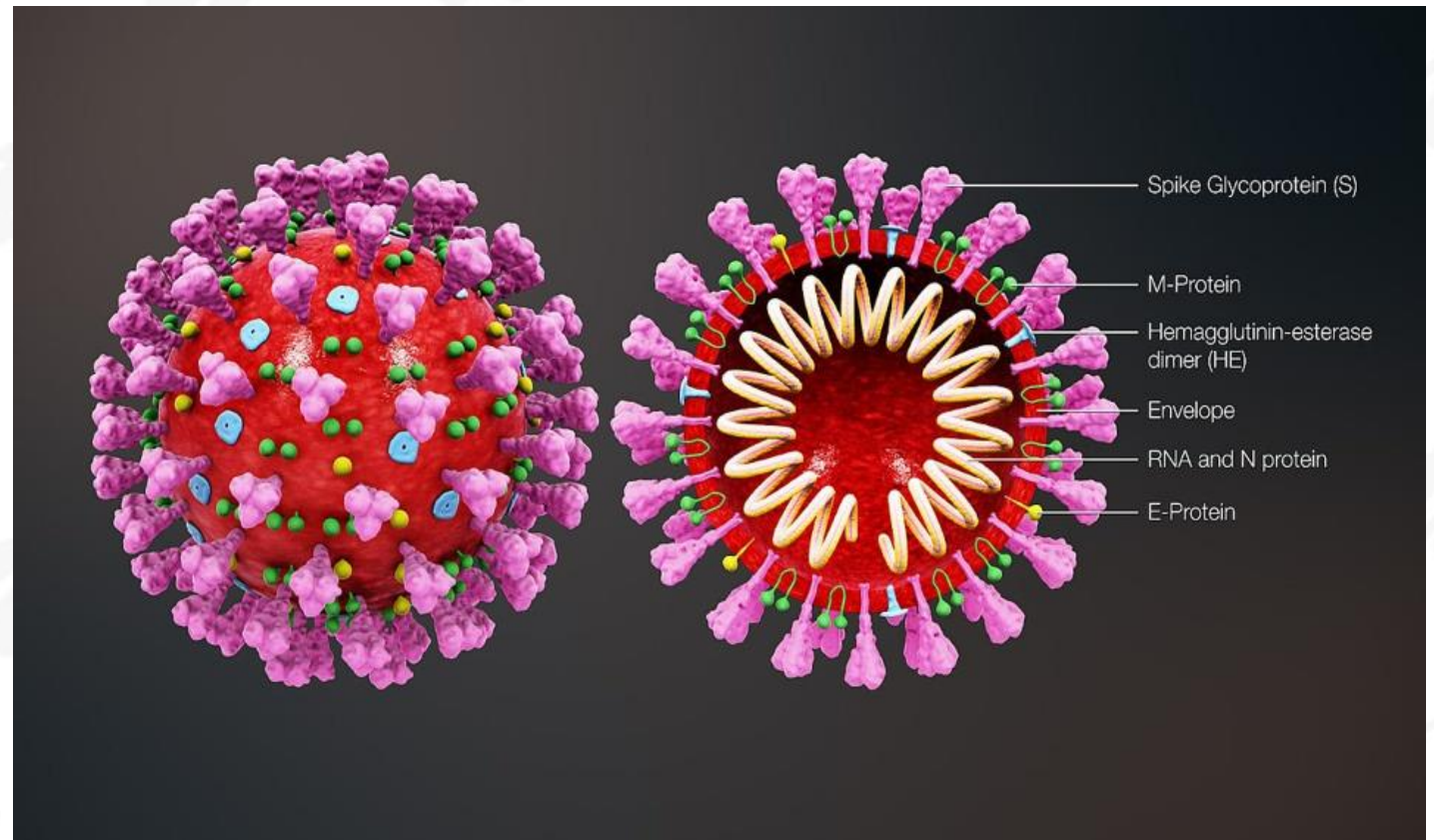


Improving health literacy for better public and patient involvement in mitigating COVID-19 pandemic using interactive and intuitive educational tools

