

Vaccine Policy and Program Implementation:

Individual Rights

vs.

Public Health

By

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Abstract:

Through primarily an exploration of ways in which the modern medical use of vaccination as a preventive measure and public health have met in the late 19th Century to the early 21st Century, this paper discusses how infectious diseases threatening human quality of life interact with individual rights and the aims of public health. It shows that although controversy over early forms of immunization and the modern practice of vaccination is a complicated debate, the threat of infectious diseases presents now more than ever a complex problem for public health policymakers, considering the increased level of human motility, or the development of the “global community,” and bioterrorism. The anthrax scares immediately following September 11, 2001, as well as the ricin scares nearly two years later, and simply the threat of smallpox being used as a biological weapon, have raised serious concerns that the United States is grossly under-prepared for what many consider to be an imminent biological terrorist attack. Because of this realization of not being well-enough prepared for the worst possible scenario, the need for public discourse and negotiation over individual as well as public rights must be addressed, as the threat posed by infectious disease goes beyond naturally-spawned epidemics to include potential biological terrorist attacks.

Purpose:

The purpose of this paper is to address issues and trade-offs that must be weighed when considering the implementation of mass vaccination programs for the purpose of infectious disease containment, in light of the new challenges faced by the public health community in its dealing with infectious diseases. This paper shows how the area of vaccine policy has changed over history, and how individual rights often conflict with maintaining the health of the public. With the need for vaccination to assist in protecting public health now more important than ever, policymakers must determine how to develop policies that achieve the goal of public safety without infringing on individual freedom. By looking at the vaccine controversy surrounding smallpox, anthrax and influenza as global as well as U.S. military issues, public health policies may be better developed to fit the needs of modern public health.

Introduction and Background:

The concern that bioterrorism may be used by terrorists as a weapon is expressed in the debate over vaccination, yet controversy over vaccines has existed even when there was no perceived threat of a terrorist attack involving the use of biological weapons, such as smallpox, anthrax, Marburg, Ebola, etc. Opponents of compulsory vaccination programs throughout history have had serious doubts over the following issues in relation to vaccination: safety, efficacy, cost-effectiveness, individual control/choice over one's body, and perceived risk.

Although the United States remains the primary focus of public health policy in this paper, many historical cases of epidemics that have occurred in other parts of the world, that further illustrate the importance of public health, and the need for open discussion of the trade-offs involved in implementing public health policy, cannot be dismissed. Smallpox is an example of an infectious disease that has long been a famous public health issue throughout the world and the history of the human race, dating back to 1157 BC, when Pharaoh Ramses V died.¹ Its lengthy existence has presented innumerable opportunities for humans to attempt to protect people from the disease, the first known practice of which dates back to ancient China.²

In 1796, smallpox infection was the reason why a British physician named Edward Jenner³ became the first person to scientifically test the efficacy of “variolation, i.e. inoculation of a healthy person with tissue taken from the postules of an individual suffering from smallpox.”⁴ He did this by observing an eight-year-old boy, James Phipps, that after “scratching his arm with pus taken from the cowpox lesion of a milkmaid... the boy failed to show any reaction or illness... [when] six weeks later... Jenner scratched Phipps’ arm with pus from a smallpox lesion.”⁵ This process observed by Jenner, of a person’s apparent protection from contraction of the smallpox virus, after

¹ Georges C. Benjamin, “Smallpox vaccine policy: the national debate, Health Policy Update, dangers of smallpox as biological weapon trigger vaccination policy debate,” *Physician Executive*, p64(3), vol. 28, issue 5, Sept-Oct 2002, 2002 American College of Physician Executives. Available from Expanded Academic ASAP, George Mason University Libraries. <<http://mutex.gmu.edu:2053>> (12 April 2004).

² Christopher King, B.A., M.J., “Smallpox,” *Microsoft® Encarta® Online Encyclopedia 2004*, ©1993-2004 Microsoft Corporation. <<http://encarta.msn.com>> (2 May 2004).

³ King, “Smallpox.”

⁴ P.H. Streefland, “Public doubts about vaccination safety and resistance against vaccination,” *Health Policy*, pp. 159-172, vol. 55, no. 3, March 2001, 2001 Elsevier Science Ireland Ltd. Available from George Mason University Libraries. <www.elsevier.com/locate/healthpol> (11 April 2004).

