



Medicine for Managers

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Coronavirus Variants

In 1965, two scientists, Tyrrell and Bynoe, discovered a virus which they named B814. It was isolated from the respiratory tract of an individual with cold symptoms. At about the same time, other researchers discovered a similar virus in the throats of a study group of medical students. At the end of the 1960s, Tyrrell and other virologists recognised a range of similar viruses in animals.

The human viruses and those viruses causing mouse hepatitis virus and infectious bronchitis and gastroenteritis virus of swine all had a similar appearance on electron microscopy.

The group was named Coronavirus, the use of the word 'Corona' denoting the crown-like

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appearance of the projections from the virus surface.

Further research showed that the viruses thrive in temperate climates, occur more often in winter and may contribute as much as 35% of total respiratory viral activity during epidemics. Overall, 15% of adult colds are due to infection with a coronavirus.

For many people, the 2019 outbreak of the Covid-19 virus in Wuhan in November of that year was the first time that they had heard of a coronavirus.

The outbreak was notified to the World Health Organisation at the end of December but the virus quickly spread throughout the world. In

March 2020 the WHO declared that the disease was a pandemic.

The principal concern with coronavirus is that new variants (mutations) may develop.

Mutations constantly occur. This is not surprising. In simple terms the virus divides again and again and again very quickly.

On occasion, a new virus mutation is formed if an exact copy is not produced by a division. The new variant may simply die-off if it is defective

or provides no benefit. Sometimes, however, a variant emerges which is of medical concern because it causes more severe disease, is more infectious, eludes existing treatments or vaccinations.

Overall hundreds of variants have occurred since Covid-19 was first identified but relatively few are regarded as variants of concern, which are those modified viruses which affect, diagnosis, treatment, transmissibility or severity.

A list of variants of concern was published by the United States Centre for Disease Control, the names of some of which will be recognised.

'...the huge medical machine that has developed to identify, map and manage Covid-19 and its variants will drive the nature of future vaccinations and the timing of their administration...'

The **Wuhan strain** first emerged in November 2019 and the name is now known worldwide.

Covid-19 alpha was the first well-known variant in November 2020. It caused a host of viral symptoms (fever, cough, breathlessness, muscle pains, headache, loss of taste and smell and GI symptoms). It faded away when the delta variant appeared and increased

Covid-19 beta, also identified in late 2020, initially in South Africa, was more likely to cause severe disease than alpha and deaths were also more common. It became clear that beta was less serious in vaccinated people and, like alpha, it was superseded by the delta variant.

Covid-19 lambda, also first appearing in the United States in November 2020, was more infectious and more resistant to vaccines than other strains. Like the other early variants, it was superseded by delta.

Covid-19 delta, first seen in India, appeared at the end of 2020. It became the predominant variant and still causes infections. It is more infectious than earlier variants, twice as infectious as alpha, and able to spread in vaccinated patients, though causing less severe disease in general in the vaccinated. It causes more severe disease in the unvaccinated. The three principal vaccines remain highly effective

in combating severe illness, hospitalisation and death.

Covid-19 gamma

appeared in July 2021 and, like other variants, was infectious even in

vaccinated patients. It became widespread in French Guiana and some cases occurred in the USA.

Covid-19 Omicron BA.1, appeared in late 2021. By January 2022, it was thought to account for between 90 and 95% of new infections. It is highly infectious but less severe than delta. It quickly overtook delta and the number of deaths with omicron fell.

Covid-19 Omicron BA.2, appeared in December 2021. It was called the 'stealth variant' because it was more difficult to identify on testing. It is more infectious than BA.1 but apparently not more severe, although it grows more quickly. Vaccines appear to be as effective against BA.2

as against BA.1. Denmark has been particularly impacted by this variant.

Covid-19 Omicron BA.3 and BA.4 have also been identified recently but, as yet, little information is available.

In the UK, following the success of the vaccination programme and the relatively small number of people without the appropriate protection, deaths and cases have fallen and the Government has been withdrawing restrictions on contact and travel.

However, it is unlikely that it will be eradicated and will therefore become endemic. Continued vigilance will be important with ongoing vaccination schedule compliance.

Coronavirus has parallels with the influenza viruses, and strains causing infections and incorporated into influenza vaccines change annually.

One key difference is that the Covid virus has not shown the same seasonal variation as influenza and other respiratory viruses.

Clearly, the huge medical machine that has developed to identify, map and manage Covid-19 and its variants will drive the nature of future vaccinations and the timing of their administration.

Only time will tell whether new variants emerge and whether any of them are more lethal, how effective the existing vaccines remain and when new ones are created and approved, and whether the considerable research on anti-viral drugs results in new treatments using courses of medication instead of, or as well as, prophylactic vaccination.

Certainly, the amazing work carried out by Universities and Pharmaceutical Companies in a relatively short time to achieve such effective management of the disease is truly impressive...

... in what is even now, only 2¼ years since we first heard of Wuhan.

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