Dr. Alessandra Medolla
Dr Vatri Marco

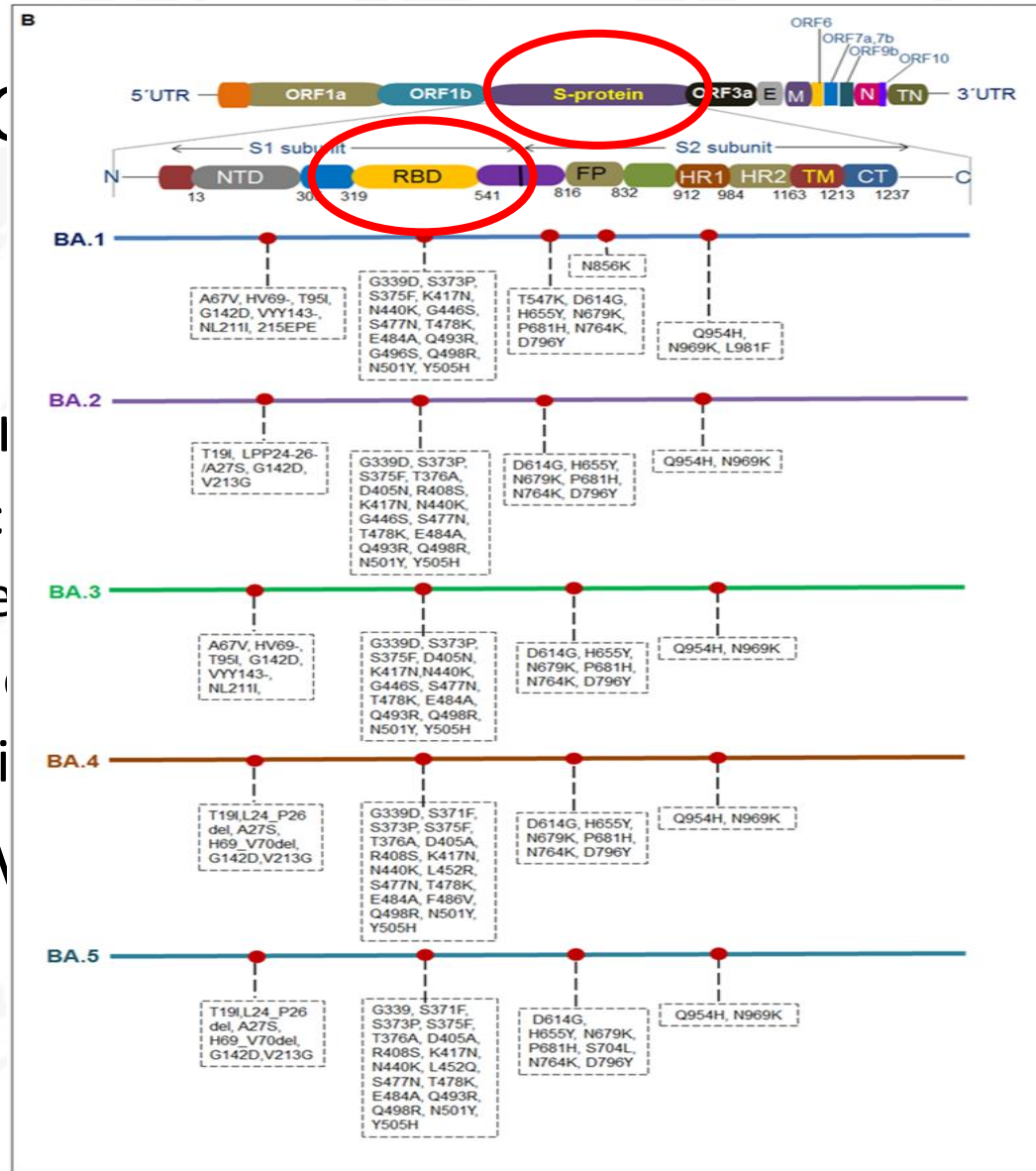
The virus life

- Replication
- Cellular mechanisms are necessary
- Avoid immune system
- Avoid therapies



Mutational

- Surviving
- Genome I
- Infect c
- Provide
- Immun
- Therapi
- SARS- CoV
virus



ities:

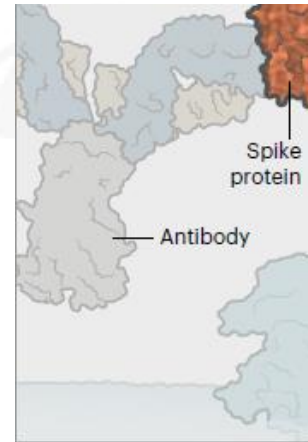
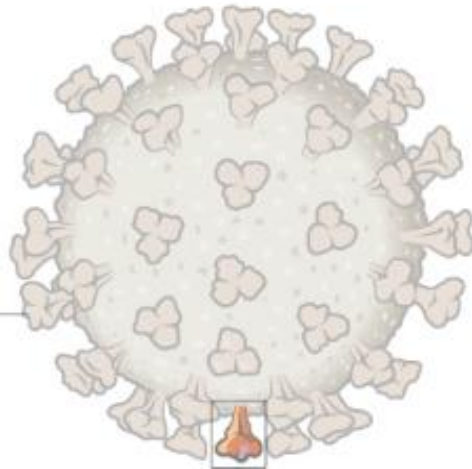
comparison with other

