INTRODUCTION/GOALS

In this paper, we recommend protective measures for the general public and identify misinformation in the “fact vs. fiction” session. MITRE experts in infectious diseases, microbiology, and virology have researched this scientifically accepted and verified information to date regarding COVID-19.

PROTECTIVE MEASURES IN PUBLIC

While the Centers for Disease Control (CDC) and the World Health Organization (WHO) suggest staying at home as much as possible, we realize this may not be possible for all. If you must venture to work, obtain household supplies, or visit a healthcare facility, here are some tips to keep yourself and others safe and healthy during this pandemic.

- **Avoid mass transit** if you can (e.g., trains, taxis, buses, etc.).
- **Keep a 6-ft distance** between you and others to minimize aerosolized droplet transmission.
- **Cover your mouth** and nose with a tissue when you cough or sneeze, or use the inside of your elbow. Immediately throw used tissues away and sanitize or wash your hands.
- **Wash your hands** after touching common surfaces such as doorknobs, elevator buttons, phones, metro poles, and touch screens. Washing your hands with soap and water for at least 20 seconds is a precautious and effective way to minimize exposure.
- If soap and water are not available and your hands are not visibly dirty, **hand sanitizers can also be used**, just ensure they contain at least 80% ethanol. This should be in contact with your hands for at least 30 seconds to be effective.
- According to the 2015 American Journal of Infection Control, people touch their face over 20 times/hour. Of these touches, approximately 44% of them are to the nose, mouth and eyes, which are susceptible to virus particles. Please make every effort to **avoid touching your face**, especially your mouth, eyes, and nose. Wearing a mask can help mitigate face touching.
- As of early April 2020, the CDC recommends **wearing cloth face coverings in public settings** where other social distancing measures are difficult to maintain. This is due to new knowledge that a significant portion of individuals with coronavirus are asymptomatic or pre-symptomatic and can transmit the virus to others without showing symptoms. These masks prevent spread of aerosolized particles from you to others. The CDC advises using simple cloth face coverings, made from household items like dish towels, t-shirts, or cotton-poly blends. Surgical or other medical masks/respirators are in very short supply and should be reserved for healthcare professionals who will be exposed to any number of diseases.
- **Do not wear gloves in public!** They may protect you but they can spread microbes to others. As mentioned before, they are protective gear that should be reserved for healthcare professionals who are actively treating and caring for patients.
- Be sure to check out the latest **data and recommendations from the CDC**.

PROTECTIVE MEASURES AT HOME

To emphasize the importance of proactive household measures, research has confirmed that this coronavirus can persist on common household surfaces for extended periods of time. This might be another route of infection, beyond aerosolized droplets. If no intervention occurs, the virus is detectable at ambient temperatures and common
household humidity for up to:

- 4 hours on copper
- 2-3 days on plastic and stainless steel
- 24 hours on cardboard (please note that WHO has confirmed the likelihood of contracting the virus on shipped goods is very low)

Of note, this study was performed in a controlled environment and does not take into consideration other factors such as ultraviolet light (from the sun), changes in altitude, humidity, temperature, and other features.

This study reveals how and what percentage of certain common household chemicals are necessary to combat viruses akin to SARS-CoV-2.

1. **Not all household chemicals are created equally.** Ensure your household disinfectants are on the [EPA registered](https://www.epa.gov/) list or specifically state effectiveness against coronaviruses. Many bleach wipes do not actually contain bleach, so please read the label to ensure they are effective against bacteria and viruses.

2. **Good cleaning practices matter.** Previous research shows that efficient inactivation of similar viruses require one of the following chemicals to be in contact with the contaminated surface for at least one minute:
   - at least 71% isopropanol, or
   - 0.5% hydrogen peroxide, or
   - 0.1% sodium hypochlorite (i.e. bleach)

3. **More glitter does not make a better hand sanitizer.** Hand rubs (as opposed to hand sanitizers) must contain at least 80% ethanol to be effective. For maximal efficacy, the hand rub must be applied for 30 seconds. Like household cleaning chemicals, hand rubs have comprehensive activity against different types of viruses.

4. **Wear disposable latex gloves when cleaning.** To protect yourself from direct contact with chemicals, as well as from microorganisms, always clean with laboratory-grade gloves. These should be discarded after using once. If you are allergic to latex, alternatives are available.

5. **Check the CDC website on protecting yourself and others.** Best practices are continuously evolving, so please check the [CDC website recommendations](https://www.cdc.gov) regularly.

**FACT VS. FICTION**

There is a lot of COVID-19 information being distributed. To ensure you have the most accurate information, here are the opinions of scientific experts.

**You can get COVID-19 twice:** UNCLEAR

Like many other infectious diseases, once you are infected, your body develops a highly effective immune response that prevents reinfection, or a second infection. This is the basis of vaccines. They initiate the development of a long-lasting, robust immune response. However, there is the possibility that the pathogen can mutate and your immune response will then no longer recognize the new mutated pathogen after the viral part that is targeted by the immune system has changed.

