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**As the novel coronavirus spreads, military commanders ponder actions to protect the force.**  
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## Protect the Force from the Novel Coronavirus

*Keeping the U.S. military safe from the Coronavirus pandemic will require deliberate planning, prevention, and response.*

**By Dr. Jerry L. Mothershead, Dr. Zygmunt F. Dembek, and Dr. Aiguo Wu**

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### The Threat (Why We are Concerned)

Since initial reports in December 2019 of an outbreak of severe respiratory illnesses due to a novel coronavirus (Severe Acute Respiratory Syndrome Coronavirus-2, or SARS-CoV-2) in Wuhan, Peoples Republic of China (PRC), the disease (COVID-19) has spread rapidly across the globe. As of 9 March, there had been 118,326 laboratory-confirmed cases of COVID-19 worldwide, with 4,627 deaths affecting 114 countries (see Table 1). Most of these have occurred in Hubei Province, PRC. Since the first SARS-CoV-2 case in the United States was reported on 23 January, that number has grown to 938 in 39 states.

**Table 1. COVID-19 Spread (9 March 2020)**

Location	Confirmed Cases	Deaths	Case Fatality Rate (CFR)
Worldwide	118,326	4,627	3.9%
People's Republic of China	80,955	3,162	3.9%
Hubei Province, PRC	67,773	3,046	4.5%
USA	938	29	3.1%

Many initial cases outside China were in individuals with direct connections through travel to China. However, in more than half the countries now affected, no link to China has been found, and local transmission has been confirmed or assumed. The rapid spread to multiple countries on multiple continents of a novel microorganism capable of human-to-human transmission prompted the World Health Organization (WHO) to declare a global pandemic on 11 March.

Coronaviruses are a group of RNA viruses that cause disease in mammals and birds. SARS-CoV-2 is one of seven that cause disease in humans. Most human coronavirus infections cause mild respiratory tract symptoms or no symptoms at all (i.e., sub-clinical). Infection by SARS-CoV-2 and 2 other coronaviruses (Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) viruses) may, however, cause severe respiratory disease and even death, with high case fatality rates (see Table 2).

**Table 2. Coronavirus Comparison Chart**

Coronavirus	Confirmed Cases	Deaths	Case Fatality Rates (CFR)	Dates
SARS	8,098	774	9.5%	2002–2004
MERS	2,506	862	34%	2012–Present
COVID-19	118,326	4,627	3.9%	2019–Present

Sneezing and coughing generate aerosols and droplets that are the primary means of spreading coronaviruses. Coronaviruses appear to survive on environmental surfaces for a week or longer, where they may be spread through secondary contact with contaminated surfaces. Initial symptoms of a non-productive cough, fever, and shortness of breath appear 2–14 days (average 5.1) after exposure, although asymptomatic but infected individuals also may carry and shed significant amounts of virus, unwittingly spreading the disease. Coronavirus outbreaks tend to occur primarily in the winter and early spring. COVID-19 has been detected in asymptomatic domesticated animals (dogs) but it is unknown whether this represents a method of spread to humans.

With no vaccines or antiviral medications currently available against SARS-CoV-2, treatment is primarily supportive. Protection and prevention strategies almost exclusively rely on non-pharmaceutical public health interventions, including case containment, quarantine, and social distancing. These interventions have been successful in slowing the spread of disease, but eventually all countries will likely be affected.

### **U.S. Government Response to COVID-19 (What is Being Done)**

In anticipation of future influenza or other pandemics, the U.S. Government developed the National Pandemic Influenza Plan in 2005, and charged federal agencies and individual states, territories, and tribal nations to develop subordinate plans aligned with it. Public health agencies and hospitals were provided grants to develop their own plans to address such issues as supply chain management, surge capabilities, disaster standards of care, and other concerns. Portions of the Plan were tested during the 2009–2010 swine flu (H1N1) pandemic. Modifying this Plan for the current coronavirus epidemic requires only minor adjustments.



The U.S. Government was concerned about COVID-19 well before the WHO declared a Public Health Emergency of International Concern (PHEIC) on 30 January. In late January, the Administration considered instituting travel restrictions from China. Travel restrictions and quarantine requirements were implemented on 7 February. On 4 February, the Secretary of Health and Human Services Alex Azar declared a public health emergency, thereby activating the National Pandemic Influenza Plan. He exercised Emergency Use Authorization (EUA) powers to allow distribution of 200 CDC-originated SARS-CoV-2 test kits, circumventing routine approval by the Food and Drug Administration (FDA). At that time, most of those infected or quarantined were identified prior to return to the United States and were sequestered from further contact with the general public. Researchers have recently opined that some infected but asymptomatic individuals may have arrived prior to travel restrictions, and have estimated that, as of 5 March, there were 1,000-10,000 such individuals present in the United States.

Early efforts against SARS-CoV-2 have focused on containment activities, designed to buy time to enhance surveillance, detection, and identification; increase production and delivery of anticipated medical supplies, including protective masks, additional and more accurate test kits, and ventilators; expand health system capacities; and accelerate vaccine development and evaluate antiviral medication efficacy against coronavirus infections. To date, containment activities have focused on:

- - Additional restriction of entry into the United States from countries or regions with significant disease;
- - Voluntary or required quarantine (at home or cohorted) of repatriated citizens until past the incubation period; and
- - Strict isolation and treatment of identified cases, with contact tracing, testing, monitoring, and potential quarantine of those closely associated with the infected.

