

## **There's Life in the Vial**

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Pilgrimage to Life & Leadership Essay

CEC for Life

10 May 2016

### There's Life in the Vial

The year was 1944. While WWII devastated countries, and the depressing death toll continued to surge, the death tolls of more complex, yet common killers began to rise, targeting millions of children and adults globally. These killers, microscopic, yet ubiquitous, were measles, mumps, influenza, and rubella (among others). Epidemics swept through global regions, wreaking havoc by exterminating or debilitating thousands of people. Although distraught parents anxiously pleaded and prayed for the safety of their children, they were not shocked when their beloved child contracted an illness. After all, these viruses and diseases were commonplace, if not inevitable. Frankly, the situation was hopeless. There was nothing to be done to annihilate these terrible pathogens from humanity — or so it seemed. The world was not aware of him yet, but a hero had been born 25 years earlier, and he was in the process of changing the entire world. In the years to come, this brilliant man would dedicate countless hours studying, researching, and developing the antidotes for many of the world's infirmities, thus saving millions of lives in the process.

In 1919 on the eastern plains of a rural town in Montana, a woman gave birth to twins, a girl and a boy. Sadly, when the girl was delivered on earth, she was also delivered in heaven. A few hours later, the mother began having seizures and was diagnosed with eclampsia. Two days later, she also passed away. However, the tiny, resolute boy survived. His name was Maurice Hilleman. Hilleman, who later remarked, "I always felt that I cheated death" (qtd. in Offit 3), would soon dedicate his life to helping millions of people worldwide cheat death. But how? With the use of vaccines. By implementing incredible foresight, painstaking determination, noteworthy altruism

and commendable humility, even in the midst of social controversy, recondite genius Maurice Hilleman developed over forty vaccines, saving millions of lives internationally and nearly obliterating once common diseases and viruses throughout the globe.

After obtaining a Ph.D. in microbiology and chemistry, 24-year-old Hilleman began working for E.R. Squibb & Sons, a pharmaceutical company in New Jersey, where he learned to mass-produce influenza vaccines, a skill that later proved invaluable. He then decided to implement his proficiency, transferring to the Walter Reed Army Medical Research Institute. At this occupation, he was expected to compile research and basically prevent the next influenza pandemic. In the spring of 1957, Maurice Hilleman's wisdom and foresight was put to the test.

One April day, Hilleman received word of a deadly influenza epidemic in Hong Kong. 250,000 people had contracted the virus, and it was quickly spreading to neighboring countries. It would only be a matter of months before this Asian flu, as it was called, would soon spread to America. Immediately, Hilleman took charge. Calling staff in Japan, he urgently asked for information about the Asian flu. Consequently, investigators discovered that an American naval serviceman had contracted the virus. Researchers isolated the virus and expediently processed it to Hilleman. Working days and nights for almost a week, Hilleman confirmed the terrifying truth: This strain of influenza was new. And it was deadly.

If his predictions were correct, the influenza epidemic would arrive in America September of 1957. Hilleman only had four months to convince research companies to manufacture and distribute vaccines to Americans, a daunting task. How could he do this? Initially, he dispatched a press release warning the people. Many individuals —

including those working for pharmaceutical companies — disbelieved the Asian flu would appear in America. Consequently, Hilleman decided to snatch the reins from the research companies in an attempt to halt this charging horse of an infection. As a result, Hilleman remarked, “I knew how the system worked . . . [s]o I bypassed the Division of Biologics Standards, called the manufacturers myself, and moved the process quickly” (Offit 16). By the end of the fall, 40 million doses were distributed to Americans.

In September Hilleman’s predictions proved correct, and the first clinical Asian flu case was recorded in San Diego, California. Fortunately, thousands of Americans had been inoculated. In his book, *Vaccinated: One Man’s quest to Defeat the World’s Deadliest Diseases*, Dr. Paul A. Offit, the chief of infectious diseases at the Children’s Hospital of Philadelphia and professor of pediatrics at the University of Pennsylvania, attests, “When it was over, the influenza pandemic of 1957 killed 70,000 Americans and 4 million people worldwide. But Hilleman’s quick action saved thousands of American lives” (17). Because of his incredible foresight and boldness, he lead companies in the quest to save thousands of Americans. Without these qualities, it would have been nearly impossible to produce and distribute millions of vaccines in such a short time period. Deservingly, Maurice Hilleman received the Distinguished Service Medal from the American military.

