing health threats. CDC is headquartered in Atlanta and has experts located throughout the United States and the world.

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EXHIBIT D

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Coronavirus Disease 2019 (COVID-19)

Frequently Asked Questions

Updated May 24, 2020

Other Frequently Asked Questions and Answers About:

Travel
Water Transmission
Healthcare Professionals
Healthcare Infection
Laboratory Viral Panels
Laboratory Biosafety
General Business
Personal Protective Equipment
K-12 Schools and Child Care Program Administrators
Community events: for administrators and individuals
Retirement Communities and Independent Living Facilities
Correctional and Detention Facilities
Event Organizers & Individuals
Cloth Face Coverings

Help control the spread of rumors and be aware of fraud schemes.

- Coronavirus Rumor Control (FEMA)
- COVID-19 Fraud Alert (Office of the Inspector General)

Coronavirus Disease 2019 Basics

What is a novel coronavirus?

A novel coronavirus is a new coronavirus that has not been previously identified. The virus causing coronavirus disease 2019 (COVID-19), is not the same as the coronaviruses that commonly circulate among humans and cause mild illness, like the common cold.

A diagnosis with coronavirus 229E, NL63, OC43, or HKU1 is not the same as a COVID-19 diagnosis. Patients with COVID-19 will be evaluated and cared for differently than patients with common coronavirus diagnosis.

Why is the disease being called coronavirus disease 2019, COVID-19?

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, first identified in Wuhan China. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV".

There are many types of human coronaviruses including some that commonly cause mild upper-respiratory tract illnesses. COVID-19 is a new disease, caused be a novel (or new) coronavirus that has not previously been seen in humans. The name of this disease was selected following the World Health Organization (WHO) best practice for naming of new human infectious diseases.

Why might someone blame or avoid individuals and groups (create stigma) because of COVID-19?

People in the U.S. may be worried or anxious about friends and relatives who are living in or visiting areas where COVID-19 is spreading. Some people are worried about getting the disease from these people. Fear and anxiety can lead to social stigma, for example, toward people who live in certain parts of the world, people who have traveled internationally, people who were in quarantine, or healthcare professionals.

Stigma is discrimination against an identifiable group of people, a place, or a nation. Stigma is associated with a lack of knowledge about how COVID-19 spreads, a need to blame someone, fears about disease and death, and gossip that spreads rumors and myths.

Stigma hurts everyone by creating more fear or anger toward ordinary people instead of focusing on the disease that is causing the problem.

How can people help stop stigma related to COVID-19?

People can fight stigma by providing social support in situations where you notice this is occurring. Stigma affects the emotional or mental health of stigmatized groups and the communities they live in. Stopping stigma is important to making communities and community members resilient. See resources on mental health and coping during COVID-19. Everyone can help stop stigma related to COVID-19 by knowing the facts and sharing them with others in your community.

Why do some state's COVID-19 case numbers sometimes differ from what is posted on CDC's website?

CDC's overall case numbers are validated through a confirmation process with jurisdictions. The process used for finding and confirming cases displayed by different places may differ.

How do CDC's COVID-19 case numbers compare with those provided by the World Health Organization (WHO) or Johns Hopkins?

CDC's COVID-19 case numbers include many publicly reported numbers, including information from state, local, territorial, international and external partners.

Why do the number of cases for previous days increase?

Delays in reporting can cause the number of COVID-19 cases reported on previous days to increase. (Sometimes this effect is described as "backfill.") State, local, and territorial health departments report the number of cases that have been confirmed and share these data with CDC. Since it takes time to conduct laboratory testing, cases from a previous day may be added to the daily counts a few days late.

COVID-19 and Hypertension

Are people with high blood pressure (hypertension) at higher risk from COVID-19?

At this time, we do not think that people with high blood pressure and no other underlying health conditions are more likely than others to get severely ill from COVID-19. Although many people who have gotten severely ill from COVID-19 have high blood pressure, they are often older or have other medical conditions like obesity, diabetes, and serious heart conditions that place them at higher risk of severe illness from COVID-19.

If you have high blood pressure, it's critically important that you keep your blood pressure under control to lower your risk for heart disease and strokes. Take your blood pressure medications as directed, keep a log of your blood pressure every day if you are able to take your blood pressure at home, and work with your healthcare team to make sure your blood pressure is well controlled. Any changes to your medications should be made in consultation with your healthcare team.

Should I continue to take my blood pressure medication?

Yes. Continue to take your blood pressure medications exactly as prescribed and make lifestyle modifications agreed upon in your treatment plan. Continue all your regular medications, including angiotensin-converting enzyme inhibitors (ACE-Is) or angiotensin receptor blockers (ARBs), as prescribed by your healthcare team. This is recommended by current clinical guidelines from the American Heart Association, the Heart Failure Society of America, and the American College of Cardiology

How COVID-19 Spreads

What is the source of the virus?

COVID-19 is caused by a coronavirus called SARS-CoV-2. Coronaviruses are a large family of viruses that are common in people and many different species of animals, including camels, cattle, cats, and bats. Rarely, animal coronaviruses can infect people and then spread between people. This occurred with MERS-CoV and SARS-CoV, and now with the virus that causes COVID-19. The SARS-CoV-2 virus is a betacoronavirus, like MERS-CoV and SARS-CoV. All three of these viruses have their origins in bats. The sequences from U.S. patients are similar to the one that China initially posted, suggesting a likely single, recent emergence of this virus from an animal reservoir. However, the exact source of this virus is unknown.

More information about the source and spread of COVID-19 is available on the Situation Summary: Source and Spread of the Virus.

How does the virus spread?

The virus that causes COVID-19 is thought to spread mainly from person to person, mainly through respiratory droplets produced when an infected person coughs or sneezes. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs. Spread is more likely when people are in close contact with one another (within about 6 feet).

COVID-19 seems to be spreading easily and sustainably in the community ("community spread") in many affected geographic areas. Community spread means people have been infected with the virus in an area, including some who are not sure how or where they became infected.

Learn what is known about the spread of newly emerged coronaviruses.

Why are we seeing a rise in cases?

The number of cases of COVID-19 being reported in the United States is rising due to increased laboratory testing and reporting across the country. The growing number of cases in part reflects the rapid spread of COVID-19 as many U.S. states and territories experience community spread. More detailed and accurate data will allow us to better understand and track the size and scope of the outbreak and strengthen prevention and response efforts.

Can someone who has had COVID-19 spread the illness to others?

The virus that causes COVID-19 is spreading from person-to-person. People are thought to be most contagious when they are symptomatic (the sickest). That is why CDC recommends that these patients be isolated either in the hospital or at home (depending on how sick they are) until they are better and no longer pose a risk of infecting others. More recently the virus has also been detected in asymptomatic persons.

How long someone is actively sick can vary so the decision on when to release someone from isolation is made using a test-based or non-test-based strategy (i.e. time since illness started and time since recovery) in consultation with state and local public health officials. The decision involves considering the specifics of each situation, including disease severity, illness signs and symptoms, and the results of laboratory testing for that patient.

Learn more about CDC's guidance on when to release someone from isolation and discharge hospitalized patients with COVID-19. For information on when someone who has been sick with COVID-19 is able to stop home isolation see Interim Guidance for Discontinuation of In-Home Isolation for Patients with COVID-19.

Someone who has been released from isolation is not considered to pose a risk of infection to others.

Can someone who has been quarantined for COVID-19 spread the illness to others?

Quarantine means separating a person or group of people who have been exposed to a contagious disease but have not developed illness (symptoms) from others who have not been exposed, in order to prevent the possible spread of that disease. Quarantine is usually established for the incubation period of the communicable disease, which is the span of time during which people have developed illness after exposure. For COVID-19, the period of quarantine is 14 days from the last date of exposure because the incubation period for this virus is 2 to 14 days. Someone who has been released from COVID-19 quarantine is not considered a risk for spreading the virus to others because they have not developed illness during the incubation period.

Can the virus that causes COVID-19 be spread through food, including restaurant take out, refrigerated or frozen packaged food?

Coronaviruses are generally thought to be spread from person to person through respiratory droplets. Currently, there is no evidence to support transmission of COVID-19 associated with food. Before preparing or eating food it is important to always wash your hands with soap and water for at least 20 seconds for general food safety. Throughout the day use a tissue to cover your coughing or sneezing, and wash your hands after blowing your nose, coughing or sneezing, or going to the bathroom.

It may be possible that a person can get COVID-19 by touching a surface or object, like a packaging container, that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

In general, because of poor survivability of these coronaviruses on surfaces, there is likely very low risk of spread from food products or packaging.

Learn what is known about the spread of COVID-19.

Can I get sick with COVID-19 if it is on food?

Based on information about this novel coronavirus thus far, it seems unlikely that COVID-19 can be transmitted through food – additional investigation is needed.

Will warm weather stop the outbreak of COVID-19?

It is not yet known whether weather and temperature affect the spread of COVID-19. Some other viruses, like those that cause the common cold and flu, spread more during cold weather months but that does not mean it is impossible to become sick with these viruses during other months. There is much more to learn about the transmissibility, severity, and other features associated with COVID-19 and investigations are ongoing.

What is community spread?

Community spread means people have been infected with the virus in an area, including some who are not sure how or where they became infected.

What temperature kills the virus that causes COVID-19?

Generally coronaviruses survive for shorter periods at higher temperatures and higher humidity than in cooler or dryer environments. However, we don't have direct data for this virus, nor do we have direct data for a temperature-based cutoff for inactivation at this point. The necessary temperature would also be based on the materials of the surface, the environment, etc. Regardless of temperature please follow CDC's guidance for cleaning and disinfection.

Can mosquitoes or ticks spread the virus that causes COVID-19?

At this time, CDC has no data to suggest that this new coronavirus or other similar coronaviruses are spread by mosquitoes or ticks. The main way that COVID-19 spreads is from person to person. See How Coronavirus Spreads for more information.

How to Protect Yourself

Am I at risk for COVID-19 in the United States?

This is a rapidly evolving situation and the risk assessment may change daily. The latest updates are available on CDC's Coronavirus Disease 2019 (COVID-19) website.

How many cases have been reported in the United States?

COVID-19 case counts for the United States are updated regularly online. See the current U.S. case count of COVID-19.

How can I help protect myself?

Visit the COVID-19 Prevention and Treatment page to learn about how to protect yourself from respiratory illnesses, like COVID-19.

What should I do if I have had close contact with someone who has COVID-19?

There is information for people who have had close contact with a person confirmed to have, or being evaluated for, COVID-19 available online.

Does CDC recommend the use of facemask or face coverings to prevent COVID-19?

In light of data about how COVID-19 spreads, along with evidence of widespread COVID-19 illness in communities across the country, CDC recommends that people wear a cloth face covering to cover their nose and mouth in the community setting. This is an additional public health measure people should take to reduce the spread of COVID-19 in addition to (not instead of) social distancing, frequent hand cleaning and other everyday preventive actions. A cloth face covering is not intended to protect the wearer, but may prevent the spread of virus from the wearer to others. This would be especially important in the event that someone is infected but does not have symptoms. A cloth face covering should be worn whenever people must go into public settings (grocery stores, for example). Medical masks and N-95 respirators are reserved for healthcare workers and other first responders, as recommended by current CDC guidance.

Is it safe to get care for my other medical conditions during this time?

- **It is important to continue taking care of your health and wellness.** If you have a chronic health problem, you may be at higher risk for severe illness from COVID-19. Below are some things you can to do to take care of your health during this time.
- **Continue your medications,** and do not change your treatment plan without talking to your healthcare provider.
- **Continue to manage your disease** the way your healthcare provider has told you.
- **Have at least a 2-week supply** of all prescription and non-prescription medications. Talk to your healthcare provider, insurer, and pharmacist about getting an extra supply of prescription medications, if possible, to reduce trips to the pharmacy.
- **Talk to your healthcare provider about whether your vaccinations are up-to-date.** People aged 65 years or older, and those with some underlying medical conditions, are recommended to receive vaccinations against influenza and pneumococcal disease as soon as your provider tells you that can.
- **Call your healthcare provider**
  - **if you have any concerns** about your medical conditions, or if you get sick.
  - **to find out about different ways you can connect with your healthcare provider for chronic disease** management or other conditions. Ask about phone calls, video appointments, use of the patient portal, emails and mailings. Learn more about telehealth here .
- **Do not delay getting emergency care for your health problems or *any* health condition that requires immediate attention.**
  - If you need emergency help, call 911.
  - Emergency departments have infection prevention plans to protect you from getting COVID-19 if you need care for your medical condition.
- **Continue** to practice everyday prevention: wash your hands often, keep space between yourself and others, cover your mouth and nose with a cloth face cover when around other people, cover coughs and sneezes, and clean and disinfect frequently touched surfaces often.

Am I at risk for COVID-19 from mail, packages, or products?

There is still a lot that is unknown about COVID-19 and how it spreads. Coronaviruses are thought to be spread most often by respiratory droplets. Although the virus can survive for a short period on some surfaces, it is unlikely to be spread from domestic or international mail, products or packaging. However, it may be possible that people can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

Learn more about safe handling of deliveries and mail.

Is it okay for me to donate blood?

In healthcare settings across the United States, donated blood is a lifesaving, essential part of caring for patients. The need for donated blood is constant, and blood centers are open and in urgent need of donations. CDC encourages people who are well to continue to donate blood if they are able, even if they are practicing social distancing because of COVID-19. CDC is supporting blood centers by providing recommendations that will keep donors and staff safe. Examples of these recommendations include spacing donor chairs 6 feet apart, thoroughly adhering to environmental cleaning practices, and encouraging donors to make donation appointments ahead of time.

Should contact lens wearers take special precautions to prevent COVID-19?

- Currently there is no evidence to suggest contact lens wearers are more at risk for acquiring COVID-19 than eyeglass wearers.
- Contact lens wearers should continue to practice safe contact lens wear and care hygiene habits to help prevent against transmission of any contact lens-related infections, such as always washing hands with soap and water before handling lenses.
- People who are healthy can continue to wear and care for their contact lenses as prescribed by their eye care professional.

Find more information about how coronavirus spreads and how to protect yourself.

Visit CDC's contact lens website for more information on healthy contact lens wear and care.

Is contact lens disinfecting solution effective against COVID-19?

- Hydrogen peroxide-based systems for cleaning, disinfecting, and storing contact lenses should be effective against the virus that causes COVID-19.
  - For other disinfection methods, such as multipurpose solution and ultrasonic cleaners, there is currently not enough scientific evidence to determine efficacy against the virus.
- Always use solution to disinfect your contact lenses and case to kill germs that may be present.
- Handle your lenses over a surface that has been cleaned and disinfected.

