

Educational Material

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‘VACCINATION’

Definition: Vaccination is the administration of a vaccine to prevent contagion against particular diseases. Vaccines are dead or weakened versions of a disease-causing microorganism and/or select constituent parts. The administration of vaccine stimulates the body’s immune system to protect itself without having to suffer potentially deadly or debilitating bouts with infectious disease. Vaccination of large majorities, roughly 80% to 90% of the population, produces herd immunity against infectious disease.

History: Vaccination and its forerunners initially emerged as preventatives against the painful and deadly scourge of smallpox. Inoculation, a forerunner to vaccination, was practiced in many regions of the world since antiquity. Inoculation is the application of contagious matter from a mildly affected smallpox victim to an unaffected patient with the purpose of ensuring immunity via a bout with less deadly and debilitating strains. Despite lowering mortality rates from smallpox where the practice was widespread, inoculation had significant disadvantages that included the emergence of serious cases amongst patients and epidemic outbreaks.

Throughout the 18th century, observers noted that people who had suffered what rural physicians called the *cowpox* (a disease affecting cattle) did not contract smallpox. In the late eighteenth-century, English doctor Edward Jenner performed experiments based upon this observation, introducing cowpox material into the arm of a boy named James Phipps. Later, he inoculated Phipps with smallpox material to no effect. Jenner published his findings in *An Inquiry into the Causes and Effects of the Variolae Vaccinae* in 1796 and smallpox vaccination quickly spread across the globe.

The rise of laboratory-based medicine and associated germ theory in the late 19th century opened new opportunities for the development of new vaccines based upon the purposeful manipulation of disease-causing organisms. While Jenner found an analogous, comparatively mild disease to spark immunity against smallpox, Louis Pasteur experimented with treating micro-organisms so that they lost their infectious capabilities, in this way developing preventatives against anthrax and rabies. Despite the difference in material and methodology, Pasteur named the preventatives “vaccines” (Latin: *vacca* 'cow') in honor of Jenner. Vaccines for dozens of diseases have since been rigorously tested and approved for use by regulatory authorities around the globe. By the twenty-first century, vaccination is credited with eradicating smallpox, eliminating diseases such as polio and tetanus from much of the world, and dramatically lowering mortality rates from infectious disease more generally.

Vaccination and Public Health

Vaccination was the first truly social application of medicine, pushing allopathic and licensed medicine towards *prevention* of disease rather than a more costly, curative medicine and its

associated emphasis on profiting from illness. Within many regions of the world, it served as the foundation for new health infrastructure and more expansive concepts of state responsibility for the public good. Globally, first smallpox then a number of different vaccines inspired global health campaigns and international collaboration for the elimination or reduction of disease.

Vaccination is the most effective method for preventing infectious disease. Vaccination has played a pivotal role in facilitating a “epidemiological transition” across much of the globe, typified by rising life expectancies, lower child mortality rates, and a shift in primary causes of mortality away from infectious disease towards chronic illnesses such as cancer and heart disease. The study of immunology, born of vaccination theory and practice, has shown that even with chronic disease, the complex interplay of micro-organisms with the bodily immune system allows space for preventatives like vaccines to slow or stop the development of chronic illness.

Despite these advances, in 2018 the World Health Organization estimates that millions of children remain unvaccinated or under-vaccinated, particularly in the developing world. The Immunization Agenda of 2030 includes the key goal of making vaccination available to everyone, everywhere, by this target.

Popular Resistance and Anti-Vaccination :

Resistance to vaccination is as old as the procedure itself, but organized resistance arose in the European context only in the 1850s and 1860s, as nations began to use their expanding public health apparatus to require vaccination. Initially organized against smallpox vaccination, much of the protest was based upon the procedure as a challenge to religious concepts of disease and death as divine will. More secular arguments posited that vaccination was a foreign “poison” which violated the integrity of the body, causing imbalance and illness. Suspicion against the growing power of the state and licensed medicine added fuel to resistance, as states mobilized the coercive power of the state to enforce vaccination amongst populations.

In colonial contexts around the world, the imposition of foreign Western medical technologies upon valuable subject populations was integral to the projection of power under colonialism. Resistance in colonial and post-colonial contexts sometimes took on the mantle of explicit anti-colonialism but more often was expressed as disengagement and apathy. Where vaccines were *indigenized* and local authorities integrated into the vaccination process/infrastructure, vaccination generally received more favorable and widespread reception.

In the late twentieth and early twenty-first centuries, increasingly vocal critics of vaccination in the developed world launch ethical, moral, religious, and safety concerns against the practice. For example, detractors have cited scientifically unsubstantiated fears of negative health effects in children, correlating chemicals (such as mercury and aluminium) utilized in the manufacturing process with developmental disorders such as autism. Critics also cite the monopolistic power of large pharmaceutical corporations as hazardous to public health and the coercive power of public health authorities as dangerous to civil liberties. Where criticism has led to non-compliance with public health regulation and/or recommendations, incidence of previously eliminated diseases such as measles have re-emerged in the developed world.

In post-colonial contexts, suspicions of Western medicine as a legacy of colonialism are sometimes mobilized against vaccination. More frequently, detractors argue for socio-economic inclusion in terms not entirely antagonistic to vaccination as a medical technology. For example, some public health advocates cite vaccination as one of many technological “magic bullets” that distract from the deeper socio-economic foundations of disease incidence. More critics argue for socio-economic justice in access to vaccines, as many countries cannot afford full range of vaccinations for public health administration. Due to the more visible risks of preventable, infectious diseases, resistance to vaccination as a medical technology in the developing world is far less vocal, organized, and/or absolute.

Global Successes and Limitations:

Considering its origins, it is not surprising that vaccination’s first success as a tool for *eradicating* human disease came with the global public health campaign against smallpox. In 1967 the World Health Organization launched the Intensified Smallpox Eradication Programme. Although the program experienced many setbacks and strategic changes in method and technology, the project was successful. In May of 1980, the General Assembly of the World Health Organization endorsed the findings of an international commission of medical scientists and declared the global eradication of smallpox a reality. The success of the smallpox eradication campaign reinvigorated eradication as a public health goal, with vaccination playing a key role in the public health toolkit of subsequent eradication campaigns against other diseases.

Further Reading:

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