⁵ King, “Smallpox.”

exposure to a related strain (cowpox), inspired the use of the word ‘vaccination,’ in place of ‘variolation,’ with the Latin word *vacca* meaning “cow.”⁶

Lois Pasteur, however, developed the first official vaccinations, through his observations of cholera bacteria,⁷ 83 years after Jenner’s experiment involving cowpox. Pasteur also “established prophylactic inoculations for anthrax, swine erysipelas, and rabies; afterward, other researchers found vaccines for the bubonic plague and typhoid.”⁸ While not all of these diseases have been eradicated from the earth, Pasteur’s discoveries helped to curb the damage incurred by epidemics of the diseases. Smallpox’s restriction of contraction to the human race makes it unique, and thus enabled the World Health Organization (WHO) to lead a world-wide mission “to eliminate smallpox [and] kill it off as a naturally occurring disease in 1977 in Somalia.”⁹ New York’s 1947 smallpox outbreak was the last in the U.S.,¹⁰ and the country’s final case was reported in 1949.¹¹ Since the U.S. alone had successfully eradicated the disease twenty-five years later in 1972, the U.S. discontinued routine vaccination for smallpox.¹² Official world eradication of smallpox is recorded as having taken place in 1980.¹³

⁶ King, “Smallpox.”

⁷ Gostin, Lawrence O., Public Health Law Power, Duty, Restraint, p. 175, Berkeley, Los Angeles, London: University of California Press; New York: The Milbank Memorial Fund, 2000.

⁸ Gostin, Public Health Law..., 2000.

⁹ Benjamin, “Smallpox vaccine policy...”

¹⁰ Benjamin, “Smallpox vaccine policy...”

¹¹ Anthony S. Fauci, “Smallpox Vaccination Policy – The Need for Dialogue,” *The New England Journal of Medicine*, pp. 1319-1320, vol. 346, no. 17, 25 April 2002, 2002 Massachusetts Medical Society. Available from Ovid, George Mason University Libraries. <<http://gateway1.ovid.com/ovidweb.cgi>> (21 April 2004).

¹² Benjamin, “Smallpox vaccine policy...”

¹³ Benjamin, “Smallpox vaccine policy...”

Eradication of smallpox was no easy task. In fact, at around the turn of the century, in 1902, in the midst of the last epidemic in Boston (1901-1903),¹⁴ the first legislation in the United States addressing compulsory vaccination laws was brought forward.¹⁵ The advice of healthcare and public health officials in ensuing testimony convinced the state to uphold the compulsory vaccination laws. In the case *Jacobson v. Massachusetts*, in 1905, the state's ability to vaccinate its residents was supported if "it could do so to protect the public in the case of a dangerous communicable disease."¹⁶ Thus, despite widespread skepticism of the administration of the smallpox vaccine, the state government felt that in the case of an outbreak, its responsibility is to protect the population from further spread of the disease.

While the history of smallpox and its prevention seems to dominate the vaccination policy debate and history, for a short time, the focus on smallpox died down with its confirmed eradication. More recently (within the past century), but before the terrorist attacks of September 11, 2001, many other diseases presented different threats. For example, anthrax is another potential agent of biological warfare that possesses its own vaccine controversy.

In 1997, the Department of Defense (DoD) implemented its Anthrax Vaccine Immunization Program (AVIP), the policy of which "is to immunize military personnel, Emergency-Essential DoD civilians and contractor personnel, assigned to or deployed for more than 15 days in higher threat areas whose performance is essential for certain

¹⁴ Michael R. Albert, M.D., et al, "The Last Smallpox Epidemic in Boston and the Vaccination Controversy, 1901-1903," Occasional Notes, *The New England Journal of Medicine*, pp. 375-379, vol. 344, no. 5, 1 February 2001, 2001 Massachusetts Medical Society. Available from Expanded Academic ASAP, George Mason University Libraries. <www.nejm.org> (21 April 2004).

¹⁵ Albert et al, "The Last Smallpox Epidemic..."

¹⁶ Albert et al, "The Last Smallpox Epidemic..."

mission critical capabilities.”¹⁷ The program only requires vaccination of persons being deployed (sent) to what are considered high-risk regions of the world for contracting malaria. This policy not only applies to the AVIP, but it also applies to the Smallpox Vaccine Policy (SVP).¹⁸ With the vaccines that have reduced risk of being contracted while in the U.S., a per-region assessment is applied to countries in which the risk is high. The very issue of perceived risk is a main reason why legal action was proposed against the DoD for implementing the AVIP. This level of resistance to the vaccine led to a short period of inactivity in the program, in which Secretary of Defense Donald Rumsfeld officially halted the program on December 23, 2003,¹⁹ and was resumed on January 7, 2004.²⁰

Currently, other vaccines in the military include those for influenza and Hepatitis A, both of which are required for all active duty military personnel.²¹ This inclusive requirement has been implemented because both diseases are threats to all active duty military personnel, as a result of the clustering of people, which results in continuous close contact among servicemembers. Therefore, vaccine programs differ even in the military’s vaccine programs. All vaccine programs in the military, however, do allow exemptions for those at a higher risk of adverse reactions. Therefore, the majority of

¹⁷ “Anthrax Vaccine Immunization Program Information,” 14 January 2004, Military Vaccine Office (MILVAX), Department of Defense (DoD).
<<http://www.vaccines.mil/documents/381ATXinfopamphlet.pdf>> (2 May 2004).

