Variants might not evolve to become less virulent

(Mains GS 3 : Science and Technology- Developments and their Applications and Effects in Everyday Life.)

Context:

Recently, World Health Organization technical lead on Covid-19, Dr Maria Van Kerkhove, cautioned that the pandemic is far from over and new variants will emerge and such variants could be more transmissible than the Omicron BA.2 variant.

Evading neutralising antibodies:

- The only way the next variant can become even more transmissible than the Omicron variant is by exhibiting a far higher ability to evade neutralising antibodies.
- This would mean that full vaccinations (two doses) will be even less effective in preventing breakthrough infections.
- But so far, fully vaccinated people have been found to be less likely to suffer from severe disease requiring hospitalisation and even death because of the T cells and B cells that come into play to reduce the severity of the disease.

Natural evolution process :

- According to experts, while the next variant has to necessarily be more infectious than the Omicron variant, whether the variant will be more or less severe cannot be said with certainty.

- But it is important to remember that right from the very early stage of the pandemic, it became clear that transmission or virus spread begins even before symptoms can show up.
- That is what makes SARS-CoV-2 very different from the 2002 SARS virus and MERS virus as transmission begins even before symptoms set in and well before the disease becomes severe, the transmission characteristic is decoupled from disease.
- As a result, the natural evolution process selects variants not based on how they cause disease but how they can escape neutralising antibodies.

Higher immune escape:

- The virus was novel and none in the world had any immunity in the beginning of the pandemic but with millions being infected by the virus and millions being fully vaccinated, and some with a combination of natural infection and vaccination, the next variant has to necessarily exhibit higher immune escape to cause infection.
- Even though the Omicron variant caused a large number of infections in virus-naïve people and in those who have been previously infected and vaccinated, at the population level, disease severity has been far less severe compared with the Delta variant.
- The studies that tried to document the intrinsic disease severity of the Omicron variant compared it with the Delta variant found that the Omicron variant is about 75% as likely to cause severe disease or death as the delta variant.

Excel at multiplying:

- Viruses don’t inevitably evolve toward being less virulent; evolution simply selects those that excel at multiplying.
- In the case of COVID-19, in which the vast majority of transmission occurs before disease becomes severe, reduced severity may not be directly selected for at all.
- Indeed, previous SARS-CoV-2 variants with enhanced transmissibility (e.g., Alpha and Delta) appear to have greater intrinsic severity than their immediate ancestors or the previously dominant variant.

Conclusion:

- Just like how transmission is decoupled from disease severity for the SARS-CoV-2 virus, it is also true that the new variants have not evolved from the existing ones.
- Thus it is clearly reflecting that none of the main variants evolved from each other instead, so far they are all distinct, becoming gradually fitter via subvariants until replaced by an entirely new variant.