The target of the antibodies is a domain of S-protein : Receptor binding protein

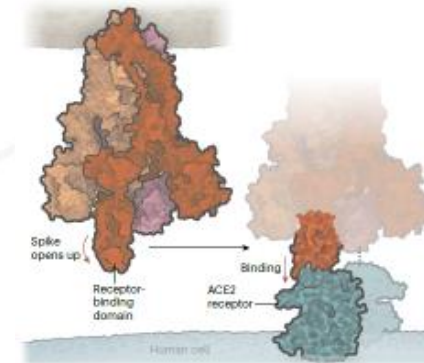
THE KEY CORONAVIRUS PROTEINS

Researchers are racing to visualize and understand the proteins used by SARS-CoV-2 to enter cells and replicate. That information could be crucial for making drugs and vaccines to stop the virus.

The virus shell is covered in spikes each made of three identical proteins. At the end of each spike is a small binding region that locks onto human cells.



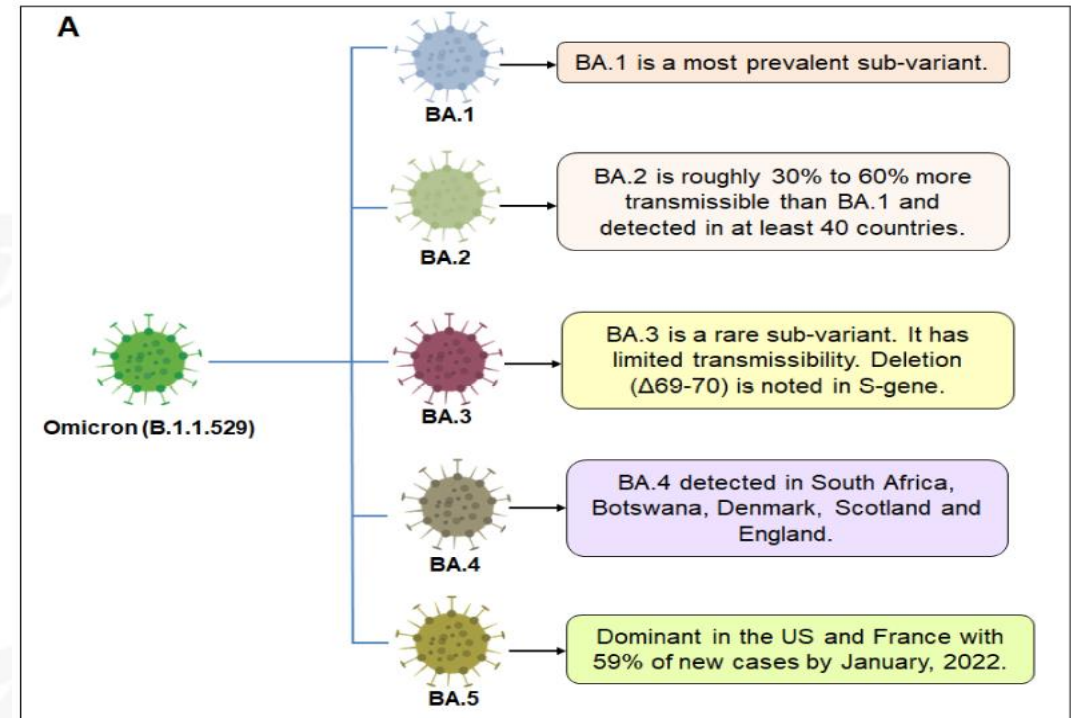
Immunogenicity:
Stimulate immune system
The antibodies bind the S-protein



The S-protein bind the ACE2 receptor making possible the penetration of the virus

Which relation between mutations and vaccines?

- The Spike protein is immunogenic
- The mutations of SARS-CoV-2 priorly regards the S-protein
- The immune escape is a direct effect of the mutation
- High rate of re-infections



Omicron is a Variant of Concern (VOC)

The most alarming insight is the ability of these variants to escape the immune system and decrease the neutralization efficiency of vaccines.

