

Comparing COVID-19 Variants

Student assessment—*Answer key*

The Word Bank below contains some of the scientific vocabulary you encountered in the Comparing COVID-19 Variants lesson. Use these words, when appropriate, to give the best scientific answers you can to questions 1-3. You will only need some of these terms.

Word Bank			
Asymptomatic	Genetic information	Mutation	Variant
Basic reproduction number (R_0)	Genome	Neutral mutation	Variant of concern
Beneficial mutation	Harmful mutation	Replication	Variant of interest
Epidemic	Infection	Sequence	Virulence
Fitness	Infectious period	Transmission/transmissibility	Virus
	Latent period		

Scenario

Public health officials are tracking COVID-19 infections in a community. They take virus samples at random from infected individuals and compare the genomic sequence of the samples to the original COVID-19 virus. A new lab tech has just completed comparing the latest batch of sequences and says to a more experienced lab tech, “Oh no, we’re in trouble! The virus has mutated!” The experienced lab tech responds in a calm voice, “Relax, it’s probably no big deal.”

Questions

The questions on the next page are based on the scenario above. Give detailed answers to each question using the correct scientific terms from the word bank, where appropriate.

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Student assessment — *Answer key*

1. Why are public health officials sequencing COVID-19 virus samples and comparing them to the original?

Public health officials are interested in knowing if and how the COVID-19 virus is mutating. They are looking to see if the sequence gives them any clues as to whether the virus is accumulating any mutations that would increase the virus's transmissibility or virulence as both would have public health consequences.

2. Explain why the experienced lab tech thinks the mutation is “probably no big deal.”

Mutations happen at a set frequency during replication, so it is normal for viruses to accumulate mutations over time. From a public health perspective, only mutations which increase transmissibility or virulence are of concern, and the experienced lab technician knows that most mutations are either neutral or harmful to the virus.

3. Do you need any other information to decide if this is a variant of concern? If so, what information?

More information would allow scientists to determine if this is a variant of concern. Specifically, scientists would like to know if:

- *The mutations change genes known to play a role in transmission or virulence*
- *The mutations are not neutral or harmful to the virus*
- *There is data showing that this strain has increased fitness. For example, 1) an increasing percentage of infected individuals are infected with this variant as opposed to another variant, 2) this variant has a higher R_0 , and/or 3) this variant is more virulent, and the infected individuals are having more disease symptoms or worse disease outcomes.*