

## Really, how bad is COVID-19?

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It seems like we learn new things every day about COVID-19. This makes sense, as COVID-19 is an entirely new virus that had not been seen until December 2019. Yet, with all this new information becoming available, this leaves us with one question. How bad is COVID-19? While this question seems simple at first, the more you look into it the more complicated the question becomes. To begin to even answer this question, we should first look at how this virus spreads and how contagious the virus is. At this time, we believe the virus spreads primarily through droplets created through talking, sneezing, or coughing (1). Knowing how COVID-19 spreads, we now have to look at how contagious COVID-19 is. A general measure of how contagious a virus is is called  $R_0$ , often shortened to  $R_0$ . In general,  $R_0$  shows how many individuals will on average get sick from one person who is already sick (3). If a virus has an  $R_0$  of more than 1, it is able to spread and infect more people. If a virus has an  $R_0$  of less than 1, then this means that the virus will not be able to spread and the outbreak will slow to a halt (3). Knowing this, let's look at historical  $R_0$  values. The 2009 H1N1 (Swine Flu) outbreak had an  $R_0$  of 1.4-1.6 while measles (one of the more contagious viruses) has an  $R_0$  of between 12-18 (2,3). This means that one individual with H1N1 would on average infect 1.4-1.6 other individuals while an individual with measles will on average infect 12-18 other individuals. It is important to note, though, that  $R_0$  can be influenced by factors such as social distancing. Now knowing all of this, let us look at the  $R_0$  for COVID-19. Currently, there are two prominent estimates for the  $R_0$  value of COVID-19. The first  $R_0$  estimate is 2.5 and is from the CDC and is used by health departments like ours in disease modeling (4). The other  $R_0$  estimate is by a research team at the Los Alamos National Laboratory who looked at earlier COVID-19 outbreaks and found an  $R_0$  of

5.7 (5). Thus, while not as contagious as Measles, COVID-19 is quite a bit more contagious than the Flu. These are, however, preliminary estimates of  $R_0$  for COVID-19 and may change as more information becomes available. Currently in Darke county we have an  $R_0$  of 1.5, similar to the H1N1 outbreak of 2009. As we open our county and get back to normality, though, we can expect this  $R_0$  to increase as our current  $R_0$  represents the time in which we were under the Ohio Department of Health's Stay at Home order.

Now that we know how contagious COVID-19 is, we should now look at how deadly this virus is currently. To examine this, we must look at both Case Fatality Rate and Mortality Rate. Case Fatality Rate shows how deadly a virus is if you do become infected, while Mortality Rate shows what percent of a population has passed away from the virus (6). In Darke county, right now, we have a Case Fatality Rate of 0.110. This means that 11% of individuals who get COVID-19 in our county have passed away from it. We can compare this to the H1N1 outbreak in 2009, which had a Case Fatality Rate of 0.0002. This means that 0.02% of individuals who got H1N1 in 2009 passed away (7). Breaking this down even further, we can find that 15.3% of males who get infected with COVID-19 have passed away and 8.1% of females who get infected with COVID-19 have passed away. Breaking this down by age we find that, so far, no one under the age of 60 have passed away from COVID-19 in our county. We then find that 4.2% of those 60-69 have passed away, 18.5% of those 70-79 have passed away and 55.9% of those 80 and older have passed away. Now looking at the mortality rate of COVID-19 in our area, we can find that the mortality rate is 0.00049. So only 0.049% of the population in Darke County have passed away from COVID-19. As time goes on, though, we can expect that the Case Fatality Rate will go down in our county as more individuals test positive and recover. We can also

expect that the mortality rate will stay the same or increase as the same number or more of our county's population pass away from COVID-19.

From this, we can come to a few conclusions. With our current knowledge of COVID-19, we can find that this virus can be incredibly dangerous to those who are over the age of 60. For those under the age of 60, though, we at this time believe that the risk of passing away from COVID-19 is low (though not zero, as other counties and states have seen individuals as young as 12 passing away) (8). This certainly does not mean that it is not a danger for individuals under 60 to get sick with COVID-19. We know that children who had COVID-19 can develop a disease known as Multisystem inflammatory syndrome in children (MIS-C). MIS-C is a severe disease that can cause many organs and body parts to become inflamed and potentially damaged (13). We also know that there is a risk for those who get COVID-19 to become incredibly sick and become hospitalized. Based on data from Darke county; if you are 30-39 you have a 9.3% chance of being hospitalized, 40-49 has a 6.3% chance of being hospitalized, 50-59 has a 9.1% chance of being hospitalized, 60-69 has a 16.7% chance of being hospitalized, 70-79 has a 25.9% chance of being hospitalized, and 80+ has a 11.8% chance of being hospitalized. If you get sick from COVID-19, you also may have a risk of developing permanent lung damage (9). Finally, even if you are asymptomatic or have mild symptoms, due to how contagious COVID-19 is we know that you may give COVID-19 to someone who is at a high risk for COVID-19 complications or give it to someone who works with individuals who are at a high risk for COVID-19 complications. You are at a high risk for COVID-19 complications if you are; 65 years old or older, immunosuppressed/immunocompromised, have chronic lung or heart disease, have diabetes, have a BMI over 40, have chronic kidney disease, or have chronic liver disease (10). Please remember, though, that this is an ever-evolving situation. New things about COVID-

19 are learned every day, which is why it is important to follow the most updated guidelines provided by the CDC and ODH. But for now, please wear a mask if you can. We know that masks can reduce the spread of COVID-19 (11). Also, please stay six feet apart or more, as we also know that this can reduce the spread of COVID-19 (12). Finally, please stay at home as much as possible. By following these, you can reduce the risk of becoming sick with COVID-19 or spreading COVID-19 to others!

### Sources

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