# COVID-19: A Brief History of a "Silent" Killer

No doubt, by now you have probably heard about the symptoms of COVID-19 which, incidentally, overlap with other respiratory illnesses like the common cold or flu. In the order of most-common-to-least-common COVID-19 symptoms, these include, though are not limited to, (1) fever (the telltale sign of systemic infection), (2) dry cough, (3) fatigue, (4) increased phlegm production (thick "snot"), (5) shortness of breath, (6) muscle pain (doctors call this *myalgia*), (7) sore throat, and (8) headache.

Some patients with COVID-19 disease also report a loss of (9) taste and smell. Interestingly, there are anecdotal reports that their loss of taste and smell can linger, long after they recover from the worst of the illness. At the time of writing this, scientists don't know why.

With COVID-19, however, what we have learned so far is that many infected individuals experience no appreciable symptoms (i.e., patients are asymptomatic). But more on this in a moment.

## SARS (2002)

If you are old enough, you might remember the SARS outbreak in 2002. SARS, by the way, stands for *Severe Acute Respiratory Syndrome*. What is meant by "acute" is sudden onset or rapid decline in health. The word "respiratory" means that the lungs are mostly affected; which, of course, affects breathing. Incidentally, the acronym for the virus that causes COVID-19 disease is SARS-CoV-2 – also a respiratory illness (though, as it is turning out, other organ systems can also be hugely affected too, like the heart, kidneys, and the brain).

The SARS outbreak in 2002 is thought to have been caused by an animal virus that readily passed to other animals which, eventually, infected humans. Once infected, host humans then infected other humans, and so on.

Animals and humans that "carry" the virus around are referred by scientists who study pandemics (i.e., epidemiologists) as *reservoirs*. Viruses like the coronavirus can't "live" without reservoirs to carry the torch as it were (which is why shelter in place is so crucial in stamping out the disease; to allow the virus to run its course and put the "torch out").

SARS likely started in a bat that infected another mammal; specifically, a *civet cat* (please see Figure 1 below). Civets, unfortunately, are considered a delicacy in Southern China. While caged in so-called "wet markets" – found in Guangdong Province of South China – infected civets passed the virus on to humans who were in close proximity. Incidentally, they are called "wet" markets because they are veritable stews of blood and guts, among other nastiness which I'll spare you!



Figure 1. Civet cat inside a "wet market."

When a disease is transferred from animals to humans, we call these types of illnesses *zoonotic* (pronounced, *"zoh-in-awe-tick"*). Rabies, Lyme disease, Salmonella, and West Nile virus are common examples of zoonotic diseases found in North America. The very first human to get infected by an animal, by the way, is often referred to as "Patient Zero."

## MERS (2012)

After SARS 2002, there was a second outbreak in 2012, called MERS. MERS stands for *Middle East Respiratory Syndrome*. Scientists think that MERS passed, again, from an infected bat to a camel; from an infected camel to a human. "Patient Zero" then went on to infect other humans.

## COVID-19

The "19" in COVID-19 refers to the year the disease was first identified (i.e., 2019). Again, COVID-19 is the disease caused by coronavirus or SARS-CoV-2. Coronavirus likely began in Wuhan, a city in China's Hubei Province (please see Figure 2 below).



Figure 2. Wuhan, China.

Similar to SARS and MERS, the origins of COVID-19 began in a wet market and the usual suspect was, not surprisingly, a bat. The type of bat believed to have caused COVID-19 is the horseshoe bat (please see Figure 3 below). Genetic analysis reveals that 95% of the coronavirus genome is

found in the horseshoe bat; which flies (pun intended) in the face of conspiracy-theory nonsense that it was cooked up (again, pun intended) in a laboratory as a biological weapon!





The jury is still out on whether the disease passed directly from the bat itself to humans or there was another mammal that served as an intermediary step – a bridge between the infectious bat and "Patient Zero." Some maintain that that mammal was a Pangolin that feasts on bats (please see Figure 4 below).



Figure 4. An endangered Pangolin (among other uses, their scales are ground up for exotic eastern medicine remedies).

For reasons that remain a mystery, bats like horseshoe bats seem to tolerate all kinds of viruses like the coronavirus reasonably well. It might be related to that fact that they are mammals that fly, which helps tune their immune response to inflammatory processes. But that's a topic for another day.

### COVID-19: A Silent "Killer"

Unfortunately, as of April 21, 2020, there have been 820,104 confirmed COVID-19 cases and, tragically, 44,228 COVID-19-related deaths. Both numbers, however, are likely an underestimation. Many people who are told to self-quarantine who report COVID-19 symptoms have not been tested due to lack of available coronavirus testing. Many people who die at home, in nursing homes, etc., have not been tested either for coronavirus (SARS-Cov-2). Because COVID-19 is now the #1 cause of death in the United States, it is therefore not an exaggeration calling it a silent "killer." Let me explain.

Unlike, SARS and MERS, COVID-19 has been "behaving" quite differently in one key respect. SARS and MERS did not seem to spread undetected, as the great majority of patients with SARS and MERS were symptomatic with moderate to severe disease. In other words, no-contact infrared sensors did a pretty good job at rooting out infected individuals because those infected ran fevers. Uninfected individuals did not.

Asymptomatic individuals did not seem to widely spread SARS and MERS. Sadly, that has not been the case with SARS-CoV-2 or the coronavirus, as we shall soon see.

