GreenFacts
Facts on Health and the Environment

This is a faithful synthesis and summary of several leading scientific reports. For the full list of sources, refer to the references section below.

The essentials about vaccines and vaccination

Vaccination saves millions of lives each year. How do they work and is there still progress to be made?

Why is Vaccination important?

Vaccination is one of the most cost-effective available health interventions, saving more than 3 million lives each year and many million more from illness and disability. Effective and safe vaccines, which protect against more than 20 serious diseases, are currently available and many promising new vaccines are being developed. Vaccinations can provide protection not just for the vaccinated person, but for the population as a whole as well. This phenomenon, called community immunity or herd immunity, occurs when a large portion of the population is vaccinated, usually over 85%, depending on the disease. If global vaccination coverage was to be increased enough to reach 90% of the population, an additional 2 million lives each year could be saved.

How does a vaccine work?

In response to an infection, some white blood cells produce antibodies, molecules that help the body react quickly and effectively to the intruding germs. The first time the body encounters a germ, it takes several days to make and use all the germ-fighting tools needed to get over the infection, including the production of antibodies.
After the first infection, the immune system keeps a memory for this germ for years, and when the body encounters the same germ another time, the defense response is both faster and stronger.
Vaccines contribute thus to develop immunity by imitating an infection without causing the illness, and by causing the body to produce the antibodies and the memory against the infectious agents.

What are the most recommended vaccinations?

The vaccination programmes of most countries include the same basic vaccines for diphtheria, tetanus, pertussis (or whooping cough), measles, polio, and tuberculosis. Over the years additional vaccines have been added. They include vaccines against hepatitis B, Haemophilus influenzae type b, mumps, pneumococcal disease, rotavirus, rubella, and – in countries where needed – yellow fever and Japanese encephalitis.
Among more recent vaccines, significant progress has been achieved in the introduction of Human papilloma-virus (HPV), pneumococcal and rotavirus vaccines in the WHO European Region. Twenty-six countries have recommended or funded use of HPV vaccine (which is the only vaccine that can prevent a cancer) for national immunization programmes.

Are there risks associated to vaccination?

As once-common diseases become less frequent, fear of the diseases themselves tend to become overshadowed by vaccine safety concerns, sometimes fueled by misinformation about vaccination, says the WHO. Although there are reports of side effects due to vaccinations, few of them are serious, and the risk from getting a disease like diphtheria or polio is much greater than any risk of side effect from vaccines.

The American Center for Disease Control (CDC) has highlighted some misconceptions about vaccination :

- "Diseases were already disappearing before vaccines, because of better hygiene and sanitation". This misconception is often cited as an argument against vaccination. Survival rates had indeed been getting better before the introduction of vaccines, but vaccines brought a dramatic decrease in the number of cases.
- -"The majority of people who get diseases have been vaccinated". Some vaccinated people will not develop immunity (vaccine effectiveness is usually 85 to 95%). When there is an outbreak of a disease, the people who are affected will be those who have not been vaccinated, and those who were, but did not develop immunity.
- -"The diseases that are preventable with vaccines have been virtually eliminated, and so there is no need for children to be vaccinated anymore". Vaccination protects not only the person who is getting vaccinated, but also the people around, more specifically those people who are the most vulnerable. If vaccination stops, then any outbreak could become devastating.
- -"Multiple vaccinations at an early age is taxing for a young child's immune system and can be harmful." Children are exposed to germs everyday, and the immune system handles them without getting overloaded. Available scientific data show that there is not harm for the immune system of young children.

Is there new progress in vaccination?

According to a UNICEF-WHO-WB report (2009) the first decade of the 21st century has been the most productive in the history of vaccine development. On the one hand, new vaccines are being developed that could reduce illness and deaths, and on the other, new production methods mean that cheaper vaccines can be provided for developing countries. About 30 of these candidates aim to protect against diseases for which there are no vaccines currently available and public-private partnerships are accelerating the availability of these new vaccines. New ways of delivering vaccines are also being developed that do not require an injection, which also facilitates their use.

What is the world's global state of vaccination coverage?

Vaccination has led to the eradication of smallpox, and poliomyelitis is also almost eradicated. Immunization currently prevents an estimated two to three million deaths every year in all age groups from diphtheria, tetanus, pertussis (whooping cough), and measles. In 2012, an estimated 83% (111 million) of infants worldwide were vaccinated with three doses of Diphtheria-Tetanus-Pertussis (DTP3) vaccine. The total number of children who died from diseases preventable by vaccines currently recommended by WHO is estimated to about 1.5 million.

In Europe, immunization levels are very high. Information to the public is an important part of the strategy of the European WHO regional office to help raise awareness and respond to concerns about vaccine safety.
In South America, it appears that the interruption of endemic measles and rubella virus transmission has been achieved but some countries have reported weakness and failures in their national surveillance systems and routine immunization programs. In the United States in 2012, adult vaccination coverage for diseases other than influenza was still low.

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You can find this summary, along with a more detailed one on the GreenFacts website at:
http://www.greenfacts.org/en/vaccines/index.htm

The sources for this summary:

- *The WHO regional office for Europe page on Vaccines: http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/vaccines-and-immunization*
- *WHO Europe: "Seven Key Reasons why immunization must remain a priority in the WHO European Region" In English: http://www.euro.who.int/__data/assets/pdf_file/0017/84302/Seven_Key_Reasons.pdf?ua=1*
- *US Center for Disease Control: "Understanding How Vaccines Work": http://www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/vacsafe-understand-color-office.pdf*
- *US Center for Disease Control: "Some Common Misconceptions About Vaccination and How to Respond to Them": Ref: http://www.cdc.gov/vaccines/vac-gen/6mishome.htm*
- *WHO: "Global Vaccine Action Plan" http://www.who.int/immunization/global_vaccine_action_plan/GVAP_Introduction_and_Immunization_Landscape_Today.pdf*
- *WHO: "Global Immunization Data" http://www.who.int/immunization/monitoring_surveillance/Global_Immunization_Data.pdf*
- *UNICEF: "State of the world's vaccines and immunization" http://www.unicef.org/media/files/SOWVI_full_report_english_LR1.pdf*
- *Pan American Health Organization (PAHO), Technical Advisory Group on Vaccine-preventable Diseases, 2013 http://www.paho.org/hq./index.php?option=com_docman&task=doc_download&gid=22423&Itemid=3482&lang=es*