Find more information about how coronavirus spreads and how to protect yourself.

Visit CDC's contact lens website for more information on healthy contact lens wear and care.

COVID-19 and Children

What is the risk of my child becoming sick with COVID-19?

Based on available evidence, children do not appear to be at higher risk for COVID-19 than adults. While some children and infants have been sick with COVID-19, adults make up most of the known cases to date. You can learn more about who is at higher risk for severe illness from COVID-19 at People who are at higher risk for severe illness.

How can I protect my child from COVID-19 infection?

You can encourage your child to help stop the spread of COVID-19 by teaching them to do the same things everyone should do to stay healthy.

- Avoid close contact with people who are sick.
- Stay home when you are sick, except to get medical care.
- Cover your coughs and sneezes with a tissue and throw the tissue in the trash.
- Wash your hands often with soap and water for at least 20 seconds, especially after blowing your nose, coughing, or sneezing; going to the bathroom; and before eating or preparing food.
- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.
- Clean and disinfect frequently touched surfaces and objects (e.g., tables, countertops, light switches, doorknobs, and cabinet handles).
- Launder items, including washable plush toys, as appropriate and in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely. Dirty laundry from an ill person can be washed with other people's items.

You can find additional information on preventing COVID-19 at Prevention for 2019 Novel Coronavirus and at Preventing COVID-19 Spread in Communities. Additional information on how COVID-19 is spread is available at How COVID-19 Spreads.

More information on Children and Coronavirus Disease 2019 (COVID-19) is available online.

Are the symptoms of COVID-19 different in children than in adults?

No. The symptoms of COVID-19 are similar in children and adults. However, children with confirmed COVID-19 have generally presented with mild symptoms. Reported symptoms in children include cold-like symptoms, such as fever, runny nose, and cough. Vomiting and diarrhea have also been reported. It's not known yet whether some children may be at higher risk for severe illness, for example, children with underlying medical conditions and special healthcare needs. There is much more to be learned about how the disease impacts children.

Should children wear masks?

CDC recommends that everyone 2 years and older wear a cloth face covering that covers their nose and mouth when they are out in the community. Cloth face coverings should NOT be put on babies or children younger than 2 because of the danger of suffocation. Children younger than 2 years of age are listed as an exception as well as anyone who has trouble breathing or is unconscious, incapacitated, or otherwise unable to remove the face covering without assistance.

Wearing cloth face coverings is a public health measure people should take to reduce the spread of COVID-19 in addition to (not instead of) social distancing, frequent hand cleaning ,and other everyday preventive actions. A cloth face covering is not intended to protect the wearer but may prevent the spread of virus from the wearer to others.

This would be especially important if someone is infected but does not have symptoms. Medical face masks and N95 respirators are still reserved for healthcare personnel and other first responders, as recommended by current CDC guidance.

How do I prepare my children in case of COVID-19 outbreak in our community?

Outbreaks can be stressful for adults and children. Talk with your children about the outbreak, try to stay calm, and reassure them that they are safe. If appropriate, explain to them that most illness from COVID-19 seems to be mild. Children respond differently to stressful situations than adults. CDC offers resources to help talk with children about COVID-19.

What steps should parents take to protect children during a community outbreak?

This is a new virus and we are still learning about it, but so far, there does not seem to be a lot of illness in children. Most illness, including serious illness, is happening in adults of working age and older adults. However, children do get the virus and become ill. Many schools across the country have announced dismissals for temporary periods. Keep track of school dismissals in your community. Read or watch local media sources that report school dismissals. If schools are dismissed temporarily, use alternative childcare arrangements, if needed.

If your child/children become sick with COVID-19, notify their childcare facility or school. Talk with teachers about classroom assignments and activities they can do from home to keep up with their schoolwork.

Discourage children and teens from gathering in other public places while school is dismissed to help slow the spread of COVID-19 in the community.

What is multisystem inflammatory syndrome in children (MIS-C) and who is at risk?

CDC is working with state and local health departments to investigate reports of multisystem inflammatory syndrome in children (MIS-C) associated with COVID-19 and gather more information as quickly as possible about how common it is and who is at risk. As new information becomes available, we will continue to provide information for parents and caregivers as well as healthcare and public health professionals. MIS-C has been described as inflammation (swelling) across multiple body systems, potentially including the heart, lungs, kidneys, brain, skin, eyes, and gastrointestinal organs. Signs and symptoms of MIS-C include fever and various symptoms such as abdominal pain, vomiting, diarrhea, neck pain, rash, and feeling tired.

If your child has any of these symptoms, other symptoms of COVID-19, or other concerning signs, contact your pediatrician. If your child is showing any emergency warning signs including trouble breathing, persistent pain or pressure in the chest, new confusion, inability to wake or stay awake, bluish lips or face, severe abdominal pain, or other concerning signs, seek emergency care right away.

School Dismissals and Children

While school's out, can my child hang out with their friends?

- The key to slowing the spread of COVID-19 is to practice social distancing. While school is out, children should not have in-person playdates with children from other households. If children are playing outside their own homes, it is essential that they remain 6 feet from anyone who is not in their own household.
- To help children maintain social connections while social distancing, help your children have supervised phone calls or video chats with their friends.
- Make sure children practice everyday preventive behaviors, such as washing their hands often with soap and water. Remember, if children meet outside of school in groups, it can put everyone at risk.
  - Revise spring break plans if they included non-essential travel.
- Information about COVID-19 in children is somewhat limited, but current data suggest children with COVID-19 may have only mild symptoms. However, they can still pass this virus onto others who may be at higher risk, including older adults and people who have serious underlying medical conditions.

While school's out, how can I help my child continue learning?

- **Stay in touch with your child's school.**
  - Many schools are offering lessons online (virtual learning). Review assignments from the school, and help your child establish a reasonable pace for completing the work. You may need to assist your child with turning on devices, reading instructions, and typing answers.
  - Communicate challenges to your school. If you face technology or connectivity issues, or if your child is having a hard time completing assignments, let the school know.
- **Create a schedule and routine for learning at home, but remain flexible.**
  - Have consistent bedtimes, and get up at the same time, Monday through Friday.
  - Structure the day for learning, free time, healthy meals and snacks, and physical activity.
  - Allow flexibility in the schedule—it's okay to adapt based on your day.
- **Consider the needs and adjustment required for your child's age group.**
  - The transition to being at home will be different for preschoolers, K-5, middle school students, and high school students. Talk to your child about expectations and how they are adjusting to being at home versus at school.
  - Consider ways your child can stay connected with their friends without spending time in person.
- **Look for ways to make learning fun.**
  - Have hands-on activities, like puzzles, painting, drawing, and making things.
  - Independent play can also be used in place of structured learning. Encourage children to build a fort from sheets or practice counting by stacking blocks.
  - Practice handwriting and grammar by writing letters to family members. This is a great way to connect and limit face-to-face contact.
  - Start a journal with your child to document this time and discuss the shared experience.
  - Use audiobooks or see if your local library is hosting virtual or live-streamed reading events.

While school's out, will kids have access to meals?

Check with your school on plans to continue meal services during the school dismissal. Many schools are keeping school facilities open to allow families to pick up meals or are providing grab-and-go meals at a central location.

While school's out, how can I keep my family healthy?

- Watch your child for any signs of illness.
  - If you see any sign of illness consistent with symptoms of COVID-19, particularly fever, cough, or shortness of breath, call your healthcare provider and keep your child at home and away from others as much as possible. Follow CDC's guidance on "What to do if you are sick."
- Watch for signs of stress in your child.
  - Some common changes to watch for include excessive worry or sadness, unhealthy eating or sleeping habits, and difficulty with attention and concentration. For more information, see the "For Parents" section on CDC's website, Manage Anxiety and Stress.
  - Take time to talk with your child or teen about the COVID-19 outbreak. Answer questions and share facts about COVID-19 in a way that your child or teen can understand.
  - Go to CDC's Helping Children Cope with Emergencies or Talking with Children About COVID-19 for more information.
- Teach and reinforce everyday preventive actions.
  - Parents and caretakers play an important role in teaching children to wash their hands. Explain that hand washing can keep them healthy and stop the virus from spreading to others.
  - Be a good role model—if you wash your hands often, they're more likely to do the same.
  - Make handwashing a family activity.
- Help your child stay active.
  - Encourage your child to play outdoors—it's great for physical and mental health. Take a walk with your child or go on a bike ride.
  - Use indoor activity breaks (stretch breaks, dance breaks) throughout the day to help your child stay healthy and focused.
- Help your child stay socially connected.
  - Reach out to friends and family via phone or video chats.
  - Write cards or letters to family members they may not be able to visit.
  - Some schools and non-profits, such as the Collaborative for Academic, Social, and Emotional Learning and The Yale Center for Emotional Intelligence, have resources for social and emotional learning. Check to see if your school has tips and guidelines to help support social and emotional needs of your child.

While school's out, limit time with older adults, including relatives, and people with chronic medical conditions.

Older adults and people who have serious underlying medical conditions are at highest risk of getting sick from COVID-19.

- If others in your home are at particularly high risk for severe illness from COVID-19, consider extra precautions to separate your child from those people.
- If you are unable to stay home with your child during school dismissals, carefully consider who might be best positioned to provide childcare. If someone at higher risk for COVID-19 will be providing care (older adult, such as a grandparent or someone with a serious underlying medical condition), limit your children's contact with other people.
- Consider postponing visits or trip to see older family members and grandparents. Connect virtually or by writing letters and sending via mail.

Children and Youth with Special Healthcare Needs

Is my child with an underlying medical condition or special healthcare need at higher risk for severe illness from COVID-19?

Children with complex, chronic medical conditions, including children with physical, developmental, behavioral, or emotional differences, can have special healthcare needs. It's not known yet whether all of these children are at higher risk for severe illness from COVID-19.

Although most COVID-19 cases in children are not severe, serious illness that needs to be treated at the hospital still happens. Some data on children reported that the majority who needed hospitalization for COVID-19 had at least one underlying medical condition. The most common underlying conditions reported among children with COVID-19 include chronic lung disease (including asthma), heart disease, and conditions that weaken the immune system. This information suggests that children with these underlying medical conditions may be at risk for more severe illness from COVID-19.

More data are needed to learn which underlying or complex medical conditions may put children at increased risk. CDC is monitoring new information as it becomes available and will provide updates as needed.

Learn more about caring for children with special health care needs during a disaster and people who are at higher risk for severe illness from COVID-19.

What additional steps should families that have a child with an underlying medical condition or special health care need take?

In addition to following the recommendations to prevent getting sick and running essential errands, families should take extra steps recommended for persons with higher risk of severe COVID-19 illness and steps outlined for those with potential COVID-19 exposure or confirmed illness.

- Identify potential alternative caregivers, if you or other regular caregivers become sick and are unable to care for your child. If possible, these alternative caregivers would not be at higher risk of severe illness from COVID-19 themselves.
- Try to have at least one month of medication and medical supplies on hand. Some health plans allow for a 90-day supply of prescription medications. Consider discussing this option with your child's healthcare provider.
- Review any care plans for your child, such as an asthma action plan, and make sure caregivers and backup caregivers are familiar with these plans.
- If you do not have care plans or an emergency notebook, try to make them. They typically include important information about your child's medical conditions, how to manage those conditions, how to get in touch with your child's doctors, allergies, information on medications (names, dosages, and administration instructions), preferences (food and other) or special needs, daily routines and activities, friends, and details about routines that are important to support behavioral and emotional health.
- Learn if your child's healthcare providers, including doctors and therapists, have new ways to be contacted or new ways of providing appointments. If they offer telemedicine visits, find out how those are arranged and any additional information you need.
- If your child receives any support care services in the home that need to be continued, make plans for what you will do if those direct care providers get sick, or if persons in your household are sick.

- Discuss with the support care agencies and the providers ways to minimize risk for exposure to the virus that causes COVID-19.
  - If your child or other persons in your household are sick with COVID-19 and are able to recover at home, inform your direct care providers and consider postponing or rescheduling services until the criteria for discontinuing home isolation have been met.
  - Ask service providers if they are experiencing any symptoms of COVID-19, or if they have been in contact with someone who has COVID-19.
  - Tell the service provider to:
    - Wear a cloth face covering if they will be close (less than 6 feet) to you or persons in your household. Their cloth face covering helps protect you if they are infected but do not have symptoms.
    - Ask them to wash their hands with soap and water or, if unavailable, use hand sanitizer with at least 60% alcohol when they enter your home, before and after helping your child (dressing, bathing/showering, transferring, toileting and/or diapering, feeding), after handling tissues, and after changing linens or doing laundry. Learn more about proper handwashing.
  - Service providers and families should:
    - Routinely clean and disinfect frequently touched objects and surfaces (counters, tabletops, doorknobs, bathroom fixtures, toilets, phones, keyboards, tablets, bedside tables), and equipment such as wheelchairs, scooters, walkers, oxygen tanks and tubing, communication boards, and other assistive devices. Refer to CDC's recommendations for Cleaning and Disinfecting Your Home.

What can I do if my child has difficulties adjusting to new routines and following recommendations?

Helping children understand and follow recommendations, like social distancing and wearing cloth face coverings, can be challenging if your child has intellectual disabilities, sensory issues, or other special healthcare needs.

- Keeping children at home and sheltering in place can lower stress created by social distancing and cloth face covering recommendations. Reach out to others for help in running essential errands.
- Behavioral techniques can be used to address behavioral challenges and to develop new routines. These include social stories, video modeling, picture schedules, and visual cues. Try rewarding your child in small ways with his or her favorite non-food treat or activities to help switch routines and to follow recommendations.
- Many of the organizations you turn to for information and support around your child's complex, chronic medical condition may have information on their websites to help families address issues related to COVID-19.
- Your child's therapist(s) and/or teachers may also have resources to help successfully introduce new routines to your child.

Additional information on caring for children and on child development specific conditions are available.

How can my family cope with the added stress?

Supporting children with special healthcare needs can put additional demands and stress on families, especially during emergency situations. You have likely found ways to manage the stress and challenges unique to your family's situation. It is important to continue your family's coping methods, including reaching out to other family members, friends, support groups, and organizations that have been helpful in the past.

See information on ways to cope with stress (such as visiting parks, trails, or open spaces) and making your family stronger.
If you, or someone you care about, are feeling overwhelmed with emotions like sadness, depression, or anxiety, or feel like you want to harm yourself or others:

- Call 911
- Visit the Disaster Distress Helpline , call 1-800-985-5990, or text TalkWithUs to 66746
- Visit the National Domestic Violence Hotline or call 1-800-799-7233 and TTY 1-800-787-3224

What if my child or someone else in the home is sick with symptoms of COVID-19?