¹⁸ Benedict M. Diniega, M.D., MPH, Program Director, Disease Prevention, Office of the Assistant Secretary of Defense (Health Affairs), Clinical & Program Policy. Interview date: 29 April 2004.

¹⁹ “Anthrax Vaccine Immunization Program Resumption,” Memorandum, Signed by David S. C. Chu, Undersecretary of Defense, Personnel and Readiness, 7 January 2004, MILVAX, DoD.
<<http://www.vaccines.mil/documents/372AVIPResumption.pdf>> (2 May 2004).

²⁰ “AVIP Resumption,” 7 Jan 04.

²¹ Diniega, 29 Apr 04.

military personnel are required to receive certain vaccinations, depending on which disease is being considered, as well as the individual person's health conditions.

Safety, efficacy and cost-effectiveness are other issues faced by policymakers who are developing public health programs that use vaccines as a preventive measure, and are more comprehensively discussed, outside of those issues presented by smallpox, anthrax and U.S. military personnel.

Methodology:

After conducting an analysis of vaccination from an international perspective in the Fall Semester of 2003, I refined my focus on the practice of vaccination to carry out a more thorough analysis of vaccine policy, particularly as it traditionally has been formulated in the U.S. Recognition, however, of the contributions from around the world to the medical and scientific apparent advancement of vaccination and immunization in general, is necessary to paint a more complete picture of circumstances in which vaccination programs have been successfully implemented. Similar to most of human history, the experiences that make up the history of vaccination programs consist of trials and errors, successes and failures. Consequently, a review of vaccine history requires a description of the most well known individual infectious diseases for which vaccines were developed, in order to control the spread of infectious diseases. Transmissibility from person to person, animal to animal, animal to person, and vice versa is only one example of the complexity of factors that must be addressed when considering courses of action to take in the implementation of vaccine policy. Mortality rates and potential

severity of damage to survivors, caused by the spread of certain diseases, are also important.

An exhaustive list of events of outbreaks in relation vaccine policy goes beyond the scope of my research and paper, but I have attempted to cover the major highlights in the history of vaccine policy, in order to illustrate the common issues that are involved in policy development, and how future development may benefit from the failures and successes of the past.

In my research, I consulted a variety of sources of information. First, I conducted an extensive internet-based search of all literature discussing vaccine policy, its history, current applications, and recommendations for future policy development. As the topic of this paper is an ever-evolving public health issue, I found that library resources could not adequately meet my requirement for access to the most current information. Journal articles, now readily available through the World Wide Web, hold the primary expertise on current medical issues. Therefore, with guidance from the Fenwick Library (GMU Fairfax Campus) reference desk on ways in which to search the University's web resources, I pursued primarily journal articles, as well as other forms of media, such as daily news. Scientific and medical journal articles were preferable to advocacy groups' websites and pamphlets, due to the increased credibility provided by the scientific community. On the other hand, I did explore a few of the viewpoints of advocacy groups predominantly through article searches conducted using "MSN Encarta Premium Magazine Center Library of current and archived magazine and news articles."²²

²² <http://web2.infotrac.galegroup.com>

Websites of other groups, such as the Task Force on Community Preventive Services,²³ a non-federal group appointed by the Director of the CDC,²⁴ were highly useful.

Second, looking into current vaccine policies and commentary found in news media on the internet was necessary to supplement scientific and medical research articles. Since I found that much of current U.S. vaccine policy exists in the form of recommendations by various agencies, I also visited the websites of the CDC's Advisory Committee on Immunization Practices (ACIP),²⁵ the DoD's Military Vaccine (MILVAX) Program,²⁶ and the American Academy of Pediatrics.²⁷

Finally, I conducted an interview with Benedict M. Diniega, M.D., MPH, Program Director, Disease Prevention, from the Office of the Secretary of Defense (Health Affairs), Clinical & Program Policy, in order to gain greater insight on the military perspective on vaccination policy: how the military addresses the subject, and its what its reasons are for implementing its policies.²⁸ We also discussed vaccine policy more generally, to include ways in which vaccine policy can be mandatory without directly imposing on individual rights (i.e. camp attendance, and school rules implemented for children).²⁹ I also spoke informally with Jeff Prather of Deployment

²³ "Vaccine Preventable Disease," *Guide to Community Preventive Services*, Task Force on Community Preventive Services. Page last updated 18 December 2003. <<http://www.thecommunityguide.org>> (7 May 2004).

