

Infectious Disease Guidance for Wildland Fire Incidents, Emergency Medical Committee

Wildland fire incident management activities create an ideal environment for the transmission of infectious diseases: high-density living and working conditions, lack of access to and use of soap and sanitizers, and a transient workforce. These and other environmental and occupational factors (e.g., smoke, heat, plants, insects, fungus, fatigue, and physically demanding work) can increase the likelihood of disease transmission. In some situations, the number of symptomatic fire personnel and suspected cases can increase rapidly, resulting in an infectious disease outbreak on the incident. An outbreak is the occurrence of more cases than would normally be expected in a specific place or among a group of people over a given time period. This guidance is intended to enable Incident Management Teams (IMTs) to effectively prevent, plan for, recognize, and respond to infectious disease issues during wildland fire operations.

This guidance provides National Wildfire Coordinating Group (NWCG) recommendations for infectious disease prevention, planning, identification, and response during wildland fire incident management activities. It does not supersede the guidance or direction of local health authorities but supplements existing direction from them.

The NWCG recommends:

- Follow [Centers for Disease Control and Prevention](#) guidance.
- Use the planning principles stated in the [Health and Human Services EMS Infectious Disease Playbook](#).
- Follow this supplemental guidance from the NWCG Emergency Medical Committee (EMC).

⇒ Background

Germs are a part of everyday life and are found in our air, soil, water, and in and on our bodies. Many germs live in and on our bodies without causing harm and some even help us to stay healthy. Only a small portion of germs are known to cause infection.

How Do Infections Occur?

An infection occurs when germs enter the body, increase in number, and cause an adverse reaction of the body.

Three things are necessary for an infection to occur:

- **Source:** Places where infectious agents (germs) live (e.g., sinks, surfaces, and human skin).
- **Susceptible Person:** Provides a way for germs to enter the body.
- **Transmission:** A way germs are moved to the susceptible person.

During a wildfire response, germs may be present in many places. People are one source of germs. People can be sick with symptoms of an infection or colonized with germs (not have symptoms of an infection but able to pass the germs to others). Germs are also found in the wildland fire environment. Examples of environmental sources of germs include:

- Dry surfaces (e.g., equipment, vehicles, doors, bathrooms, and tables).
- Wet surfaces, moist environments, and [biofilms](#) (e.g., showers, wash basins, and food).
- Dust or decaying debris (e.g., dust or wet materials in the environment).

To understand the principles of prevention, it is important to understand how germs that cause infectious diseases are spread. Infectious diseases are caused by germs or microorganisms, usually bacteria or viruses but sometimes fungi and parasites. They spread from person to person by six specific mechanisms:

1. Contact

- a. **Direct contact:** Transmission occurs through directly touching an infectious person (e.g., handshake, kiss).
- b. **Indirect contact:** Transmission occurs through an intermediate object such as touching a contaminated surface.

2. **Respiratory droplets:** Occurs when droplets are propelled from an infectious host into the conjunctiva/mouth/mucosa of a susceptible host (i.e. large particles from coughing, or sneezing). Microorganisms do not remain in the air and require much closer proximity than airborne transmission to susceptible host.
3. **Airborne:** Occurs when microorganisms suspended in the air are inhaled by a susceptible host (i.e. smaller particles than droplets or dust). Temperature and humidity influence transmission and microorganisms can travel considerable distances.
4. **Vehicle-borne:** Occurs from the ingestion of contaminated food or water, puncture by a contaminated needle or other sharp instruments, or an infusion or injection.
5. **Vector-borne:** A vector can be a mechanical or biological vehicle that transmits disease from reservoir to host. For example, a mosquito is a vector for West Nile virus.
6. **Vertical transmission:** In utero, at birth, or through breastmilk.

⇒ Pre-Planning and Preparing

Pre-planning and preparing is very important for identifying and responding to infectious diseases during wildfire response activities. The IMT needs to consider how best to decrease the spread of illness and lower the impact of an outbreak during a wildfire response. Agency Administrators should develop infectious disease outbreak plans and clearly identify and communicate their objectives in those plans, which may include one or more of the following: (a) reducing transmission among fire personnel; (b) protecting fire personnel who are at higher risk for adverse health complications; (c) maintaining fire operations, and; (d) minimizing adverse effects on other impacted entities. These plans should be considered and incorporated, along with the guidance in this document, when responding to infectious diseases on wildland fire incidents.

