

# FAQs

## The Indian SARS-CoV-2 Consortium on Genomics (INSACOG)

### Q What is the context ?

A The Indian SARS-CoV-2 Consortium on Genomics (INSACOG) has sequenced about 1,00,000 samples.

### Q What is INSACOG?

A

- INSACOG is a consortium of 10 labs and 18 satellite labs across India tasked with scanning COVID samples from patients and finding the variants that has led to spike in transmission.
- The institutes involved include the laboratories of the Department of Biotechnology, Council of Scientific and Industrial Research, Indian Council of Medical Research, and the Health Ministry.
- Its work began in January 2020, by sequencing all samples with a history of travel from the U.K. and a proportion of positive samples in the community.

### Q What are the tasks of INSACOG ?

A

- The NCDC is tasked with coordinating collections of samples from the States as well as correlating disease with certain mutations.
- It is mainly involved in genomic sequencing which is done by isolating the genetic material of the coronavirus samples.
- It is also tasked with tracking certain combinations of mutations that become more widespread in India.

### Q What has it found so far?

A

- The INSACOG sequenced about 1,00,000 samples as of early December 2021 when this data was last made publicly available.
- The bulk of its effort has been focussed on identifying international 'variants of concern' (VoC) that are marked out by the WHO as being particularly infectious or pathogenic.

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- International travellers who arrive in India and test positive are the ones whose samples usually get sent to INSACOG for determining the genomic variant.

## Q Why is genome sequencing useful?

A

- **Understanding mutations:** The purpose of genome sequencing is to understand the role of certain mutations in increasing the virus's infectivity.
- **Immune response:** Some mutations have also been linked to immune escape, or the virus's ability to evade antibodies, and this has consequences for vaccines.
- **Effectiveness of vaccines:** Labs across the world, including many in India, have been studying if the vaccines developed so far are effective against such mutant strains of the virus.
- **Evolution of viruses:** Studies such as this have shown that Omicron, for instance, has evolved to evade antibodies much better than the Alpha or Delta variant. This prompted the push towards booster doses.

## Q How is it done?

A

- Genomic sequencing is done by isolating the genetic material (RNA) of the coronavirus samples.
- RNA consists of millions of nucleotide bases and genomic sequencing is about identifying and comparing the sequence in a given sample to a reference sample.
- Changes in the sequence are clues to mutations that show that the virus may have undergone distinct changes at some key locations.
- There are several approaches to genome sequencing whole genome sequencing, next-generation sequencing that have different advantages.
- It has now evolved to a stage where large sequencers can process even thousands of samples simultaneously.

## Q What are various challenges that INSACOG faces ?

A

- **Geographical variations:** Given that COVID-19 is spreading, mutating and showing geographical variations, the original aim of the group was to sequence at least 5% of COVID-19 samples.
- **Shortage of funds:** But only 1% has been achieved yet, primarily due to a shortage of funds, insufficient reagents and tools necessary to rapidly scale up.

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- **Red-tapism:** The INSACOG, in spite of being peopled by expert scientists, is ultimately within the Central government's communication structure.
- **Infrastructure lacunae:** Not all INSACOG labs have the same quality of equipment and manpower and therefore a surge or spike in some cities can mean difficulties in processing.

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