An alarming scientific paper on COVID-19 recently came out in the prestigious medical journal, *New England Journal of Medicine (NEJM; published on April 13, 2020)*. Between March 22 and April 4, 2020, a total of 215 pregnant women who delivered babies at two large hospitals in New York City were screened on admission for symptoms of COVID-19. The study authors did not specify the ages of the women though, naturally, they were of reproductive age; so they were likely relatively young. During a recent interview, one of the study authors said they more or less decided to test all 215 women on a whim after several initially showed COVID-19 symptoms.

Here is the breakdown of their hospital data. Four women (1.9%) had fever or other COVID-19 symptoms on admission. All 4 tested positive for the coronavirus or SARS-CoV-2. Please see Figure 5 below.



Figure 5. 215 pregnant women tested for SARS-CoV-2 on hospital admission to a maternity ward.

13.5% or about 29 of the 215 women tested positive for coronavirus (SARS-CoV-2). Readers should note, however, that *only 1.9% or 4 women experienced symptoms and tested positive*. Said differently, over 60% of the women were reservoirs (aka carriers) of the virus though were symptom free.

Infected though asymptomatic individuals are often referred to as "super-spreaders," as they shed and spread the disease unknowingly to countless others. When they don't think they have an illness, people have a tendency to be careless when it comes to hygiene (If you don't believe me, stand outside a men's washroom and listen for the sink; you will have to wait a very, very, very long while!). Perhaps, you have heard of the tragic tale of Typhoid Mary? Her real name was Mary Mallon (please see Figure 6 below). She was an Irish immigrant. Ms. Mallon had been infected with the *Salmonella typhi* – a nasty infectious bacterium that causes typhoid fever. In 1907, about 3,000 New Yorkers had been infected with Salmonella typhi.

Ms. Mallon – a so-called super-spreader – might have been the main reason for the outbreak (aka Patient Zero). She worked as a cook for well-to-do families and unknowingly spread the bacteria as she seemed to be immune to the disease herself. Naturally, as family members fell ill with the disease, she lost her job and was then hired by other unsuspecting families, and the cycle continued.

As a side note, Ms. Mallon is believed to have spread the disease by not adequately washing her hands while preparing one dish in particular: Ice cream with raw peaches (the heat from cooking other dishes apparently kills Salmonella typhi). So, wash your hands! (or conversely, never eat ice cream with raw peaches!)



*Figure 6.* Asymptomatic "Typhoid Mary" in quarantine to protect other people (Where is an iPhone when you need one?! Seriously, that would have been awful for a healthy young woman; which makes our shelter-in-place look like a walk in the park).

The news site, *Reuters*, among other news sources recently cited another concerning report (April 16, 2020). On the coronavirus-stricken U.S. aircraft carrier, Theodore Roosevelt, the Navy tested the entire 4,800-member crew. What they found was shocking. Approximately, 60% of the over 600 sailors who tested positive with coronavirus (SARS-CoV-2) did not show the characteristic symptoms associated with COVID-19.

Presumably, most crew members were on the younger side of the age continuum. 60% or 360 sailors were, therefore, potential super-spreaders. Had they not been quarantined, they would still be shedding virus like a domestic long-haired cat or Labrador Retriever sheds fur in springtime.

60% is a larger figure than what infectious-disease expert, Dr. Anthony Fauci, initially cited during a recent White House press briefing. He estimated that super-spreaders ranged somewhere between 25% and 50% of those who test positive for coronavirus (SARS-CoV-2). Clearly, Dr. Fauci needs to revise his figures in light of these two recent reports.

Why Social Distancing, Shelter-in-Place, and Masking Are Essential

So, now what? Unlike countries like South Korea, the United States has only tested about 1% of its citizens. One percent is nowhere near the amount of universal testing necessary for folks to safely mill about in public; for the country to return to business as usual. Not even close. Moreover, due to testing shortages across the nation, only those individuals with COVID-19 symptoms are tested. What about super-spreaders, slinking about the shadows of daily existence without a care in the world?

Because no one knows for certain whether he or she is infected with coronavirus, to keep everyone safe, we must think like we all are reservoirs (aka carriers). If we all behaved like we were infected with coronavirus, we would be doing exactly what we are supposed to do to stop the virus from spreading to other people who are healthy.

We would maintain a safe distance from others (aka social distancing); We would cover our coughs (with the crook of our elbow or, preferably, use a tissue that we immediately toss in the trash); We would religiously wash our hands with soap and water for about the time it takes to sing your "A, B, Cs"; and we would frequently wipe down and sanitize surfaces where the virus can live (SARS-CoV-2 can live on some surfaces for days). We would also wear a mask around other people when out in public, even when we feel COVID-19-free. Masking, incidentally, is most effective when the infected individual is wearing the mask because it helps contain the virus (Have you seen that nasty, slowmo video of a person sneezing? Gross!!!!).

## Concluding Remarks

In conclusion, a person might be sick and not even know it – potentially shedding virus all over the place. As mentioned, reports from last week suggest that – at least in younger folks – the majority of people with coronavirus are infected without ever knowing it. Meanwhile, elders, people with pre-existing medical conditions (e.g., heart disease, diabetes, and cancer), and those individuals who are otherwise immunocompromised are falling critically ill all around them.

Now, more than ever, the country needs its citizens to put its most vulnerable first. In the land of rugged individualism, that simple request is turning out to be harder than anyone expected. Patience is not a virtue for everyone.