Pre-planning also includes planning for and ordering PPE for fire personnel when interacting with symptomatic fire personnel. The National Fire Equipment System (NFES) has two infectious disease barrier kits for use on incidents. Incident Medical Unit Leaders (MEDLs) will need to determine the minimum initial stocking levels of these kits for each incident based on the incident's staffing levels and other perceived risk factors. The barrier kits are:

- Individual Infectious Disease Barrier Kit (NFES 1660) is designed for Medical Units to have on hand in order to assist in the treatment of symptomatic fire personnel. The kit contains:
 - [1] When respiratory protection is required in an occupational setting, respirator use must be done through a comprehensive respiratory protection program as required under the [Occupational Safety and Health Administration's \(OSHA\) Respiratory Protection standard \(29 CFR 1910.134\)](#). This includes medical evaluation, respirator fit testing, and training of the worker. When required in the occupational setting, tight-fitting respirators cannot be used by people with facial hair that interferes with the face seal. When respirators are used on a voluntary basis in an occupational setting, employers should follow the requirements for voluntary use of respirators. This information can be found on the [OSHA website](#).
 - One polycoated uni-size coverall or polycoated uni-size gown with sleeves, hood, elastic wrist, and elastic face enclosure or coverall with sleeves, hood, elastic wrist, elastic ankle, and elastic face enclosure,
 - A NIOSH-approved disposable N95 filtering facepiece respirator[1] to help reduce inhalation exposures to certain airborne infectious agents (e.g., *Bacillus anthracis*, *Mycobacterium tuberculosis*, etc.),

- A pair of large nitrile gloves,
- A pair of safety glasses,
- A pair of boot covers,
- A pair of shoe covers having nonskid bottoms, and
- A biohazard bag (marked with the biohazard symbol) having a capacity of four to six gallons.
- Multi-Person Infectious Disease Barrier Kit (NFES 1675) was developed to provide protection for up to 10 people. The kit contains:
 - Ten polycoated uni-size coveralls or gowns with sleeves, hood, elastic wrist and elastic face enclosure,
 - Ten NIOSH-approved disposable N95 respirators to help reduce inhalation exposures to certain airborne biological particles (e.g., *Bacillus anthracis*, *Mycobacterium tuberculosis*, etc.),
 - 10 pairs of large nitrile gloves,
 - Two pairs of safety glasses,
 - Ten pairs of boot covers,
 - Ten pairs of shoe covers having non-skid bottoms, and
 - Three biohazard bags (marked with the Biohazard symbol), each having a capacity of four to six gallons.

⇒ Prevention

One of the first steps to prevent infectious diseases from occurring on a wildland fire incident is to encourage the prevention of illnesses using common-sense practices and personal protective equipment (PPE) among all fire personnel each and every day. These practices can help prevent illness on an incident and include:

- **Staying up to date on vaccinations:** Recommend all personnel get a seasonal influenza vaccine every year. All personnel should also get the Tdap vaccine once if they did not receive it as an adolescent to protect against pertussis (whooping cough), and then a Td (tetanus, diphtheria) booster shot every 10 years. Personnel should talk with their doctor to find out which additional vaccines are recommended.
- **Performing hand hygiene:** When soap and water are available all fire personnel should wash their hands often for at least 20 seconds, especially after coughing or sneezing. This is especially true when a fire personnel's hands are visibly dirty, after touching commonly touched surfaces like porta potty doors, tables, and equipment, after using the toilet, or before eating. If soap and water are not readily available, alcohol-based hand sanitizers with at least 60% alcohol should be used.
- **Following respiratory hygiene/cough etiquette principles:** Fire personnel should be advised to cover their nose and mouth with a tissue when coughing or sneezing. If using a tissue, they should immediately throw away the tissue away after use and wash or sanitize their hands as described above.
- **Keeping hands away from face:** Fire personnel should practice not touching their eyes, nose, or mouth. While it may seem simple, germs often spread this way.
- **Cleaning and disinfecting the environment appropriately:** IMTs should implement policies and procedures where frequently touched surfaces in the workplace are routinely cleaned and if necessary disinfected.
- **Wearing PPE and handle medical waste appropriately when exposed to body fluids:** When fire personnel are exposed to blood or other bodily fluids, ensure they wear proper PPE (such as gloves), properly dispose of used PPE, and clean up contaminated surfaces.

Additionally, it's important food service contract workers implement and follow food safety procedures to prevent foodborne illnesses.

⇒ Key Control Strategies

- Do not delay infection control measures pending definitive diagnosis of a certain illnesses. There is no guarantee that the individual introducing an infectious disease into a population is aware of their status as a carrier.

