



Natural immunity Vs vaccineinduced immunity

- Natural immunity is acquired from exposure to the disease organism through infection with the actual pathogen.
- Vaccine-induced immunity is acquired through the introduction of a killed or weakened/inactivated form of the disease organism through vaccination.
- Vaccines contribute to active immunity by providing us with a controlled way of creating an immune response.
- A vaccine may also confer passive immunity by providing antibodies or lymphocytes already made by an animal or human donor. E.g. from mother to child

Types of immunity

- Innate immunity: Everyone is born with innate (or natural) immunity, a type of general protection. ...
- Adaptive immunity: Adaptive (or active) immunity develops throughout our lives. ...
- Passive immunity: Passive immunity is "borrowed" from another source and it lasts for a short time.
 - Passive immunity can occur naturally, such as when an infant receives a mother's antibodies through the placenta or breast milk, or
 - Artificially, such as when a person receives antibodies in the form of an injection (gamma globulin injection).

Immunity and immunization

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The immune system or lymphatic system is made up of: lymph nodes (also called lymph glands) -- which trap microbes. lymph vessels -- tubes that carry lymph, the colourless fluid that bathes your body's tissues and contains infection-fighting white blood cells. white blood cells (lymphocytes).

The immune system is an extremely important defense mechanism that can identify an invading organism and destroy it. Immunization prevents disease by enabling the body to more rapidly respond to attack and enhancing the immune response to a particular organism.

Immunity to COVID-19



British Society for

www.immunology.org

Immunity to COVID-19



Natural infection with SARS-CoV-2



Vaccination

What it means for you

- May become **very unwell** with COVID-19.
- Potential to develop long-term complications (long COVID).
- Can spread virus to others.

- Significantly reduces chance of developing COVID-19 & how unwell you become.
- Induces an immune response in a safe & controlled way.
- Reduces chance of spreading virus to others.
- Vaccine cannot give you COVID-19.

Immune response



• Varies hugely between people. Many factors impact on immune response effectiveness e.g. age. Some people do not have a detectable long-term immune response.

 May be linked with disease severity; people who experience more severe illness are more likely to have a stronger long-term immune response.



- Varies but most (even older people) produce a strong immune response.
- May produce a more robust immune response.
- Immunity to the virus from natural infection is boosted after vaccination.

Herd immunity and COVID-19

- 'Herd immunity', also known as 'population immunity', is the indirect protection from an infectious disease that happens when a population is immune either through vaccination or immunity developed through previous infection.
- WHO supports achieving 'herd immunity' through vaccination, not by allowing a disease to spread through any segment of the population, as this would result in unnecessary cases and deaths.
- Herd immunity against COVID-19 should be achieved by protecting people through vaccination, not by exposing them to the pathogen that causes the disease

Rapid COVID-19 Vaccine Development

► WHO emergency

Pandemic preparedness/technology

 SARS-CoV-2 is a member of the coronavirus family with more than one hundred types

- Research on coronaviruses has lasted for more than 50 years.
- The SARS, or severe acute respiratory syndrome, epidemic in 2002
- □ The MERS, or Middle East respiratory syndrome, in 2012.
- Existing data on the structure, genome, and life cycle of this type of virus.

CONCLUSION

- Vaccines train our immune systems to produce neutralizing antibodies (IgG, IgA...), just as would happen when we are exposed to a disease but – crucially – vaccines work without making us sick.
- Vaccinated people are protected from getting the disease in question and passing on the pathogen, breaking any chains of transmission.