In addition to his incredible Asian flu pandemic prediction, Hilleman was afforded another chance to display his foresight in preventing and eventually eradicating another horrible viral disease: rubella. Rubella, which means “little red” in Latin, is denoted by a red rash, pink eye, and low fever, among other symptoms. Prior to the invention of its vaccine, it was considered a mild, common childhood virus. However, when the rubella

epidemic of 1963-1965 attacked America, researchers discovered that severe congenital birth defects resulted from the mother's contraction of the disease. Offit contends, "The virus permanently harmed. . . [the] unborn by infecting the liver, causing hepatitis; the pancreas, causing diabetes; the lungs, causing pneumonia; and the brain, causing mental retardation, blindness, epilepsy, and autism" (71). According to the Centers for Disease Control and Prevention, "During the last major rubella epidemic in the United States from 1964 to 1965, an estimated 12.5 million people got rubella, 11,000 pregnant women lost their babies, 2,100 newborns died, and 20,000 babies were born with congenital rubella syndrome (CRS)" ("Rubella in the U.S.").

A few years prior to this epidemic, Hilleman had signed a contract with Merck as the director of virus and cell biology research. Soon he began developing a rubella vaccine. Because of the complexities and toxicity of the virus, many years passed before Hilleman could attenuate the virus. Knowing that he did not want consequences similar to the 1963-1965 epidemic, it was imperative to develop and distribute the vaccine immediately. To make matters worse, based on his predictions, another epidemic was due between 1970 and 1973. Finally, in 1965, he determined that his rubella vaccine was sound enough to distribute. However, he encountered a dilemma.

An extremely wealthy, brazen philanthropist named Mary Lasker approached Hilleman and his co-researcher Max Tishler, beseeching them to abandon their vaccine. Because another rubella vaccine (the Meyer/Parkman rubella vaccine) was in the making, Lasker urged Hilleman, "You should get together and make one vaccine or else you'll have trouble getting yours licensed" (qtd. in Allen 238). Although Hilleman believed that his vaccine was safer and more effective than his competitors's vaccine,

he acquiesced and merged with Harry Meyer and Paul Parkman. Soon Hilleman obtained the vaccine and modified it himself. By 1969, Merck began distributing millions of doses of Hilleman's altered rubella vaccine, and the predicted rubella epidemic of the early 1970s never materialized.

Because Hilleman understood the tragic price of not having a rubella vaccine at all, he deemed it more important to relinquish his vaccine — even though he worked for years perfecting it — than to risk the lives of millions of people. Tony Fauci, director of the National Institute of Allergy and Infectious Diseases testified, “He was interested in the result and the product, not in taking credit for [it]. . . .When he had a vaccine or a discovery, his attitude was more, ‘Isn’t this an interesting discovery,’ rather than, ‘I, Maurice Hilleman, did this’” (qtd. in Offit 189). His humility caused a contagion effect (no pun intended), which led to the distribution of rubella vaccines worldwide. The World Health Organization acknowledged that as of 2014, the rubella vaccine was introduced to 140 different countries (“Immunization Coverage”). Additionally, in April 2015, rubella and congenital rubella syndrome were declared obliterated in the Americas. Without Hilleman's foresight and humility, it is possible that we would still be battling rubella today.

In addition to Hilleman's humility, he was also an altruistic and determined man (despite his stringent and inflexible manner of working). While still in the midst of developing the rubella vaccine, Hilleman had the opportunity to develop another similar vaccine. One night while sleeping soundly before leaving for a business trip to Central America, Hilleman's five-year-old daughter Jeryl Lynn shuffled into his bedroom and gently tapped her father on the shoulder, attempting to wake him. Her neck was sore

and very swollen. Hilleman opened his weary eyes, sat up, and felt the sides of her tiny neck. Immediately, he knew she had mumps. Coaxing little Jeryl Lynn back to bed, he comforted her and tucked her in. Leaving his daughter with the housekeeper (a year earlier, Maurice's wife Thelma had died of breast cancer), he selflessly drove twenty minutes to Merck. After gathering swabs, beef broth, and vials, he jumped back into his car and drove home. Finally arriving, he woke his daughter and swabbed her puffy throat. Even though it was nearly 2:00 A.M. by this time, Hilleman drove back to Merck, leaving the inoculated broth in the lab. This incidence would lead to the creation of the mumps vaccine in 1967, an indispensable discovery.

