

Correlating COVID-19

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Abstract

I wanted to help my community decrease the spread of COVID-19. Therefore, that lead to my question, what is the most accurate number of days to self-quarantine when you test positive? With all the background information I found, I discovered the periods when the virus is most infectious. I compared that information with my databases (CDC, RIDOH, Mayo Clinic) and found that the mandatory period is 5 days, at least. I cross-referenced that data with when the databases stated the isolation period ends. Each databases gave a different answer and I managed to narrow down on an accurate number for the isolation period. To decrease the spread and number of cases, the isolation period should be 8 – 10 days. Every person is different, so the number also varies on if you have any underlying medical conditions and whether you are still showing symptoms. However, this general number gives the infected person time to recover and for the symptoms to decrease.

Introduction

My name is Natashia Anderson, and I am a freshman at Navajo Preparatory School. My question came about from the troubles of today's world. I wanted to help my community in any way I could, with my science project. The largest issue the world faces is COVID-19. With what information I learn, I wish to use it to help slow the spread of COVID-19 in my area and on the Navajo reservation.

So, I asked the question, what is the most accurate number of days to self-quarantine when you test positive? People are being informed with different numbers of days and this does not help with the spread of COVID-19 when others are misinformed. Since I cannot test this directly because of the ongoing pandemic, I decided to base my study on the statistics from different databases.

Background Research

The COVID-19 pandemic is caused by a disease called Corona Virus Disease 2019, the year this deadly disease was first discovered. A coronavirus is a group of related viruses that causes diseases in mammals or birds. This concludes that COVID-19 can and was discovered in animals. This portrays mainly towards house pets that were in contact, dogs and cats. COVID-19 is caused by the SARS-CoV-2 or otherwise known as severe acute respiratory coronavirus 2. Severe acute respiratory syndrome is extremely rare and can be treated by medical professionals. It first appeared in 2002 in China, but it was quickly contained. There are no reported signs of transmission since 2004. It has mutated and is showing up again today.

COVID-19 is transmittable from person to person. Studies show that COVID-19 is transmittable from person to animal. The two main transmissions happen when an infected person breathes out small particles that contain and/or carry the virus. These transmissions are airborne transmission and surface-contact transmission. Airborne transmission happens when another is in the immediate vicinity or rather within 6 feet, and an infected person exhales these particles. Touching surfaces that contain the virus then touching your eyes/nose/mouth is surface contact transmission. SARS-CoV-2 transmission occurs early in the course of infection. The average period of infectiousness and risk of transmission between

2-3 days before and 8 days after symptom onset. These transmissions may include symptoms whether you experience presymptomatic or asymptomatic transmission.

Your symptoms may appear 2 – 14 days after being exposed to COVID-19. The incubation period is when you've been exposed but are not experiencing symptoms. The isolation period is when you've been exposed or contacted COVID-19 and must be self-quarantined. Although those who recovered and went through the isolation period, can still detect SARS-COV-2 in their upper respiratory systems for up to 3 months after being exposed. These includes your nostrils, nasal cavity, mouth, throat and larynx. However, while the SARS-CoV-2 virus can be detected, it is unlikely that it will reproduce and replicate after the isolation period. This also includes being transmissible.

A virus is not able to produce more copies of it and survive simply by itself. When it encounters a host, it takes over the host's cell machinery and produces more copies. This is called viral replication and when these copies are produced, mistakes can make copies of a virus that are exactly similar to the "parent virus". The mistakes are called mutations or rather, variants. COVID-19 has 12 variants that are being monitored or cause major concern. These variants are Alpha, Beta, Gamma, Epsilon, Eta, Iota, Kappa, 1.617.3 (no specific name), Mu, Zeta, Delta and Omicron. The more familiar variants, Delta and Omicron, are the variants that caused the most concern. The Delta variant was first discovered in India and has increased

transmissibility and reduction in neutralization. The Omicron variant was first discovered in South America and has increased transmissibility better than the Delta variant. However due to the small number of cases with the Omicron variant, the severity of death and illness is unclear. Omicron has a shorter incubation period (2-4 days), defined as the time between becoming infected and symptom onset.

Data Analysis

The CDC (Centers for Disease Control and Prevention) states that “shorter isolation (for asymptomatic and mildly ill people) and quarantine periods of 5 days to focus on the period when a person is most infectious, followed by continued masking for an additional 5 days.”

The Mayo Clinic states, “You’ll need to self-isolate until: Your symptoms are improving, and it's been 24 hours since you've had a fever, and at least five days have passed since your symptoms first appeared. Wear a mask for five more days. If you don't have a fever and want to get tested after at least five days, you may do so. But if your test is positive, stay at home for five more days.”

The Rhode Island Department of Health states, “You must stay home (isolate) for at least 5 days. Someone with COVID-19 must isolate even if they do not have symptoms of COVID-19. Only leave isolation for medical emergencies. If you have symptoms, stay home for at least 5 days since you started having symptoms. If you do not have symptoms, stay home for at least 5 days following the day you were tested.”

All these sources state that you need to self-isolate for at least five days, regardless of your vaccination status. However, each source states a different tactic for when to end your isolation period. The CDC states that you must wear a mask

for 5 days after your self-quarantine. The Mayo Clinic suggests getting another COVID-19 test and go off the result of that test. The RIDOH says that after your 5 days, you are okay to stop quarantine.

	Vaccination status?	Isolation period?	When to stop quarantine?
CDC	Regardless	5 days	After 5 days of continued masking
Mayo Clinic	Regardless	At least 5 days	Negative COVID-19 test result
RIDOH	Regardless	5 days	After isolation period

According to these databases, the isolation period needs to be at least 5 days. Not any less. To decrease the chances of spread, we should isolate for a week or 7 days. Since SARS-Cov-19 can still be detected after you have recovered from the virus, you shouldn't wait for a negative COVID-19 test result. You must wait 3 months, in order to be able to test negative.

The period when the virus is at its highest rate of infectious is about 8 days after you experience symptoms. This is more than the standard 5-day quarantine. So, 8 – 10 days should be neutral ground. This leaves enough time for your symptoms to decrease, and it is safer for the environment around you.

Conclusion

I wanted to help the area I reside in, decrease the spread of COVID-19. Therefore, that lead to my question, what is the most accurate number of days to self-quarantine when you test positive? I found that 8-10 days would be the most accurate number of days. With this new information I can inform my community, decrease the number of cases and overall stop the spread. If we all do our part, this pandemic will end soon. The isolation period does rely on the patient and if you have any underlying medical conditions. 8 – 10 days is the most accurate number of days of quarantine for mild positive cases of COVID-19.

Future Research

I found interest in the variants of SARS-CoV-2 and their genetic make-up. In the years to come, the different variants and mutations of COVID-19 would be a possible idea to further investigate. Also, another idea I have taken a liking to, is how do scientists confirm that there is another variant and what it came into contact with? How do they know that it isn't the flu or another known disease? I want to further research the "why" in questions about the SARS-CoV-2 virus.

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