²⁴ "About Us," *Guide to Community Preventive Services*, Task Force on Community Preventive Services. Page last updated 18 December 2003. <<http://www.thecommunityguide.org/about/default.htm>> (7 May 2004).

²⁵ <http://www.cdc.gov/nip/ACIP/default.htm>

²⁶ <http://www.vaccines.mil/default.aspx>

²⁷ <http://www.aap.org/>

²⁸ Diniega, 29 Apr 04.

²⁹ Diniega, 29 Apr 04.

Health Support Directorate, on March 30, 2004,³⁰ who assisted in providing ideas useful in my quest for information provided in this paper.

Results:

Ways in which vaccine programs have been implemented have improved over time, but many of the themes underlying both sides of the issue remain the same. Throughout vaccine policy literature, three factors are the most common reasons why some programs have been implemented successfully, and why others have encountered a great amount of resistance: target population, type of disease, and cost-effectiveness.

Age, race, region, and culture are only a few of the characteristics of target populations that have affected vaccine policy implementation. For the most part, past programs that have considered the target population when devising a public health strategy, have been the most successful. More recently, however, increased ability of persons to travel has further complicated the population issue. In fact, international travel for the purpose of participating in the “annual Muslim pilgrimage (the Hajj) in 2000, [resulted in] more than 400 cases of W135 [strain meningococcal infection] in pilgrims and in their close contacts... [as] reported from 16 countries.”³¹ Saudi Arabia’s policy, in reaction to this type of outbreak, the first of which was caused by serogroup A (MenA) in 1987,³² was to make vaccination for the disease a requirement for obtaining a Hajj visa.³³

³⁰ Jefferson B. Prather, PE, CIH, Senior Analyst, Force Health Protection, Deployment Health Support Directorate, Office of the Secretary of Defense (Health Affairs), Force Health Protection and Readiness. Discussion date: 30 March 2004.

³¹ Ronald Gold, “Epidemiology of meningococcal disease in light of recent Hajj-associated outbreaks,” Editorial Commentary, Editorial, *Clinical Infectious Diseases*, pp. 684-686, vol. 36, issue 6, 15 March 2003, 2003 University of Chicago Press. Available from Expanded Academic ASAP, George Mason University Libraries. <http://mutex.gmu.edu:2096> (24 April 2004).

³² Gold, “Epidemiology...”

This policy is still in effect, and the vaccine has been changed to include the more modern transmissible strains of the disease.

In addition to some international groups being more prone to contract specific diseases, some vaccine-preventable diseases are more prevalent in smaller, local groups than in others. Studies conducted on the rates of incidence of smallpox, for instance, in the Boston outbreak of 1901-1903 found that even at that time, increased rates of incidence occurred in African-American residents, where out “of 243 consecutive patients with smallpox who were admitted to the smallpox hospital on Southampton Street, 18 (7 percent) were [African-American], although [they] made up only 2 percent of Boston’s population in 1900.”³⁴ In addition, 49 percent of 238 “patients whose birthplace was identified... were immigrants, whereas only 35 percent of the city’s residents were foreign-born.”³⁵ This may just be another example of how people of lower socio-economic status do not have the same access to public health care as do those of higher socio-economic status.

Rates of meningitis just in the U.S. vary by age, region, and certain groups. The CDC and the American Academy of Pediatrics recommend that college students, especially intended residents of dormitories, and other “high-risk groups such as persons with terminal complement deficiencies or asplenia and those who plan to travel to areas where there is an epidemic”³⁶ of the disease, receive the vaccine. Not all people are required to get the vaccine for this very reason of differing rates among demographic

³³ Gold, “Epidemiology...”

³⁴ Albert et al, “The Last Smallpox Epidemic...”

³⁵ Albert et al, “The Last Smallpox Epidemic...”