Mumps, like rubella, was considered a relatively harmless childhood virus. However, it was the repercussions of mumps that were devastating. Potentially causing paralysis, meningitis, seizures, and deafness, the virus could also render men sterile by infecting the testes. Similar to rubella, mumps affected pregnant women, causing birth defects and fetal death. However, after distributing Hilleman's Jeryl Lynn strain of the vaccine, Dr. Offit asserts, "By 2000, mumps vaccines had prevented almost one million children from getting mumps every year and had prevented meningitis and deafness in thousands. Furthermore, the introduction of Hilleman's mumps vaccine in Denmark, Finland, Norway, Sweden, Slovenia, Croatia, England, Wales, Israel, Poland, Romania, and Latvia has virtually eliminated the disease from those countries" (30). Today, especially in America, mumps is rare, and its prevalence is long forgotten.

Together with his rubella, mumps, and influenza vaccines, Hilleman developed over forty others. Soon millions of children were receiving many separate shots for each vaccine. Arthur Allen, a renowned American author, journalist, and editor asserts in his

book *Vaccine: The Controversial Story of Medicine's Greatest Lifesaver*, "In a field in which brilliant men have worked their entire lives without managing to bring a single vaccine to market, Hilleman developed three dozen. . . More than half the shots that American children receive in their first two years of life either started or spent a significant period of their development in Hillman's lab" (221). Because of the multiple injections and expenses of packaging, preparing, and distributing the vials, Hilleman was inspired to create a safe, triune vaccine for measles, mumps, and rubella, known as MMR. As a result of his brilliancy and determination developing vaccines, the scientific community revered and praised Hilleman for many years. However, extreme controversy regarding MMR — which still lingers today— was soon to follow.

In 1971, after years of painstaking research and meticulous development, Hilleman finally licensed his MMR vaccine. Initially, the public raved about the efficiency of the immunization, and millions of parents immunized their children. However, in 1998, despite its effectiveness, the accusations began. Dr. Andrew Wakefield, a popular English gastroenterologist, attended an illustrious press conference held by the Royal Free Hospital in London. In tandem with eleven co-authors, Wakefield began unraveling Hilleman's pertinacious work. Wakefield recalled the stories of twelve British children who had received the MMR vaccine and subsequently developed autism. In the press conference, he informed a large audience of his findings, purporting that Hilleman's MMR vaccine caused autism. Supposedly, the twelve children who had received the MMR vaccine developed intestinal problems because the vaccine had ruined the lining of their stomachs. The intestinal damage then allowed dangerous proteins to seep into

their bloodstreams, forcing the harmful chemicals to travel to the brain, therefore causing autism (Offit 160). The media was enthralled.

Dr. Wakefield's findings were published in the *Lancet*, a prestigious medical journal, and quickly gained immense popularity. Parents of autistic kids praised Wakefield, viewing him as a scientific hero. As word traveled swiftly, people in many countries rejected vaccinations altogether. Soon countless Americans also jumped on the anti-vaccine bandwagon. Sadly, the declining statistics of measles, mumps, and rubella began to surge again in certain countries (especially UK), negating the extensive work that Maurice Hilleman and his researchers performed. He received hate mail because the public believed that he was to blame for causing autism. Nevertheless, being a humble and dedicated man, he quietly continued his life, knowing that his MMR vaccine was harmless and indispensable to humanity. However, in 2004, the controversy turned another direction.

