

Immunization and the Science of Immunity

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Presentation Overview

- • Introduction to Immunization and Vaccination
- • How Immunization Works
- • Innate vs Adaptive Immunity
- • Active vs Passive Immunity
- • Natural vs Artificial Pathways

Introduction to Immunization

- Process of making a person immune via vaccines.
- Goal: Stimulate immune system for future protection.
- Vaccination = act; Immunization = result.

A Brief History of Success

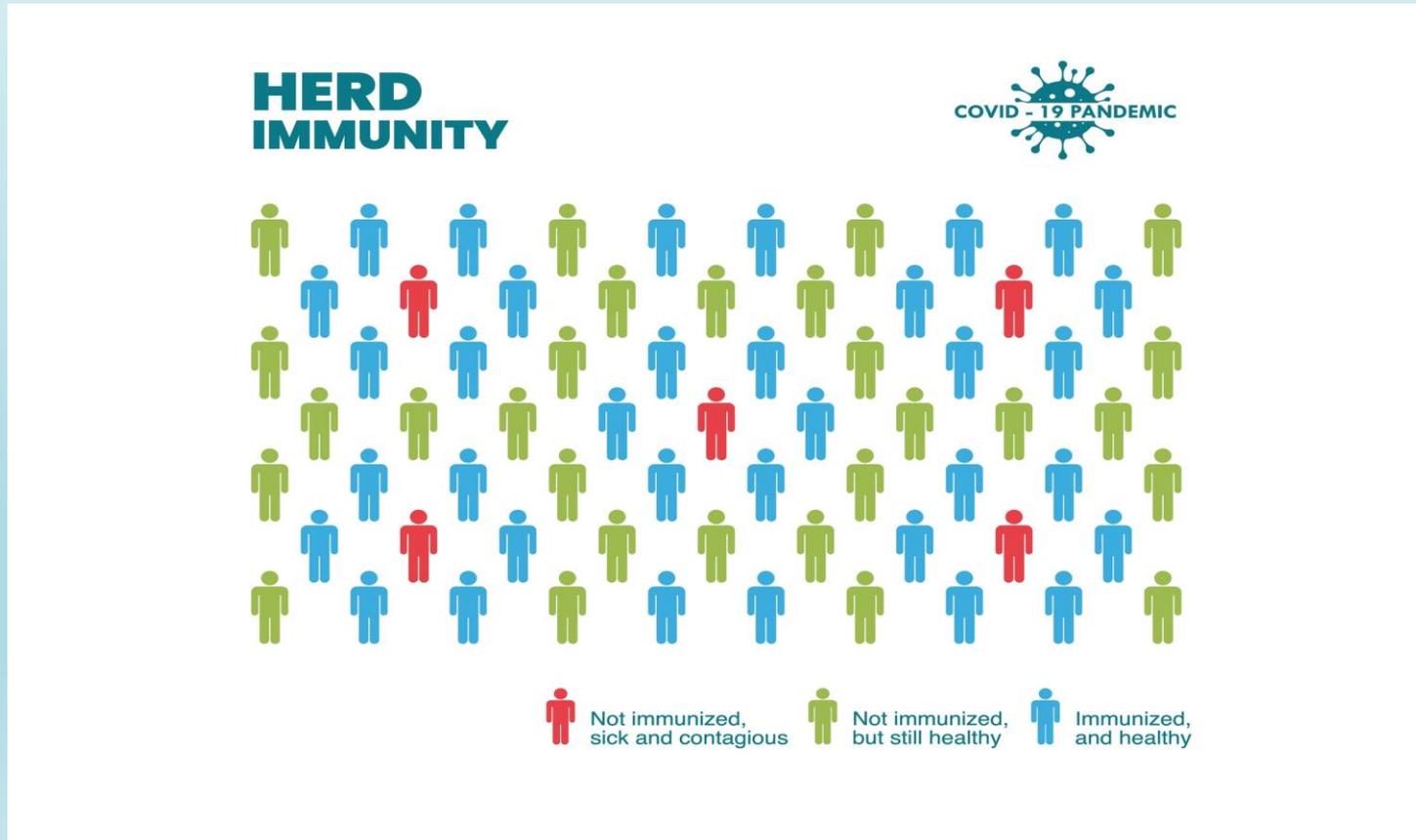
- Edward Jenner (1796) – Smallpox vaccine
- Eradication of Smallpox
- Near-eradication of Polio
- Reduction in MMR diseases

How Immunization Works

- Antigen introduced
- Immune response produces antibodies
- Immune memory protects against future infection