³⁶ Paul A. Offit and Georges Peter, “The Meningococcal Vaccine – Public Policy and Individual Choices,” Sounding Board, *The New England Journal of Medicine*, pp. 2353-2356, vol. 349, no. 24, 11

groups. Opponents of the meningococcal vaccine claim that the multiple expensive injections that are involved in vaccination against meningitis is one reason why parents choose not to have their children vaccinated against the disease, if they do not belong to one of the listed high-risk groups.³⁷ On the other hand, children should be considered a high-risk group, according to the statistics offered by Offit and Peter:

since 1960, the annual incidence of meningococcal disease in the United states has been 0.9 to 1.5 cases per 100,000 population. The incidence is highest among infants less than 1 year of age, among whom it was reported in 2001 to be 7.1 cases per 100,000 population, as compared with rates of 1.8, 0.7, and 0.7 per 100,000 in persons 2 to 4 years, 5 to 17 years, and 18 to 34 years of age, respectively.³⁸

If data indicate that children have a higher potential to contract the disease, the multiple injections should be made more readily available, through increased access to information for parents, and more importantly, a less expensive version of the vaccine.³⁹ An ultimately more effective vaccine with fewer doses and with immunity to more strains of the disease also needs to be developed.⁴⁰

As evident in the above information concerning vaccines, situations vary. Diseases differ in their levels of virulence, which is part of the reason why the meningitis vaccine has been the subject of many vaccination policy debates. It has a reputation of “rapid onset, a case fatality rate of 10 percent, a rate of sequelae of 11 to 19 percent, and a capacity to inspire fear in a community.”⁴¹ Smallpox is also highly virulent, and extremely contagious. The smallpox vaccine is also more dangerous than others are, with an increased chance of suffering adverse effects from receiving it, because it contains live

December 2003, 2003 Massachusetts Medical Society. Available from Ovid, George Mason University Libraries. <<http://gateway1.ovid.com/ovidweb.cgi>> (28 March 2004).

³⁷ Offit and Peter, “The Meningococcal Vaccine...”

³⁸ Offit and Peter, “The Meningococcal Vaccine...”

³⁹ Offit and Peter, “The Meningococcal Vaccine...”

⁴⁰ Offit and Peter, “The Meningococcal Vaccine...”

vaccine, or vaccinia. Vaccinia is “a live orthopox virus vaccine, [and] is highly effective against smallpox if given pre-exposure... [but it] is not without risks. It can result in both death and disability in a small number of people.”⁴² Because of the risks associated with receiving the smallpox vaccine, the risks of contracting the disease must outweigh the risks associated with having an adverse reaction to the vaccine.

Finally, culture is an important aspect of target populations, with perhaps the most influential cultural factor being religion. Individuals who object to vaccination on grounds of religious belief are more likely to speak out among certain populations. In the late 1700’s and early 1800’s, objections to variolation were based on a perception of uncleanness (which may or may not be attributed to the practice of religion), due to being exposed to an animal by-product, and of interference with religious beliefs, due to a fear that the will of God would be interrupted.⁴³ Later, it was found that the practice of variolation was important to the ability of public health programs to gain the trust of the public, when modern vaccination programs were first implemented, especially in populations where religion was a major factor.⁴⁴ When vaccine programs were implemented on a larger scale in countries such as India, for instance, because much of the population had already been used to the idea of immunization in the form of variolation, public resistance was not as strong.⁴⁵

In the case of the military, some say that it possesses its own culture, making it an American sub-culture, so to speak. If this is true, its vaccine policy is also unique, because the DoD cites circumstances that require immunization particularly for its

⁴¹ Offit and Peter, “The Meningococcal Vaccine...”

⁴² Benjamin, “Smallpox Vaccine Policy...”

⁴³ King, “Smallpox...”

⁴⁴ Streefland, “Public doubts...”

employees, not considered necessary for most of the rest of the U.S. public. The factors upon which the military's mandatory anthrax and smallpox vaccine programs rely are "when it is known that the vaccine or medical measure is safe and effective, and exposure or possible exposure to an agent poses a real risk."⁴⁶ It also is concerned about the health of one or a few persons who have contracted a disease as weakening the health of the entire group, according to Dr. Diniega.⁴⁷ Therefore, military readiness, through good health, is considered a top priority for military health officials.⁴⁸

Those who are granted waivers from receiving any particular vaccine, however, are not exempted from deployment to areas considered at a high risk for anthrax exposure. Also controversial, this means that if a non-immunized servicemember, who has been granted a waiver, is deployed to a country in which he/she is then exposed to anthrax, the military cannot be held responsible if the person contracts the disease, because the program is otherwise mandatory. Dr. Diniega states that the DoD anthrax program has had a high rate of success.⁴⁹ In comparison to the United Kingdom's 25% protection rate in its voluntary military anthrax vaccine program, the mandatory program of the U.S. has a 95% immunization rate among its military servicemembers (and this indicates a 95% health readiness rate if a biological attack using anthrax were to take place).⁵⁰

⁴⁵ Streefland, "Public doubts..."