Its transmissibility is higher than the other variants (high affinity for ACE receptors)

The disease is rarely severe

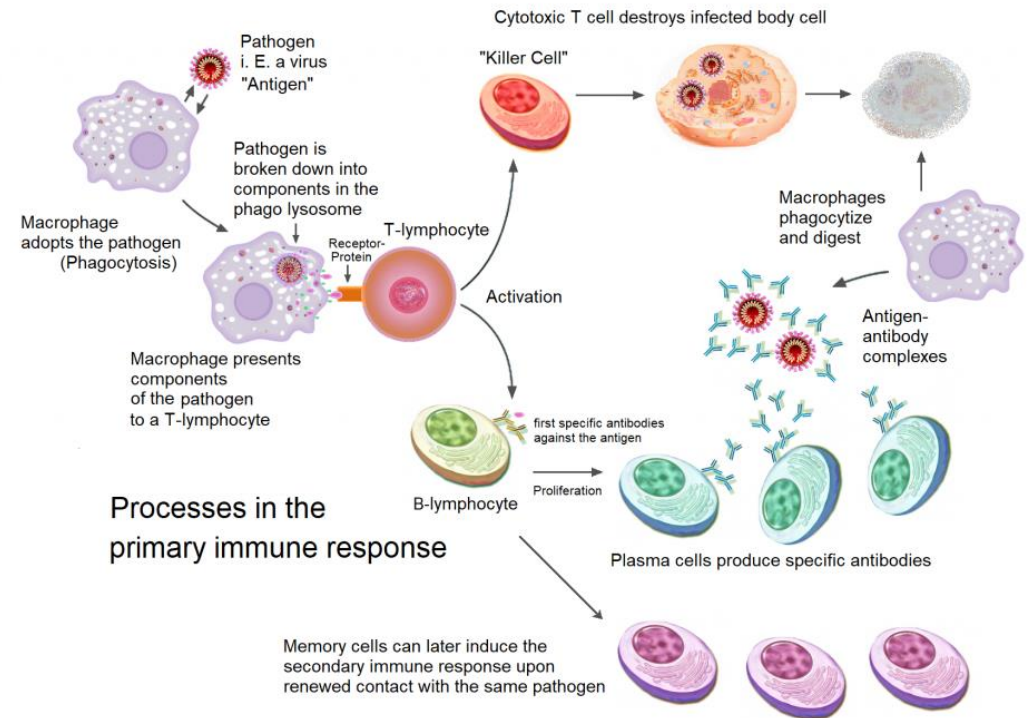
The vaccines are able to provide a protection from a severe disease

How do the vaccines work?

When a pathogen or part of it penetrates a human organism it causes a cascade of events due to the activation of the immune system.

The immune system creates a memory of the pathogen.

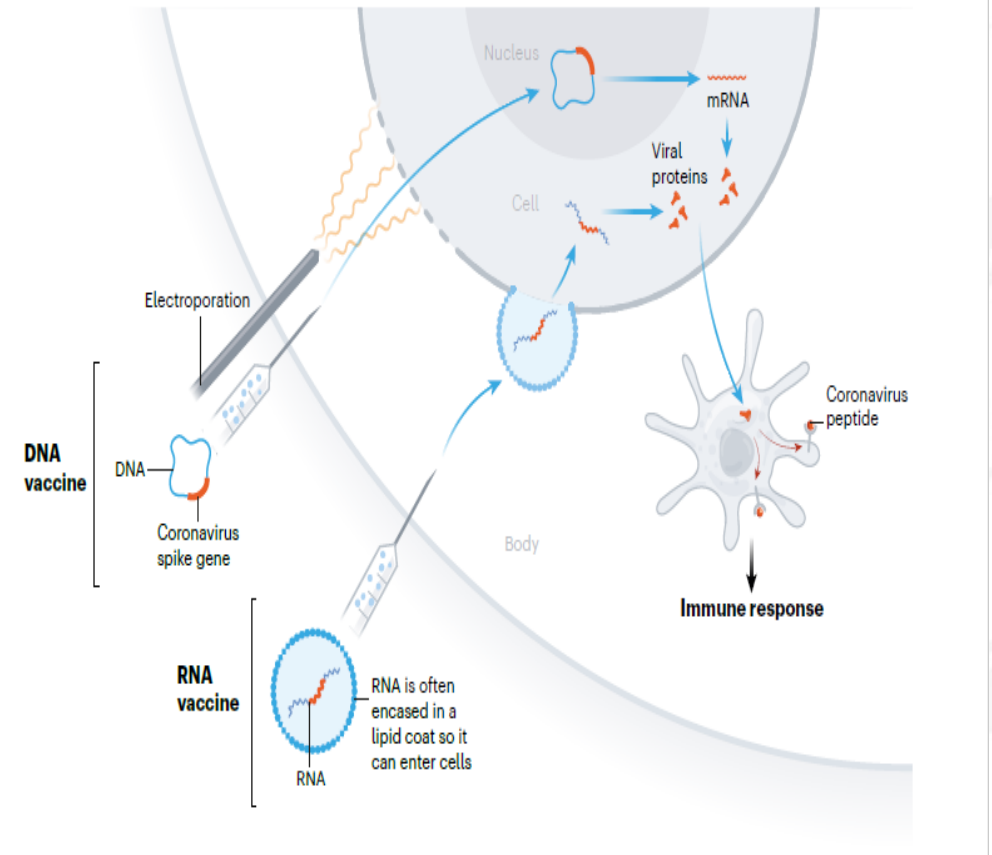
In case of re-infection the immune system will recognize and will provide to eliminate the pathogen in different ways.



