

# DIET AND COVID-19

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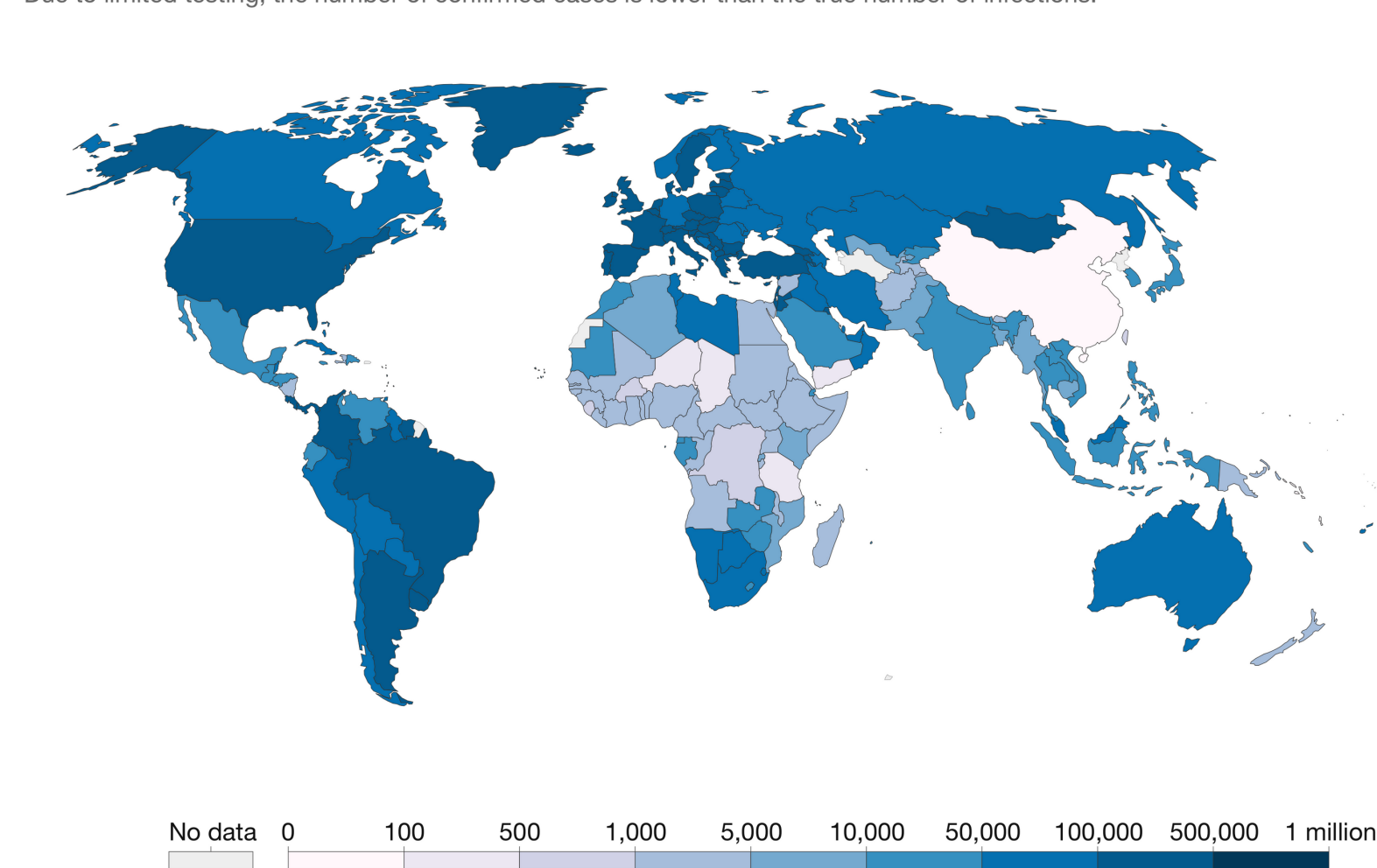
February 2022