⁴⁶ "AVIP Information," 14 Jan 04.

⁴⁷ Diniega, 29 Apr 04.

⁴⁸ Diniega, 29 Apr 04.

⁴⁹ Diniega, 29 Apr 04.

⁵⁰ Diniega, 29 Apr 04.

Discussion:

Several epidemics in the past century represent points at which core public health goals have been challenged, citing an individual's right to maintain bodily integrity.⁵¹ This charge strikes at the heart of the main goal of public health policy-making, which is to protect the population at-large, against the threat of infectious diseases. Thus, one of the most important lessons that can be learned from past vaccine policy experiences is the need for achieving and maintaining public trust. In fact, public trust, through the consideration of individual concern, is crucial to policy program implementation.

Obtaining public trust has been difficult partially because vaccination was associated with public health officials using physical force, despite that instructions for home visits in the "house-to-house"⁵² vaccination program in Boston in the early 1900's included warnings against using force in the administration of vaccines to individuals.⁵³ In addition, because a stigma was attached to smallpox under the notion that homeless persons were the primary reason for the spread of the disease, lack of individual rights was almost implicit in efforts to vaccinate the homeless.⁵⁴ In Figure 1, below, it is evident that the outbreak was successfully curbed, in comparison to longer preceding outbreaks, and it became the last epidemic in Boston. It is obvious, though, that its successes are at least somewhat attributable to the unethical means through which the program was implemented.

⁵¹ Gostin, *Public Health Law*, 2000.

⁵² Albert et al, "The Last Smallpox Epidemic..."

⁵³ Albert et al, "The Last Smallpox Epidemic..."

⁵⁴ Albert et al, "The Last Smallpox Epidemic..."

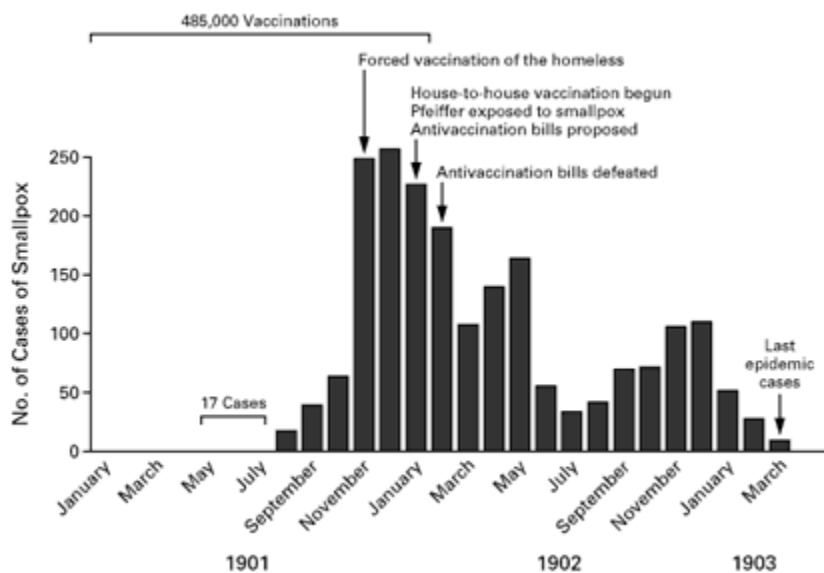


Figure 1. Distribution of Smallpox Cases in Boston during the Epidemic of 1901 through 1903. Data are from the annual reports of the Boston Health Department.⁵⁵

In effect, vaccination policy in the early 1900’s had evolved to uphold protection of the population at-large, but at the cost of minority groups whose rights were violated, through the use of force and social stigmatization. A misperception other than that of homeless people being the cause of smallpox outbreaks, was one held even by a prominent doctor by the name of “Immanuel Pfeiffer, a Danish immigrant.”⁵⁶ He believed that those who are in good health are immune to contracting the disease, but this inference was dispelled when he contracted and died of smallpox after walking, non-immunized, through a hospital full of smallpox patients.⁵⁷

Another aspect of most compulsory vaccination programs is that they are seen as the responsibility of the government. Usually this is true, for compulsory programs

⁵⁵ Albert et al, “The Last Smallpox Epidemic...”

⁵⁶ Albert et al, “The Last Smallpox Epidemic...”

