



OVERVIEW

Climate change impacts all of us in various ways - from increasing temperatures, wildfires, drought, flooding, and sea level rise. Currently, scientists are studying how diseases may be accelerated due to climate change.

Infectious diseases are caused by microorganisms such as viruses, bacteria, parasites, or fungi (infection agents).^{2,19} These infection agents may live, grow, and multiply in human, animal, or environmental habitats known as reservoirs. Infection agents may be transmitted to susceptible people (hosts) through direct contact, droplet spread, via airborne transmission, through vectors such as mosquitoes, fleas, and ticks, or through “vehicles” such as food and water.

An **epidemic** is a widespread occurrence of an infectious disease in a specific community at a distinct time.²⁰

A **pandemic** is an epidemic that occurs worldwide, or over a very wide area.²² It crosses international boundaries and usually affects a large number of people. One of the most important characteristics of pandemics and epidemics is that most of the population does not have immunity towards the disease. If a disease causes mild to asymptomatic effects, it is more likely that human carriers will inadvertently spread it. Diseases that cause severe illness can limit spread, especially if the mortality rate is high. Climate change has the potential to affect infection agents, reservoirs, and the susceptibility of hosts and threatens to alter the rates, spread, source, and location of infectious diseases.²



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HOW CLIMATE CHANGE MAY CONTRIBUTE TO PANDEMIC OUTBREAKS

Loss of biodiversity, increasing temperatures, and wildfires can create favorable environmental conditions for an increase in the frequency and intensity of disease outbreaks.⁷ Specifically, infectious diseases are becoming more emergent and easily transmitted via vectors (such as mosquitos) as they are sensitive to climatic changes.^{7,8} Vectors and their pathogens prefer a warmer and more humid climate and have the ability to survive in some areas that they were not able to survive before.⁸

Emerging diseases can be categorized as “newly emerging”, “re-emerging”, or “deliberately emerging” and can be caused by changes in ecosystem, climate, or human behaviors.^{10,11} More specifically, emerging diseases are characterized by at least one of the following criteria:

1. diseases caused by a new, previously unknown agent or syndrome;
2. disease symptoms that are more severe and/or more difficult to treat;
3. increased disease incidence in a region; and,
4. widening global distribution.¹¹

Early studies have shown a positive correlation between air pollution and the spread of COVID-19.^{21,29} Pollutants such as PM^{2.5} (*particulate matter less than 2.5 micrometers*), nitrogen oxide, and sulfur dioxide are contributing to overall air pollution. In the western U.S., wildfires have increased in intensity and severity as a result of climate change, and PM^{2.5} concentrations from wildfire smoke have increased as a result.^{30,31}

Research has shown that, for individuals exposed long term to these pollutants (*including wildfire smoke*), leads to respiratory illnesses, lung inflammation, and are more prone to infection agents including SARS-Cov-2, the virus that causes COVID-19.^{21,23, 24} SARS stands for severe acute respiratory syndrome and along with COVID-19, both belong to the coronavirus family, which is a “*large family of respiratory viruses that can cause mild to severe diseases from the common cold to respiratory syndromes.*”²¹



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TRIBES AND COVID-19

American Indian and Alaska Native (AI/AN) communities have suffered from health disparities since 1492 with the arrival of Europeans and the introduction of new infectious diseases.¹² The 1928 Spanish influenza pandemic, the onset of the Sin Nombre hantavirus in the Four Corners region in the 1990s, and the 2009 H1N1 influenza A pandemic have all severely affected the American Indian and Alaska Native population with infection rates higher than any other racial and ethnic group in the United States. Now, history repeats itself as COVID-19 continues to take a disproportionate toll on the health and economy of AI/AN communities throughout the United States.^{3,9} It is important to note that the true impacts of COVID-19 on Indigenous Peoples (including Native Hawaiians and Pacific Islanders) may not be reflected in the overall data and analyses being done by the Centers for Disease Control and Prevention, the Department of Health and Human Services, and other researchers.^{27,28} This may be due to lack of data collection by state and local agencies on the impacts of COVID-19 on Native Hawaiians, Pacific Islanders, and other Indigenous Peoples that may not be federally recognized by the U.S. government.^{27,28}