There are some reports circulating that people can catch COVID-19 again. Scientists believe these reports may stem from erroneous testing or from people who have not completely recovered. As of now, there is no evidence from the research community that the virus has mutated. One study performed by researchers from a medical university in China evaluated the similarities of 95 full-length sequences from this virus' strains and determined they were 99% similar at the amino acid level.

However, a recent study analyzing the immune response generated by COVID-19 indicates that almost 50% of recovered individuals enlisted in a study had low to medium-low levels of neutralizing antibodies. These neutralizing antibodies are known to be indicative of immunity against future infections, so these results suggest that a significant percentage of individuals who recover from COVID-19 may lack immunity for subsequent SARS-CoV-2 infections. These results were published in a preprint journal and are not yet peer reviewed; more studies are needed to understand the long-term immune response and risks of reinfection. At this time, the WHO affirms that reinfection is a possibility.
**Clearing the virus with water:** FALSE
There is an article circulating that claims people should take a few sips of water every 15 minutes at least, because if the virus gets into your mouth, drinking water or other liquids will wash them down through your throat and into the stomach. Once there, your stomach acid will completely kill the virus. This is FALSE! While it is good to keep hydrated, the main route of infection is through inhalation of respiratory droplets. Drinking water to wash down the virus into the stomach will not prevent infections via the lungs.

**Holding your breath for 10 seconds:** FALSE
Similarly, this claim was shared widely through the internet and by TV personalities. There is no scientific literature to support this. If you notice a dry cough, trouble breathing, or shortness of breath in conjunction with a fever, seek medical attention.

**Young people don’t get sick:** FALSE
Data from CDC indicates that adults aged 20-44 are still susceptible and require hospitalization, some needing intensive care. Thus, if you think COVID-19 will not impact you, think again! Additionally, keep in mind that protecting yourself also means protecting the older generations who may be more susceptible. Preventing your illness will also help to “flatten the curve,” which means slowing down the speed of new cases through dampened infection rates. This slowed rate of new cases will also protect our healthcare system from becoming overwhelmed.

**Type O blood patients have improved outcomes against COVID-19:** POSSIBLY
A new study from China of 2,173 patients has revealed that patients with blood group O experience lower risk for COVID-19 infection compared to patients with other blood types. In contrast, patients with blood type A were the most susceptible to acquiring COVID-19. The exact mechanism for this phenomenon is still under investigation by the scientific community.

**SARS-CoV-2 can remain infectious on inanimate objects:** TRUE
Several studies have shown that SARS-CoV-2 can remain infectious for extended periods of time on surfaces. The University Nebraska Medical Center (UNMC) conducted a recent study that showed the virus was prevalent on objects in and around patients’ hospital rooms, as well as within the air inside and directly outside the patients’ rooms. Additional studies are necessary to confirm that the virus material they detected is still infectious to others or a passerby.

**SARS-CoV-2 may be more infectious than originally projected:** TRUE
Original estimations of $R_0$ (or the number of people infected by each individual) was thought to be between 2.2 and 2.7. However, a new model projects that the number may be closer to 5.7. This has implications on how much immunity is necessary within the population to achieve herd immunity (i.e., community immunity). If each person infects 5.7 others, over 84% of the population would need to have naturally acquired immunity or vaccine-acquired immunity to protect the population from another outbreak. This study, along with many others, reiterates that it will be crucial that everyone be vaccinated once a vaccine is ready.

**Masks in public are only for people with preconditions or weak immune systems:** FALSE
Masks are designed to keep your saliva from encountering other people. When we talk, sneeze, cough, or even breathe, small droplets of mucus are expelled into our environment. In fact, sometimes a sneeze can reach upwards of eight yards (or 24 feet) away! The smaller the particle, the farther it travels. Don’t believe it? Check out the research by MIT Professor Lydia Bourouibia on mucosal clouds that shows videos on mucus dispersion.

Masks are an essential barrier to protect others from exposure to you, especially if you are pre-symptomatic (i.e., before disease) or asymptomatic (i.e., not showing disease). Wearing a mask expresses a courtesy to others, acknowledging that you care about their health and wellbeing. Additionally, wearing a mask protects you by limiting the number of times your hands contact your face, which could expose you to germs on your hands.

As CDC recommends, everyone should be wearing masks that adequately cover their nose and mouth in public when social distancing cannot be maintained – no exceptions.
SURVIVING COVID-19
BEST PRACTICES AND TIPS TO
PROTECT YOURSELF AND OTHERS

Wireless 5G is causing COVID-19: FALSE
Throughout Europe, conspiracy theories emerged, linking the newly installed 5G cellphone towers installed near Wuhan to the novel coronavirus outbreak. However, there are no known biological mechanisms where electromagnetic waves cause or assist in spreading infectious diseases.

To stay up to date with changing COVID-19 information and recommendations, refer to the CDC and WHO websites on the COVID-19 outbreak.

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