If your child with special healthcare needs becomes sick with symptoms of COVID-19, contact your child's healthcare provider. If your child has new or worsening emergency warning signs, such as trouble breathing, pain or pressure in the chest, confusion or inability to wake them up, or bluish lips or face, call 911. If you think your child may have COVID-19, notify the operator so that first responders may be appropriately prepared to protect themselves and others.

Notify your child's healthcare provider if someone else in your house becomes sick with COVID-19, so they can provide any advice specific for your child.

See additional information if someone in the home is sick with COVID-19 or suspected of having COVID-19.

What if my child's symptoms of their underlying medical condition or complex, chronic medical condition get worse?

- Call your child's healthcare provider if you have any concerns about your child's medical conditions. If you need emergency help, call 911.
- Emergency departments have infection prevention plans to protect you and your child from getting COVID-19 if your child needs care for medical conditions not related to COVID-19. Do not delay getting emergency care for your child's underlying condition or complex medical condition because you are afraid of getting exposed to COVID-19 when visiting the healthcare setting.

What if my child needs to go to the hospital?

If your child's healthcare provider tells you to go to the hospital for any health problem, including COVID-19:

- Ask the healthcare provider to let the hospital know you are coming and to share the important information the hospital will need to know to care for your child.
- Visiting policies may have changed due to COVID-19. If your child's hospital policy does not allow an adult to stay with a child, ask your child's healthcare provider for a statement explaining your child's need for a familiar adult to be present.
- Bring your care plans/emergency notebook with you along with paper and pen to write down questions you have during your time at the hospital.

Preparing Your Home and Family for COVID-19

How can my family and I prepare for COVID-19?

Create a household plan of action to help protect your health and the health of those you care about in the event of an outbreak of COVID-19 in your community:

- Talk with the people who need to be included in your plan, and discuss what to do if a COVID-19 outbreak occurs in your community.
- Plan ways to care for those who might be at greater risk for serious complications, particularly older adults and those with severe chronic medical conditions like heart, lung or kidney disease.
  - Make sure they have access to several weeks of medications and supplies in case you need to stay home for prolonged periods of time.
- Get to know your neighbors and find out if your neighborhood has a website or social media page to stay connected.
- Create a list of local organizations that you and your household can contact in the event you need access to information, healthcare services, support, and resources.
- Create an emergency contact list of family, friends, neighbors, carpool drivers, health care providers, teachers, employers, the local public health department, and other community resources.

What steps can my family take to reduce our risk of getting COVID-19?

Practice everyday preventive actions to help reduce your risk of getting sick and remind everyone in your home to do the same. These actions are especially important for older adults and people who have severe chronic medical conditions:

- Avoid close contact with people who are sick.
- Stay home when you are sick, except to get medical care.
- Cover your coughs and sneezes with a tissue and throw the tissue in the trash.
- Wash your hands often with soap and water for at least 20 seconds, especially after blowing your nose, coughing, or sneezing; going to the bathroom; and before eating or preparing food.
- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.
- Clean and disinfect frequently touched surfaces and objects (e.g., tables, countertops, light switches, doorknobs, and cabinet handles).
- Launder items, including washable plush toys, as appropriate and in accordance with the manufacturer's instructions. If possible, launder items using the warmest appropriate water setting for the items and dry items completely. Dirty laundry from an ill person can be washed with other people's items.

What should I do if someone in my house gets sick with COVID-19?

Most people who get COVID-19 will be able to recover at home. CDC has directions for people who are recovering at home and their caregivers, including:

- Stay home when you are sick, except to get medical care.

When to Seek Emergency Medical Attention

Look for **emergency warning signs*** for COVID-19. If someone is showing any of these signs, **seek emergency medical care immediately**

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face

*This list is not all possible symptoms. Please call your medical provider for any other symptoms that are severe or concerning to you.

Call 911 or call ahead to your local emergency facility: Notify the operator that you are seeking care for someone who has or may have COVID-19.

- Use a separate room and bathroom for sick household members (if possible).
- Wash your hands often with soap and water for at least 20 seconds, especially after blowing your nose, coughing, or sneezing; going to the bathroom; and before eating or preparing food.
- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.
- Provide your sick household member with clean disposable facemasks to wear at home, if available, to help prevent spreading COVID-19 to others.
- Clean the sick room and bathroom, as needed, to avoid unnecessary contact with the sick person.
- Avoid sharing personal items like utensils, food, and drinks.

How can I prepare in case my child's school, child care facility, or university is dismissed?

Talk to the school or facility about their emergency operations plan. Understand the plan for continuing education and social services (such as student meal programs) during school dismissals. If your child attends a college or university, encourage them to learn about the school's plan for a COVID-19 outbreak.

How can I prepare for COVID-19 at work?

Plan for potential changes at your workplace. Talk to your employer about their emergency operations plan, including sick-leave policies and telework options. Learn how businesses and employers can plan for and respond to COVID-19.

Should I use soap and water or a hand sanitizer to protect against COVID-19?

Handwashing is one of the best ways to protect yourself and your family from getting sick. Wash your hands often with soap and water for at least 20 seconds, especially after blowing your nose, coughing, or sneezing; going to the bathroom; and before eating or preparing food. If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol.

What cleaning products should I use to protect against COVID-19?

Clean and disinfect frequently touched surfaces such as tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks. If surfaces are dirty, clean them using detergent or soap and water prior to disinfection. To disinfect, most common EPA-registered household disinfectants will work. See CDC's recommendations for household cleaning and disinfection.

Should I make my own hand sanitizer if I can't find it in the stores?

CDC recommends handwashing with soap and water for at least 20 seconds or, using alcohol-based hand sanitizer with at least 60% alcohol when soap and water are not available. These actions are part of everyday preventive actions individuals can take to slow the spread of respiratory diseases like COVID-19.

- When washing hands, you can use plain soap or antibacterial soap. Plain soap is as effective as antibacterial soap at removing germs.
- If soap and water are not readily available, you can use an FDA-approved alcohol-based hand sanitizer that contains at least 60% alcohol. You can tell if the sanitizer contains at least 60% alcohol by looking at the product label.

CDC does not encourage the production and use of homemade hand sanitizer products because of concerns over the correct use of the ingredients and the need to work under sterile conditions to make the product. Local industries that are looking into producing hand sanitizer to fill in for commercial shortages can refer to the World Health Organization guidance . Organizations should revert to the use of commercially produced, FDA-approved product once such supplies again become available.

- To be effective against killing some types of germs, hand sanitizers need to have a strength of at least 60% alcohol and be used when hands are not visibly dirty or greasy.
- Do not rely on "Do It Yourself" or "DIY" recipes based solely on essential oils or formulated without correct compounding practices.
- Do not use hand sanitizer to disinfect frequently touched surfaces and objects. See CDC's information for cleaning and sanitizing your home.

See FAQs about hand hygiene for healthcare personnel responding to COVID-2019.

In Case of an Outbreak in Your Community

What should I do if there is an outbreak in my community?

During an outbreak, stay calm and put your preparedness plan to work. Follow the steps below:

Protect yourself and others.

- Stay home if you are sick. Keep away from people who are sick. Limit close contact with others as much as possible (about 6 feet).

Put your household plan into action.

- **Stay informed about the local COVID-19 situation.** Be aware of temporary school dismissals in your area, as this may affect your household's daily routine.

- **Continue practicing everyday preventive actions.** Cover coughs and sneezes with a tissue and wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use a hand sanitizer that contains 60% alcohol. Clean frequently touched surfaces and objects daily using a regular household detergent and water.
- **Notify your workplace as soon as possible if your regular work schedule changes.** Ask to work from home or take leave if you or someone in your household gets sick with COVID-19 symptoms, or if your child's school is dismissed temporarily. Learn how businesses and employers can plan for and respond to COVID-19.
- **Stay in touch with others by phone or email.** If you have a chronic medical condition and live alone, ask family, friends, and health care providers to check on you during an outbreak. Stay in touch with family and friends, especially those at increased risk of developing severe illness, such as older adults and people with severe chronic medical conditions.

Will schools be dismissed if there is an outbreak in my community?

Depending on the situation, public health officials may recommend community actions to reduce exposures to COVID-19, such as school dismissals. Read or watch local media sources that report school dismissals or and watch for communication from your child's school. If schools are dismissed temporarily, discourage students and staff from gathering or socializing anywhere, like at a friend's house, a favorite restaurant, or the local shopping mall.

Should I go to work if there is an outbreak in my community?

Follow the advice of your local health officials. Stay home if you can. Talk to your employer to discuss working from home, taking leave if you or someone in your household gets sick with COVID-19 symptoms, or if your child's school is dismissed temporarily. Employers should be aware that more employees may need to stay at home to care for sick children or other sick family members than is usual in case of a community outbreak.

Will businesses and schools close or stay closed in my community and for how long? Will there be a "stay at home" or "shelter in place" order in my community?

CDC makes recommendations, shares information, and provides guidance to help slow down the spread of COVID-19 in the U.S. including guidance for schools and businesses. CDC regularly shares information and provides assistance to state, local, territorial, and tribal health authorities. These local authorities are responsible for making decisions including "stay at home" or "shelter in place." What is included in these orders and how they are implemented are also decided by local authorities. These decisions may also depend on many factors such as how the virus is spreading in a certain community.

Please contact your local health department to find out more.

Can CDC tell me or my employer when it is safe for me to go back to work/school after recovering from or being exposed to COVID-19?

CDC cannot address the policies of any business or organization. CDC shares recommendations based on the best available science to help people make decisions that improve their health and safety. Employers, schools, and organizations may decide to visibly screen for symptoms or perform on-site symptom checks.

If your employer, school, or organization requires you to present documentation regarding COVID-19 before returning to work or school (for example, proof of a negative COVID-19 lab test, if a test was performed, contact your healthcare provider to ask if he or she would be able to provide a form of documentation for you. Documentation of self-isolation and self-quarantine may not be possible.

CDC has guidance for when and how people with COVID-19 can discontinue home isolation: https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/steps-when-sick.html.

CDC also has guidance for what people should do if they think they have been exposed or feel sick: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html.

In all cases, follow the guidance of your healthcare provider and local health department. Local decisions depend on local circumstances.

Symptoms & Testing

What are the symptoms and complications that COVID-19 can cause?

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. People with these symptoms may have COVID-19:

- Cough
- Shortness of breath or difficulty breathing
- Fever
- Chills
- Muscle pain
- Sore throat
- New loss of taste or smell

Children have similar symptoms to adults and generally have mild illness.

This list is not all inclusive. Other less common symptoms have been reported, including gastrointestinal symptoms like nausea, vomiting, or diarrhea.

Read about COVID-19 Symptoms.

Is it possible to have the flu and COVID-19 at the same time?

Yes. It is possible to test positive for flu (as well as other respiratory infections) and COVID-19 at the same time.

Should I be tested for COVID-19?

Maybe; not everyone needs to be tested for COVID-19.

If you have symptoms of COVID-19 and want to get tested, call your healthcare provider first.

You can also visit your state or local health department's website to look for the latest local information on testing. See

Test for Past Infection for more information.

How can I get tested for COVID-19?

Two kinds of tests are available for COVID-19: viral tests and antibody tests. A viral test checks for a current infection. An antibody test checks for a previous infection.

If you think you need a viral test, call your healthcare provider or state or local health department and tell them about your symptoms and how you think you may have been exposed to the virus. Your healthcare provider can let you know if they offer viral tests at their office. Your state or local health department can provide local information on where testing is available. See Testing for Current Infection for more information.

If you want an antibody test, call your healthcare provider to see if they offer antibody tests and whether you should get one. You can also visit your state or local health department's website for local information on antibody testing.

Can someone test negative and later test positive on a viral test for COVID-19?

Yes, it is possible. You may test negative if the sample was collected early in your infection and test positive later during this illness. You could also be exposed to COVID-19 after the test and get infected then. Even if you test negative, you still should take steps to protect yourself and others. See Testing for Current Infection for more information.

What kind of tests are being used to diagnose COVID-19?

Viral tests are used to diagnose COVID-19. These tests tell you if you currently have an infection with the virus that causes COVID-19. There are many viral tests available. All of the viral tests identify the virus in respiratory samples, such as from swabs from the inside of your nose.

Some tests are conducted at the testing site you visit, and results are available to you within minutes. Other tests must be sent to a laboratory to analyze, a process that takes 1-2 days once the laboratory receives your samples. Two tests allow you to collect your sample at home – either a swab from the inside of your nose or a saliva sample – but you will still need to send the sample to a laboratory for processing.

Locations and types of testing sites vary depending on where you live (see question: Where can I get tested). Check with your testing site to learn which test it uses. You can find a patient information sheet about each test on FDA's website.

What is antibody testing? And can I be tested using this method?

Antibody testing checks a sample of a person's blood to look for antibodies to the virus that causes COVID-19. When someone gets COVID-19, their body usually makes antibodies. However, it typically takes one to three weeks to develop these antibodies. Some people may take even longer to develop antibodies, and some people may not develop antibodies. A positive result from this test may mean that person was previously infected with the virus. Talk to your healthcare provider about what your antibody test result means.

Antibody tests should not be used to diagnose COVID-19. To see if you are currently infected, you need a viral test. Viral tests identify the virus in respiratory samples, such as swabs from the inside of your nose.

We do not know yet if having antibodies to the virus that causes COVID-19 can protect someone from getting infected again or, if they do, how long this protection might last. Scientists are conducting research to answer those questions.

If I have recovered from COVID-19, will I be immune to it?

We do not know yet if people who recover from COVID-19 can get infected again. CDC and partners are investigating to determine if a person can get sick with COVID-19 more than once. Until we know more, continue to take steps to protect yourself and others.

Higher Risk

Who is at higher risk for serious illness from COVID-19?

COVID-19 is a new disease and there is limited information regarding risk factors for severe disease. Based on currently available information and clinical expertise, **older adults** and **people of any age who have serious underlying medical conditions** might be at higher risk for severe illness from COVID-19.

Based on what we know now, those at high-risk for severe illness from COVID-19 are:

- People aged 65 years and older
- People who live in a nursing home or long-term care facility

People of all ages with underlying medical conditions, particularly if not well controlled, including:

- People with chronic lung disease or moderate to severe asthma
- People who have serious heart conditions
- People who are immunocompromised
  - Many conditions can cause a person to be immunocompromised, including cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications
- People with severe obesity (body mass index [BMI] ≥40)
- People with diabetes
- People with chronic kidney disease undergoing dialysis
- People with liver disease

What should people at higher risk of serious illness with COVID-19 do?

