



Developing vaccination methods to avoid epidemics and pandemics diseases

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Received: 31-Mar-2023, Manuscript No. AJVEPD-23-93737; **Editor assigned:** 03-Apr-2023, PreQC No. AJVEPD-23-93737 (PQ); **Reviewed:** 17-Apr-2023, QC No AJVEPD-23-93737; **Revised:** 31-May-2023, Manuscript No. AJVEPD-23-93737 (R); **Published:** 07-Jun-2023, DOI: 10.51268/2937-2709-23.08.023

DESCRIPTION

Epidemics and pandemics are large scale outbreaks of infectious diseases that can have devastating consequences for human health, society and economy. Epidemics occur when a disease affects a large number of people in a given area or region, while pandemics occur when a disease spreads across countries or continents. Examples of epidemics and pandemics include cholera, influenza, measles, polio, and smallpox, Acquired Immunodeficiency Syndrome, Human Immunodeficiency Virus (HIV/AIDS), Severe Acute Respiratory Syndrome (SARS), Ebola and coronavirus disease 2019 (COVID-19). One of the most effective ways to prevent epidemics and pandemics is through vaccination. Vaccination is a process that stimulates the body's immune system to produce antibodies that can fight off a specific disease causing agent, such as a virus or a bacterium. Vaccination can protect individuals from getting sick or reduce the severity of illness if they get infected. Vaccination can also protect others by reducing the transmission of the disease in the population. Vaccination strategies can be classified into two main types: Routine and reactive. Routine vaccination refers to the regular administration of vaccines to individuals or groups according to a predefined schedule, usually based on age, risk factors or geographical location. Routine vaccination aims to achieve and maintain high levels of immunity

in the population and prevent the occurrence or re-emergence of certain diseases. Examples of routine vaccination programs include childhood immunization against diseases such as measles, mumps, rubella, polio and tetanus; seasonal influenza vaccination for high risk groups such as elderly people, pregnant women and health care workers; and travel vaccination for people visiting areas with endemic diseases such as yellow fever, typhoid or meningitis. Reactive vaccination refers to the rapid administration of vaccines to individuals or groups in response to an outbreak or an imminent threat of an outbreak of a specific disease. Reactive vaccination aims to contain or stop the spread of the disease and reduce its impact on health and society. Examples of reactive vaccination strategies include ring vaccination, mass vaccination and targeted vaccination. Ring vaccination involves vaccinating people who are in close contact with confirmed or suspected cases of the disease, such as family members, friends, neighbors or co-workers. Mass vaccination involves vaccinating large segments of the population in an affected area or region, regardless of their exposure status. Targeted vaccination involves vaccinating specific groups of people who are at higher risk of exposure or severe outcomes from the disease, such as health care workers, school children or refugees.

Vaccination strategies require careful planning and coordination among various stakeholders, such as health authorities, vaccine manufacturers, health care providers, community leaders and media. Some of the factors that need to be considered when designing and implementing vaccination strategies include the availability and supply of safe and effective vaccines, the epidemiology and transmission dynamics of the disease. The characteristics and preferences of the target population. The logistics and infrastructure for vaccine delivery and storage. The monitoring and evaluation of vaccine coverage and impact. The communication and engagement with the public and the media

Vaccination strategies can have significant benefits for public health and society by

preventing morbidity and mortality from infectious diseases, reducing health care costs and economic losses, enhancing social cohesion and trust, and contributing to global health security. However, vaccination strategies also face some challenges and limitations, such as vaccine hesitancy or refusal among some individuals or groups; vaccine shortages or delays; vaccine safety or efficacy issues; ethical or legal dilemmas; political or social resistance; or emerging or evolving pathogens that may escape vaccine induced immunity. Therefore, vaccination strategies need to be complemented by other measures to prevent epidemics and pandemics, such as surveillance, diagnosis, treatment, isolation, quarantine, contact tracing, hygiene, social distancing, and personal protective equipment.