



# Biological Hazards

WEEK 1: 25 MAY, 2020

## WHAT ARE BIOLOGICAL HAZARDS?

**Biological hazards, also known as bio-hazards, refer to biological substances that pose a threat to the health of living organisms, primarily that of humans. This can include microorganism, viruses, or toxins (from a biological source) that can affect human health.**

Because of COVID-19, most of us are now much more aware of biological hazards in our environments. These biohazards are not easily eliminated so we need to understand what they are and how they can affect us.

We are all familiar with how the common cold and flu can be spread by an infected person coughing and sneezing, producing bioaerosols. Bioaerosols are biological particles of organic dust and/or droplets suspended in the air, such as viruses, bacteria, endotoxin, fungi, secondary metabolites of fungi, particles of feces, bodies of mites and insects, and feather, hair, feces, and urine of birds and mammals. These

sources can cause a variety of health effects ranging from skin irritation and allergies to infections such as tuberculosis, AIDS, cancer and so on.

When a new virus appears, humans typically have no immunity to it which allows it to take hold and spread. A pandemic occurs when a disease occurs over a wide geographic area and affects an exceptionally high proportion of the population, causing serious illness or death. An epidemic is the same but on a smaller scale. Cholera, bubonic plague, smallpox, and influenza are some of the most brutal killers in human history. Flu pandemics usually happen every 30-40 years with the 2009 Swine Flu being the most recent. Some flu pandemics have been extremely deadly, such as the 1918 Spanish Flu which killed almost 50 million people worldwide. Other pandemic/epidemic diseases also have large death tolls. For example, HIV/AIDS has killed over 35 million people worldwide to date.



As we are always going to be exposed to biohazards, it is important that we understand their sources and what they actually do in order to protect ourselves from their harmful effects. Vaccine development and improved hygiene have been successful in combating diseases. In the US, vaccines are the reason we don't worry about diseases such as polio, rubella, mumps, and chickenpox, to name a few. Continued research will provide more answers and protection from current and future pandemics.

### THE NUMBERS:

- **Bacteria in the body outnumber human cells by 10 to 1**
- **About 5 lbs of a 200 lbs adult is made up of bacteria**
- **Viruses are the most abundant microbes on earth**
- **320,000 types of viruses are able to infect mammals**
- **219 viruses are known to infect humans**

## VIRUSES AND BACTERIA

**While bacteria and viruses can both cause mild to serious infections, they are different from each other. This is important to understand, because bacterial and viral infections must be treated differently.** Misusing antibiotics to treat viral infections contributes to the problem of antibiotic resistance.

### Bacteria vs Viruses

Bacteria and viruses are too tiny to be seen by the naked eye, can cause similar symptoms, and are often spread in the same way, but that's where the similarities end. A bacterium is a single, but complex, cell. It can survive on its own, inside or outside the body. Most bacteria aren't harmful. In fact, we have many bacteria on and inside our body, especially in the gut to help digest food.

Viruses are smaller and are not cells. Unlike bacteria, they need a host such as a human or animal to multiply. Viruses cause infections by entering and multiplying inside the host's healthy cells.

### Bacterial vs Viral Infections

As the names suggest, bacteria cause bacterial infections, and viruses cause viral infections. Examples of bacterial infections include whooping cough, strep throat, and ear infections. Viral infections include the common cold, influenza, most coughs and bronchitis, chickenpox and HIV/AIDS. It can be difficult to know what causes an infection, because viral and bacterial infections can cause similar symptoms. Doctors may need a blood sample or oral swabs for a 'culture' test to have the bugs identified under a microscope.

### Treatment

Doctors usually treat bacterial infections with antibiotics that either kill bacteria or stop them multiplying. But since antibiotic resistance is a growing problem, antibiotics may be prescribed only for serious bacterial infections. The treatment of viral infections can include:

- managing symptoms which could include using medicine to relieve fever, for example
- stopping viral reproduction using antiviral medicines, such as medicines for HIV/AIDS and cold sores
- preventing infection in the first place, such as vaccines for flu and hepatitis

**Remember: Antibiotics won't work for viral infections.**

# STANDARD PRECAUTIONS

Here is a list of standard precautions that the Center for Disease Control and Prevention recommends. Everyone should follow these guidelines to minimize the risk of contracting COVID-19 and other communicable diseases.

**Wash your hands often** with soap and water for at least 20 seconds especially after you have been in a public place, or after blowing your nose, coughing, or sneezing. If soap and water are not readily available, use a hand sanitizer that contains at least 60% alcohol. 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 with people who are sick, even inside your home. If possible, maintain 6 feet between the person who is sick and other household members. Put distance between yourself and other people outside of your home. Remember that some people without symptoms may be able to spread virus. **Stay at least 6 feet (about 2 arms' length) from other people.** Do not gather in groups. Stay out of crowded places and avoid mass gatherings. Keeping distance from others is especially important for people who are at higher risk of getting very sick.

**Cover your mouth and nose** with a cloth face cover when around others. You could spread COVID-19 to others even if you do not feel sick. Everyone should wear a cloth face cover when they have to go out in public, for example to the grocery store or to pick up other necessities. Cloth face coverings should not be placed on young children under age 2, anyone who has trouble breathing, or is unconscious, incapacitated or otherwise unable to remove the mask without assistance. The cloth face cover is meant to protect other people in case you are infected. Do NOT use a facemask meant for a healthcare worker. Continue to keep about 6 feet between yourself and others. **The cloth face cover is not a substitute for social distancing.**

If you are in a private setting and do not have on your cloth face covering, remember to always cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow. Throw used tissues in



the trash. Immediately wash your hands with soap and water for at least 20 seconds. If soap and water are not readily available, clean your hands with a hand sanitizer that contains at least 60% alcohol.

**Clean AND disinfect frequently touched surfaces daily.** This includes tables, doorknobs, light switches, 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 will work.

## CAMP PENDLETON AND COVID-19

Camp Pendleton is currently in HPCON Charlie. As stated on the official website, "Camp Pendleton is coordinating with interagency partners and local communities to support disease-containment operations, and we continue to assess and monitor the situation to ensure mission readiness for our forces and families. Camp Pendleton is prepared to take measured action to preserve the health of the force and prevent the

spread of COVID-19." While surrounding civilian areas may have different rules concerning COVID-19, please understand that on base, you must follow the rules and restrictions as they are implemented. For up-to-date information, check the Camp Pendleton website at [www.pendleton.marines.mil/Unit-Home/COVID-19/](http://www.pendleton.marines.mil/Unit-Home/COVID-19/). There you will also find multiple links to additional information and resources.

**If you are concerned that you may have been exposed to COVID-19, please call the Nurse Advice line at 1-800-874-2273, option 1, and follow their instructions before coming to the hospital. If you have flu-like symptoms and are in need of emergency services and cannot self-transport, please let the dispatcher know at (760) 725-4321.**



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### CAMP PENDLETON SAFETY CENTER

We provide a wide range of safety support services aimed at preserving combat readiness by identifying hazards and reducing risk to people and resources. We perform inspections, provide technical support, assist with safety program implementation, conduct mishap investigations, and offer safety training opportunities for all base personnel to include tenant commands. We want to empower all Sailors, Marines, civilians, and their families to embrace a proactive culture of risk identification and management to achieve zero preventable mishaps.

Have a question? Email us at: [Cpen\\_safety\\_help@usmc.mil](mailto:Cpen_safety_help@usmc.mil)

Commanding General's Safety Hotline: 760.763.7233