If you are at higher risk of getting very sick from COVID-19, you should:

- Stock up on supplies

- Take everyday precautions to keep space between yourself and others
- When you go out in public, keep away from others who are sick
- Limit close contact and wash your hands often
- Avoid crowds, cruise travel, and non-essential travel

If there is an outbreak in your community, stay home as much as possible. Watch for symptoms and emergency signs. If you get sick, stay home and call your doctor. More information on how to prepare, what to do if you get sick, and how communities and caregivers can support those at higher risk is available on People at Risk for Serious Illness from COVID-19.

How were the underlying conditions for people considered higher risk of serious illness with COVID-19 selected?

This list is based on:

- What we are learning from the outbreak in other countries and in the United States.
- What we know about risk from other respiratory infections, like flu.

As CDC gets more information about COVID-19 cases here in the United States, we will update this list as needed.

Are there any medications I should avoid taking if I have COVID-19?

Currently, there is no evidence to show that taking ibuprofen or naproxen can lead to a more severe infection of COVID-19.

People with high blood pressure should take their blood pressure medications, as directed, and work with their healthcare provider to make sure that their blood pressure is as well controlled as possible. Any changes to your medications should only be made by your healthcare provider.

What about underlying medical conditions that are not included on this list?

Based on available information, adults aged 65 years and older and people of any age with underlying medical conditions included on this list are at higher risk for severe illness and poorer outcomes from COVID-19. CDC is collecting and analyzing data regularly and will update the list when we learn more. People with underlying medical conditions not on the list might also be at higher risk and should consult with their healthcare provider if they are concerned.

We encourage all people, regardless of risk, to:

- Take steps to protect yourself and others.
- Call your healthcare provider if you are sick with a fever, cough, or shortness of breath.
- Follow CDC travel guidelines and the recommendations of your state and local health officials.

What does a well-controlled health condition mean?

Generally, well-controlled means that your condition is stable, not life-threatening, and laboratory assessments and other findings are as similar as possible to those without the health condition. You should talk with your healthcare provider if you have a question about your health or how your health condition is being managed.

What does more severe illness mean?

Severity typically means how much impact the illness or condition has on your body's function. You should talk with your healthcare provider if you have a question about your health or how your health condition is being managed.

Are people with disabilities at higher risk?

Most people with disabilities are not inherently at higher risk for becoming infected with or having severe illness from COVID-19. Some people with physical limitations or other disabilities might be at a higher risk of infection because of their underlying medical condition.

- People with certain disabilities might experience higher rates of chronic health conditions that put them at higher risk of serious illness and poorer outcomes from COVID-19. Adults with disabilities are three times more likely to have heart disease, stroke, diabetes, or cancer than adults without disabilities.

You should talk with your healthcare provider if you have a question about your health or how your health condition is being managed.

COVID-19 and Hypertension

Are people with high blood pressure (hypertension) at higher risk from COVID-19?

At this time, we do not think that people with high blood pressure and no other underlying health conditions are more likely than others to get severely ill from COVID-19. Although many people who have gotten severely ill from COVID-19 have high blood pressure, they are often older or have other medical conditions like obesity, diabetes, and serious heart conditions that place them at higher risk of severe illness from COVID-19.

If you have high blood pressure, it's critically important that you keep your blood pressure under control to lower your risk for heart disease and strokes. Take your blood pressure medications as directed, keep a log of your blood pressure every day if you are able to take your blood pressure at home, and work with your healthcare team to make sure your blood pressure is well controlled. Any changes to your medications should be made in consultation with your healthcare team.

Should I continue to take my blood pressure medication?

Yes. Continue to take your blood pressure medications exactly as prescribed and make lifestyle modifications agreed upon in your treatment plan. Continue all your regular medications, including angiotensin-converting enzyme inhibitors (ACE-Is) or angiotensin receptor blockers (ARBs), as prescribed by your healthcare team. This is recommended by current clinical guidelines from the American Heart Association, the Heart Failure Society of America, and the American College of Cardiology.

Healthcare Professionals and Health Departments

What should healthcare professionals and health departments do?

For recommendations and guidance on persons under investigation; infection control, including personal protective equipment guidance; home care and isolation; and case investigation, see Information for Healthcare Professionals. For information on specimen collection and shipment, see Information for Laboratories. For information for public health professional on COVID-19, see Information for Public Health Professionals.

See also: FAQs for Healthcare Professionals

COVID-19 and Funerals

Am I at risk if I go to a funeral or visitation service for someone who died of COVID-19?

There is currently no known risk associated with being in the same room at a funeral or visitation service with the body of someone who died of COVID-19.

Am I at risk if I touch someone who died of COVID-19 after they have passed away?

COVID-19 is a new disease and **we are still learning how it spreads.** The virus that causes COVID-19 is thought to mainly spread from close contact (i.e., within about 6 feet) with a person who is currently sick with COVID-19. The virus likely spreads primarily through respiratory droplets produced when an infected person coughs or sneezes, similar to how influenza and other respiratory infections spread. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs. This type of spread is not a concern after death.

It may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

People should consider not touching the body of someone who has died of COVID-19. Older people and people of all ages with severe underlying health conditions are at higher risk of developing serious COVID-19 illness. There may be less of a chance of the virus spreading from certain types of touching, such as holding the hand or hugging after the body has been prepared for viewing. Other activities, such as kissing, washing, and shrouding should be avoided before, during, and after the body has been prepared, if possible. If washing the body or shrouding are important religious or cultural practices, families are encouraged to work with their community's cultural and religious leaders and funeral home staff on how to reduce their exposure as much as possible. At a minimum, people conducting these activities should wear disposable gloves. If splashing of fluids is expected, additional personal protective equipment (PPE) may be required (such as disposable gown, faceshield or goggles and N-95 respirator).

Cleaning should be conducted in accordance with manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method and contact time). Products with EPA-approved emerging viral pathogens claims are expected to be effective against COVID-19 based on data for harder to kill viruses. After removal of PPE, perform hand hygiene by washing hands with soap and water for at least 20 seconds or using an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water are not available. Soap and water should be used if the hands are visibly soiled.

What do funeral home workers need to know about handling decedents who had COVID-19?

A funeral or visitation service can be held for a person who has died of COVID-19. Funeral home workers should follow their routine infection prevention and control precautions when handling a decedent who died of COVID-19. If it is necessary to transfer a body to a bag, follow Standard Precautions, including additional personal protective equipment (PPE) if splashing of fluids is expected. For transporting a body after the body has been bagged, disinfect the outside of the bag with a product with EPA-approved emerging viral pathogens claims expected to be effective against COVID-19 based on data for harder to kill viruses. Follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method and contact time, etc.). Wear disposable nitrile gloves when handling the body bag.

Embalming can be conducted. During embalming, follow Standard Precautions including the use of additional PPE if splashing is expected (e.g. disposable gown, faceshield or goggles and N95 respirator). Wear appropriate respiratory protection if any procedures will generate aerosols or if required for chemicals used in accordance with the manufacturer's label. Wear heavy-duty gloves over nitrile disposable gloves if there is a risk of cuts, puncture wounds, or other injuries that break the skin. Additional information on how to safely conduct aerosol-generating procedures is in the CDC's Postmortem Guidance. Cleaning should be conducted in accordance with manufacturer's instructions. Products with EPA-approved emerging viral pathogens claims are expected to be effective against COVID-19 based on data for harder to kill viruses. Follow the manufacturer's instructions for all cleaning and disinfection products (e.g., concentration, application method and contact time).

After cleaning and removal of PPE, perform hand hygiene by washing hands with soap and water for at least 20 seconds or using an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water is not available. Soap and water should be used if the hands are visibly soiled.

Decedents with COVID-19 can be buried or cremated, but check for any additional state and local requirements that may dictate the handling and disposition of the remains of individuals who have died of certain infectious diseases.

How can loved ones safely handle belongings of someone who died from COVID-19?

The belongings of someone who has died of suspected or confirmed COVID-19 outside their home (for example, in a hospital setting) may be returned to family members along with instructions for cleaning and disinfection. Depending on local rules and regulations, family members may retrieve these belongings at the funeral home or the healthcare facility.

Family members should use gloves and practice good hand hygiene when handling these items. Depending on the belongings received, family members should also follow the household item-specific cleaning and disinfection guidelines for personal items, such as electronics.

What should I do if my family member died from COVID-19 while overseas?

When a US citizen dies outside the United States, the deceased person's next of kin or legal representative should notify US consular officials at the Department of State. Consular personnel are available 24 hours a day, 7 days a week, to provide assistance to US citizens for overseas emergencies. If a family member, domestic partner, or legal representative is in a different country from the deceased person, he or she should call the Department of State's Office of Overseas Citizens Services in Washington, DC, from 8 am to 5 pm Eastern time, Monday through Friday, at 888-407-4747 (toll-free) or 202-501-4444. For emergency assistance after working hours or on weekends and holidays, call the Department of State switchboard at 202-647-4000 and ask to speak with the Overseas Citizens Services duty officer. In addition, the US embassy closest to or in the country where the US citizen died can provide assistance.

My family member died from COVID-19 while overseas. What are the requirements for returning the body to the United States?

CDC does not require an autopsy before the remains of a person who died overseas are returned to the United States. Depending on the circumstances surrounding the death, some countries may require an autopsy. Sources of support to the family include the local consulate or embassy, travel insurance provider, tour operator, faith-based and aid organizations, and the deceased's employer. There likely will need to be an official identification of the body and official documents issued by the consular office.

CDC requirements for importing human remains depend upon if the body has been embalmed, cremated, or if the person died from a quarantinable communicable disease.

At this time, COVID-19 is a quarantinable communicable disease in the United States and the remains must meet the standards for importation found in 42 Code of Federal Regulations Part 71.55 and may be cleared, released, and authorized for entry into the United States only under the following conditions:

- The remains are cremated; OR
- The remains are properly embalmed and placed in a hermetically sealed casket; OR
- The remains are accompanied by a permit issued by the CDC Director. The CDC permit (if applicable) must accompany the human remains at all times during shipment.
    - Permits for the importation of the remains of a person known or suspected to have died from a quarantinable communicable disease may be obtained through the CDC Division of Global Migration and Quarantine by calling the CDC Emergency Operations Center at 770-488-7100 or emailing dgmqpolicyoffice@cdc.gov.

Please see CDC's guidance for additional information.

What CDC is Doing

What is CDC doing about COVID-19?

CDC is working with other federal partners in a whole-of-government response. This is an emerging, rapidly evolving situation and CDC will continue to provide updated information as it becomes available. CDC works 24/7 to protect people's health. More information about CDC's response to COVID-19 is available online.

Cleaning and Disinfection

What is the difference between cleaning and disinfecting?

Cleaning with soap and water removes germs, dirt, and impurities from surfaces. It lowers the risk of spreading infection. *Disinfecting* kills germs on surfaces. By killing germs on a surface after cleaning, it can further lower the risk of spreading infection.

Is it safe to vacuum in a school, business, or community facility after someone with suspected or confirmed COVID-19 has been present?

The risk of transmitting or spreading SARS-CoV-2, the virus that causes COVID-19, during vacuuming is unknown. At this time, there are no reported cases of COVID-19 associated with vacuuming. If vacuuming is necessary or required in a school, business, or community facility that was used by a person with suspected or confirmed COVID-19, first follow the CDC recommendations for Cleaning and Disinfection for Community Facilities that apply, which includes a wait time of 24 hours, or as long as practical.

After cleaning and disinfection, the following recommendations may help reduce the risk to workers and other individuals when vacuuming:

- Consider removing smaller rugs or carpets from the area completely, so there is less that needs to be vacuumed.
- Use a vacuum equipped with a high-efficiency particulate air (HEPA) filter, if available.
- Do not vacuum a room or space that has people in it. Wait until the room or space is empty to vacuum, such as at night, for common spaces, or during the day for private rooms.
- Consider temporarily turning off room fans and the central HVAC system that services the room or space, so that particles that escape from vacuuming will not circulate throughout the facility.

What is routine cleaning? How frequently should facilities be cleaned to reduce the potential spread of COVID-19?

Routine cleaning is the everyday cleaning practices that businesses and communities normally use to maintain a healthy environment. Surfaces frequently touched by multiple people, such as door handles, bathroom surfaces, and handrails, should be cleaned with soap and water or another detergent at least daily when facilities are in use. More frequent cleaning and disinfection may be required based on level of use. For example, certain surfaces and objects in public spaces, such as shopping carts and point of sale keypads, should be cleaned and disinfected before each use. Cleaning *removes* dirt and impurities, including germs, from surfaces. Cleaning alone does not kill germs, but it reduces the number of germs on a surface.

Is cleaning alone effective against the virus that causes COVID-19?

Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. If a surface may have gotten the virus on it from a person with or suspected to have COVID-19, the surface should be cleaned and disinfected. Disinfecting kills germs on surfaces.

Who should clean and disinfect community spaces?

Regular cleaning staff can clean and disinfect community spaces. Cleaning staff should be trained on appropriate use of cleaning and disinfection chemicals and provided with the personal protective equipment (PPE) required for the chemicals used.

How long do companies need to close for disinfection after an exposure? How long before other workers can come back to work?

Companies do not necessarily need to close after a person with confirmed or suspected COVID-19 has been in a company facility. The area(s) used or visited by the ill person should be closed for 24 hours or as long as possible. Open outside doors and windows as much as possible ensuring that doing so does not pose a safety risk to children using the facility (i.e. make sure that children are not able to enter the closed off area through any windows or doors). and use ventilating fans to increase air circulation in the area. Once the area has been appropriately disinfected, it can be opened for use. Workers without close contact with the person with confirmed or suspected COVID-19 can return to work immediately after disinfection is completed.

How effective are alternative disinfection methods, such as ultrasonic waves, high intensity UV radiation, and LED blue light?

The efficacy of these disinfection methods against the virus that causes COVID-19 is not known. EPA only recommends use of the surface disinfectants identified on List N against the virus that causes COVID-19. EPA does not routinely review the safety or efficacy of pesticidal devices, such as UV lights, LED lights, or ultrasonic devices. Therefore, EPA cannot confirm whether, or under what circumstances, such products might be effective against the spread of COVID-19.

Should outdoor playgrounds, like those at schools or in parks, be cleaned and disinfected to prevent COVID-19?

Outdoor areas generally require normal routine cleaning and do not require disinfection. Spraying disinfectant on outdoor playgrounds is not an efficient use of disinfectant supplies and has not been proven to reduce the risk of COVID-19 to the public. You should maintain existing cleaning and hygiene practices for outdoor areas. If practical, high touch surfaces made of plastic or metal, such as grab bars and railings, should be cleaned routinely. Cleaning and disinfection of wooden surfaces (e.g., play structures, benches, tables) or groundcovers (e.g., mulch, sand) is not recommended.

Can sanitizing tunnels be used at building entrances or exits to prevent the spread of COVID-19?

