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The Development of Vaccine

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The Development of Vaccine

Vaccination entails introducing a vaccine into the body to help develop the immune system to offer a solid defense against diseases. The introduced antigenic elements are capable of inducing protective immunity against the corresponding infectious diseases. According to the World Health Organization, it is prudent for international travelers to be immunized against infectious diseases in the recipient country. Some of the diseases include hepatitis, cholera, yellow fever, and Japanese encephalitis. The increased mortality due to the Covid-19 pandemic, HIV and AIDS, and cancer calls for an intense need for a vaccine to contain the situation. The essay seeks to highlight the history of vaccination, its contribution to the global society, the controversies, and the socio-economic and health perspective of vaccination.

One of the most significant medical arena personalities is Edward Jenner, who is regarded as the pioneer for immunology and the smallpox vaccine. Born in May 1749 in Berkeley, Edward had a strong desire for nature and science during his early times. He began an apprenticeship with George Hardwicke in 1764, where he gained considerable knowledge in medical practice and surgery. His interest in developing protection against cowpox began during that time with George when many dairymaids assumed that they could not suffer from smallpox after surviving cowpox. Jenner pondered over the sentiments and summed up that "cowpox not only protected against smallpox but also could be transmitted from one person to another as a deliberate mechanism of protection." (Redial, 2015). In 1776, he met Sarah Nelms, who was suffering from cowpox. Edward used lesions from Nelm and inoculated them into James Philips, who became better after nine days. After two months, Edward ² inoculated the boy again with content from a smallpox lesion that was fresh. Philip did not suffer from any other disease prompting Edward to conclude that protection was a success. His work is a representation of the first attempts to control an infectious illness through

vaccination. Jenner was the pioneer of incorporating science on the vaccination operation and follow its scientific research. The science inquiries in the subsequent centuries proved Jenner's antics correct. They include the study of viruses and the germ theory. The discovery of vaccination helped in the eradication of smallpox.

The impacts of vaccination globally since its conception and the general future impacts are well discussed by Greenwood (2014). He asserts that vaccination has positively impacted the universal community's well-being, especially in eradicating rinderpest and smallpox. The article builds on Riedel's work by affirming that Jenner is behind eradicating smallpox via vaccination. The next notable success was the development of the rabies vaccine by Pasteur after the experiments of Jenner. The use of the attenuation principle developed the vaccine. Its success led to the development of many other vaccines using the same method. They include typhoid, influenza, and rubella vaccines. Currently, the development of whole-cell vaccines is underway to tackle diseases like malaria. Generally, vaccination has registered much success in the past 200 years. Several emerging vaccines are expected on the market in the new decade, although via many challenges. The recent stubborn diseases, for instance, HIV, corona, and malaria, have complex structures. The success against such diseases would require combination vaccinations. The new vaccines are expected to be more expensive and a burden to the developing nations where the vaccines are expected to be in high demand. Many developing nations are making economic progress to avoid support from GAVI and international aid. Childhood mortality is expected to decline more if rotavirus and conjugate vaccines are used.

Despite the success that vaccination has brought to the global society, various controversies surround the practice, as Brofin (2008) discussed. The article builds on Greenwood's (2014) work by highlighting the challenges and controversies surrounding immunization as aired by the parents to pediatricians. Some of the parents' questions include

why they should immunize a teenager against Hepatitis B when she certainly will not be engaging in premarital sex or using intravenous drugs. Also, the parents are concerned that some of the vaccines lead to death instead of curing. One of the parents said that his baby dies after receiving a diphtheria-Pertussis-Tetanus vaccine. The vaccine could cause irritability, high fever, and even death. Another relevant case is the 1955 incident in the Cutter Laboratories, where live polio was introduced in a vaccine. The incident led to five deaths and 51 cases of paralysis. Other worries include the portion that using the Human Papillomavirus Vaccine will encourage girls to engage in sex. The measles-mump-rubella vaccine leads to autism, and the Rotavirus vaccine causes intestinal blockage in babies.

Another relevant article is by Rodriques and Plotkin (2020). The authors explain the sociological and economic impacts of vaccines in the global community. They also affirm that Jenner was instrumental in setting the vaccination practice to the platform of medicine. The authors also highlight how vaccination has reduced the morbidity and mortality of infectious diseases worldwide, especially among children. The vaccines can prevent more than 7 million deaths annually and save 97 million disability-adjusted life years 380 million life-years globally. The vaccines have also resulted in cancer prevention, antibiotic resistance, and eradicating infectious diseases, for instance, smallpox. This leads to high longevity in the immunized children. The economic benefits include saving of cost in terms of vaccine purchase and infrastructure. The enhanced health status of society leads to high economic productivity and improve educational results. The social benefits include equity of Healthcare, women empowerment, and the strengthening of social and Healthcare infrastructure.

In recap, as modern diseases such as cancer continue to be prevalent and result in high mortality rates, understanding the complexity of illness and vaccines' development can significantly impact treatment options. By developing various vaccines and overcoming the

challenges in developing the vaccine, many lives can be saved in the future. My goal is to find the best way of developing and using vaccination for disease prevention.

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