

# Pathology Newsletter December 2021

The Omicron SARS-CoV-2 and its evolution

Pathology

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by Prof. Pierre M. Durand

Ten common questions raised by healthcare practitioners and the lay public

## 1. Where do we get the most up-to-date, reliable information?

This may sound like a strange question to pose, but it is surprisingly common. In this time of misinformation and circumstance where everyone has an opinion it is imperative that healthcare workers and the public obtain their information from authorities in the field. South Africa is blessed with many of these.

My advice is always to follow the information from the experts (or healthcare professional who rely on these experts). There are many experts who communicate in the academic literature, via reliable media sources and through institutions like the NICD (National Institute for Communicable Diseases), MRC (Medical Research Council) and the DoH (dept of Health). There are many people one can name, to mention just a few these are experts like Prof S. Madhi, Prof G. Gray, Prof Karim, and, of course, many others.

#### 2. Why is the question above important?

In volatile times such as these we can be assured that academics and institutionally appointed experts are motivated by our own, national interests. They are the default source of accurate and reliable information and most healthcare professional will agree.

It is wise to be suspicious of those on the fringes perpetuating their own views and agendas. One must also remember that the private sector medical industry (and here I refer to corporatized healthcare providers and suppliers of diagnostic tests, not individual healthcare practitioners) is profit driven although the socially responsible ones do also have altruistic projects. The point I wish to make is that the interests of profit driven entities do not always overlap with the public good, even in healthcare.

#### 3. What is the Omicron variant of SARS-CoV-2?

The new variant was identified as B.1.1.529 according to the recommended technical nomenclature and declared a variant of concern by the World Health Organisation. It was assigned the name Omicron. The variant was reported in South Africa but was already present in many other countries before being identified here.

## 4. How reliable are the diagnostic tests for this variant?

Most of the RT-PCR diagnostic assays used in South Africa remain suitable. There are variations in sensitivities and specificities because most of the mutations in Omicron occur in the S gene which codes for the viral 'spike' protein. So, relying on the S gene for detection of SARS-CoV-2 is problematic. But this is generally not a hindrance to detection because more than one gene is always being tested for and positive results are usually interpreted by experienced professionals. There are newer specific assays that target the Omicron variant, but whether this important for clinical management is at this stage not known.

## 5. Can the S gene in the diagnostic assays be used to differentiate Omicron from other variants?

One query that has been raised is this.



If a positive RT-PCR result reports that the S gene was not detected and the other genes (N, RdRp, or E) were detected, can we conclude that the variant being detected is Omicron. This question was raised because of the answer to question 4 above. The answer is no. Positive for RdRp / E / N and negative for S does not allow us to conclude the variant is Omicron. It may be consistent with Omicron, but as any pathologist working in this area will know not all the genes are detected consistently in every case. We would wish to see the hypothesis tested rigorously before any conclusions can be drawn.

#### 6. Will the vaccines work?

Vaccines differ in the magnitude of the neutralising antibodies induced. The extent to which vaccines are compromised in preventing infections due to Omicron will therefore also differ. This is the case for most of the variants detected. At the same time vaccines induce B and T cell responses against diverse regions on the spike protein so they are likely to prevent against severe COVID. However, it must be borne in mind that this is an evolving scenario and there are insufficient data to make categorical statements.

#### 7. What should we do differently now?

The recommended prevention methods apply more than ever. Masks, handwashing, social distancing etc. are critical. And get vaccinated if you have not already done so!

#### 8. Does Omicron cause more severe COVID?

We do not know. Data are rapidly being collated and it does seem that the variant is no more likely to cause severe COVID than other strains. But this remains to be verified.

#### 9. Is Omicron more transmissible?

The latest data and anecdotal discussions suggest this is the case, but this also awaits further investigation.

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### 10. When viruses evolve do they become more or less virulent?

Evolutionary biology is, for the most part at least, not a predictive science. So, while it is sometimes possible to predict what is more likely to happen based on an organism's life history strategy, we can seldom make any predictions with certainty.

The laws governing living systems dictate that all populations of organisms evolve because of genetic drift and selection pressures.

Sars-CoV2 populations are subjected to selection pressures like the host's immune response, vaccines and environmental constraints that affect viral transmissibility. It is no surprise, therefore, that new variants emerge, and this will almost certainly remain the case in the future.

Organisms are, however, limited in their potential to evolve because of genetic or environmental, as well as physical and chemical constraints. For example, by becoming more transmissible a virus may decrease in virulence when one component (transmissibility) is traded off against another (virulence).

However, these kinds of evolutionary medicine data are still in the very early stages and are certainly not known for all variants.

#### JDJ Pathology Laboratories

Suite LG 2, Musgrave Park, 18 Musgrave Road Durban, 4001

☎ 031 201 4647
∞ 067 826 7473
☞ 031 201 4910

☑ clientservices@jdjd.co.za
 ☑ accounts@jdjd.co.za
 ⊕ www.jdjd.co.za