- Initiate controls for elimination or reduction of cross infection. This may require isolation of symptomatic fire personnel. Be prepared to provide separate feeding, sanitation, showering, and sleeping facilities away from the asymptomatic population at base camp or spike camps.
- Ensure rigorous sanitary and personal hygiene practices to reduce the transmission of infectious diseases. Insist that adequate hand washing and sanitation facilities and supplies are available. No amount of emphasis on personal hygiene can be too much.
- Clean and disinfect frequently touched objects such as door handles on portable toilets, wash basins, showers, radios, and surfaces using a regular household cleaning spray or wipe. Work with local public health officials to determine any additional control measures. Public health officials may exercise authority in further management of the incident.
- Encourage fire personnel stay up to date on vaccinations.

⇒ Managing the Suspected Outbreak

In the event an IMT is confronted with increased numbers of symptomatic fire personnel on an incident and an outbreak may be suspected, the following initial steps are recommended.

1. Infection control measures should in place from the beginning of the incident and strengthened pending a definitive diagnosis.
2. Record all affected fire personnel symptoms and the times of successive visits to incident medical units. MEDLs should identify all affected fire personnel and systematically record each worker's symptoms and visits to incident medical units.
3. For each symptomatic worker, it is important to record their symptoms, work, and exposure history. This includes information about other people the symptomatic fire personnel may have been in contact with, specific tasks they performed, ICP/fire locations they frequented, and if illness is gastrointestinal, their food choices. This will help to better characterize the illness and assist with generating hypotheses about the source of the illness. The ICS 214 activity log may be used for this purpose. Information captured may help to identify other fire personnel who may be at increased risk. Once contacted, local public health resources may be able to aid with this step.

NOTE: If symptomatic fire personnel are engaged in different functions across the incident or are experiencing a variety of different symptoms, evaluate and eliminate the possibility of those symptoms being linked to other factors such as strenuous activity, fatigue, or other environmental exposures rather than infectious disease.

*NOTE: Isolating symptomatic fire personnel or quarantining asymptomatic fire personnel who were in contact with symptomatic fire personnel may be advised at this time. **Isolation** separates sick people with a contagious disease from people who are not sick. **Quarantine** separates and restricts the movement of people who were exposed to a contagious disease to see if they become sick.*

4. Notify the Incident Commander (IC), Safety Officer (SOF), Logistics Section Chief (LSC), Finance Section Chief (FSC), and Public Information Officer (PIO) and provide them with your best estimate of the situation.
5. Notify the Agency Administrator and provide them with the best estimate of the situation. Ensure the Agency Administrator makes the proper contacts. Notify the local public health department and request assistance. Further isolation or quarantining an area may be advised by local public health. Contact information for public health agencies can be obtained from state EMS offices (below).
6. Direct media questions and reactions to the potential outbreak to the incident PIO or local or state Public Health Official if appropriate.

⇒ Managing the Confirmed Outbreak

The following recommendations are suggested for IMTs when an infectious disease outbreak has been confirmed on an incident.

