

Comparing Natural and Vaccine Immunity

Concern: I have read that “natural immunity” (getting the disease) is safer and works better than getting vaccinated.

General Responses:

- It is true that natural infection almost always causes better immunity than vaccines.
 - Because after a single natural infection, you often get immunity (like with measles or chickenpox) whereas you generally need 2 or more doses of a vaccine to be protected.
- Consider the high risk of developing natural immunity from these diseases:
 - Pneumonia or invasive group Strep B infections from chickenpox
 - Pneumonia from pneumococcus
 - Meningitis or epiglottitis from HIB
 - Birth defects from rubella
 - Liver cancer from hep B virus
 - Death from measles
- “Chickenpox Parties” are risky but they “work” because chickenpox is a very contagious disease.
 - Put 100 people in a room together with one of them being infected with chickenpox while the 99 have never been infected with chickenpox or vaccinated with the chickenpox vaccine. Over that time, 85 of these 99 people will get chickenpox disease.
- In the chickenpox pre-vaccination era:
 - Approximately 11,000 persons with varicella required hospitalization each year
 - Rate of approximately 2-3 per 1,000 cases among healthy children and 8 per 1,000 cases among adults
 - Death occurred in approximately 1 in 60,000 cases.
 - From 1990 through 1996, an average of 103 deaths from varicella was reported each year.
 - Most deaths occurred in immunocompetent (healthy) children and adults.
- Prior to vaccine era, serious HIB disease caused the death of about 1,000 children each year in the U.S.
- Approximately 1 out of every 10 people who get meningococcal disease will die.
- Vaccines cause less serious risks but, like natural infection, induce long-lived immunity.

Risk of Disease:

- Vaccine-preventable diseases continue to be a real threat to the health of U.S. residents.
- Vaccines are necessary because none of the diseases that they protect against have been eliminated from the world - all are just a plane trip away.
- Bacteria that cause, for example, HIB, pneumococcal or meningococcal diseases, or viruses that cause chickenpox, mumps, flu or rotavirus (“gastroenteritis”) are common in the U.S. - just waiting to infect people.

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- Nearly everyone in the U.S. got measles before there was a vaccine, and hundreds died from it each year.
 - Today, most doctors have never seen a case of measles, but that is changing with 664 cases reported in 2014 in the U.S. (5 in MI).
- An epidemic of rubella (German measles) in 1964-65 infected 12½ million Americans, killed 2,000 babies, and caused 11,000 miscarriages. In 2012, with vaccination, 9 cases of rubella were reported to CDC.

Benefit of Vaccines:

- Varicella (chickenpox) vaccine was licensed in 1995. Since 1996, the number of hospitalizations and deaths from varicella has declined more than 90%.
 - 1 dose of varicella is 85% effective in preventing any form of chickenpox and almost 100% effective against severe chickenpox.
 - In pre-licensure studies: 2 doses of varicella are 98% effective at preventing any form of varicella and 100% effective against severe chickenpox.
 - In post-licensure studies: 2 doses of varicella vaccine are 88-98% effective at preventing all chickenpox.
- Human papillomavirus (HPV) vaccine – The high purity of the specific protein in the vaccine leads to a better immune response than natural infection.
- Tetanus vaccine – The toxin made by tetanus is so potent that the amount that causes disease is actually lower than the amount that induces a long-lasting immune response. This is why people with tetanus disease are still recommended to get the vaccine.
- *Haemophilus influenzae* type b (Hib) vaccine – children less than 2 years old do not typically make a good response to the complex sugar coating (polysaccharide) on the surface of Hib that causes disease; however, the vaccine links this polysaccharide to a helper protein that creates a better immune response than would occur naturally. Therefore, children less than 2 years old who get Hib disease are still recommended to get the vaccine.
- Pneumococcal vaccine – This vaccine works the same way as the Hib vaccine to create a better immune response than natural infection.

Resources:

Centers for Disease Control

Website: What Would Happen If We Stopped Vaccinations?

<http://www.cdc.gov/vaccines/vac-gen/whatifstop.htm>

Understanding How Vaccines Work

<http://www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/vacsafe-understand-bw-office.pdf>

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Infant Immunization FAQs

http://www.cdc.gov/vaccines/events/niiw/ed-resources/downloads/f_provider-qa-bw.pdf

Ensuring the Safety of Vaccines in the United States

<http://www.cdc.gov/vaccines/hcp/patient-ed/conversations/downloads/vacsafe-ensuring-bw-office.pdf>

Immunization Vaccine Safety

http://www.cdc.gov/vaccines/pubs/downloads/f_vacsafe.pdf

Children's Hospital of Philadelphia

Facts about Childhood Vaccines

<http://vec.chop.edu/export/download/pdfs/articles/vaccine-education-center/vaccines-fact.pdf>

Vaccine Safety and Your Child: Separating Fact from Fiction (Booklet; Not a handout)

<http://vec.chop.edu/export/download/pdfs/articles/vaccine-education-center/vaccine-safety-eng.pdf>

Every Child by Two

Booklet: Protect Your Child-Immunize on Time, Every Time

<http://www.ecbt.org/images/articles/eBookOfDiseases.pdf>