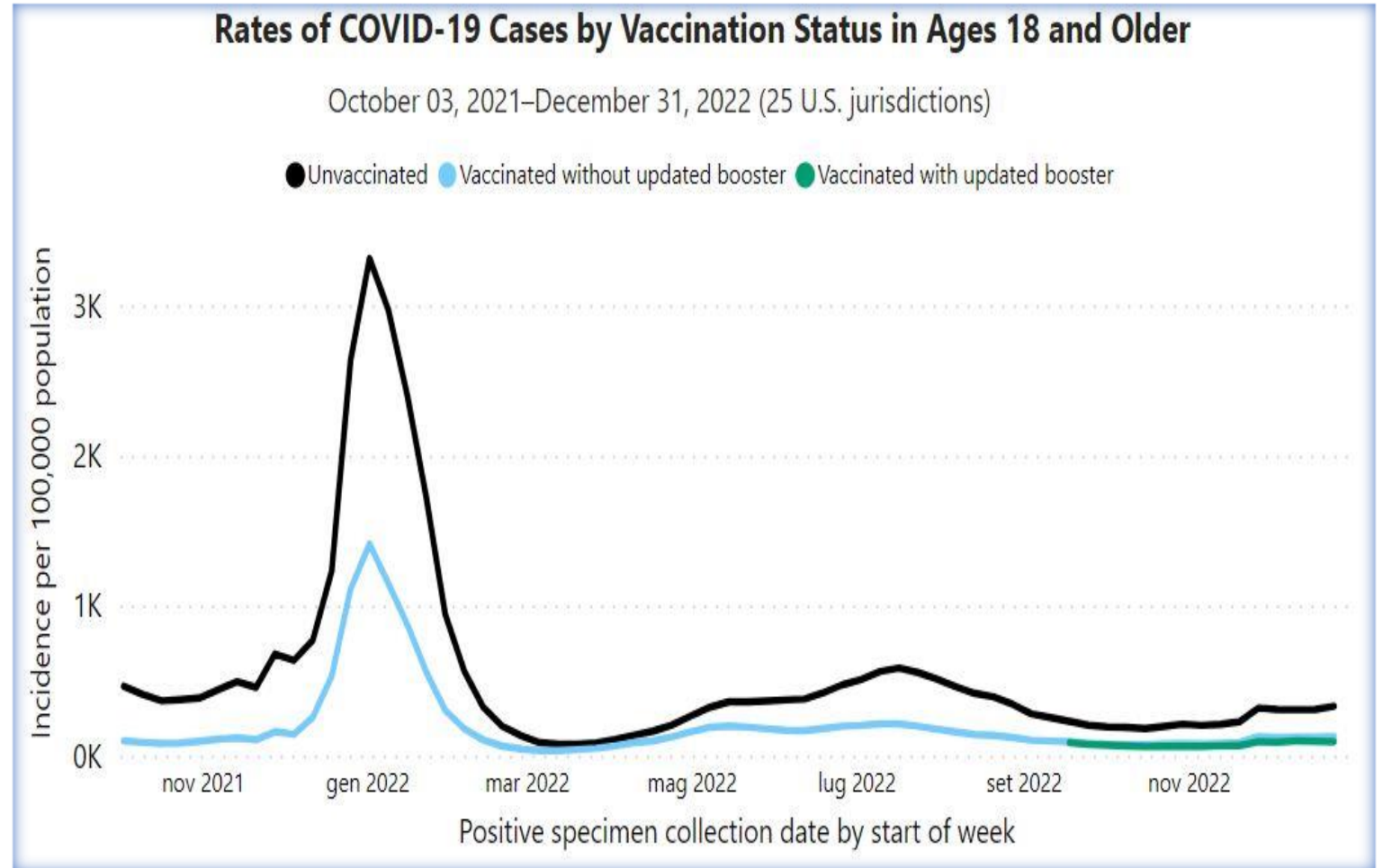
How do the vaccines work?