1. Continue to follow all the steps listed in the prevention section above.
2. Rigorous sanitary and personal hygiene practices are important to keeping the spread of the infectious disease to a minimum. Insist that adequate hand washing and sanitation facilities are available in both general fire personnel population and isolation areas. Emphasize that proper hand washing and cleaning up after one's self is stressed to all incident personnel. No amount of emphasis on personal hygiene can be too much.
3. Coordinate with the Agency Administrator and establish who has authority to demobilize and/or isolate the incident.
4. Continue to work with your local and state health departments to ensure appropriate local protocols and guidelines are followed for case identification, infection prevention, and cleaning and disinfection.
5. Review Human Resources (HR) policies and ensure that policies and practices implemented are consistent with public health recommendations (which may depend on the jurisdiction where the incident is located) and are consistent with existing state and federal workplace laws.
6. Develop or use a prepared communication strategy and assign responsibilities for dissemination of information. Maintain a high level of timely and accurate information flow. Coordinate with the host unit as to how the information flow will be handled and who will serve as the point-of-contact.
7. Educate all fire personnel to recognize the symptoms of the disease and provide instructions on what to do if symptoms develop. This is especially important for fire personnel who may have come into contact symptomatic fire personnel, or who may handle equipment and supplies (including sanitation) used by symptomatic fire personnel.
8. Initiate controls for elimination or reduction of cross infection. This may require isolation of symptomatic fire personnel or quarantine of exposed fire personnel or sending them to their home unit (if possible). Be prepared to provide separate feeding, sanitation, showering, and sleeping facilities away from the asymptomatic and unexposed population at the incident. Preventing further spread of the disease will vary depending on mode of transmission. Local and state public health departments will be able to provide advice on prevention of the infectious disease.
 - Symptomatic fire personnel will need to be monitored by appropriate medical staff. Restrict the personnel entering isolation and quarantine areas, and implement standard and transmission-based precautions. Public health resources may be able to assist with this planning and monitoring of symptomatic fire personnel.
 - Protect fire personnel in close contact with the confirmed/suspected cases by using additional engineering and administrative controls and PPE.
 - If possible, keep fire personnel suspected of having illness from those with confirmed illness to prevent further transmission.
9. Be prepared to close off areas used by the symptomatic fire personnel and wait as long as practical before beginning cleaning and disinfection to minimize potential for exposure to contaminated surfaces and materials. Cleaning and decontamination methods will vary depending on the infectious disease present, its mode of transmission, and the surface contaminated (if applicable). Local and state public health departments can provide assistance on appropriate cleaning and decontamination methods.
 - *NOTE: Workers who conduct cleaning tasks must be protected from exposure to blood, certain body fluids, and other potentially infectious materials covered by OSHA's Bloodborne Pathogens standard ([29 CFR 1910.1030](#)) and from hazardous chemicals used in these tasks. In these cases, the PPE ([29 CFR 1910 Subpart I](#)) and Hazard Communication ([29 CFR 1910.1200](#)) standards may also apply. Do not use compressed air or water sprays to clean potentially contaminated surfaces, as these techniques may aerosolize infectious material.*
 - Ensure proper disposal of regulated waste, and PPE ([29 CFR 1910.132](#)).
 - Policies and trainings for worker protection must be developed and adhered to for all cleaning staff and fire personnel who are responsible for clean up, prior to initiating any cleanup activities. Training should include when to use PPE, what PPE is necessary, how to properly don (put on), use, and doff (take off) PPE, and how to properly dispose of PPE.
 - All "community" ice chests, coolers, or other common items may need to be removed and one controlled point for distribution may need to be established.
10. The MEDL will contact the Compensations Claims Unit Leader (COMP) or the FSC if a COMP is not available to ensure the appropriate workers' compensation paperwork is completed. The MEDL and

COMP will follow standard operating procedures for arranging transportation from the incident to the medical facility and return. The COMP or FSC will determine the appropriate methodology for payment; workers' compensation or Agency Provided Medical Care. Any arrangements to isolate the symptomatic fire personnel will be handled through a resource order if necessary, until the individual can be transported home or return to duty.

11. The servicing local dispatch and Geographic Area Coordination Center (GACC) should be advised of the situation, and the adjustments made for demobilizations, reassignments, or holds associated with the IMTs. Occupational medicine providers or local public health departments may be able to provide advice on return to work.
12. MEDL should consider implementing these guidelines specific to the outbreak. Guidelines should include, but are not limited to:
 - Request assistance from medical unit personnel to help evaluate if outside help may be needed from local or regional medical services.
 - Coordination with local public health authorities may become necessary.
 - Plan on overstaffing the medical unit as the disease runs its course.
 - Provide PPE (and training on how to use PPE) as necessary for all staff involved and encourage regular handwashing.
 - Limit the medical unit staff from going between affected and unaffected areas.
 - Clean areas as instructed by local or state public health.
 - Wash the handles and sink areas of wash basins frequently. If possible, avoid touching these areas when in use to prevent cross-contamination.
13. Isolate and contain all potentially contaminated items. Determine which items are the individual's personal items versus incident issued and separate accordingly. Collection of these items should be performed with the personnel wearing and trained on the appropriate PPE Place the items in bags and tag the bags with information that they have been exposed to an infectious disease.
 - *NOTE: The MEDL or Supply Unit Leader (SPUL) should communicate with the servicing cache and inform them of the situation. The servicing cache will provide any additional instructions or assistance. A Cache Demobilization Specialist should be assigned to the incident to facilitate the proper handling of all items for return to the cache.*
 - *NOTE: The cache issued items can be cleaned through their refurbishing process. Cache personnel will make a determination upon inspection if the items are not able to be refurbished and they will dispose of those items in accordance with biohazard disposal policies if necessary.*
 - *NOTE: The MEDL should contact the local health department for the standards on cleaning personal items at the home unit if needed.*
14. Work with public health officials to determine any additional control measures. Public health officials may exercise authority in further management of the incident.
15. If necessary, work with National Contract Mobile Food Service providers and shower contractors. Notify them of the potential for stop work orders, creation of separate facilities for symptomatic and asymptomatic personnel, and requests for cooperation from public health officials.
16. Expect to logistically support all fire personnel who are in recovery until they show no further signs or symptoms. This will vary between individuals, the type of infectious disease encountered and incubation period. Assistance from public health officials may be requested in determining release times. A person in recovery may still have the ability to infect others. This may cause issues or problems with release or reassignment, even the replacement of an IMT. Work with the servicing GACC and Agency Administrator on how to deal with the unavailability of symptomatic resources.
17. Prevention and rapid intervention for handling infectious diseases will help ensure that incident medical episodes are contained and controlled. Pre-planning is critical and contacting the appropriate state EMS office will provide the necessary information for that state's reporting requirements. Working with state and local agencies usually opens the channels for receiving the resources needed to manage infectious disease events occurring on wildland fire incidents.

