

Immunization is a preventative health measure that makes a person resistant to a specific disease, typically by administering a vaccine. Vaccines work by stimulating the body's immune system to recognize and fight off a disease-causing germ without causing the full illness. It is one of the most successful and cost-effective public health interventions, saving millions of lives annually and preventing deaths from serious diseases like measles, diphtheria, tetanus, and polio.

How immunization works

Initial exposure: A vaccine introduces a weakened or killed version of a germ (virus or bacteria) to the body, or a component of it.

Immune response: The immune system responds as if it's a real infection, creating antibodies to fight the germ.

Memory cells: The body develops "memory cells" that remember the germ.

Future protection: If the body encounters the actual germ later, the immune system can quickly produce the specific antibodies to prevent the person from getting sick or significantly reduce the severity of the illness.

Importance and benefits

Prevents serious illness and death: Immunization prevents many life-threatening diseases, disabilities, and deaths, making it a critical tool for public health.

Saves lives: Immunization currently prevents 3.5 to 5 million deaths every year from diseases like diphtheria, tetanus, pertussis (whooping cough), influenza, and measles.

Cost-effective: It is a highly cost-effective intervention; for example, every \$1 spent on childhood immunizations in Africa is estimated to return \$44 in economic benefits.

Prevents outbreaks: Vaccines are critical for controlling infectious disease outbreaks. When immunization coverage drops, dangerous diseases like measles can re-emerge.

Protects vulnerable populations: Infants and young children are particularly at risk because their immune systems are still developing, making them prime candidates for vaccination.

Challenges and future directions.

Coverage gaps: Despite widespread availability, gaps in immunization coverage persist globally and within countries, leaving many at risk from vaccine-preventable diseases.

Need for sustained efforts: The COVID-19 pandemic has highlighted the need for ongoing recovery, catch-up, and system strengthening to maintain immunization programs.

Innovation: Organizations are using technology and innovation to make immunization programs



more efficient and to reach underserved populations.

Addressing disparities: Immunization rates and outcomes have been affected by disparities based on factors like race and ethnicity, which point to the need for targeted intervention.

The five main types of immunization are live-attenuated, inactivated, subunit, toxoid, and mRNA vaccines. Each works differently to stimulate the immune system: live-attenuated vaccines use a weakened germ, inactivated use a killed one, subunit use only specific pieces of the germ, toxoid use an inactivated toxin, and mRNA vaccines provide genetic instructions for the body to build immunity.

1. Live-attenuated vaccines

These vaccines use a weakened, live version of the virus or bacteria.

They create a strong, long-lasting immune response.

Examples include the measles, mumps, and rubella (MMR) and varicella (chickenpox) vaccines.

2. Inactivated vaccines

These are made from a killed version of the germ.

The immune response is not as strong as with live-attenuated vaccines, so multiple doses are often needed.

Examples include the polio (IPV), rabies, and hepatitis A vaccines.

3. Subunit, recombinant, polysaccharide, and conjugate vaccines

These vaccines contain only specific pieces of the germ, such as its protein, sugar, or capsid.

Conjugate vaccines link a polysaccharide to a protein to improve the immune response in young children.

Examples include the hepatitis B, HPV, and meningococcal vaccines.

4. Toxoid vaccines

These vaccines target the harmful toxins produced by a bacterium instead of the germ itself.

They create immunity to the effects of the toxin.

Examples include the tetanus and diphtheria vaccines.

5. mRNA vaccines

These vaccines deliver messenger RNA (mRNA) into cells, providing instructions for making a viral protein.



The body's immune system then recognizes and builds a response to that protein, providing immunity.

Some COVID-19 vaccines use this technology.

Types of prevention are primary, secondary, and tertiary. In primary prevention, a disorder is actually prevented from developing. Types of primary prevention include the following: Vaccinations. Counseling to change high risk behaviour.

How to Prevent Infectious Diseases: 12 Tips

Five ways to prevent diseases include washing hands frequently, getting recommended vaccinations, practicing safe food handling, avoiding contact with sick people, and covering coughs and sneezes. These practices limit the spread of germs and help protect against both infectious and non-communicable diseases.

1. Practice good hygiene

Wash hands often: Use soap and water for at least 20 seconds, especially before eating, after using the bathroom, and after contact with animals or dirt.

Cover coughs and sneezes: Cough or sneeze into your elbow or a tissue to prevent spreading germs.

Avoid touching your face: Keep your hands away from your eyes, nose, and mouth.

2. Get vaccinated

Stay up-to-date on recommended immunizations to protect against specific diseases.

3. Practice safe food handling

Cook foods like meat and eggs to safe internal temperatures.

Wash fruits and vegetables, and avoid unpasteurized foods and beverages.

Keep hot food hot and cold food cold.

4. Avoid contact with sick individuals

Stay home when you are sick to avoid spreading illness to others.

Avoid being around others who are contagious, or wear a mask if you must be near them.

Do not share personal items like utensils or towels with sick people.

5. Take precautions against insect and animal bites

Use insect repellent and wear protective clothing when in areas with insects like ticks.



Avoid touching wild animals and be cautious around unfamiliar domestic animals.

If bitten by an animal, clean the wound immediately with soap and water and consult a doctor.