A reporter determined that Wakefield's findings were incomplete, fraudulent, and highly unethical. He asserted that although Wakefield claimed that all of the children participating in the study were "previously normal," the majority of the children in the purported study had pre-existing health issues, developmental delays, or close relatives diagnosed with mental problems. Additionally, when countless, unrelated scientific groups attempted to duplicate Wakefield's study, they all received parallel results: The study was fraudulent, and it could not be recreated. Dr. David Gorski, a surgical oncologist and professor of surgery at Wayne State University School of Medicine, wrote in an SBM article, "When it comes to the science, there is no doubt. No reputable scientist has been able to replicate Wakefield's findings, and there is a remarkable

convergence and agreement of findings of major studies looking for a correlation between MMR vaccination and autism: There ain't one" ("The General Medical Council"). To further exacerbate the study, Dr. Wakefield was accused (and proven) of serious professional misconduct. Investigative journalist Brian Deer exposed in an BMJ article, "Wakefield was working on a lawsuit, for which he sought a bowel-brain "syndrome" as its centrepiece. Claiming an undisclosed £150 (€180, \$230) an hour through a Norfolk solicitor named Richard Barr, he had been confidentially put on the payroll two years before the paper was published, eventually grossing him £435,643, plus expenses" ("How the Case Against the MMR"). The entire study was a mercenary ploy.

Fortunately, in February 2010, ten of the thirteen authors supporting Wakefield's study renounced their support, and the *Lancet* retracted the article. BBC News reported, "The General Medical Council ruled he had acted "dishonestly and irresponsibly" in doing his research" (Triggle). Andrew Wakefield was stripped of his license to practice medicine in the UK. Sadly, Maurice Hilleman, who was previously battling cancer, was not alive to witness the vindication of his MMR.

Even while ill, Hilleman displayed determination and altruism to the end. Knowing that heat-shock proteins destroyed cancer cells in mice, he was curious to know if they killed cancer cells in humans. Determined to find out, he dispatched his own cancer cells to a research company, hoping to conduct four weekly cancer experiments on himself with these proteins. Unfortunately, on April 14, 2005, he was unable to complete his final experiment.

Although Maurice Hilleman is no longer alive, it is as clear as a glass vial that his investment in humanity and leadership in vaccinology will live on. Implementing incredible foresight and quick action, he saved millions of lives during the Asian flu pandemic. While developing the rubella vaccine, his humility prevented the rubella outbreak of 1970, saving millions more lives worldwide. Although not all discussed in this paper, the contribution of his mumps, chickenpox, measles, meningitis, Hepatitis A , Hepatitis B, and pneumonia vaccines (along with countless other discoveries), continues to save countless children and adults globally from death, disease, and disability. Allen supports, “Hilleman. . . is a legend in the world of vaccination and public health, and for good reason: his products undoubtedly saved more lives than those of any other individual of the past half-century” (221). Even in the midst of the MMR controversy, Hilleman stood humbly by the effectiveness of his vaccines. Adel Mahmoud, an Egyptian parasitologist and former president of Merck veritably concludes, “Despite all of society’s negative pressures, vaccination has proven itself beyond the shadow of doubt to be the most logical way to control infectious diseases in a community” (qtd in Offit 185). Because of Hilleman’s persistence in research and development, his leadership in the vaccine industry, and his love for mankind and science, people all over the world are safer from microscopic killers. Millions of parents no longer worry over their children's lives because of looming diseases and death. The situation is no longer hopeless — Maurice Hilleman developed cures.

Works Cited

Allen, Arthur. *Vaccine: The Controversial Story of Medicine's Greatest Lifesaver*. New York. W.W. Norton & Company, Inc. 2007. Print.

Deer, Brian. "How the Case Against the MMR Vaccine was Fixed." *BMJ* 2011;342:c5347. The British Medical Journal, 5 January 2011. 5 May 2016.

Gorski, David. "The General Medical Council to Andrew Wakefield: 'The panel is satisfied that your conduct was irresponsible and dishonest.'" *Science Based Medicine*, 1 Feb 2010. Web. 4 May 2016.

"Immunization Coverage". World Health Organization, March 2016. Web. 5 May 2016.

Offit, Paul A. MD. *Vaccinated: One Man's Quest to Defeat the World's Deadliest Diseases*. New York. HaperCollins Publishers Inc, 2007. Print.

"Rubella in the U.S." Centers for Disease Control and Prevention, 31 March 2016. Web. 5 May 2016.

Triggle, Nick. "MMR Scare Doctor 'Acted Unethically', Panel Finds." *BBC News*. The BBC, 28 Jan 2010. Web. 5 May 2016.