COVID-19 Variants

Genetics Service Learning Project

General information about ourselves

- Danielle - I am a senior biochemistry major. I also am a captain on the ODU women's lacrosse team. I am from outside of Philadelphia.
- Shania - I'm a Biology major with a minor in Poli Sci. I graduate May 2022 and I'm from Fort Lauderdale FL, Im also a twin.
- Diamond- I am a pre-med biology major. I'm originally from NJ, but have lived in Richmond, VA and Norfolk, VA for several years. I plan on becoming a physician after completion of my undergraduate courses.
- Minh-Thy - Senior biology major
- Kerolos - I am a pre-med biology major
- Bishoy - I am a sophomore biomedical sciences major
- Thia - I am a junior majoring in biology, and I plan to go to graduate school for public health.

What is covid-19? General information about

SARS-CoV-2

SARS= Severe acute respiratory syndrome

CoV= coronaviruses

SARS-COV-1

- The SARS COV-1 virus originated in China and spread to much of the world. China, along with Canada and Singapore, suffered the most infections and deaths.
- Unlike SARS COV-2, this virus did not spread very easily. Severe symptoms typically showed within two days making it easier to identify and isolate those who were affected before they could get others sick.
- The outbreak was resolved through the use of masks and temperature scanners in public spaces. Strict quarantine measures were also implemented until the virus finally disappeared in 2003.

Sars-Cov-1 (symptoms)

-SARS-CoV-1 is the virus that causes severe acute respiratory sickness.

-The virus causes a severe disease that begins with systemic symptoms such as muscle discomfort, headache, and fever.

-SARS patients may develop a dry cough after 2 to 7 days. The majority of people will acquire pneumonia.

-About 10-20% of the patients have diarrhea.

-A decrease in the amount of lymphocytes circulating in the blood is another common finding in SARS patients.

Sars-Cov-1 (long terms)

-Covid-19 Symptoms can last for months at a time. The virus has the potential to harm the lungs, heart, and brain, increasing the risk of long-term health issues.

-Post-COVID-19 conditions are a term used to describe these health problems.

-The following are some of the most common long-term indications and symptoms:

-fatigued

-SOB

-Chest pain

-Sleep problems

SARS-COV-2 (KEY DEFINITIONS)

- **Genetic mutations-** viruses like these are constantly evolving which cause changes in the genetic code to occur during replication of the genome
- **Lineage-** a group of closely related viruses with a common ancestor (for example: SARS-COV-2 has many lineages that all cause COVID-19)
- **Variant -** viral genome (genetic code) that may contain one or more mutations

SARS-COV-2 (BISHOY)

- Since the commencement of the COVID-19 pandemic, genetic lineages of SARS-CoV-2 have emerged and circulated over the globe.
- Epidemiological research, virus genetic sequence-based tracking, and laboratory tests are frequently conducted to track SARS-CoV-2 genetic lineages.
- The SARS-CoV-2 Interagency Group (SIG) of the US government has introduced an additional class of SARS-CoV-2 variations known as Variants Being Monitored.

SARS-COV-2

Four classes of variants:

i)Variant being monitored (vbm)

-> alpha, beta, gamma, epsilon, eta, iota, kappa, mu, zeta

ii) Variant of interest (voi)

iii)Variant of concern (voc)

-> delta

iv)Variant of high consequence (vohc)

-> no variants of high consequence in the US at this time

-> sub lineages associated with alpha, delta and gamma could become an issue

How the Virus Mutates Diamond

Key terms:

- **Mutation**:is a change in gene sequence. (Neither of which is good or bad)
- **RNA**:Ribonucleic Acid, its function is to carry out instructions within the cell.

How the virus Mutates (Viruses in a Nutshell) Diamond

- Viruses replicate through entering its RNA into the cells of its host, therefore when host cells replicate they also process and copy the RNA from the virus thus producing more infected cells.
- The RNA in viruses carry its genetic material much like DNA in normal cells.
- This genetic material is constantly altered.

How the virus mutates (Mutations and their affects) Diamond

- ➔ Mutations occur on two scales:
    - Small changes with little to no affect how the body’s immune system responds is known as drift.
    - Larger more significant changes usually to the structure of the virus is known as shift.
- ➔ Globally scientists have been tackling many variants of the virus.
    - Variants being monitored

How does the vaccine work?

Key terms to understand

- **Macrophages**: white blood cells that swallow and digest germs and dead/dying cells; they leave behind parts of invading germs (antigens)
- **B-lymphocytes**: are defensive white blood cells that produce antibodies which attack pieces of the virus left behind by the macrophages
- **T-lymphocytes**: a type of defensive white blood cell that attack infected cells in the body

How does the vaccine work? (cont.)

- There are different types of vaccines but each has the same result
  - The body is left with a supply of “memory” T-lymphocytes and B-lymphocytes that will remember the virus in the future.
  - Production of T-lymphocytes and B-lymphocytes typically takes a few weeks after vaccination.
- Symptoms after vaccination: fever, chills, headache, etc.
  - These symptoms are normal and are signs that the body is building immunity.
- Hybrid immunity: occurs in those who have contracted the virus and later received the vaccine

Ways to prevent/ avoid covid-19

- Wear a mask to protect yourself and others and stop the spread of COVID-19.
- Stay at least 6 feet (about 2 arm lengths) from others who don’t live with you.
- Avoid crowds and poorly ventilated spaces. The more people you are in contact with, the more likely you are to be exposed to COVID-19.
- Get a COVID-19 vaccine when it’s available to you.
- Clean your hands often, either with soap and water for 20 seconds or a hand sanitizer that contains at least 60% alcohol.
- Avoid close contact with people who are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean frequently touched objects and surfaces daily. If someone is sick or has tested positive for COVID-19, disinfect frequently touched surfaces.
- Monitor your health daily.

Kahoot GAME

- https://create.kahoot.it/details/0e09e11b-a0c2-441e-ada2-87caca70f984

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