

## **The Epidemiology of COVID-19 by Richard P. Leach, MD April 4, 2020**

Here are some critically important epidemiological thoughts to consider in the face of this terrible COVID-19 pandemic.

First, the numbers we see today of infected and dead represent infections that were acquired 3 to 5 weeks ago. It is hard to comprehend this fact unless you study how this virus works. Those weeks represent what we call the incubation phase, during which the virus is multiplying in the body, but before the symptoms of the disease develop.

Second, we must understand the concept of exponential growth of cases in this viral pandemic in a community like ours. Think of it this way: if one infectious person transmits the virus to two other people over say three days, and if each of these newly infected people transmits the virus to two other people over another three days, then exponential growth of numbers of the infected will go to a caseload in one month of 1000.

So if we are seeing say 20 cases of COVID-19 in Warren County today, it probably means that there are about 20,000 cases actually brewing in Warren County now that we will not see for another 3 to 5 weeks. One of those cases could be me, or you. That, I know, is super scary. Yet it is unfortunately the reality we are facing. It is also why each of us must understand and adhere to the developing rules of how to behave. Social distancing. Self-quarantine. Self-isolation. These can drop our risks of getting the virus.

Understanding what these rules are now, and keeping up with how they may change in short days to come, is the duty of each of us, the duty to our own healths and to the healths of our families, neighbors, friends, communities.

There are lots of places where one can learn about the rules on line. Good places to start are the websites of Warren County Public Health and the CDC. If you haven't already done so, copy and paste the addresses below into your web browsers and have a look. Or look again...and please follow the rules, I beg you.

<https://www.warrencountyny.gov/covid/>

<https://www.cdc.gov/coronavirus/2019-ncov/index.html?>

[CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2Findex.html](https://www.cdc.gov/coronavirus/2019-ncov/index.html)

On a hopeful note, it is worth pointing out that more than 98% of people sick with COVID-19 survive the infection. When they do, they probably have protective antibody. That will mean that in the future if this survivor sees this virus coming at him or her again it is not likely to cause an infection. He or she will likely be immune. At this point in our studies, we don't know for sure how protective the antibodies are or for how long they will remain protective, but research is fast and furious in this field.

It is also worth while pointing out that there clearly are many asymptomatic infections. It isn't clear what percentage of infections are asymptomatic versus symptomatic. But it may be as much as 25% versus 75%. If so, then folks in this 25% who never even knew they were sick may likewise have protective antibody levels.

In the end, it is very likely that enough people will have protective antibody in any given community to produce what we call "herd immunity," which may then result in the infection just burning out. That's what happened in the 1918 influenza pandemic, which was equally horrible then as is this COVID-19 now. We will get through this damn thing. It may take a long time, and many of us will suffer. But we will. And we will get through it better if each of us understands that we are together in this and if each of us looks out for all of us.