DNA and RNA vaccines

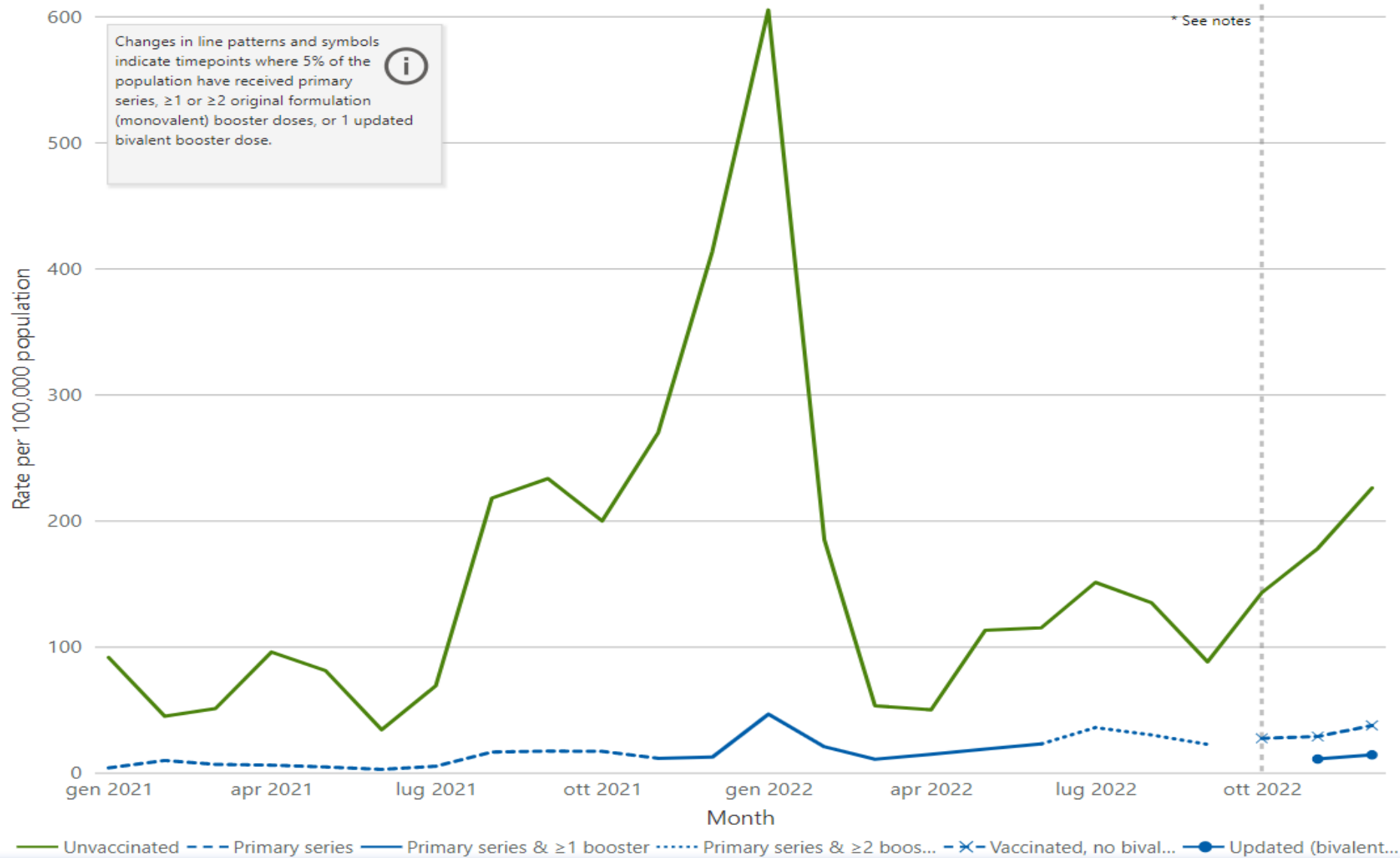
- *The strains of DNA or mRNA use the natural cellular mechanism to produce the S-protein*
- *DNA-vaccine use a viral vector that bring the S-protein strain in the cellular nucleus*
- *mRNA-vaccine does not penetrate the nucleus*
- *As a result, human cells produce the **spike protein** that stimulates an immune response*



