

Nurses' response to the science of COVID-19 and variants

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The Special Issue, “Strengthening Resilience in Healthcare” (*Nursing & Health Sciences*, Vol. 23, Issue 3 [September 2021]), included articles on the COVID-19 response (Campo-Arias et al., 2021; Moore et al., 2021) and the interdisciplinary focus of other articles (Bonsaksen et al., 2021) provide an indication of the current research focus of the nursing and health sciences community.

Previous articles on the Wiley Online Library reveal a wealth of information about the operational responses nurses make to patient demand and also the impact this has on their health and well-being. Some articles focus on nurse reactions to situations (Thapa et al., 2021), while others argue for the expansion of nursing roles around particular illnesses (Nurmeksela et al., 2021). Despite these informative sources, I remain concerned that the point where nursing and health science intersect is not attracting adequate research attention.

The worldwide challenge of responding effectively to the COVID-19 pandemic and the mutations that are developing requires unprecedented collaborative effort between the sciences and health practitioners. I am also motivated by the online conference, “Strategies for epidemiological surveillance of emerging SARS-CoV-2 variants” (Nature Portfolio Webcasts, 2021).

Within the past 18 months, since the first reported release of the SARS-CoV-2 genome in January 2020, worldwide spread and mutations have enabled the virus to achieve heterogeneity. The rapid spread of these variants means that genomic surveillance using widespread screening systems and laboratory testing is the only feasible way of identifying variants and then classifying them into the following:

1. **VOC or Variants of Concern** – those with increased transmissibility, worse outcomes, resistance to vaccine effectiveness. Currently these are known to be in the UK, South Africa, Brazil, and India.
2. **VOI or Variants of Interest**, also called **VUI or Variants Under Investigation** – those that are increasing in prevalence (measured as being present in the blood of the population) and also with mutations in biologically important regions that lack the capacity to collect evidence on transmissibility, virulence, and immune

evasion (the virus's ability to bypass natural or vaccine-acquired immunity).

3. **VHC or Variants of High Consequence** – so far no evidence has been found of this lethal variant type but current surveillance is patchy worldwide. I get the impression that this category, if it emerges and escapes into the general population, could represent “game over” for us all.

The expert speakers in the above-mentioned online conference agreed, in broad terms, that this virus has gained an impressive ability to survive. Scientifically, the coronavirus presents a moving target for researchers because of its capacity to spread and adapt so quickly. Real-time genomic sequencing of samples is the only way known to keep up with coronavirus mutations in a way that enables counter-measures such as vaccines, diagnostic technology, and public health advice to be developed and implemented. This level and type of testing is highly skilled and expensive and many regions of the world have little or no access to this technology.

Genomic sequencing produces a lot of different combinations, and the task in the laboratory is to decide which ones are of interest or concern and which ones can be ignored. This part of the process is tricky because the virus is always changing. Quality control in laboratories is continuous and everyone involved must remain alert. The quality monitoring systems also need to be agile but rigorous. Some fail-safe procedures are in place, for instance, not relying on a single laboratory technician to do the testing on a sample and make “category of risk” decisions alone. This obvious safety step has cost implications for the number of technicians, the equipment, and time resources needed. But the cost of a mistake would be far worse. Some countries that do have the resources seem not to have grasped the urgency of screening, testing, and vaccine development and roll-out, in addition to not having clarity about essential public health measures.

A testament to the efficiency of this virus and its variants is that when a population begins to suppress the prevalence of the virus, the coronavirus becomes pressured to mutate, to change and emerge to bypass the suppressive measures being used. The importance of

constantly tracking vaccine effectiveness cannot be overstressed. So much about these virulent strains remains to be identified and verified. The only measures that the coronavirus cannot adapt to and bypass are mask-wearing, social distancing, and diligent personal hygiene.

After 18 months of pandemic experience we know enough to realize that a culture of “localism” by governments and societies that allows “other places” to remain infected, re-infecting and producing new variants, provides significant help to the virus in its bid to continue the process of becoming a VHC. Denial, ignorance, smugness, and complacency are the other great global cultural allies of this virus.

In places like New Zealand, where the virus has been eradicated/controlled there are opportunities for researchers to discover how that population has adapted so strongly. Surveillance should be continued in places where no cases are being found, and laboratories should continue running genomic sequencing on large numbers of samples to build evidence. In this way they have a chance to pick up on emerging variants in time to develop countermeasures and get them implemented within the community and points of patient contact.

For me the message is clear: This virus and its variants only need a little more time to become immune to all antivirals and vaccines, and perhaps to extend its current cross-species transmission to get into the human food chain. It can be detected in sophisticated sewerage treatment plants as a sentinel indicator of spread, but what of regions where sanitation systems are not so robust?

It is time for everyone to recognize the situation that confronts us all. Dithering and arguing about whether to get vaccinated or not, or insisting on our personal right to catch the virus and spread it, only impedes humanity's ability to compete in this race for survival. The experts say we have the knowledge, skills, equipment and surveillance systems, and the countermeasure development capability, so all we need now is a strong global culture of personal responsibility and the policy resolve to engage decisively in the strategy to neutralize this imminent threat.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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