CDC does not recommend the use of sanitizing tunnels. There is no evidence that they are effective in reducing the spread of COVID-19. Chemicals used in sanitizing tunnels could cause skin, eye, or respiratory irritation or damage.

Should sidewalks and roads be disinfected to prevent COVID-19?

CDC does not recommend disinfection of sidewalks or roads. Spraying disinfectant on sidewalks and roads is not an efficient use of disinfectant supplies and has not been proven to reduce the risk of COVID-19 to the public. The risk of spreading the virus that causes COVID-19 from these surfaces is very low and disinfection is not effective on these surfaces.

COVID-19 and Animals

Can I get COVID-19 from my pets or other animals?

At this time, there is no evidence that animals play a significant role in spreading the virus that causes COVID-19. Based on the limited information available to date, the risk of animals spreading COVID-19 to people is considered to be low. A small number of pets have been reported to be infected with the virus that causes COVID-19, mostly after contact with people with COVID-19.

Pets have other types of coronaviruses that can make them sick, like canine and feline coronaviruses. These other coronaviruses cannot infect people and are not related to the current COVID-19 outbreak.

However, since animals can spread other diseases to people, it's always a good idea to practice healthy habits around pets and other animals, such as washing your hands and maintaining good hygiene. For more information on the many benefits of pet ownership, as well as staying safe and healthy around animals including pets, livestock, and wildlife, visit CDC's Healthy Pets, Healthy People website.

Do I need to get my pet tested for COVID-19?

No. At this time, routine testing of animals for COVID-19 is not recommended.

Can animals carry the virus that causes COVID-19 on their skin or fur?

Although we know certain bacteria and fungi can be carried on fur and hair, there is no evidence that viruses, including the virus that causes COVID-19, can spread to people from the skin, fur, or hair of pets.

However, because animals can sometimes carry other germs that can make people sick, it's always a good idea to practice healthy habits around pets and other animals, including washing hands before and after interacting with them.

Should I avoid contact with pets or other animals if I am sick with COVID-19?

We are still learning about this virus, but it appears that it can spread from people to animals in some situations. Until we learn more about this new coronavirus, you should restrict contact with pets and other animals while you are sick with COVID-19, just like you would with people. When possible, have another member of your household care for your animals while you are sick. If you are sick with COVID-19, avoid contact with your pet, including

- Petting
- Snuggling
- Being kissed or licked
- Sharing food or bedding

If you must care for your pet or be around animals while you are sick, wash your hands before and after you interact with pets and wear a cloth face covering.

What animals can get COVID-19?

We don't know for sure which animals can be infected with the virus that causes COVID-19. CDC is aware of a small number of pets, including dogs and cats, reported to be infected with the virus that causes COVID-19, mostly after close contact with people with COVID-19. A tiger at a zoo in New York has also tested positive for the virus.

Recent research shows that ferrets, cats, and golden Syrian hamsters can be experimentally infected with the virus and can spread the infection to other animals of the same species in laboratory settings. Pigs, chickens, and ducks did not become infected or spread the infection based on results from these studies. Data from one study suggested dogs are not as likely to become infected with the virus as cats and ferrets. These findings were based on a small number of animals, and do not show whether animals can spread infection to people.

At this time, there is no evidence that animals play a significant role in spreading the virus that causes COVID-19. Based on the limited information available to date, the risk of animals spreading COVID-19 to people is considered to be low. Further studies are needed to understand if and how different animals could be affected by the virus that causes COVID-19 and the role animals may play in the spread of COVID-19.

Should I worry about my pet cat?

We are still learning about this virus and how it spreads, but it appears it can spread from humans to animals in some situations. CDC is aware of a small number of pets, including cats, reported to be infected with the virus that causes COVID-19, mostly after close contact with people with COVID-19. Most of these animals had contact with a person with COVID-19. A tiger at a New York zoo has also tested positive for the virus that causes COVID-19.

At this time, there is no evidence that animals play a significant role in spreading the virus that causes COVID-19. Based on the limited data available, the risk of animals spreading COVID-19 to people is considered to be low. The virus that causes COVID-19 spreads mainly from person to person, typically through respiratory droplets from coughing, sneezing, or talking.

People sick with COVID-19 should isolate themselves from other people and animals, including pets, during their illness until we know more about how this virus affects animals. If you must care for your pet or be around animals while you are sick, wear a cloth face covering and wash your hands before and after you interact with pets.

Can I walk my dog?

Walking a dog is important for both animal and human health and well-being. Walk dogs on a leash, maintaining at least 6 feet (2 meters) from other people and animals, do not gather in groups, and stay out of crowded places and avoid mass gatherings. Do not go to dog parks or public places where a large number of people and dogs gather. To help maintain social distancing, do not let other people pet your dog when you are out for a walk.

Can I take my dog to daycare or a groomer?

Until we know more about how this virus affects animals, CDC encourages pet owners to treat pets as you would other human family members to protect them from possible infection. This means limiting contact between pets and people or animals outside the household as much as possible and avoiding places where large numbers of animals and people gather.

Some areas are allowing groomers and boarding facilities such as dog daycares to open. If you must take your pet to a groomer or boarding facility, follow any protocols put into place at the facility, such as wearing a cloth face covering and maintaining at least 6 feet of space between yourself and others if possible.

Limit pet items brought from home to the groomer or boarding facility, and disinfect any objects that are taken into a facility and returned home (such as leashes, bowls, and toys). Use an EPA-registered disinfectant to clean items and rinse thoroughly with clean water afterwards. Do not wipe or bathe your pet with chemical disinfectants, alcohol, hydrogen peroxide, or any other products not approved for animal use.

Do not put face coverings on pets, and do not take a sick pet to a groomer or boarding facility. Signs of sickness in animals may include:

- Fever
- Coughing
- Difficulty breathing or shortness of breath
- Lethargy
- Sneezing
- Nasal/ocular discharge
- Vomiting
- Diarrhea

If you think your pet is sick, call your veterinarian. Some veterinarians may offer telemedicine consultations or other plans for seeing sick pets. Your veterinarian can evaluate your pet and determine the next steps for your pet's treatment and care.

See more information on pets and COVID-19 and recommendations for how to help keep your pet safe.

What should I do if my pet gets sick and I think it's COVID-19?

There is a small number of animals around the world reported to be infected with the virus that causes COVID-19, mostly after having contact with a person with COVID-19. Talk to your veterinarian about any health concerns you have about your pets.

If your pet gets sick after contact with a person with COVID-19, **do not take your pet to the veterinary clinic yourself.** Call your veterinarian and let them know the pet was around a person with COVID-19. Some veterinarians may offer telemedicine consultations or other plans for seeing sick pets. Your veterinarian can evaluate your pet and determine the next steps for your pet's treatment and care.

Why are animals being tested when many people can't get tested?

Animals are only being tested in very rare circumstances. Routine testing of animals is not recommended at this time, and any tests done on animals are done on a case by case basis. For example, if the pet of a COVID-19 patient has a new, concerning illness with symptoms similar to those of COVID-19, the animal's veterinarian might consult with public health and animal health officials to determine if testing is needed.

Are pets from a shelter safe to adopt?

Based on the limited information available to date, the risk of animals spreading COVID-19 to people is considered to be low. There is no reason to think that any animals, including shelter pets, play a significant role in spreading the virus that causes COVID-19.

What about imported animals or animal products?

CDC does not have any evidence to suggest that imported animals or animal products pose a risk for spreading COVID-19 in the United States. This is a rapidly evolving situation and information will be updated as it becomes available. CDC, the U. S. Department of Agriculture (USDA), and the U.S. Fish and Wildlife Service (FWS) play distinct but complementary roles in regulating the importation of live animals and animal products into the United States.

- CDC regulates animals and animal products that pose a threat to human health,
- USDA regulate animals and animal products that pose a threat to agriculture; and
- FWS regulates importation of endangered species and wildlife that can harm the health and welfare of humans, the interests of agriculture, horticulture, or forestry, and the welfare and survival of wildlife resources.

Can I travel to the United States with dogs or import dogs into the United States during the COVID-19 outbreak?

Please refer to CDC's requirements for bringing a dog to the United States. The current requirements for rabies vaccination apply to dogs imported from high-risk countries for rabies.

What precautions should be taken for animals that have recently been imported from outside the United States (for example, by shelters, rescues, or as personal pets)?

Imported animals will need to meet CDC and USDA requirements for entering the United States. At this time, there is no evidence that companion animals, including pets and service animals, can spread the virus that causes COVID-19. As with any animal introduced to a new environment, animals recently imported should be observed daily for signs of illness. If an animal becomes ill, the animal should be examined by a veterinarian. Call your local veterinary clinic **before** bringing the animal into the clinic and let them know that the animal was recently imported from another country.

This is a rapidly evolving situation and information will be updated as it becomes available.

Can wild animals spread the virus that causes COVID-19 to people or pets?

Currently, there is no evidence to suggest the virus that causes COVID-19 is circulating in free-living wildlife in the United States, or that wildlife might be a source of infection for people in the United States. The first case of a wild animal testing positive for the virus in the United States was a tiger with a respiratory illness at a zoo in New York City. However, this tiger was in a captive zoo environment ,and public health officials believe the tiger became sick after being exposed to a zoo employee who was infected and spreading the virus.

If a wild animal were to become infected with the virus, we don't know whether the infection could then spread among wildlife or if it could spread to other animals, including pets. Further studies are needed to understand if and how different animals, including wildlife, could be affected by COVID-19. Because wildlife can carry other diseases, even without looking sick, it is always important to enjoy wildlife from a distance.

Take steps to prevent getting sick from wildlife in the United States:

- Keep your family, including pets, a safe distance away from wildlife.
- Do not feed wildlife or touch wildlife droppings.
- Always wash your hands and supervise children washing their hands after working or playing outside.
- Leave orphaned animals alone. Often, the parents are close by and will return for their young.
- Consult your state wildlife agency's guidance if you are preparing or consuming legally harvested game meat.
- Do not approach or touch a sick or dead animal - contact your state wildlife agency instead.

Can bats in United States get the virus that causes COVID-19, and can they spread it back to people?

Other coronaviruses have been found in North American bats in the past, but there is currently no evidence that the virus that causes COVID-19 is present in any free-living wildlife in the United States, including bats. In general, coronaviruses do not cause illness or death in bats, but we don't yet know if this new coronavirus would make North American species of bats sick. Bats are an important part of natural ecosystems, and their populations are already declining in the United States. Bat populations could be further threatened by the disease itself or by harm inflicted on bats resulting from a misconception that bats are spreading COVID-19. However, there is no evidence that bats in the United States are a source of the virus that causes COVID-19 for people. Further studies are needed to understand if and how bats could be affected by COVID-19.

Is hunter-harvested game meat safe to eat during the COVID-19 pandemic?

Currently, there is no evidence that you can get infected with the virus that causes COVID-19 by eating food, including wild hunted game meat. However, hunters can get infected with other diseases when processing or eating game. Hunters should always practice good hygiene when processing animals by following these food safety recommendations:

- Do not harvest animals that appear sick or are found dead.
- Keep game meat clean and cool the meat down as soon as possible after harvesting the animal.
- Avoid cutting through the backbone and spinal tissues and do not eat the brains of any wild animal.
- When handling and cleaning game:
  - Wear rubber or disposable gloves.
  - Do not eat, drink, or smoke.
- When finished handling and cleaning game:
  - Wash your hands thoroughly with soap and water.
  - Clean knives, equipment, and surfaces that were in contact with game meat with soap and water and then disinfect them. While these recommendations apply to general food safety practices, if you are concerned about COVID-19, you may use a product on the EPA list of disinfectants for use against the COVID-19 virus .
- Cook all game meat thoroughly (to an internal temperature of 165°F or higher).

- Check with your state wildlife agency regarding any testing requirements for other diseases and for any specific instructions regarding preparing, transporting, and consuming game meat.

How can I safely run my equestrian facility?

You should follow your state and/or local jurisdictional guidance regarding continuing operations at your facility. **There have not been any reports of horses testing positive for the virus that causes COVID-19.** Based on the limited information available to date, the risk of animals spreading the virus that causes COVID-19 to people is considered to be low. COVID-19 is primarily spread from person to person, so steps should be taken to reduce the risks for people visiting your facility.

- **Encourage employees and other visitors, including boarders, owners, farriers, veterinarians, and those taking lessons, not to enter the facility if they are sick.** Employees should not return to work until the criteria to discontinue home isolation are met, after talking with their doctor. Implement sick leave policies that are flexible, nonpunitive, and consistent with public health guidance, allowing employees to stay home if they have symptoms of respiratory infection.
- **Consider conducting daily health checks (e.g., symptom and/or temperature screening) of employees and others visiting the facility before they enter the premises.** People with a fever of 100.4°(38.0°C) or above or other signs of illness should not be admitted to the premises. If implementing health checks, conduct them safely and respectfully. See General Business FAQs for more information.
  - Employees or visitors who appear to have symptoms upon arrival or who become sick during their visit should immediately be separated from other employees and visitors and sent home.
- **Limit the number of people entering the facility.** Consider staggering lesson and visiting times to limit the number of people in the facility and potential for person-to-person contact. If possible, you can also take steps to decrease high-traffic areas by limiting areas open to visitors/owners or staggering use of common areas like grooming or wash stalls and tack rooms.
- **Increase distance and limit duration of contact between employees and visitors in the facility.** Whenever possible, people should maintain at least 6 feet of distance between each other at the facility, including instructors teaching lessons. Allow for social distancing and avoid large numbers of people within the facility, including in employee-only areas.
- **Visitors and employees should wear cloth face coverings** to protect others especially where social distancing measures are difficult to maintain. Wearing a cloth face covering does NOT replace the need to practice social distancing.

- Set up hand hygiene stations at the entrance and within the facility, so that employees and people entering can clean their hands before they enter. Employees should wash hands regularly with soap and water for at least 20 seconds. An alcohol-based hand sanitizer containing at least 60% alcohol can be used, but if hands are visibly dirty, they should be washed with soap and water before using an alcohol-based hand sanitizer. Examples of hand hygiene stations may be a hose and soap located at entrances to allow for handwashing before entry.
- **Clean and disinfect frequently touched surfaces** such as grooming tools, halters, lead ropes, shared tack and equipment, and door handles/gates (including those to stall doors and pasture/turn out areas) on a routine basis. To disinfect, use products that meet EPA's criteria for use against the virus that causes COVID-19 and are appropriate for the surface, diluted household bleach solutions prepared according to the manufacturer's label for disinfection, or alcohol solutions with at least 70% alcohol. Follow manufacturer's directions for use, especially regarding product contact time and protections from chemical hazards posed by cleaners and disinfectants.
- **Follow local guidance** on shelter in place and travel recommendations when traveling for showing, training, or trail riding.
- If traveling to a new facility, **limit contact between people, horses, tack, equipment, and other supplies** from different facilities, and maintain a distance of at least 6 feet between horses and riders.
  - Follow state and local guidance on travel. People who are sick should not travel to other facilities.
  - People visiting other facilities should follow the same precautions as they would normally, including maintaining at least 6 feet of distance between each other, wearing a cloth face covering to protect others, and washing hands frequently with soap and water.
- If other animals, such as barn cats, are present at the facility, be aware that a small number of pets have been reported to be infected with the virus that causes COVID-19, mostly after contact with people with COVID-19.