Herd Immunity

- Community-wide protection
- Protects vulnerable populations

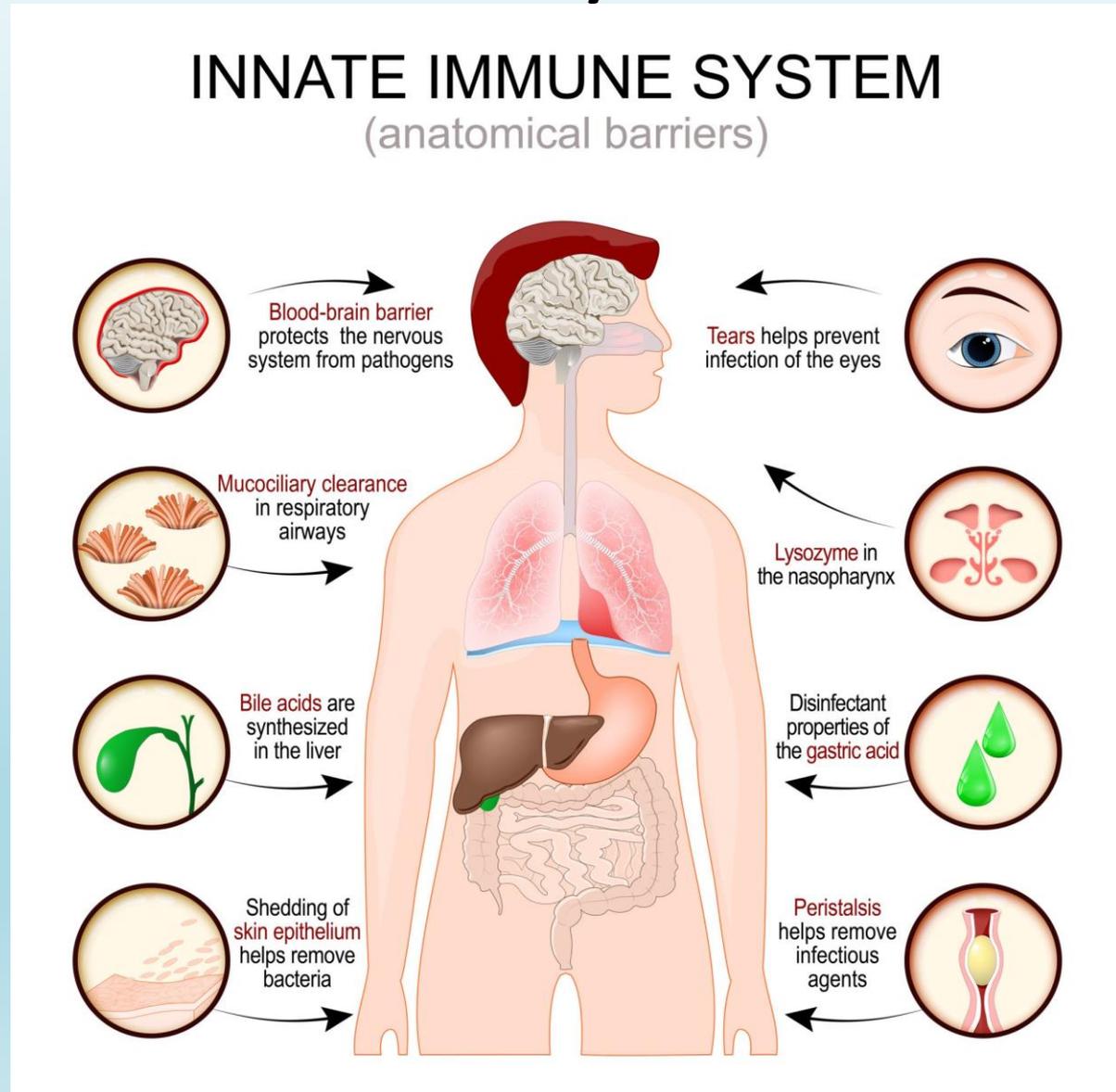


Introduction to Immunity

- Ability to resist microorganisms
- Immune system = cells, tissues, organs
- Innate & Adaptive branches

Innate Immunity

- First line, non-specific
- Skin, acid, mucous membranes
- Phagocytes and inflammation



Adaptive Immunity

- Developed over time
- Specific responses
- B-cells & T-cells

Types of Adaptive Immunity

- Active: Body produces antibodies
- Passive: Antibodies received

Active Immunity

- Natural: Infection
- Artificial: Vaccination
- Long-lasting

Passive Immunity

- Natural: Maternal antibodies
- Artificial: Immunoglobulin injections
- Short-term

Summary: Types of Immunity

- Natural Active – Infection – Long-term
- Artificial Active – Vaccine – Long-term
- Natural Passive – Maternal – Short-term
- Artificial Passive – Injection – Short-term

Type	How it is Acquired	Source of Antibodies	Duration
Natural Active	Illness/Infection	Self	Long-term
Artificial Active	Vaccination	Self	Long-term
Natural Passive	Maternal (Placenta/Milk)	Other (Mother)	Short-term
Artificial Passive	Immunoglobulin Injection	Other (Donor)	Short-term

Booster Shots

- Immunity may wane
- Boosters restore protection

Conclusion & Q&A

- Immunization saves lives
- Immunity = innate + adaptive
- Questions?



**THANK
YOU**