## OBJECTIVES

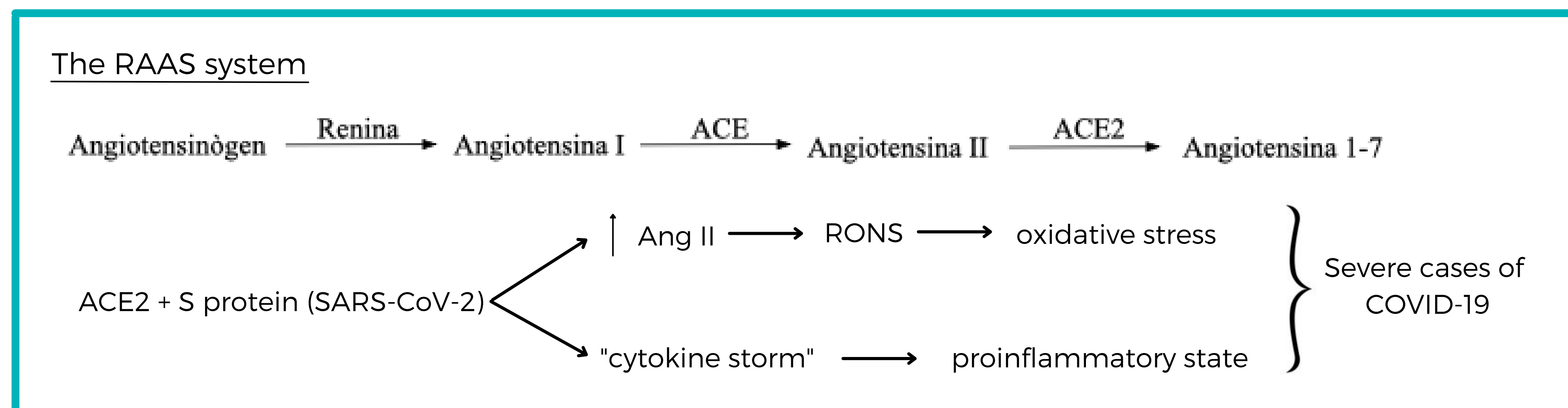
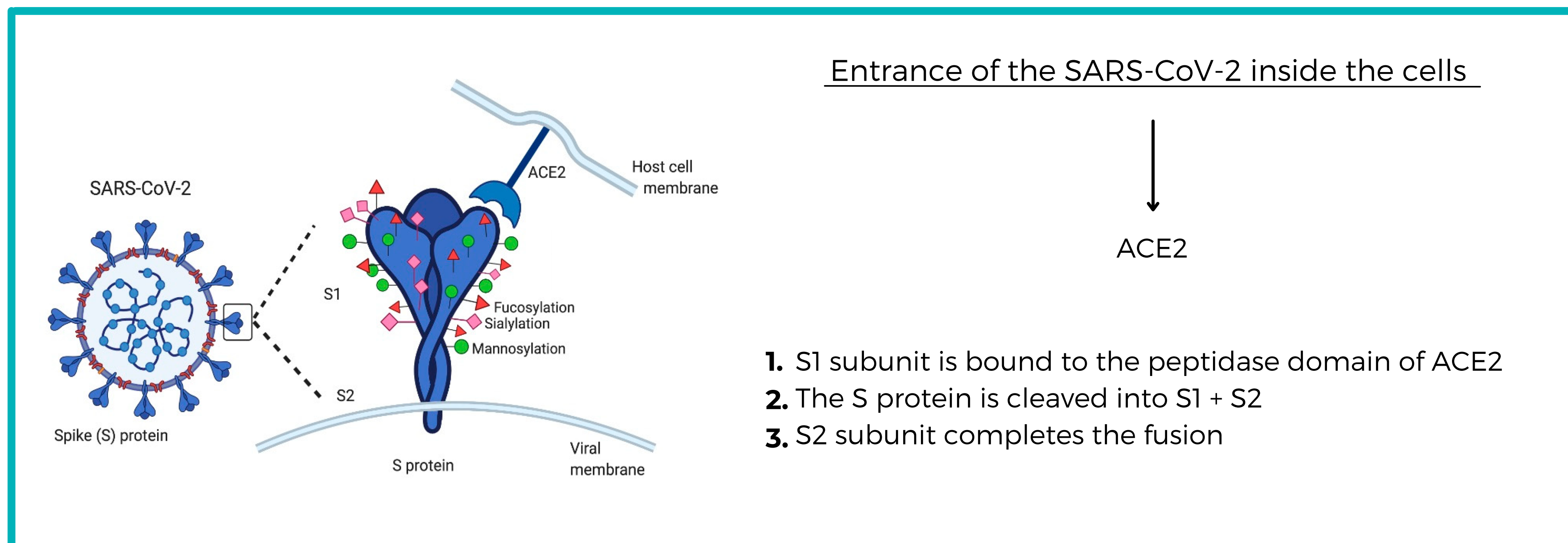
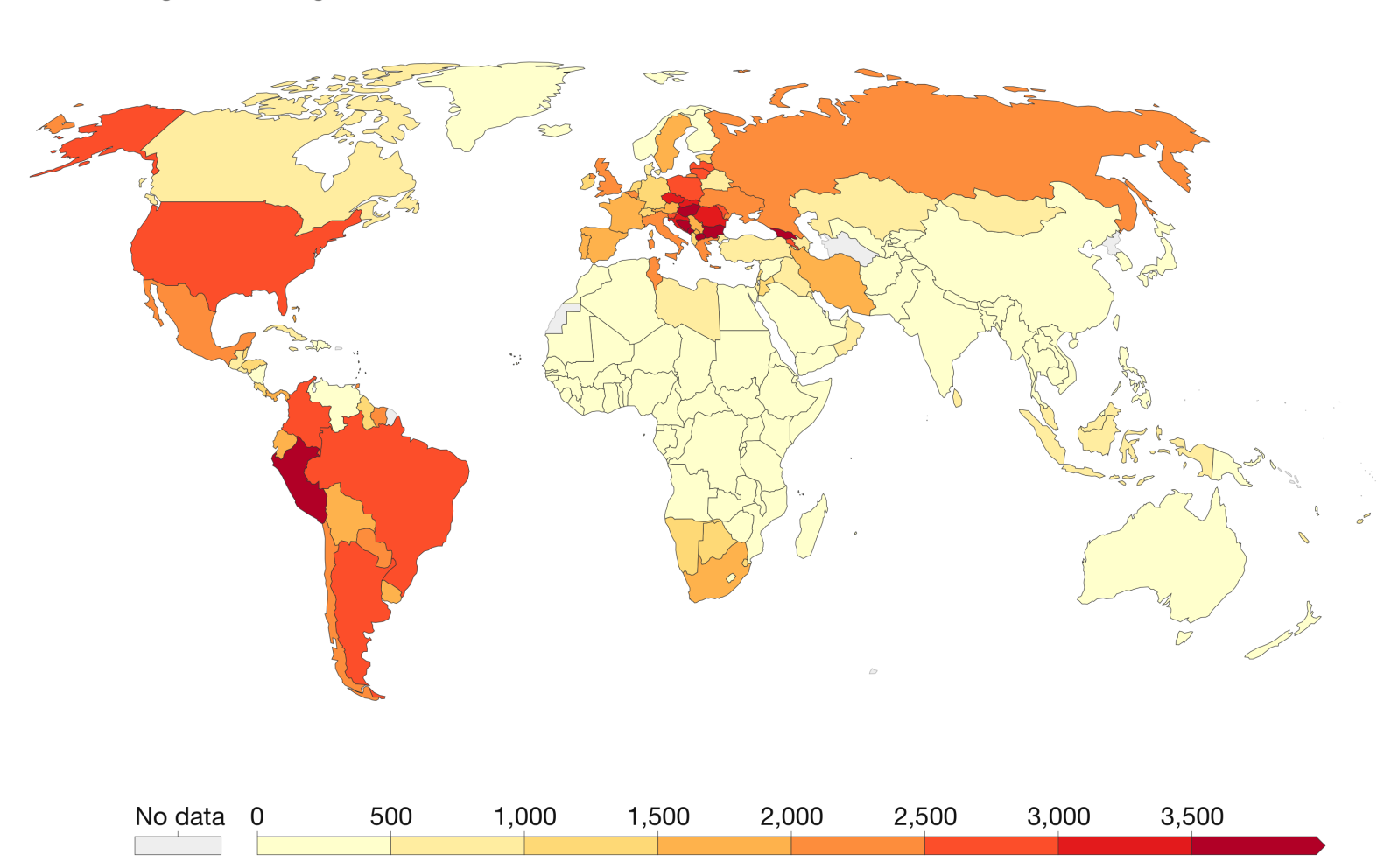
- To understand the mechanism followed by the SARS-CoV-2 virus to infect the cells
- Analyze the influence that nutrition has on the severity of the COVID-19
- Research about the influence that bad nutrition-related pathologies such as obesity have in COVID-19 cases
- Investigate in the existence of food or dietary components with beneficial properties that decrease the probability to suffer severe cases of the disease