For more information, see Guidance on Preparing Workplaces for COVID-19 and Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19).

See also: Animals and COVID-19

Community Mitigation

What is community mitigation?

Community mitigation activities are actions that people and communities can take to slow the spread of infectious diseases, including COVID-19. Community mitigation is especially important before a vaccine or drug becomes widely available.

What are community mitigation actions for COVID-19?

Some community mitigation actions may include:

- Washing hands often
- Avoiding close contact with people who are sick, and practicing social distancing
- Covering mouth and nose with a cloth face cover when around others
- Covering coughs and sneezes
- Cleaning and disinfecting frequently touched surfaces daily

Who is involved in community mitigation actions?

Individuals, communities, schools, businesses and healthcare organizations all have a role to play in community mitigation. Policies*, which include limits on large gatherings, restrictions on businesses, and school closures are often needed to fully put in place community mitigation strategies.

Each community is unique. Because some actions can be very disruptive to daily life, mitigation activities will be different depending on how much disease has spread within the community, what the community population is like, and the ability to take these actions at the local level. To identify appropriate activities, all parts of a community that might be impacted need to be considered, including populations most vulnerable to severe illness, and those who might be more impacted socially or economically. When selecting mitigation activities, states and communities need to consider the spread of disease locally, characteristics of the people who live in the community (for example, age groups, languages spoken, overall health status), and the kind of public health resources and healthcare systems (like hospitals) that are available in the community. State and local officials may need to adjust community mitigation activities and immediately take steps to scale them up or down depending on the changing local situation.

Putting mitigation into practice is based on:

- Emphasizing individual responsibility for taking recommended personal-level actions
- Empowering businesses, schools, and community organizations to take recommended actions, particularly in ways that protect persons at increased risk of severe illness
- Focusing on settings that provide critical infrastructure or services to individuals at increased risk of severe illness
- Minimizing disruptions to daily life to the extent possible

*CDC cannot address the policies of any business or organization. CDC shares recommendations based on the best available science to help people make decisions that improve their health and safety. In all cases, **follow the guidance of your healthcare provider and local health department**. Local decisions depend on local circumstances.

COVID-19 and Water

Can the virus that causes COVID-19 spread through drinking water?

The virus that causes COVID-19 has not been detected in drinking water. Conventional water treatment methods that use filtration and disinfection, such as those in most municipal drinking water systems, should remove or inactivate the virus that causes COVID-19.

Is the virus that causes COVID-19 found in feces (stool)?

The virus that causes COVID-19 has been found in the feces of some patients diagnosed with COVID-19. However, it is unclear whether the virus found in feces may be capable of causing COVID-19. There has not been any confirmed report of the virus spreading from feces to a person. Scientists also do not know how much risk there is that the virus could be spread from the feces of an infected person to another person. However, they think this risk is low based on data from previous outbreaks of diseases caused by related coronaviruses, such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS).

Can the virus that causes COVID-19 spread through pools, hot tubs, spas, and water play areas?

While there is ongoing community spread of COVID-19 of the virus that causes COVID-19, it is important for individuals as well as owners and operators of these facilities to take steps to ensure health and safety:

Can the COVID-19 virus spread through sewerage systems?

The virus that causes COVID-19 has been found in untreated wastewater. Researchers do not know whether this virus can cause disease if a person is exposed to untreated wastewater or sewerage systems. There is no evidence to date that this has occurred. At this time, the risk of transmission of the virus that causes COVID-19 through properly designed and maintained sewerage systems is thought to be low.

Should wastewater workers take extra precautions to protect themselves from the virus that causes COVID-19?

Recently, the virus that causes COVID-19 has been found in untreated wastewater. While data are limited, there is no information to date that anyone has become sick with COVID-19 because of exposure to wastewater.

Standard practices associated with wastewater treatment plant operations should be sufficient to protect wastewater workers from the virus that causes COVID-19. These standard practices can include engineering and administrative controls, hygiene precautions, specific safe work practices, and personal protective equipment (PPE) normally required when handling untreated wastewater. No additional COVID-19–specific protections are recommended for workers involved in wastewater management, including those at wastewater treatment facilities.

If my utility has issued a Boil Water Advisory, can I still use tap water to wash my hands?

In most cases, it is safe to wash your hands with soap and tap water during a Boil Water Advisory. Follow the guidance from your local public health officials. If soap and water are not available, use an alcohol-based hand sanitizer containing at least 60% alcohol.

Footnotes

[1] Fever may be subjective or confirmed

[2] Close contact is defined as—

a) being within approximately 6 feet (2 meters) of a COVID-19 case for a prolonged period of time; close contact can occur while caring for, living with, visiting, or sharing a health care waiting area or room with a COVID-19 case

– or –

b) having direct contact with infectious secretions of a COVID-19 case (e.g., being coughed on)

If such contact occurs while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator, eye protection), criteria for PUI consideration are met"

See CDC's updated Interim Healthcare Infection Prevention and Control Recommendations for Persons Under Investigation for 2019 Novel Coronavirus.

Data to inform the definition of close contact are limited. Considerations when assessing close contact include the duration of exposure (e.g., longer exposure time likely increases exposure risk) and the clinical symptoms of the person with COVID-19 (e.g., coughing likely increases exposure risk as does exposure to a severely ill patient). Special consideration should be given to those exposed in health care settings.

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EXHIBIT E

PROCLAMATIONS

Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak

Issued on: March 13, 2020

In December 2019, a novel (new) coronavirus known as SARS-CoV-2 ("the virus") was first detected in Wuhan, Hubei Province, People's Republic of China, causing outbreaks of the coronavirus disease COVID-19 that has now spread globally. The Secretary of Health and Human Services (HHS) declared a public health emergency on January 31, 2020, under section 319 of the Public Health Service Act (42 U.S.C. 247d), in response to COVID-19.

I have taken sweeping action to control the spread of the virus in the United States, including by suspending entry of foreign nationals seeking entry who had been physically present within the prior 14 days in certain jurisdictions where COVID-19 outbreaks have occurred, including the People's Republic of China, the Islamic Republic of Iran, and the Schengen Area of Europe. The Federal Government, along with State and local governments, has taken preventive and proactive measures to slow the spread of the virus and treat those affected, including by instituting Federal quarantines for individuals evacuated from foreign nations, issuing a declaration pursuant to section 319F-3 of the Public Health Service Act (42 U.S.C. 247d-6d), and releasing policies to accelerate the acquisition of personal protective equipment and streamline bringing new diagnostic capabilities to laboratories. On March 11, 2020, the World Health Organization announced that the COVID-19 outbreak can be characterized as a

pandemic, as the rates of infection continue to rise in many locations around the world and across the United States.

The spread of COVID-19 within our Nation's communities threatens to strain our Nation's healthcare systems. As of March 12, 2020, 1,645 people from 47 States have been infected with the virus that causes COVID-19. It is incumbent on hospitals and medical facilities throughout the country to assess their preparedness posture and be prepared to surge capacity and capability. Additional measures, however, are needed to successfully contain and combat the virus in the United States.

NOW, THEREFORE, I, DONALD J. TRUMP, President of the United States, by the authority vested in me by the Constitution and the laws of the United States of America, including sections 201 and 301 of the National Emergencies Act (50 U.S.C. 1601 *et seq.*) and consistent with section 1135 of the Social Security Act (SSA), as amended (42 U.S.C. 1320b-5), do hereby find and proclaim that the COVID-19 outbreak in the United States constitutes a national emergency, beginning March 1, 2020. Pursuant to this declaration, I direct as follows:

Section 1. Emergency Authority. The Secretary of HHS may exercise the authority under section 1135 of the SSA to temporarily waive or modify certain requirements of the Medicare, Medicaid, and State Children's Health Insurance programs and of the Health Insurance Portability and Accountability Act Privacy Rule throughout the duration of the public health emergency declared in response to the COVID-19 outbreak.

Sec. 2. Certification and Notice. In exercising this authority, the Secretary of HHS shall provide certification and advance written notice to the Congress as required by section 1135(d) of the SSA (42 U.S.C. 1320b-5(d)).

Sec. 3. General Provisions. (a) Nothing in this proclamation shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department or agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(b) This proclamation shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This proclamation is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

IN WITNESS WHEREOF, I have hereunto set my hand this thirteenth day of March, in the year of our Lord two thousand twenty, and of the Independence of the United States of America the two hundred and forty-fourth.

DONALD J. TRUMP

EXHIBIT F

EXECUTIVE ORDERS

Executive Order on Prioritizing and Allocating Health and Medical Resources to Respond to the Spread of Covid-19

HEALTHCARE

Issued on: March 18, 2020

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Defense Production Act of 1950, as amended (50 U.S.C. 4501 *et seq.*) (the "Act"), and section 301 of title 3, United States Code, it is hereby ordered as follows:

Section 1. Policy and Findings. On March 13, 2020, I declared a national emergency recognizing the threat that the novel (new) coronavirus known as SARS-CoV-2 poses to our national security. In recognizing the public health risk, I noted that on March 11, 2020, the World Health Organization announced that the outbreak of COVID-19 (the disease caused by SARS-CoV-2) can be characterized as a pandemic. I also noted that while the Federal Government, along with State and local governments, have taken preventive and proactive measures to slow the spread of the virus and to treat those affected, the spread of COVID-19 within our Nation's communities threatens to strain our Nation's healthcare system. To ensure that our healthcare system is able to surge capacity and capability to respond to the spread of COVID-19, it is critical that all health and medical resources needed to respond to the spread of COVID-19 are properly

distributed to the Nation's healthcare system and others that need them most at this time.

Accordingly, I find that health and medical resources needed to respond to the spread of COVID-19, including personal protective equipment and ventilators, meet the criteria specified in section 101(b) of the Act (50 U.S.C. 4511(b)). Under the delegation of authority provided in this order, the Secretary of Health and Human Services may identify additional specific health and medical resources that meet the criteria of section 101(b).

Sec. 2. Priorities and Allocation of Medical Resources.

(a) Notwithstanding Executive Order 13603 of March 16, 2012 (National Defense Resource Preparedness), the authority of the President conferred by section 101 of the Act to require performance of contracts or orders (other than contracts of employment) to promote the national defense over performance of any other contracts or orders, to allocate materials, services, and facilities as deemed necessary or appropriate to promote the national defense, and to implement the Act in subchapter III of chapter 55 of title 50, United States Code, is delegated to the Secretary of Health and Human Services with respect to all health and medical resources needed to respond to the spread of COVID-19 within the United States.

(b) The Secretary of Health and Human Services may use the authority under section 101 of the Act to determine, in consultation with the Secretary of Commerce and the heads of other executive departments and agencies as appropriate, the proper nationwide priorities and allocation of all health and medical resources, including controlling the distribution of such materials (including applicable services) in the civilian market, for responding to the spread of COVID-19 within the United States.

(c) The Secretary of Health and Human Services shall issue such orders and adopt and revise appropriate rules and regulations as may be necessary to implement this order.

Sec. 3. General Provisions. (a) Nothing in this order shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department or agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(b) This order shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

DONALD J. TRUMP

THE WHITE HOUSE,
March 18, 2020.

EXHIBIT G

Centers for Disease Control and Prevention

Coronavirus Disease 2019 (COVID-19)

How to Protect Yourself & Others

Protect Yourself

Updated Apr. 24, 2020 Print

Older adults and people who have severe underlying medical conditions like heart or lung disease or diabe seem to be at higher risk for developing serious complications from COVID-19 illness. More information on Ar at higher risk for serious illness.

Know how it spreads

- There is currently no vaccine to prevent coronavirus disease 2019 (COVID-19).
- **The best way to prevent illness is to avoid being exposed to this virus.**
- The virus is thought to spread mainly from person-to-person.
  - Between people who are in close contact with one another (within about 6 feet).
  - Through respiratory droplets produced when an infected person coughs, sneezes or tall
  - These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.
  - Some recent studies have suggested that COVID-19 may be spread by people who are n showing symptoms.

Everyone Should

Wash your hands often

- Wash your hands often with soap and water for at least 20 seconds especially after you have b a public place, or after blowing your nose, coughing, or sneezing.
- It's especially important to wash:
  - Before eating or preparing food
  - Before touching your face
  - After using the restroom
  - After leaving a public place

- After blowing your nose, coughing, or sneezing
- After handling your cloth face covering
- After changing a diaper
- After caring for someone sick
- After touching animals or pets

- If soap and water are not readily available, **use a hand sanitizer that contains at least 60% alc** Cover all surfaces of your hands and rub them together until they feel dry.
- **Avoid touching your eyes, nose, and mouth** with unwashed hands.

Avoid close contact

- **Inside your home:** Avoid close contact with people who are sick.
  - If possible, maintain 6 feet between the person who is sick and other household membe
- **Outside your home:** Put 6 feet of distance between yourself and people who don't live in you household.
  - Remember that some people without symptoms may be able to spread virus.
  - Stay at least 6 feet (about 2 arms' length) from other people.
  - Keeping distance from others is especially important for people who are at higher risk of very sick.

Cover your mouth and nose with a cloth face cover when arou others

- You could spread COVID-19 to others even if you do not feel sick.
- The cloth face cover is meant to protect other people in case you are infected.
- Everyone should wear a cloth face cover in public settings and when around people who don't your household, especially when other social distancing measures are difficult to maintain.
  - Cloth face coverings should not be placed on young children under age 2, anyone who ha trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the ma without assistance.
- Do NOT use a facemask meant for a healthcare worker. Currently, surgical masks and N95 resp are critical supplies that should be reserved for healthcare workers and other first responders.
- Continue to keep about 6 feet between yourself and others. The cloth face cover is not a subst for social distancing.

Cover coughs and sneezes

- **Always cover your mouth and nose** with a tissue when you cough or sneeze or use the inside elbow and do not spit.
- **Throw used tissues** in the trash.
- Immediately **wash your hands** with soap and water for at least 20 seconds. If soap and water a readily available, clean your hands with a hand sanitizer that contains at least 60% alcohol.