⁵⁷ Albert et al, “The Last Smallpox Epidemic...”

involve legal stipulation, and legal disciplinary action or sanction if one does not comply. This idea is hardly ever questioned, yet when the government is then obligated to effect policies to protect public health, its authority in affecting individual action becomes questionable. Most individuals do not wish to be exposed to a massive outbreak of any infectious disease, but the principle alone of the relinquishment of individual choice imposed by the government is enough to motivate people to resist vaccination. This is one of the very reasons why state government has played such a large role in vaccination programs. Federal government involvement is seen as too strong of a measure, and therefore only exists in the form of recommendations on how state governments should act to contain infectious disease, and what decisions should be made by individuals. The responsibility is dispersed in this way among communities, and state jurisdiction.⁵⁸

The DoD's semi-compulsory AVIP became less controversial in comparison to the later Smallpox Vaccine Program (SVP). Both programs, however, have by far stirred the most unrest among the general population and Congress, not to mention in the military, which must take disciplinary action against those who refuse the vaccine.⁵⁹ Although not all compulsory vaccinations use coercion through disciplinary action against those who do not comply, from the military's stance of protection of servicemembers who have been placed in regions in which they are at higher risk of contracting a disease than they would be in the U.S., it is seen as necessary in order to protect as many servicemembers as possible.

⁵⁸ "Achievements in Public Health, 1900-1999: Changes in the Public Health System," *MMWR Weekly*, pp. 1141-1147, vol. 48, no. 50, 24 December 1999. Page last reviewed, 2 May 2001, Centers for Disease Control and Prevention. <<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4850a1.htm>> (7 May 2004).

⁵⁹ "AVIP Information," 14 Jan 04.

On the other hand, those who oppose this method of program implementation feel that “the fundamental objection to the shots... is lack of informed consent.”⁶⁰

Cummings, an advocate against AVIP states that a reason why many are apprehensive of receiving the vaccine is that some feel that the military did not inform its servicemembers of their receipt of vaccinations in the Gulf War.⁶¹ From a practical perspective, other opponents of the program are leery of the multiple doses over a long period, which are unavoidable (at this time) characteristics of the vaccine’s ultimate effectiveness.⁶²

Despite the heated debate surrounding the military anthrax and smallpox vaccine programs, vaccination programs have existed in the military for decades, especially considering that the military has required for years, vaccination of servicemembers for other diseases, such as “tetanus, typhoid and yellow fever vaccines.”⁶³ Moreover, military program implementation is based on FDA approval (indicating safety and effectiveness), and supported by CDC recommendations.⁶⁴

Conclusion:

Overall, the use of vaccines throughout the world has provided many benefits and has improved quality of life throughout the world. Vaccination even has been listed as the highest item in the *Morbidity and Mortality Weekly Report (MMWR)*’s “Ten Great

⁶⁰ Mary L. Cummings, “Anthrax and the Military,” *The Nation*, p. 24, vol. 275, issue 1, 1 July 2002, 2002 The Nation Company L.P. Available from MSN Encarta Premium Magazine Center, Library of current and archived magazine and news articles. <<http://web2.infotrac.galegroup.com>> (3 May 2004).

⁶¹ Cummings, “Anthrax and the Military.”

⁶² Diniega, 29 Apr 04.

⁶³ “AVIP Information,” 14 Jan 04.

⁶⁴ “Vaccine Information Statements,” National Immunization Program, Centers for Disease Control, <<http://www.cdc.gov/nip/publications/VIS/default.htm#flu>> (2 May 2004).

Public Health Achievements -- United States, 1900-1999.”⁶⁵ Vaccines are an excellent example of the benefits of modern medical science used in the implementation of public health policies, and their role in public health is even more important as the threat of terrorist attacks and mutating strains of viruses and bacteria continue to taunt human health. Smallpox, to which a large amount of this paper was devoted, is an incredibly virulent and life-threatening disease, and its eradication and the use of different techniques to combat the disease in conjunction with compulsory vaccination programs, represents one of the greatest success stories of public health. The history of smallpox and the innumerable epidemics that served as the vehicles for vaccination policy debate, can be a highly useful tool in the development of future vaccination policy.

Unfortunately, the disease is not eradicated from general public health concern, for now an entirely different threat is made even more daunting in light of its eradication. While smallpox vaccine policy originally had been implemented to stop the spread of the disease, now a policy must be decided upon by public health officials either “to vaccinate the entire population and effectively eliminate the threat of such an attack or to implement a restricted program of vaccination only after an attack has occurred or if the likelihood of an attack is deemed high by federal law enforcement or intelligence authorities.”⁶⁶ It is probably infeasible at this point to vaccinate the entire U.S. civilian population, from the perception of reduced risk of disease contraction, but a definitive plan does need to be finalized, in order to prepare for a potential biological attack using smallpox.