## WHAT IS COVID-19

Cumulative confirmed COVID-19 cases per million people, Jan 12, 2022



Cumulative confirmed COVID-19 deaths per million people, Jan 12, 2022



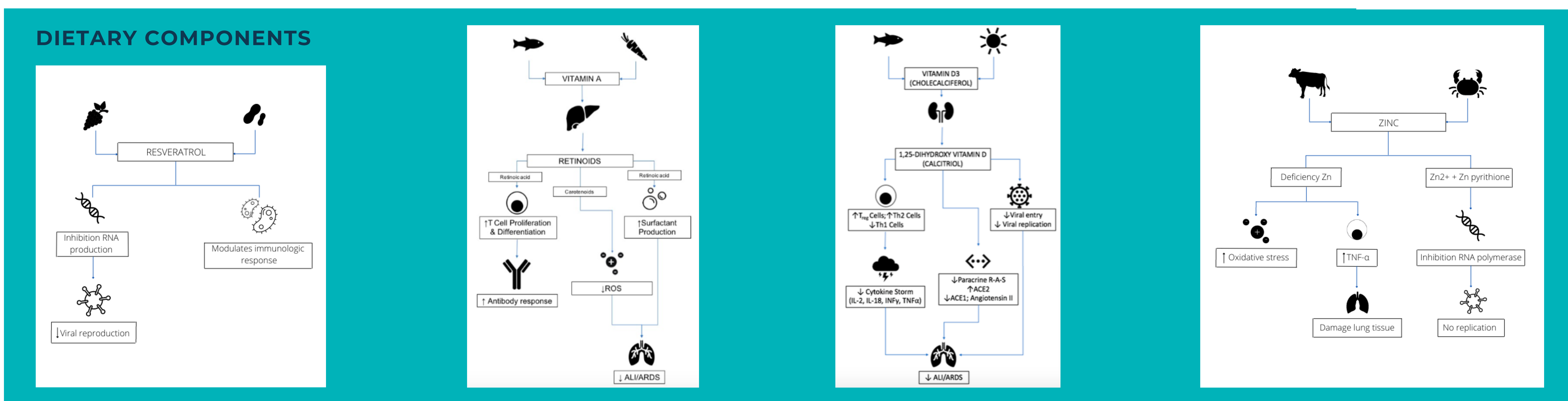
## INFLUENCE OF THE DIET IN COVID-19

### Obesity

- Chronic inflammation state
- Increase in the production of cytokines ("cytokine storm")
  - Decrease in the macrophage activity
  - Disrupt innate and adaptative immune responses
  - Respiratory symptoms

### Type II diabetes

- Chronic inflammation state
- Increase in the production of cytokines ("cytokine storm")
  - Higher neutrophil-to-lymphocyte ratio
  - Increased inflammation-related biomarkers
  - Production of RONS



## CONCLUSIONS

- ✓ COVID-19 is a disease caused by the SARS-CoV-2 virus which was declared a pandemic for the WHO. The expansion around the globe has been in a heterogenous way presenting differences between countries. Since COVID-19 is a multifactorial disease to explain its incidence you have to take into account several factors such as nutrition.
- ✓ The SARS-CoV-2 virus is capable to overcome the first line of defense and infect the cells so they can replicate. Thanks to the ACE2 receptors found in the cell surface of different tissues but especially in the pulmonary one, the virus membrane is fusion with the cell membrane. On account of the affinity between the virus and the ACE2, the angiotensin II can not be transformed into angiotensin 1-7 which increases the RONS production, and by consequence, it induces an oxidative stress state. With this situation, the immune system reacts to spreading proinflammatory substances that lead to a disequilibrium of the system called "cytokine storm". A generalized inflammatory state is related to severe cases of COVID-19. Some pathologies might increase the possibility to have severe stages of the COVID-19 such as obesity or diabetes. Patients with this type of illness have a chronic inflammatory state so also with a disequibrated immune system.
- ✓ Once the mechanism has been studied, some compounds which can be obtained from the diet have been suggested to improve the immune system or interact in some pathways of the SARS-CoV-2 infection. Most of them present antioxidant properties since it reduces oxidative stress, principally, vitamin A and D or resveratrol. Also, zinc can reduce the oxidant species, and it can regenerate the pulmonary tissue.
- ✓ Even though these properties seem to improve the severe stages of the COVID-19 it can not be declared that the consumption of these substances is a solution to fight the disease.