

by Tayo Fasuan

For years, I had often worried about the amount of microbial particles necessary to initiate an infection, called an infectious dose, and recent articles I've been seeing indicate that this might be important to our immune system fighting the SARS-COV2. An infectious dose, in more explicit terms, refers to the number of a particular microbe – bacterial, viral, protozoal or fungal – necessary to initiate an infection on entering the body after overpowering the immune system. To understand this, we have to realise all microbes exist as particles, and these particles could actually be counted. Also, the number of the particles present in an infectious sample also varies from microbes to microbes.

A good example to explain this can be found in our drinking table water, where the treatments given to this water to make it drinkable aren't usually targeted to completely eradicate the microbes that can cause infection in it. But those treatments are targeted to reducing the microbes below a threshold standard acceptable enough and known not to be enough to cause infection.

In this particular Coronavirus issue for instance, if a droplet of respiratory fluid carries the virus, how many viral particles are present there? Will the number present be able to overcome the immune system and become an infection? From the various publications circulating around, this might be very important in determining recovery from this viral infection or collapsing under its weight.

Although microbial load is usually commonly measured in bacterial samples, it has become imperative to observe viral loads these days. The reason for the difficulty in assessing viral infectious doses has to do with the fact that while bacteria do not enter a cell to cause an infection, viruses need to enter the cell, being intracellular parasite. And since the virulence also differs, and the ability to mutate as well, determining if one or more particle can cause an infection might be a bit trickier.

Once an external organism enters the body, the immune system mobilises its weapons and

attack the invading microbes. However, the presence of many numbers of the invading organism may turn the tide of war against the immune system, breaking its rank and proceeding to cause infection. The initial fight between the microbe and the immune system is highly important, and usually determine the severity of most diseases.

For COVID-19, the number of infectious dose of viral particles hasn't been determined, but there are fresh reasons as to why some people are recovering while some are breaking down under the weight of the disease. For many of those who have suffered the severe form of the illness, it has been suggested that they were exposed to a high number of the infectious particle, that is, they were infected by a high infectious dose of the Coronavirus. This exposure might be a one-off occurrence in form of a high number or a multiple/continuous exposure to the virus to the extent of having the immune system defenses crumble under the weight of attack.

This may explain why, apart from having underlying health conditions and genetic predisposition, others are having a severe form of the infection. It may also further strengthen the argument that social distancing might be an effective tool against the virus, though other sources of the virus such as fomites/inanimate objects, should be considered as well. It may sadly also be the reasons why young medical doctors and nurses at the frontiers of our fight against the virus are getting severely affected as well.

Determining the infectious dose, means of measuring it and other ways of reducing exposures to the various sources might eventually become powerful ways of subjugating this virus in our current war with it. Cheers.

To add to your knowledge about the virus, you can also read [*Three reasons COVID-19 might be difficult to control and three reasons it might be easily controlled*](#) from the same author.

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COVID-19 and the Infectious Viral Load: Another Angle to Fighting the Infection

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