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CHALLENGING MINDS, CHANGING LIVES

Commentary

Origins of Vaccination and Immunizations[a]

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When discussing the beginnings of immunizations, it is often started with the topic of Edward Jenner. In 1796, Jenner created an inoculation of material from the cowpox pustules that were present in much of the population at that time. This vaccine evolved over time and over the next 200 years, small pox was eradicated. However, there is evidence that the Chinese, as well as Africa and Turkey, used similar inoculations, as early as 1000 CE. The science of vaccinations has greatly evolved since that time. The use of DNA recombinant has led to targeted vaccinations against many once common childhood diseases.

Massachusetts became the first state that passed a law stating school-age children required vaccinations in 1855. By 1970, 29 other states had followed suit, requiring that children be vaccinated to attend public schools. In response to these mandates, the Anti-Vaccination Society of America was formed in 1879. They claimed that the "efficacy of vaccination as a disease preventative is a matter of individual opinion". This began the heated debate on whether or not vaccines should be required for children, and if their benefits out-weighed the risks.

Today, the Centers for Disease Control (CDC) recommends that children aged 0-6 receive a total of 28 doses of 10 vaccinations. These vaccinations cover a variety of diseases and include: hepatitis A, hepatitis B, chicken pox, diphtheria, haemophilus influenza type B, influenza, measles, mumps, pertussis, polio, pneumococcus, rotavirus, rubella, and tetanus. There are no US federal laws that mandate vaccination, however all 50 states require certain vaccinations for children who are entering public schools. The majority of the states do allow for medical and religious exemptions.

There have been many debated pros and cons about the vaccination of children. Those who are against mandated vaccinations, base this on the belief that it should be the right of individual and not the state, to determine what happens to one's own body, or that of their child. Those who support vaccination argue that "when a critical portion of a population is vaccinated against a contagious disease, it is unlikely that an outbreak of the disease will occur; so most members of the community will be protected". Many agencies, including the Food and Drug Administration (FDA), the Center for Disease Control (CDC), the American Medical Association (AMA), and the American Academy of Pediatrics (AAP) argue and support the fact that vaccines are safe. They argue that "vaccines save children's lives and adverse reactions to vaccines are extremely rare".

There has been concern that vaccinations contain harmful ingredients that can cause serious and sometimes fatal effects. However, those who support vaccines argue that the harmful ingredients are safe in the small amounts that are used. In 1998, an article by Dr. Andrew Wakefield sparked concern when it reported that the MMR vaccination could be linked to autism. The article led to many frightened parents choosing not to vaccinate their children in fear that they might be harmed. Though Dr. Wakefield was later accused of falsifying medical records and had his medical license stripped from him, it has left many still leery of potential side effects. Another opposing argument is that natural immunity is more beneficial than vaccination. Natural immunity occurs when the body comes in contact with an infection, and the immune system produces antibodies against the organism. Vaccinations provide a similar response from the body, although it takes multiple exposures from several doses to achieve immunity, whereas natural immunity occurs after a single infection. Vaccinations also save money. Treating infectious diseases is not cheap. In addition to the costs of medical care, prescriptions and medications, there is also the cost of loss wages due to missed work. The CDC reported that in 2008, 11 children that had not been vaccinated were exposed in an outbreak of measles. It is estimated that the cost of care ended up being about $10, 376 per case.

Overall, vaccinations have been proven to be one of the most effective ways to reduce the spread of disease. Andre et al. (2011) claimed that "vaccination greatly reduces disease, disability, death, and inequity worldwide" and that "only clean water, also considered to be a basic human right, performs better". According to UNICEF, "pneumonia, diarrhea, malaria, measles, HIV/AIDS, and malnutrition are the primary killers of children in the developing world." In developing countries, children are often faced with malnutrition and overcrowded living spaces. These living conditions make them more susceptible to infections. Providing a strain on the immune system and making it harder to overcome these illnesses. One of the biggest challenges has been getting vaccinations to developing countries. Orenstein, Seib, Graham-Rowe, and Berkley (2014) explained that in 2000, the Global Alliance for Vaccines and Immunisations (GAVI) was created. They play a role in promoting the use of vaccinations in the poorest countries. The GAVI website states that "in 2012, approximately 6.6 million children died before the age of five. WHO estimates that 1.5 million of these deaths were due to vaccine-preventable diseases" (2015). They support the poorest 73 countries and estimate that they will have approximately 70% of the children vaccinated in these countries by 2030. GAVI is funded by government donors and also the Bill and Melinda Gates Foundation.

The state of Mississippi requires that children are immunized "in order to enter school, Head Start, or daycare". This mandate has ensured that a majority of the state receives immunizations. Mississippi is also one of two states that does not allow for exemption due to religious reasons for children entering school. In further efforts to promote vaccinations, the Mississippi Department of Health initiated the Vaccines for Children program (VFC). The program enables children up to the age of 18 to receive free vaccinations. It provides vaccinations at no cost for those "who receive Medicaid, Native Americans or Alaskan Natives, and children who have health insurance that does not cover vaccination." Today 350 health care providers over the state participate in the program to make vaccinations more readily available.

It is clear that the pros of vaccinations outweigh the cons. While I do agree that it is the right of a parent to decide whether or not to vaccinate their children, I whole-heartedly support the mandates of immunizations to be allowed to attend school. Parents and individuals have the freedom to decide for themselves and their families, but they do not have the right to put other children at risk. With the use of technology and research, vaccinations will have the potential to become even safer. Research will also be able to provide us with

vaccinations for many other diseases that can affect populations today. I think that it is wise to use the technology and knowledge gained thus far to further promote the health of individuals all over the world.

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