⇒ Special Considerations

Planning a medical incident within an incident (IWI) may be challenging for the IMT. Additional planning and assistance from local resources and public health agencies may be needed to overcome some of the challenges listed below:

1. The local health system may not be able to handle the influx of symptomatic fire personnel from the incident,
2. Transporting symptomatic fire personnel back to their home or other off-site facilities may be restricted due to isolation or quarantine recommendations,
3. Symptomatic fire personnel may not be allowed to use public transportation and may not be well enough to drive long distances until they recover, and
4. Other factors may complicate the situation including:
 - a. EMTs, paramedics, and other Emergency Medical Services (EMS) personnel charged with the support of the fire personnel may be exposed,
 - b. Incident facilities may be quarantined and/or require special disinfection,
 - c. The incident continues to require staffing, or
 - d. The event may require creating other clean facilities with non-affected staff personnel.

⇒ Resources

- EMS Infectious Disease Playbook: <https://files.asprtracie.hhs.gov/documents/aspr-tracie-transport-playbook-508.pdf>
- Centers for Disease Control and Prevention: <https://www.cdc.gov>
- Infection Control After a Disaster: <https://www.cdc.gov/disasters/infectioncontrol.html>
- Response Worker Health and Safety: <https://www.cdc.gov/disasters/workers.html>

Potential Infectious Disease Handouts

- COVID-19 <https://www.cdc.gov/coronavirus/2019-ncov/downloads/2019-ncov-factsheet.pdf>
- Influenza: https://www.cdc.gov/flu/resource-center/images/multi-language-pdfs/flu_and_you_english_508.pdf
- Foodborne: <https://www.cdc.gov/foodsafety/pdfs/food-Safety-symptoms-P.pdf> ??
- Norovirus: <https://www.cdc.gov/norovirus/downloads/keyfacts.pdf>
- What Vaccines are Recommended for You: <https://www.cdc.gov/vaccines/adults/rec-vac/index.html>

State EMS Office Contact List

State	Phone	Website
Alabama	334-206-5383	Website
Alaska	907-465-3027	Website
Arizona	602-364-3150	Website
Arkansas	501-661-2262	Website
California	916-322-4336	Website
Colorado	303-691-4932	Website
Connecticut	860-509-8000	Website
Delaware	302-223-1350	Website
District of Columbia	202-671-4222	Website
Florida	850-245-4440	Website
Georgia	770-996-3133	Website
Hawaii	808-733-9210	Website

Idaho	208-334-4000	Website
Illinois	217-785-2080	Website
Indiana	317-234-6804	Website
Iowa	800-728-3367	Website
Kansas	785-296-7296	Website
Kentucky	866-97KBEMS	Website
Louisiana	225-925-4022	Website
Maine	207-626-3860	Website
Maryland	410-706-5074	Website
Massachusetts	617-753-7300	Website
Michigan	517-241-3024	Website
Minnesota	651-201-2800	Website
Mississippi	601-576-7400	Website
Missouri	573-751-6356	Website
Montana	406-444-3895	Website
Nebraska	402-471-2158	Website
Nevada	775-687-7590	Website
New Hampshire	603-223-4200	Website
New Jersey	609-633-7777	Website
New Mexico	505-476-8200	Website
New York	518-402-0996	Website
North Carolina	919-855-3935	Website
North Dakota	701-328-2388	Website
Ohio	614-466-9447	Website
Oklahoma	405-271-4027	Website
Oregon	971-673-0520	Website
Pennsylvania	717-787-8740	Website
Rhode Island	401-222-2401	Website
South Carolina	803-545-4204	Website
South Dakota	605-773-4031	Website
Tennessee	615-741-2584	Website
Texas	512-834-6700	Website
Utah	801-538-6435	Website
Vermont	802-863-7310	Website
Virginia	804-888-9100	Website
Washington	360-236-2830	Website
West Virginia	304-558-3956	Website
Wisconsin	608-266-1568	Website
Wyoming	307-777-7955	Website

This guidance was developed by the NWCG Emergency Medical Committee (EMC). Comments, questions, and recommendations shall be submitted to the [appropriate agency representative assigned to EMC](#).