Photo courtesy of: Colleen Cooley

The disproportionate toll of COVID-19 impacts on Tribal communities is a direct failure of the U.S. government's trust and treaty responsibilities with Tribes. According to the Indian Health Service, COVID-19 is widespread in Tribal communities, especially on the Navajo Nation with a per capita death rate higher than any U.S. state, coupled with high unemployment rates.³

Tribal communities are socially more susceptible to the impacts of pandemics and epidemics due to socioeconomic factors such as families living in multi-generational households, limited access to quality health care, unemployment, poverty, and food insecurity.^{4,12} Within these communities, certain subpopulations are particularly vulnerable to the effects of a pandemic. Vulnerable populations in Tribal communities may include those with underlying health conditions, disabilities, elderly, and/or residents living in remote and isolated areas.⁴

Under the United States federal policies of self-determination through self-government, Native Americans are largely self-funded with a full array of basic governmental services that any state or local government is expected to provide. American Indian and Alaska Native governments are sovereign entities with authority to establish and administer public health programs within their communities, yet lack capacity to provide services due to funding limitations.^{4,16} Further, Native Americans are not able to collect adequate taxes to pay for operation and services that would help mitigate the effects of COVID-19.

Due to funding limitations, inadequate infrastructure, and decades of energy extraction, nearly 48% of Native American communities do not have access to safe and clean drinking water and therefore, are more susceptible to the spread of COVID-19.^{16,17,18} In addition, lack of access to clean water and proper sanitation may exacerbate the impacts on health, education, and economic development in Tribal communities.¹⁷

Developing and operating small businesses on Tribal lands was already a challenge before the arrival of the COVID-19 pandemic due to a variety of factors and therefore, many Tribes relied on a single revenue stream such as casinos and coal mining or oil and gas operations.¹⁶ Since the onset of the pandemic, lockdowns and curfews were mandated on many Tribal lands, which forced Tribal casinos, critical businesses and other services to close, resulting in job loss and services such as health care, education, and law enforcement.⁹



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RESPONSES & ACTIONS TO ADDRESS THE SPREAD OF COVID-19 FOR TRIBES

Since the onset of COVID-19 in early 2020, numerous organizations, Tribes, and programs have initiated efforts to help address the impacts and challenges it has brought upon Tribes across the country. Some of these include [Seeding Sovereignty](#), [Navajo & Hopi Families COVID-19 Relief Fund](#), [NDN Collective COVID-19 Project](#), [Native Waters on Arid Lands \(N WAL\) project](#), and more.

Before the pandemic, the N WAL project team had been working on understanding and helping Tribes find ways to address the impacts of climate change.²⁵ Since March 2020, their focus switched to finding ways to address the impacts of the pandemic on Tribes, and have been meeting weekly (*virtually*) with Tribal Colleges and Universities, Tribal leaders, and Federally recognized Tribal extension program agents.

Below are actions that some Tribes have taken to address the spread COVID-19:

Self-reliance

Food brings people together and for the Makah Tribe, food has always been an essential part of the community's security, but it has become more apparent during the pandemic.⁵ *"We have always preserved our culture and traditional ways enough that we go pick nettle, dig clams, and get mussels. Those are just normal things we do here,"* says Isabell Ides of the Makah Tribe.

Due to lack of running water on both Navajo and Hopi Nations, organizations and mutual aid efforts such as the [Red Feather Development Group](#) and [Kinlani/Flagstaff Mutual Aid](#) have raised money to provide handwashing stations and a DIY (Do-It-Yourself) Emergency Handwashing Station template, respectively.

