The Value of Vaccines

- Vaccines can help protect the body against disease by training the immune system to recognize and destroy viruses or bacteria\(^1\).
- Despite being one of the most effective public health interventions, vaccines continue to be underused and undervalued\(^2\).
- Vaccine advancements have and must continue to be made as long as public health needs remain unmet.

According to the World Health Organization (WHO), no other public health intervention except the provision of clean drinking water has done more to reduce the global burden of disease than vaccination\(^3\).

Despite the benefits of immunization, vaccines remain underused and undervalued, threatening the return of some diseases once thought to be eradicated\(^2\). In addition, there continues to be unmet needs in preventing deadly infectious diseases.

Vaccines Have Changed Our Lives

A vaccine is a biological preparation that helps protect the body against a particular disease\(^1\). Vaccines are designed to prime the body so that it will recognize a harmful virus or a bacterium, destroy it and remember it, so that the body’s immune system can more easily recognize and destroy the virus or bacteria if it encounters it again\(^1\).

Vaccines, which help protect the body against disease by training the immune system to recognize and destroy the viruses or bacteria\(^1\), are widely considered to be safe and one of the most effective public health interventions. Immunization has eradicated many once-feared diseases. For example:

- **Approximately 350 million people are estimated to have been spared from smallpox infection** and 40 million from dying of the disease\(^2\) since it was eliminated in the late 1970s\(^5\).
- **The number of polio cases fell from more than 300,000 per year in the 1980s to just 2,000 in 2002\(^2\);** some 5 million people estimated to have escaped paralysis since 1988\(^6\).
- **Since 1974,** the number of reported measles deaths has dropped from 6 million to less than 1 million per year\(^5\).
- **Meningococcal group C (MenC) infections and deaths were reduced by more than 90 percent** after the 1999 deployment of a vaccination campaign in the UK with a new MenC conjugate vaccine developed to combat an epidemic there\(^7\).
Vaccines have the potential to protect the unvaccinated. An effect known as “herd immunity” occurs when the vaccination of a large portion of the population provides some protection for unvaccinated individuals by reducing the number of people carrying the disease and offering little opportunity for it to spread within the community. Importantly, direct vaccine protection provides more reliable protection than indirect protection via herd immunity.

The vaccination campaign in the UK against MenC reduced the combined number of clinical cases and deaths by 90 percent as well as a 66 percent decrease in asymptomatic carriage.

Large Return on a Small Investment

Vaccines are one of the most cost-effective public health measures. For example:

- **One case of measles may cost 23 times as much** as a single vaccination to prevent the viral disease.
- **Influenza vaccination could save as much as $60-$4,000 per illness case**, according to a study conducted in the United States among healthy people aged 18-64 years; among studies of healthy young adults, more than 70 percent of the costs prevented were associated with reductions in lost work productivity.
- **On a broader scale**, good health can promote social development and economic growth.

Immunization Schedules Help to Ensure Vaccine Uptake

Many vaccinations are designed to be given to infants, children and/or teenagers, protecting against harmful infection and creating immunity for years to come. In 1977, in order to help increase vaccination rates, the WHO founded the Expanded Program on Immunization (EPI). The program helped countries establish the infrastructure needed to provide a standard childhood vaccination schedule. Over time, additional vaccines are added to the schedules, as and when they become available.

Consequences of Declining Vaccine Rates

Despite efforts to increase vaccine uptake, many people have become less concerned with preventing illness and more concerned with risks associated with vaccines. In addition, available vaccines may also be underutilized because they may have done their job “too well.” People who have not witnessed the devastation of diseases like polio as a result of widespread vaccination may think the disease poses no risk, and the public may become apathetic about prevention.
If vaccination is stopped or if insufficient numbers of people are vaccinated, diseases that were once thought to be eradicated can re-emerge. Despite herd immunity, as more and more people choose to avoid vaccination, overall coverage rates decline and the community is once again exposed to the threat of disease. For instance, polio has re-surfaced in Nigeria, due to a fall in vaccination against the disease. Cases of measles are back in the US and Europe after now widely discredited information published in the late 1990s led to a drop in MMR vaccination.

Immunization Advancement

In the 20th century, vaccines greatly diminished many deadly diseases. In the 21st century, vaccination has the potential to save even more lives as advances are made against infectious diseases that still pose serious health challenges.

For example, in 2009 we saw the availability of the first ever vaccines to protect against cancer. Cervarix® and Gardasil® are now included in many national childhood vaccination schedules, helping young girls – and boys in some countries – against some strains of the human papillomavirus (HPV), which causes cervical cancer.

There have been recent advancements in vaccines against meningococcal disease. Vaccination campaigns against two of the three leading causes of bacterial meningitis – Haemophilus influenzae type b (Hib) and Streptococcus pneumoniae (pneumococcus) – have already proven to be highly successful.

Bexsero® (Meningococcal Group B Vaccine [rDNA, component, adsorbed]) is the result of more than 20 years of pioneering research in vaccine development. MenB has been a particularly elusive target because the outer coating of the bacteria is not well recognized by the immune system, making it especially challenging to develop a broadly effective vaccine until recent scientific developments. Bexsero was developed using an award-winning scientific approach that involved decoding the genetic makeup (genome sequence) of MenB. This innovative approach provides the foundation for a new generation of vaccines that could help prevent other diseases with a significant diversity of disease-causing strains.

After the approval of Menveo® (Meningococcal Group A, C, W-135 and Y- Conjugate Vaccine) in 2010, the anticipated approval of groundbreaking Bexsero underscores Novartis leadership position in the fight against devastating meningococcal disease. Novartis may soon be in the position of being able to offer vaccines to help protect against all five main serogroups of meningococcal bacteria (A, B, C, W-135 and Y) that cause the majority of all cases around the world.
References