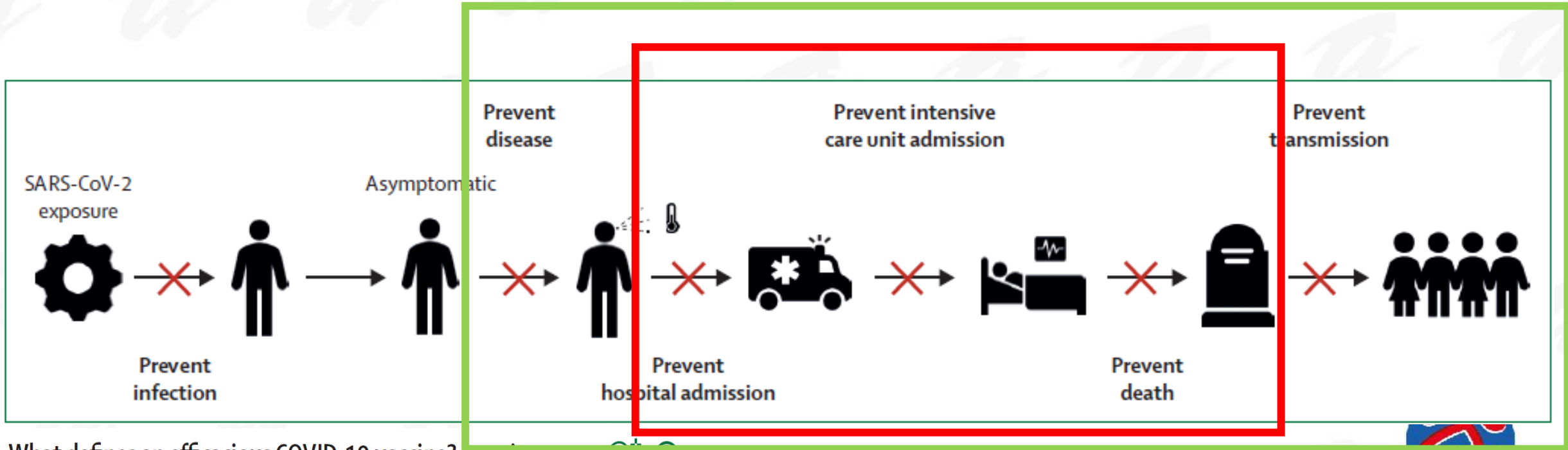
What should
we expect
from the anti-
COVID-19
vaccine?



Monthly Age-Adjusted Rates of COVID-19-Associated Hospitalization by Vaccination Status in Patients Ages ≥ 18 Years gennaio 2021 - dicembre 2022



Expectations about vaccines

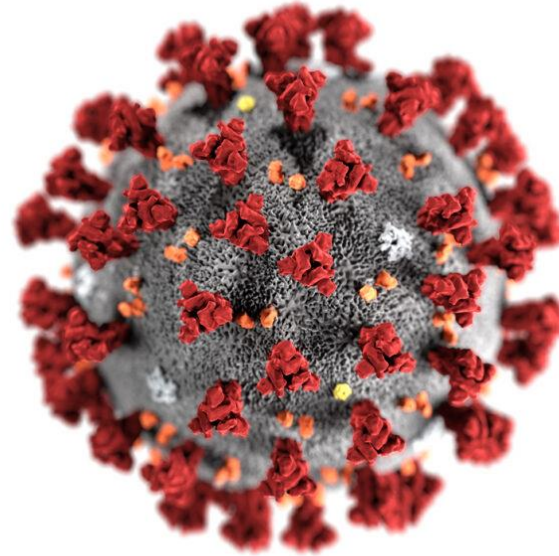


What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2



What should we not expect?

- ~~The vaccine causes COVID-19.~~



- It is impossible to contract COVID-19 from taking the vaccine. Neither vaccine contains any live virus.
- Those who get vaccinated may experience temporary side effects, such as discomfort and swelling at the injection site, muscle or joint aches, mild fever, tiredness and headache—which are signs that it's working!

What should we not expect?

- ~~COVID-19 vaccines alter your DNA.~~



- these vaccines work outside of our cells' nucleus (where our DNA is kept) and teach the cells how to make a protein that triggers an immune response. Your cells break down and get rid of the mRNA soon after they have finished using the instructions.

What should we not expect?