⁶⁵ “Ten Great Public Health Achievements – United States, 1900-1999,” *MMWR Weekly*, p. 1141, vol. 48, no. 50, 24 December 1999. Page last reviewed, 2 May 2001, Centers for Disease Control and Prevention <<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4850bx.htm>> (7 May 2004).

⁶⁶ Fauci, “Smallpox Vaccination Policy – The Need...”

Although it seems to many that public health has only become important within the past 50 to 100 years, with the unprecedented growth of the global population, the increased motility of people to all parts of the world, and the threat of bioterrorism, analysis of immunization history reveals that for a long time, humans have grappled with the dilemma of groups vs. individuals. They also have struggled to recognize that human health, social behavior, and the environment are interdependent. Consequently, effective implementation of public health policies require on the part of the individual a greater understanding of the complexities presented by the existence of infectious diseases such as smallpox and influenza. This can be achieved through public health policies aimed toward encouraging individual responsibility in maintaining one's own health. More cost-effective vaccination programs are also greatly needed, to encourage people to obtain vaccination against diseases only more recently viewed as public health threats.

Progress is being made toward implementing a more thorough influenza vaccination program for the U.S. civilian population. A very important first step was recently taken, when the ACIP published recommendations that children aged from six months to two years receive the influenza vaccine.⁶⁷ The ACIP's recommendations follow a highly publicized fall/winter 2003-2004 flu season, in which many experts had thought an unprecedented outbreak since the early 20th Century would occur. This did not prove to be true, after all, but it was significantly feared.⁶⁸

Finally, vaccines are only one preventive practice used in public health programs designed to combat the spread of infectious diseases. Many other practices, such as

⁶⁷ "Flu shots added to infant vaccine list," Health Cold and Flu, *MSNBC*, 30 April 2004, 2004 Reuters Limited. <<http://www.msnbc.msn.com/id/4871474/?GT1=3391>> (2 May 2004).

quarantine, screening, testing and case reporting must be implemented concurrently, in order to fully increase the effectiveness of vaccine programs.⁶⁹ The below figure, “Logic Framework,”⁷⁰ lays out an ideal scenario for public health programs targeted toward fighting infectious disease, because it shows the relationship among a community’s population, its needs, and what can be monitored within a population in order to base health policy decisions on population-specific needs.

In conclusion, current and future public health policymakers will have newer responsibilities toward protecting the health of the public, and vaccination is only one method by which this may be accomplished. Only through adjacent programs of the application of epidemiology and environmental surveillance, comprehensive education programs in which the personal role in preventive techniques is emphasized, and the goal of achieving greater cost-effectiveness, will the threat of infectious disease be more manageable.

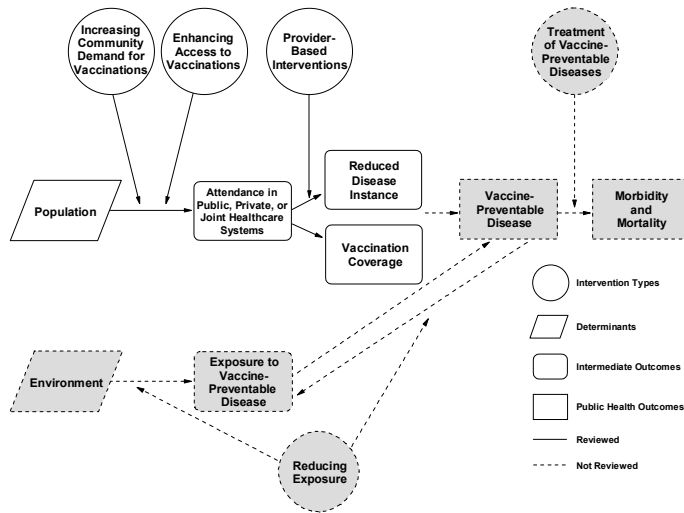
⁶⁸ “Flu vaccine results leave experts uncertain,” Health Cold and Flu, *MSNBC*, 18 February 2004, 2004 The Associated Press. <<http://www.msnbc.msn.com/id/4305143/>> (2 May 2004).

⁶⁹ Gostin, *Public Health Law*, 2000.

⁷⁰ “Evidence-based review: what works for adult immunization: Findings from the Task Force on Community Preventive Services,” Slide Sets, Vaccine Preventable Disease, *Guide to Community Preventive Services*, Task Force on Community Preventive Services. Page last

Logic Framework

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updated 18 December 2003. <<http://www.thecommunityguide.org/vaccine/vpd.ppt>> (7 May 2004).