Clean and disinfect

- **Clean AND disinfect frequently touched surfaces daily.** This includes tables, doorknobs, light sv countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
- **If surfaces are dirty, clean them.** Use detergent or soap and water prior to disinfection.
- **Then, use a household disinfectant.** Most common EPA-registered household disinfectants work.

Monitor Your Health Daily

- **Be alert for symptoms.** Watch for fever, cough, shortness of breath, or other symptoms **of CO**
  - Especially important if you are running essential errands, going into the office or workplac in settings where it may be difficult to keep a physical distance of 6 feet.
- **Take your temperature** if symptoms develop.
  - Don't take your temperature within 30 minutes of exercising or after taking medications t could lower your temperature, like acetaminophen.
- Follow CDC guidance if symptoms develop.

Stop the Spread of Germs

COVID-19 Stop the Spread of Germs

Help stop the spread of COVID-19 and other resp illnesses by following these steps.

Handwashing Resources

Handwashing tips

Hand Hygiene in Healthca
Settings

More information

Symptoms

What to do if you are sick

If someone in your house gets sick

Frequently asked questions

Travelers

Individuals, schools, events, businesses and more

Healthcare Professionals

10 Things You Can Do to Manage COVID-19 at Hor

10 Things You Can Do to Manage COVID-19 at Hor
Version)

Social Distancing (ASL Video)

ASL Video Series: What You Need to Know About
Handwashing

Last Updated A

EXHIBIT H

CORRESPONDENCE

Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany

TO THE EDITOR: The novel coronavirus (2019-nCoV) from Wuhan is currently causing concern in the medical community as the virus is spreading around the world.[1] Since identification of the virus in late December 2019, the number of cases from China that have been imported into other countries is on the rise, and the epidemiologic picture is changing on a daily basis. We are reporting a case of 2019-nCoV infection acquired outside Asia in which transmission appears to have occurred during the incubation period in the index patient.

A 33-year-old otherwise healthy German businessman (Patient 1) became ill with a sore throat, chills, and myalgias on January 24, 2020. The following day, a fever of 39.1°C (102.4°F) developed, along with a productive cough. By the evening of the next day, he started feeling better and went back to work on January 27.

Before the onset of symptoms, he had attended meetings with a Chinese business partner at his company near Munich on January 20 and 21. The business partner, a Shanghai resident, had visited Germany between January 19 and 22. During her stay, she had been well with no signs or symptoms of infection but had become ill on her flight back to China, where she tested positive for 2019-nCoV on January 26 (index patient in Fig. 1) (see Supplementary Appendix, available at NEJM.org, for details on the timeline of symptom development leading to hospitalization).

On January 27, she informed the company about her illness. Contact tracing was started, and the above-mentioned colleague was sent to the Division of Infectious Diseases and Tropical Medicine in Munich for further assessment. At presentation, he was afebrile and well. He reported no previous or chronic illnesses and had no history of foreign travel within 14 days before the onset of symptoms. Two nasopharyngeal swabs and one sputum sample were obtained and were found to be positive for 2019-nCoV on quantitative reverse-transcriptase–polymerase-chain-reaction (qRT-PCR) assay.[2] Follow-up qRT-PCR assay revealed a high viral load of 10^8 copies per milliliter in his sputum during the following days, with the last available result on January 29.

On January 28, three additional employees at the company tested positive for 2019-nCoV (Patients 2 through 4 in Fig. 1). Of these patients, only Patient 2 had contact with the index patient; the other two patients had contact only with Patient 1. In accordance with the health authorities, all the patients with confirmed 2019-nCoV infection were admitted to a Munich infectious diseases unit for clinical monitoring and isolation. So far, none of the four confirmed patients show signs of severe clinical illness.

This case of 2019-nCoV infection was diagnosed in Germany and transmitted outside Asia. However, it is notable that the infection appears to have been transmitted during the incubation period of the index patient, in whom the illness was brief and nonspecific.[3]

The fact that asymptomatic persons are potential sources of 2019-nCoV infection may war-

THIS WEEK'S LETTERS

970 Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany

972 Dapagliflozin in Patients with Heart Failure and Reduced Ejection Fraction

974 A Smartwatch to Identify Atrial Fibrillation

976 Focused Cardiac Ultrasonography for Left Ventricular Systolic Function

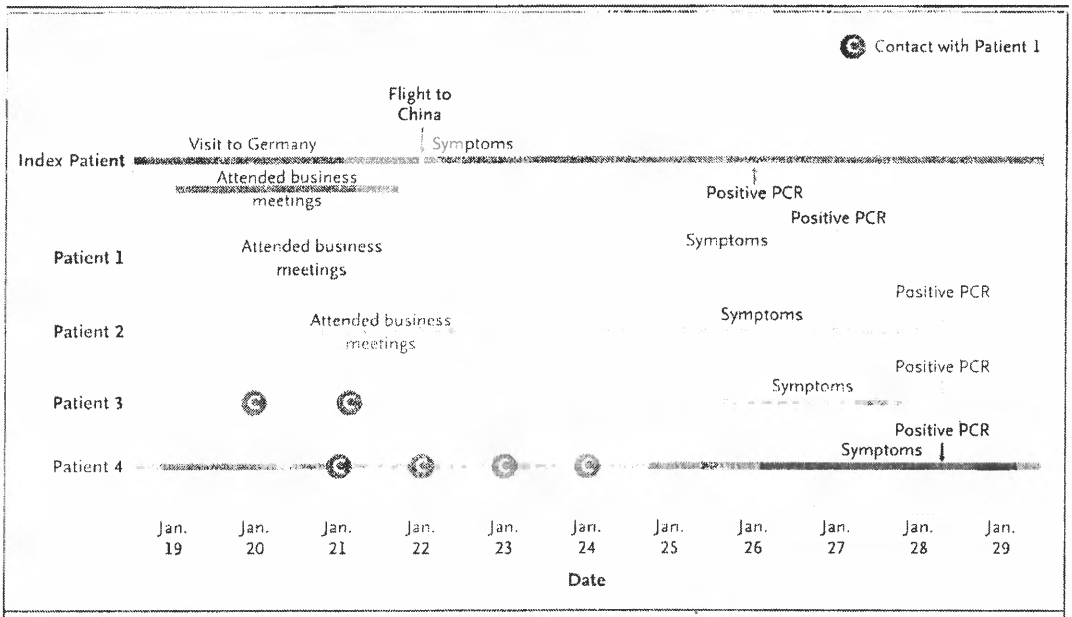

Figure 1. Timeline of Exposure to Index Patient with Asymptomatic 2019-CoV Infection in Germany.

rant a reassessment of transmission dynamics of the current outbreak. In this context, the detection of 2019-nCoV and a high sputum viral load in a convalescent patient (Patient 1) arouse concern about prolonged shedding of 2019-nCoV after recovery. Yet, the viability of 2019-nCoV detected on qRT-PCR in this patient remains to be proved by means of viral culture.

Despite these concerns, all four patients who were seen in Munich have had mild cases and were hospitalized primarily for public health purposes. Since hospital capacities are limited — in particular, given the concurrent peak of the influenza season in the northern hemisphere — research is needed to determine whether such patients can be treated with appropriate guidance and oversight outside the hospital.

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Peter Sothmann, M.D.
Gisela Bretzel, M.D.
Guenter Froeschl, M.D.
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Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

This letter was published on January 30, 2020, and updated on February 6, 2020, at NEJM.org.

1. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727-33.
2. Corman V, Bleicker T, Brünink S, et al. Diagnostic detection of Wuhan coronavirus 2019 by real-time RT-PCR. Geneva: World Health Organization, January 13, 2020 (https://www.who.int/docs/default-source/coronaviruse/wuhan-virus-assay-v1991527e5122341d99287a1b17c111902.pdf).
3. Callaway E, Cyranoski D. China coronavirus: six questions scientists are asking. Nature 2020;577:605-7.

DOI: 10.1056/NEJMc2001468

EXHIBIT I

COVID-19 Dashboard by the Cen...

15,566,087

Confirmed Cases by

4,057,100 US

2,287,475 Brazil

1,288

Cumulative Confirmed Cases

144,524 deaths US

84,082 deaths

32,594 deaths, 72,466 recovered New

20M

15M

Confir...

Lancet Inf Dis Article: Here.
Mobile Version: Here

EXHIBIT J

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Coronavirus Disease 2019 (COVID-19)

MENU >

Cases in the U.S.

Updated July 23, 2020

Print

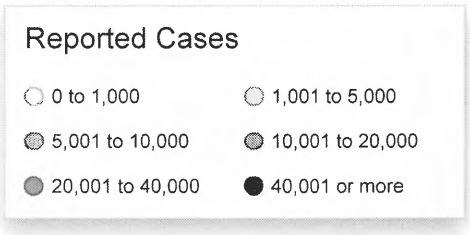
TOTAL CASES
3,952,273
70,106 New Cases*

TOTAL DEATHS
142,755
1,078 New Deaths*

This page is updated daily based on data confirmed at 4:00pm ET the day before.

Cases by Jurisdiction

This map shows COVID-19 cases reported by U.S. states, the District of Columbia, New York City, and other U.S.-affiliated jurisdictions. Hover over the maps to see the number of cases reported in each jurisdiction. To go to a jurisdiction's health department website, click on the jurisdiction on the map.



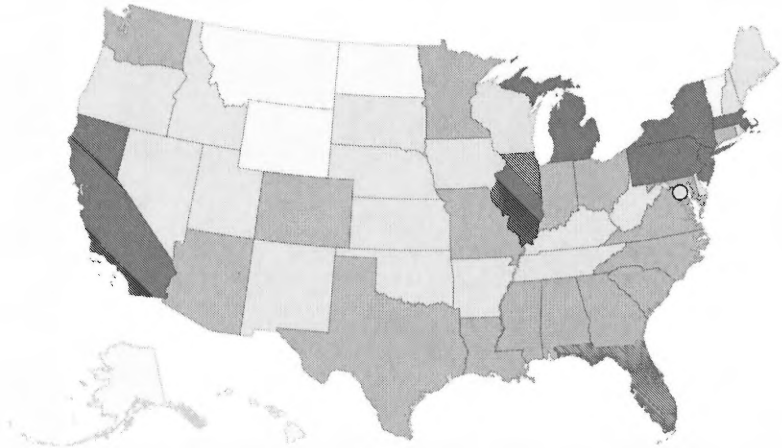
AS GU MH FM MP PW PR VI

Jurisdictions

Add U.S. Map to Your Website

Deaths by Jurisdiction

This map shows COVID-19 cases reported by U.S. states, the District of Columbia, New York City, and other U.S.-affiliated jurisdictions. Hover over the maps to see the number of deaths reported in each jurisdiction. To go to a jurisdiction's health department website, click on the jurisdiction on the map.



AS GU MH FM MP PW PR VI

Jurisdictions

Add U.S. Map to Your Website

Cases & Deaths by County

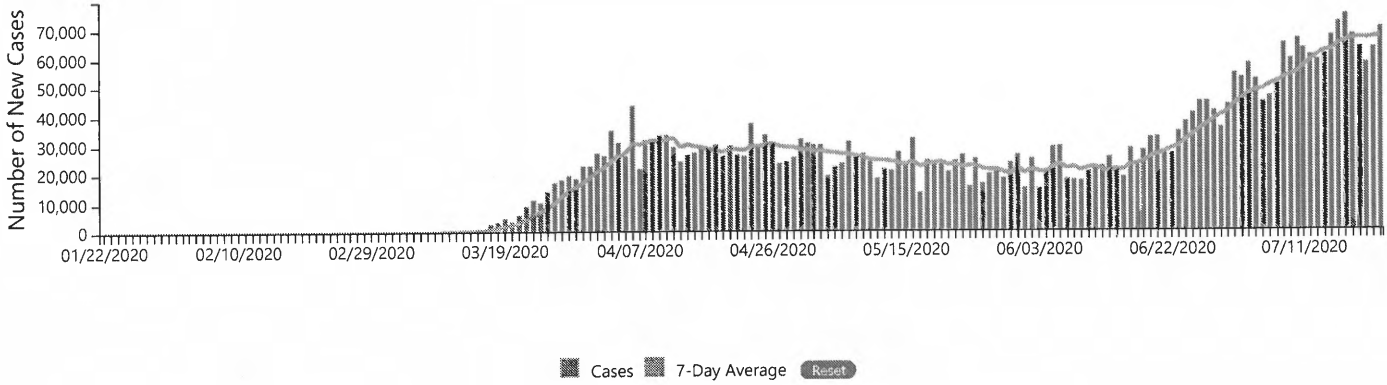
Select a state to view the number of cases and deaths by county. This data is courtesy of USAFacts.org

Select a State

View County Data

New Cases by Day

The following chart shows the number of new COVID-19 cases reported each day in the U.S. since the beginning of the outbreak. Hover over the bars to see the number of new cases by day.



The 7-Day moving average of new cases (current day + 6 preceding days / 7) was calculated to smooth expected variations in daily counts.

View Data +

Cases & Deaths among Healthcare Personnel

Data were collected from 2,996,967 people, but healthcare personnel status was only available for 641,477 (21.4%) people. For the 106,976 cases of COVID-19 among healthcare personnel, death status was only available for 71,397 (66.7%).

CASES AMONG HCP	DEATHS AMONG HCP
106,976	560

Previous Data

CDC has moved the following information to the Previous U.S. COVID-19 Case Data page.

- Level of community transmission by jurisdiction — last updated May 18, 2020
- Total number of cases by day — last updated April 28, 2020

- Number of cases by source of exposure — last updated April 16, 2020
- Number of cases from Wuhan, China and the Diamond Princess cruise — last updated April 16, 2020
- Number of cases by illness start date — last updated April 15, 2020

More Information

COVIDView – A Weekly Surveillance Summary of U.S. COVID-19 Activity

Previous U.S. COVID-19 Case Data

FAQ: COVID-19 Data and Surveillance

Testing Data in the U.S.

World Map

Health Departments

Last Updated July 21, 2020, 03:00 PM
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

EXHIBIT K

Communicable Disease Service

New Jersey COVID-19 Dashboard

Go Back to Main COVID-19 page

Department of Health
P. O. Box 360
Trenton, NJ 08625-0360

Last Reviewed: 4/8/2020

EXHIBIT L

The New York Times

Worst-Case Estimates for U.S. Coronavirus Deaths

Projections based on C.D.C. scenarios show a potentially vast toll. But those numbers don't account for interventions now underway.

By Sheri Fink

Published March 13, 2020 Updated March 18, 2020

Officials at the U.S. Centers for Disease Control and Prevention and epidemic experts from universities around the world conferred last month about what might happen if the new coronavirus gained a foothold in the United States. How many people might die? How many would be infected and need hospitalization?

