

Immunisation Sustainability

Herd immunity is a form of immunity that occurs when the vaccination of a significant portion of a population provides a measure of protection for individuals who have not developed immunity. However, when immunisation rates fall, herd immunity can break down leading to an increase in the number of new cases. For example, recent measles outbreaks in the UK, Israel and USA.

Vaccination coverage in Low and Middle Income Countries (LMICs) being low, outbreaks of some conditions such as measles continue.

Recent trends for groups of people denouncing mass immunisations has caused havoc in resurgence of epidemics of diseases that had been generally controlled in the populations by vaccination programmes. Persistence of polio where religious objections persist (Pakistan and Afghanistan), causing obstruction to eradication of Polio from the world is being hindered. Emerging measles epidemics due to certain sections of populations boycotting immunisation programmes is a dilemma for health service providers. Freedom for one's choice of deciding against a lifesaving intervention is not only affecting those who decide against it but allows the disease to circulate among others who are vulnerable due to one or the other reason.

Vaccines safely triggers a response in the body producing antibodies against the disease under consideration and protect the immunised person for long periods of time. However, a very small proportion of individuals fail to create this anti-body response and remain vulnerable to the disease. Concept of mass immunisation programmes rests on 95% of the population being protected against a disease. This does not allow virus or bacteria freely circulating in a population, and the 5% who do not respond to the effectiveness of the vaccination process, are at a much lower risk of contracting the disease and possibly dying from it.

The seven common routine immunisations given to children soon after birth and schedule completed in the first year of life are BCG, Polio, Diphtheria, Pertussis and Tetanus (DPT), Hepatitis B and Measles.

BCG, the abbreviation for the long name of bacterium causing tuberculosis (TB), is commonly given soon after birth. It protects children against TB and possibly from leprosy. TB is a devastating disease children can contract if any family member has the disease and fail to thrive. They either survive after developing natural immunity from TB infection itself or get full blown disease and invariably die if not treated soon enough. Immunisations and other measures have brought down the incidence of disease considerably, but the burden of disease, particularly in LMICs continues. Because of the breakdown of immune response among HIV infected individuals, they are at a very high risk of contracting TB.

Polio is another disease which can kill the person or leave a lifelong paralysis of one or more limbs. Polio drops are given in three doses at monthly intervals which provides lifelong immunity against the disease. It was a common site to see people limping only a couple of decades back, who were most likely victims of polio infection during childhood. The disease has almost disappeared from the face of the earth because of mass immunisations programmes covering the whole world. Afghanistan and Pakistan are the only two countries which are not free of the disease because of certain groups of people branding immunisations against their religious faith.

DPT (Diphtheria, Pertussis and Tetanus), a combined vaccine for three bacterial diseases put together, is given as three injection at monthly intervals, along with the Polio immunisation. **Diphtheria**, a dangerous bacterial disease affecting heart and other vital organs, used to be a great killer for children

before the vaccine became available. **Pertussis**, whooping cough was a dreadful condition in children. Severe cough would persist for months, not allowing any food to be retained in stomach due to vomiting induced by the cough. Many children died because of the effects of the disease. Finally **Tetanus**, a great killer producing severe contraction of long muscles from the toxins produced by the bacteria, leading to inability to breath and death. Tetanus bacteria thrives in soil. Unhygienic assistance during childbirth affected women and the new-borns, and became the most common victims. Adults were not spared either. Tetanus vaccine has changed that and today it is rare to see a person with the disease. Tetanus vaccination during antenatal period saves both the mother and newborn from any dangers of the condition at birth and children further get protection against the disease from DPT in the first year of life.

Hepatitis B, a viral infection, is another condition which has been added to the immunisation schedule relatively recently. It is spread by body fluids and can be easily passed person to person with infected needles or transfusion. The vaccination, which is also given along with polio and DPT as three doses at monthly intervals, gives permanent immunity and protects against chronic liver disease, a late effect of the disease.

Measles, also a viral disease, affects children causing morbidity and mortality in many cases, especially if the child is undernourished. Given after ten months of birth, provides lifelong immunity.

There are boosters for these vaccines provided to children under immunisation programmes, keeping them safe from the diseases for life.

The question arises if all these diseases are gone why continue to immunise people. If a virus or bacteria is completely eradicated and does not exist any more, there may be no need for immunisations, as in the case of Smallpox which was eradicated in December 1979. Efforts are on to put Polio in that category and eradicate it from the face of the earth. But most of the immunisable diseases somehow persist and if immunisation status in a population is not sustained these diseases can re-emerge. Measles resurgence is a good example from Israel, USA and the UK where it was almost eradicated.

Vaccinations are safe, effective and necessary. They are not toxic and do not cause autism, moreover, they save lives. Those who oppose and refuse vaccinations, put their children and communities at risk.