Claims were made of the virus being manufactured in laboratories and then shipped to nations to let loose on their populations. Conspiracy theories competed with each other like racy Hollywood plots at the box office. In a paper published on March 17, Nature Medicine busted the theory of a lab-cultured SARS-CoV-2. The paper, The proximal origin of SARS-CoV-2, by Kristian G. Andersen, Andrew Rambaut, W. Ian Lipkin et al, made it clear that this was a case of zoonoses.

Why Nature Medicine claims Sars-CoV-2 is a naturally evolved virus rather than being manufactured in a lab?

- While agreeing that it was theoretically possible that SARS-CoV-2 acquired mutations in a petri dish, the Nature paper added that “the finding of SARS-CoV-like coronaviruses from pangolins with nearly identical RBDs, however, provides a much stronger and more parsimonious explanation of how SARS-CoV-2 acquired these via recombination or mutation.
- It also posited the possibility of a “progenitor of SARS-CoV-2 that jumped into humans, acquiring the genomic features through adaptation during undetected human-to-human transmission”.
- The changes in the genome occurred as a part of the natural evolutionary process.
- All SARS-CoV-2 genomes sequenced so far have the genomic features described and are thus derived from a common ancestor that had them too.

According to the United Nations Environment Programme (UNEP), 60% of all infectious diseases in humans are zoonotic, and about 75% of all emerging infectious diseases are zoonotic in nature. Emerging pathogens are more likely to be viruses, than any other kind — bacteria, parasites, fungi — and are more likely to have a broad host range.

Why are zoonotic diseases prevalent?

- The inevitable interaction between humans and livestock with wildlife exposes the human species to the risk of spillover of potential pathogens.
- For many zoonotic diseases or zoonoses, **livestock serve as an epidemiological bridge** between wildlife and human infections. Among zoonoses that emerged or re-emerged recently, the UNEP counts Ebola, bird flu, Middle East Respiratory Syndrome (MERS), Rift Valley fever, severe acute respiratory syndrome (SARS), West Nile virus, Zika virus disease, and COVID-19.
- The UNEP is also very clear that the drivers of zoonotic disease emergence are changes in the environment, usually as a result of human activities ranging from land use change; changes in animals or human hosts; and changes in pathogens, which are programmed to survive, and in the process exploit multiple hosts.
- For instance, bat-associated viruses emerged due to the loss of habitats, it argues. The Ebola outbreak in West Africa was reportedly the result of forest losses leading to closer contacts between wildlife and human settlements; the emergence of avian influenza was linked to intensive poultry farming; and the Nipah virus was linked to the intensification of pig farming and fruit production in Malaysia.
- Changes in weather patterns, and extreme weather events affect the distribution areas of
disease, pathogens and pests. Also, changes in human behaviour, including travel, conflicts, migration, wildlife trade, urbanisation, and dietary and medical preferences, can result in disease emergence, according to researchers at the UNEP.

Why to preserve the ecosystem?

- A presentation by the UNEP argues, “Ecosystem integrity underlines human health and development. Human-induced environmental changes modify wildlife population structure and reduce biodiversity, resulting in new environmental conditions that favour particular hosts, vectors, and/or pathogens.” Consequently, preserving ecosystem integrity can actually help regulate diseases by supporting a diversity of species so that it is more difficult for one pathogen to spill over, amplify or dominate.
- Never before have so many opportunities existed for pathogens to pass from wild and domestic animals to people. Our continued erosion of wild spaces has brought us uncomfortably close to animals and plants that harbour diseases that can jump to humans.

What about the plant kingdom?

- It is not just animal-to-human transmission we need to worry about. Peter Beetham writes in the Scientific American that we must be wary of transmission from the plant kingdom as well — “The current COVID-19 pandemic underscores how unprepared we humans are in fighting zoonotic diseases: pathogens that originate in wildlife and jump to humans. Human immune systems are equally unprepared for drug-resistant diseases that jump from plants to humans.

Is ‘One Health’ the solution for this pandemic?

According to the World Health Organisation, ‘One Health’ is an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

The areas of work in which a ‘One Health’ approach is particularly relevant include food safety, the control of zoonoses, and combating antibiotic resistance (when bacteria change after being exposed to antibiotics and become more difficult to treat).

The concept helps practitioners understand disease determinants, manage risks and optimise interventions.

Climate scientists argue and epidemiologists agree that ‘One Health’ is a key principle for the control of zoonotic diseases, antimicrobial resistance, food safety and vector-borne diseases.

Way ahead:

The UNEP calls for strong global stewardship of nature and bio-diversity. Additionally, developing sharper, reliable early warning systems (for diseases), and a ‘One Health’ approach may be the guides for the road ahead.