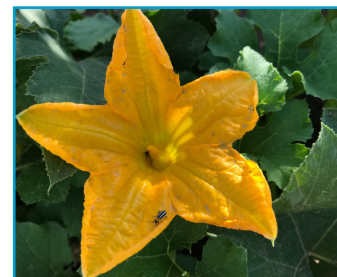
Self-isolation

The Grand Caillou/Dulac Band of Biloxi-Chitimacha-Choctaw along with the Makah Tribe have turned to self-isolation, a self-sustaining practice that Tribal communities have done for generations as a means for protection, cultural resiliency, and traditional ways of living.^{5,6}

"We stayed weeks and weeks and weeks without seeing anybody," said Marie Marlene V. Foret, in reference to how her family would pack up and move to a trapping camp every fall and sustain themselves with hunting and what they grew on the land.⁶

Food Sovereignty

Before the pandemic hit, many American Indian and Alaska Native families and households were already reliant on food distribution programs such as the [Supplemental Nutrition Assistance Program](#) (SNAP), the [Food Distribution Program on Indian Reservations](#) (FDPPIR), and [Special Supplemental Nutrition Program for Women, Infants, and Children](#) (WIC).¹⁴ Now, there has been an increase in use of some of these programs as unemployment rates have increased due to COVID.



Photos courtesy of: Colleen Cooley

While the pandemic has further impacted and disrupted food access and food distribution programs for Tribal communities, it has also provided the opportunity and importance to strengthen Tribal food sovereignty.¹³ Some of these opportunities include:

- A partnership between Diné (Navajo) chef Brian Yazzie and the [American Indian Center's Gatherings Café](#) in Minneapolis, MN to provide healthy, daily meals to over a hundred elders that were cut off from meal programs;
- [The Cheyenne River Youth Project](#) has served dinner to youth that no longer have access to school meals;
- "Resilience Gardens" by Rowen White, director of the [Indigenous Seedkeepers Network](#) in which Rowen packaged and sent seeds to Native families who needed them; and,
- The Duck Valley Shoshone Paiute Tribe have developed a successful hoop house program, which has increased in demand since the onset of the pandemic.²⁵ The program promotes food security and influences overall physical and mental health. A hoop house is a type of greenhouse that can be made with plastic or metal pipes and covered with plastic.



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RESOURCES

Below are a few examples of Tribal Hazard Mitigation Plans that have created guidelines and procedures on how to prepare for a future epidemic/pandemic:

- [The Suquamish Tribe Multi-Hazard Mitigation](#)

Plan have provided the following agreement in case of an epidemic emergency:

"Olympic Regional Tribal-Public Health Collaboration and Mutual Aid Agreement: The Suquamish Tribe, other Tribal Governments, and the County Health Districts within the state's Homeland Security Region 2 entered into a Mutual Aid Agreement in 2010. The purpose of this agreement is to voluntarily aid and assist each other by the interchange of public health resources and services in the event that a public health incident, emergency or disaster situation should occur and overwhelm the capabilities of an immediate local or regional response by leveraging collective resources." (pg. 11-4)

- [The Snoqualmie Tribal Hazard Mitigation Plan](#) outlines an emergency response to a future pandemic, outlined on pages 4-81 to 4-84.
- [The Morongo Band of Mission Indians Tribal Hazard Mitigation Plan](#) includes a section in their plan on Assessing Vulnerabilities to a Pandemic, outlined on pages 92-94.

FUNDING

- Tribal Water Utility Water Resources for the COVID-19 Pandemic:
<https://www.epa.gov/coronavirus/tribal-water-utility-resources-covid-19-pandemic>
- FEMA Tribal Funding, Mitigation and Planning Resources:
<https://www.fema.gov/about/organization/tribes/funding-mitigation-planning-resources>
- Tribal Homeland Security Grant Program:
<https://www.fema.gov/grants/preparedness/tribal-homeland-security>

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