One of the agency's top disease modelers, Matthew Biggerstaff, presented the group on the phone call with four possible scenarios — A, B, C and D — based on characteristics of the virus, including estimates of how transmissible it is and the severity of the illness it can cause. The assumptions, reviewed by The New York Times, were shared with about 50 expert teams to model how the virus could tear through the population — and what might stop it.

The C.D.C.'s scenarios were depicted in terms of percentages of the population. Translated into absolute numbers by independent experts using simple models of how viruses spread, the worst-case figures would be staggering if no actions were taken to slow transmission.

Between 160 million and 214 million people in the United States could be infected over the course of the epidemic, according to a projection that encompasses the range of the four scenarios. That could last months or even over a year, with infections concentrated in shorter periods, staggered across time in different communities, experts said. As many as 200,000 to 1.7 million people could die.

And, the calculations based on the C.D.C.'s scenarios suggested, 2.4 million to 21 million people in the United States could require hospitalization, potentially crushing the nation's medical system, which has only about 925,000 staffed hospital beds. Fewer than a tenth of those are for people who are critically ill.

The assumptions fueling those scenarios are mitigated by the fact that cities, states, businesses and individuals are beginning to take steps to slow transmission, even if some are acting less aggressively than others. The C.D.C.-led effort is developing more sophisticated models showing how interventions might decrease the worst-case numbers, though their projections have not been made public.

"When people change their behavior," said Lauren Gardner, an associate professor at the Johns Hopkins Whiting School of Engineering who models epidemics, "those model parameters are no longer applicable," so short-term forecasts are likely to be more accurate. "There is a lot of room for improvement if we act appropriately."

Those actions include testing for the virus, tracing contacts, and reducing human interactions by stopping mass gatherings, working from home and curbing travel. In just the last two days, multiple schools and colleges closed, sports events were halted or delayed, Broadway theaters went dark, companies barred employees from going to the office and more people said they were following hygiene recommendations.

The Times obtained screenshots of the C.D.C. presentation, which has not been released publicly, from someone not involved in the meetings. The Times then verified the data with several scientists who did participate. The scenarios were marked valid until Feb. 28, but remain "roughly the same," according to Ira Longini, co-director of the Center for Statistics and Quantitative Infectious Diseases at the University of Florida. He has joined in meetings of the group.

The C.D.C. declined interview requests about the modeling effort and referred a request for comment to the White House Coronavirus Task Force. Devin O'Malley, a spokesman for the task force, said that senior health officials had not presented the findings to the group, led by Vice President Mike Pence, and that nobody in Mr. Pence's office "has seen or been briefed on these models."

Latest Updates: Global Coronavirus Outbreak Updated 2020-07-23T10:30:23.915Z

- California and Texas are among the states setting new daily records.
- Landlords are jumping the gun as an eviction moratorium wanes.
- For workers who cobble together employment, the pandemic has exposed deep holes in the safety net.

See more updates

More live coverage: **Markets**

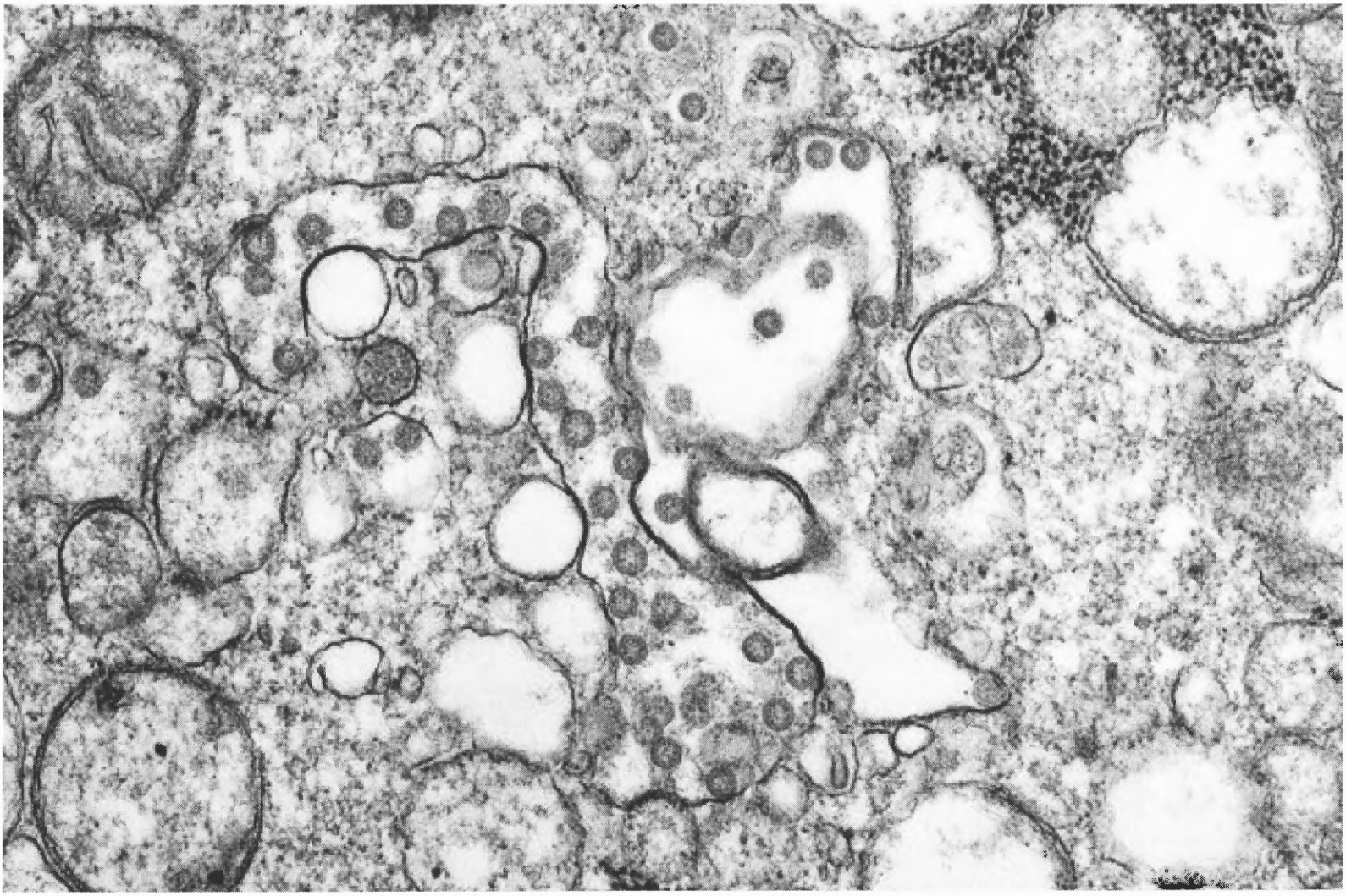
The assumptions in the C.D.C.'s four scenarios, and the new numerical projections, fall in the range of others developed by independent experts.

Dr. Longini said the scenarios he helped the C.D.C. refine had not been publicly disclosed because there remained uncertainty about certain key aspects, including how much transmission could occur from people who showed no symptoms or had only mild ones.

"We're being very, very careful to make sure we have scientifically valid modeling that's drawing properly on the epidemic and what's known about the virus," he said, warning that simple calculations could be misleading or even dangerous. "You can't win. If you overdo it, you panic everybody. If you underdo it, they get complacent. You have to be careful."

But without an understanding of how the nation's top experts believe the virus could ravage the country, and what measures could slow it, it remains unclear how far Americans will go in adopting — or accepting — socially disruptive steps that could also avert deaths. And how quickly they will act.

Studies of previous epidemics have shown that the longer officials waited to encourage people to distance and protect themselves, the less useful those measures were in saving lives and preventing infections.



An isolate from the first U.S. case of Covid-19, the illness caused by coronavirus. Centers for Disease Control via Reuters

"A fire on your stove you could put out with a fire extinguisher, but if your kitchen is ablaze, that fire extinguisher probably won't work," said Dr. Carter Mecher, a senior medical adviser for public health at the Department of Veterans Affairs and a former director of medical preparedness policy at the White House during the Obama and Bush administrations. "Communities that pull the fire extinguisher early are much more effective."

From Flu to Coronavirus

Dr. Biggerstaff presented his scenarios in a meeting held weekly to model the pandemic's effects in the United States, Dr. Longini said. Its participants had been at work for several months before the emergence of the virus, modeling a potential influenza pandemic. "We just kind of retooled, re-shifted," said Dr. Longini. "The priority's now coronavirus."

The four scenarios have different parameters, which is why the projections range so widely. They variously assume that each person with the coronavirus would infect either two or three people; that the hospitalization rate would be either 3 percent or 12; and that either 1 percent or a quarter of a percent of people experiencing symptoms would die. Those assumptions are based on what is known so far about how the virus has behaved in other contexts, including in China.

Other weekly C.D.C. modeling meetings center on how the virus is spreading internationally, the impact of community actions such as closing schools, and estimating the supply of respirators, oxygen and other resources that could be needed by the nation's health system, participants said.

In the absence of public projections from the C.D.C., outside experts have stepped in to fill the void, especially in health care. Hospital leaders have called for more guidance from the federal government as to what might lie in store in the coming weeks.

Even severe flu seasons stress the nation's hospitals to the point of setting up tents in parking lots and keeping people for days in emergency rooms. Coronavirus is likely to cause five to 10 times that burden of disease, said Dr. James Lawler, an infectious diseases specialist and public health expert at the University of Nebraska Medical Center. Hospitals "need to start working now," he said, "to get prepared to take care of a heck of a lot of people."

Dr. Lawler recently presented his own "best guess" projections to American hospital and health system executives at a private webinar convened by the American Hospital Association. He estimated that some 96 million people in the United States would be

infected. Five out of every hundred would need hospitalization, which would mean close to five million hospital admissions, nearly two million of those patients requiring intensive care and about half of those needing the support of ventilators.

Dr. Lawler's calculations suggested 480,000 deaths, which he said was conservative. By contrast, about 20,000 to 50,000 people have died from flu-related illnesses this season, according to the C.D.C. Unlike with seasonal influenza, the entire population is thought to be susceptible to the new coronavirus.

Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, speaking at a congressional hearing on Thursday, said predictions based on models should be treated with caution. "All models are as good as the assumptions that you put into the model," he said, responding to a question from Representative Rashida Tlaib about an estimate from the attending physician of Congress that the United States could have 70 million to 150 million coronavirus cases.

What will determine the ultimate number, he said, "will be how you respond to it with containment and mitigation."

Clues From 1918

Independent experts said these projections were critically important to act on, and act on quickly. If new infections can be spread out over time rather than peaking all at once, there will be less burden on hospitals and a lower ultimate death count. Slowing the spread will paradoxically make the outbreak last longer, but will cause it to be much milder, the modelers said.

A Red Cross hospital in Wuhan, China, the outbreak's epicenter. Agence France-Presse — Getty Images

A preliminary study released on Wednesday by the Institute for Disease Modeling projected that in the Seattle area, enhancing social distancing — limiting contact with groups of people — by 75 percent could reduce deaths caused by infections acquired in the next month from 400 to 30 in the region.

A recent paper, cited by Dr. Fauci at a news briefing on Tuesday, concludes that the rapid and aggressive quarantine and social distancing measures applied by China in cities outside of the outbreak's epicenter achieved success. "Most countries only attempt social distancing and hygiene interventions when widespread transmission is apparent. This gives the virus many weeks to spread," the paper said, with the average number of people each new patient infects higher than if the measures were in place much earlier, even before the virus is detected in the community.

"By the time you have a death in the community, you have a lot of cases already," said Dr. Mecher. "It's giving you insight into where the epidemic was, not where it is, when you have something fast moving." He added: "Think starlight. That light isn't from now, it's from however long it took to get here."

He said a single targeted step — a school closing, or a limit on mass gatherings — cannot stop an outbreak on its own. But as with Swiss cheese, layering them together can be effective.

This conclusion is backed up by history.

The most lethal pandemic to hit the United States was the 1918 Spanish flu, which was responsible for about 675,000 American deaths, according to estimates cited by the C.D.C.

The Institute for Disease Modeling calculated that the new coronavirus is roughly equally transmissible as the 1918 flu, and just slightly less clinically severe, and it is higher in both transmissibility and severity compared with all other flu viruses in the past century.

Dr. Mecher and other researchers studied deaths during that pandemic a century ago, comparing the experiences of various cities, including what were then America's third- and fourth-largest, Philadelphia and St Louis. In October of that year Dr. Rupert Blue, America's surgeon general, urged local authorities to "close all public gathering places if their community is threatened with the epidemic," such as schools, churches, and theaters. "There is no way to put a nationwide closing order into effect," he wrote, "as this is a matter which is up to the individual communities."

The mayor of St. Louis quickly took that advice, closing for several weeks "theaters, moving picture shows, schools, pool and billiard halls, Sunday schools, cabarets, lodges, societies, public funerals, open air meetings, dance halls and conventions until further notice." The death rate rose, but stayed relatively flat over that autumn.

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By contrast, Philadelphia took none of those measures; the epidemic there had started before Dr. Blue's warning. Its death rate skyrocketed.

The speed and deadliness of the pandemic humbled doctors then much as the coronavirus pandemic is doing now. Some commented on the difficulty of getting healthy people to take personal precautions to help protect others at greater risk.

Modern societies have tools that did not exist then: advanced hospitals, the possibility of producing a vaccine in roughly a year, the production of diagnostics. But other signs are more worrying.

The world population is about triple the size it was the year before the 1918 flu, with 10 times as many people over 65 and 30 times as many over 85. These groups have proven especially likely to become critically ill and die in the current coronavirus pandemic. In Italy, hospitals are so overwhelmed that ventilators are being rationed.

"It's so important that we protect them," said Dr. Gabriel Leung, a professor in population health at Hong Kong University. In work accepted for publication in the journal Nature Medicine, he estimated that 1.5 percent of symptomatic people with the virus died. He and others who have devoted their careers to modeling said that looking at the experiences of other countries already battling the coronavirus was all it took to know what needed to be done in the United States.

"All U.S. cities and states have the natural experiment of the cities that have preceded us, namely the superb response of Singapore and Hong Kong," said Dr. Michael Callahan, an infectious disease specialist at Harvard. Those countries implemented

school closures, eliminated mass gatherings, required work from home, and rigorously decontaminated their public transportation and infrastructure. They also conducted widespread testing.

They were able to "reduce an explosive epidemic to a steady state one," Dr. Callahan said.

As in the case of an approaching hurricane, Dr. Mecher said, "You've got to take potentially very disruptive actions when the sun is shining and the breeze is mild."