Enhanced guidance and physical personal protection should also have been provided to potential caregivers, including first responders, emergency medical services personnel, facility-based healthcare workers, and assisted living and nursing home attendants.

As new cases continue to appear, the ability to contain the outbreak becomes less likely. Although containment efforts will continue, federal, state, and local governments are now considering or transitioning to mitigation efforts, which are implemented primarily to further slow the spread of disease (so-called “flattening of the epidemiological curve”), thus reducing the strain on health systems struggling to identify, isolate, and treat affected populations.

### **Impact on the Department of Defense**

Active and reserve U.S. military forces and supporting Department of Defense (DoD) civilian personnel currently exceed 2 million, with a worldwide presence and large in-garrison forces in South Korea, Japan, Germany, Italy, and the United Kingdom—all countries now having COVID-19 cases. Routine deployments, international exercises, and contingency or humanitarian assistance/disaster recovery operations further project forces outside the United States.

DoD priorities during this global public health crisis are to:

- - Ensure sufficient manpower and resources are available to provide the highest possible level of health support to military forces, civilian personnel, and beneficiaries (force health protection);



- - Preserve worldwide operational effectiveness (continuity of operations); and
- - To the extent possible, support civilian authorities at all levels in responding to and recovering from the crisis (Defense Support of Civil Authorities or Host National Support).

The ability to maintain these latter two capabilities is inextricably dependent on the effectiveness of force health protection measures.

### **Actions Commanders Can Take to Protect Their Personnel**

COVID-19 most severely affects the elderly or those having comorbid diseases, such as chronic cardiovascular or pulmonary disease, diabetes, or immunocompromising conditions. Because 90 percent of the U.S. military is younger than 40 years of age, and very few have significant comorbidities, only a small fraction should be adversely affected by SARS-CoV-2. A greater risk exists among beneficiaries and civilians who may have underlying conditions. Among the general population, the disease is mild or asymptomatic in more than 85 percent of cases, serious illness occurs in less than 5 percent, and overall mortality rate in those under 50 is 0.2 percent or less—similar to seasonal influenza.

The threat to the force is also not uniform geographically or temporally. Pandemics spread in waves and do not respect geopolitical lines. The Centers for Disease Control and Prevention (CDC) reports cases at the state level. Eighty-five percent of the U.S. population resides in 392 metropolitan statistical areas (MSAs) ranging in size from 55,000 to 20 million. These high population density nodes are separated by more sparsely populated territories. It could be expected that outbreaks would be at different levels at different MSAs, even in the same region or state. As military commanders assess the current threat level and consider implementing various interventions, attention to disease incidence in nearby MSAs may result in more refined interventions.

All commanders should have access to designated public health emergency officers (PHEOs) who have received specific training to assist in public health emergencies and know how to contact community public health agencies and higher health service support authorities. Enhanced public health practices should have already been instituted, including:

- Frequent and repetitive education of all beneficiaries on the threat, early symptoms, and actions to take if infection is suspected
- Encouraging behaviors, such as frequent hand washing, covering coughs, and avoidance of touching hands to eyes or mouths, and avoiding handshakes
- Tables, desks, computer keyboards, doorknobs, bathrooms, and other common use areas should be cleaned with antiseptic solutions several times daily and allowed to air dry
- Common use equipment (such as mechanic's tools and copy machines) and cafeteria tables should be cleaned after each use.
- All service personnel should have seasonal influenza vaccinations unless medically contraindicated; other beneficiaries should be encouraged to get vaccinated if they have not done so.
- Liberal application of sick leave practices.







Mitigation interventions may also be required, depending on local conditions and essential mission requirements. Careful consideration should be given to logistical support requirements or unintended consequences of these interventions, which include:

- Social distancing, likely the least disruptive mitigation intervention. The virus is spread primarily by droplets, which travel about 3 feet, so maintaining at least that much separation reduces likelihood of disease spread.
- If environmental control systems vent outdoors, increasing air exchange to reduce potential concentration of contaminated aerosols.
- Telework/tele-education options for all personnel, subject to mission requirements. Telework reduces workspace interactions, and provides replacement personnel should those at work contract the disease or be placed in quarantine.
- Cancellation or closure of mass gathering events such as large training events, day care centers, DoD schools, parades, installation sporting events and other such venues.
- Reduction of non-essential travel, especially where mass transit is required, or if travel is to an area with a significant number of local cases.
- Individual or collective restriction of movement should be considered as a last resort in an area with uncontrolled disease spread. Considering that most U.S.-based military personnel reside in off-base housing, complete restriction of movement may be an option only at overseas installations, especially if significant local transmission exists nearby. Certain local establishments that might promote disease spread—including concerts, sporting events, or bars—could be temporarily placed off-limits. Restriction and/or screening of visitors to work centers or installations may also be considered.

### **Summary**

At this time, it is impossible to predict whether the virus will abate as warmer weather arrives in the Northern Hemisphere. Commanders at all levels must take appropriate actions to ensure continued essential mission effectiveness. Well-considered and measured force health protection interventions, informed by science but balanced against essential mission requirements, will slow the magnitude and spread of the outbreak. Deliberate planning and identifying triggers to implement mitigation strategies will go far in achieving this goal, for the current coronavirus and future pandemics.

*The views expressed in this article are those of the authors and do not reflect the official policy or position of the Defense Threat Reduction Agency, Department of Defense, or the U.S. Government.*

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