~~• Covid vaccines cause autism~~



- This claim stems from a discredited and retracted study that linked the measles, mumps and rubella (MMR) vaccine to autism. Unfortunately, this flawed study has kicked off a resilient storm of misinformation.
- Hundreds of studies across the globe have shown time and time again that there is no connection, but a 2016 national study revealed 16.5% of parents or primary caregivers of autistic children believed vaccines caused their child's autism.

What should we not expect?

- ~~Covid vaccines can erase sars cov 2 infection~~

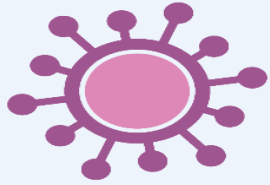


- But even the existence of a highly effective vaccine is no guarantee that we will be able to eliminate or eradicate the virus.
- The likely scenario in the context of an effective global vaccination programme is that the virus would become an endemic virus with a low level of threat.

USE OF ANTIBIOTICS IN SARS-COV-2 INFECTION: WHEN IS IT APPROPRIATE?



NEVER

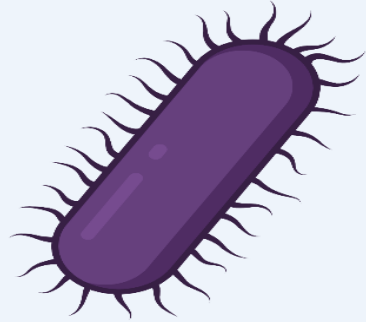


Virus

replicates only inside the living cells of an organism

Influenza – Sars-cov-2
HIV – Herpes

ANTIVIRAL

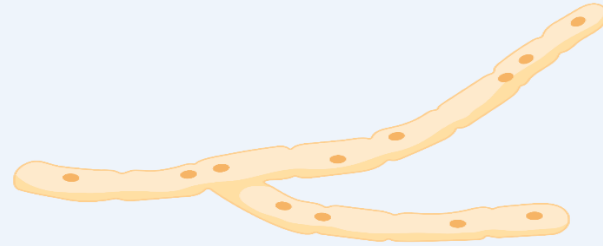


Bacteria

mostly free-living organisms

Stafilococcus – Streptococcus
Clostridium – Salmonella

ANTIBIOTIC

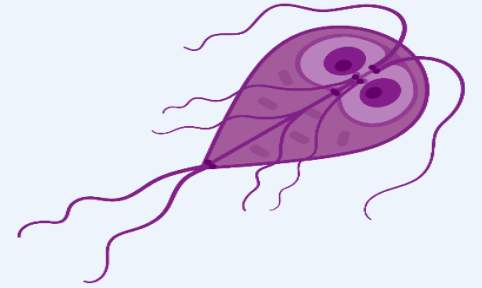


Fungus

group of eukaryotic organisms that includes microorganisms such as yeasts and molds

Candida – Aspergillus

ANTIMICOTIC



Parasite

organism that has sustained contact with another organism to the detriment of the host organism

Giardia – Malaria – Tenia

ANTIPARASITIC

...EXEPT WHEN WE SUSPECT A SUPERINFECTION

Factors associated with COVID-19

- Respiratory distress after 5-7 days of influenza-like illness
- Loss of sense of smell/taste
- Lymphopenia present
- Neutrophilia absent
- Non-lobar bilateral CXR infiltrates

Factors associated with bacterial infection

- Lobar pneumonia on CXR
- Increased sputum volume/purulence
- Rapidly unwell after a few days
- Neutrophilia present
- History of COPD/bronchiectasis

The type of antibiotic depends on several factors as age, comorbidities, hospitalization, etc. And is a medical decision

SOME DATA

In one meta-analysis, which was conducted at the beginning of the COVID-19 pandemic, bacterial co-infection was identified in 3.5% of patients and secondary bacterial infection in 14.3% of patients.

In a comprehensive review of data from post-mortem studies bacterial lung super-infection was uncommon as the cause of death

The widespread overuse of antibiotics observed among COVID-19 patients during the pandemic **runs the risk of increasing antimicrobial resistance** in both inpatient and outpatient settings.

- **A Detailed Overview of SARS-CoV-2 Omicron: Its Sub-Variants, Mutations and Pathophysiology, Clinical Characteristics, Immunological Landscape, Immune Escape, and Therapies Srijan Chatterjee 1,†, Manojit Bhattacharya**
- **Morbidity and mortality weekly report (CDC)**
- **What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2**
- **Characteristics of SARS-CoV-2 patients dying in Italy .Report based on available data on January 10th, 2022- ISS**