

# From Miracle To Mishap:

The Cutter Incident and its

Impact on Modern Vaccine Safety Standards

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This year, I wanted to explore a topic that was both outside of my comfort zone and relevant to modern times. The topic of vaccines first caught my attention after I heard about the resurgence of measles and other preventable diseases in America. From there, I encountered many sources which vaguely referenced a past safety issue with the polio vaccine. I decided to dig deeper, and discovered that this ‘issue’ was the Cutter Incident, a catastrophe in which over 120,000 people received polio vaccines containing live virus. I soon realized that the Cutter Incident was both a perfect fit for this year’s theme of Triumph and Tragedy, as well as story waiting to be told.

I started my research by looking at secondary sources, especially books, to get a general idea of the topic. Next, I turned to primary documents and accounts, including those found in the Alan Mason Chesney Medical Archives, the U.S. National Library of Medicine, and the National Archives for more specific information including statistics and correspondences between government officials. I also wanted to hear from people who could provide different perspectives regarding the incident, which led to me reaching out to Dr. Peter Salk, Dr. Paul Offit, and Anne Gottsdanker for interviews. Dr. Salk and Ms. Gottsdanker were especially helpful since, as the son of Jonas Salk and a victim of the Cutter Incident respectively, they were able to give perspectives that I could not find in any other source.

I felt a documentary was the best medium to present my research because of the breadth and depth of audiovisual sources available. To structure my project, I first focused on the events of the incident itself, then branched out to the history of the polio virus and the development of the polio vaccine to provide context. After that, I focused on the improvement of regulations after the incident to show its legacy. When creating the film, I incorporated primary videos and

newspaper clippings to illustrate various events, and added clips from my interviews to help emphasize some of my points.

Jonas Salk's polio vaccine was in almost every way a significant triumph for the American people, giving humanity a way to fight back against a seemingly unconquerable disease.

Similarly, the Cutter Incident was a quintessential tragedy. Not only did it result in the physical harm of numerous children, the resulting halt in the nationwide vaccination program prevented millions more from receiving protection from the upcoming polio season. However, in the long run, the Cutter Incident allowed the government to see that their existing protocols and regulations were insufficient, which naturally led to the improvement of these protocols and regulations. Ultimately, the combination of the polio vaccine and the Cutter Incident was responsible for many of the aspects of public health we take for granted nowadays, and it is likely that those aspects will continue to impact lives for many generations to come.

## Annotated Bibliography

### Primary Sources

#### **Audiovisual:**

*A Special Report on Polio.* NBC Television Network, 1955. *Library of Congress*, [www.loc.gov/item/mbrs00056792/](http://www.loc.gov/item/mbrs00056792/). Accessed 11 Feb. 2019.

This source was a report which featured Oveta Culp Hobby and Leonard Scheele who spent the majority of the time explaining the mechanics of the polio vaccine and how it was not guaranteed to be 100% effective. This gave me a good example of how the people who were in charge at the time of the Cutter incident attempted to lessen the negative press by arguing that there was never a full guarantee of safety or efficacy. I used a clip of Scheele and Hobby sitting next to each other while talking about the regulators' role in the Cutter incident in my documentary.

*April 12 1955: Polio Announcement.* Thomas Francis, CBS, 1955. *historyofvaccines.org*, [www.historyofvaccines.org/content/polio-vaccine-results-announced](http://www.historyofvaccines.org/content/polio-vaccine-results-announced). Accessed 18 Feb. 2019.

This video clip from a CBS live news report of Thomas Francis' announcement for the 1954 polio vaccine field trial helped demonstrated how invested the American people were in this vaccine and how important this announcement would be for the history of medicine in America as a whole. The video features a fully packed audience as well as a horde of reporters. I used footage of the reporters swarming the people who are handing out briefing packets to show just how important the field trial was to the American people, and how the success of the field trial was a huge triumph for America.

*Children with Polio Pioneers Button.* 1955. *Bentley Historical Library*, [quod.lib.umich.edu/cgi/i/image/api/image/bhl:HS3718:HS3718/full/res:1/0/native.jpg?attachment=1](http://quod.lib.umich.edu/cgi/i/image/api/image/bhl:HS3718:HS3718/full/res:1/0/native.jpg?attachment=1). Accessed 10 May 2019.

This image depicted two smiling young children holding onto a Polio Pioneer button. I used this image right before my title slide to help demonstrate that despite the tragedy of the Cutter incident, the cumulative impact of the polio vaccine was overwhelmingly positive.

*Dr. Alexander Langmuir and his Polio Surveillance Unit.* 1955. WHO Polio Committee and Correspondence, Alan Mason Chesney Medical Archives, Johns Hopkins Medical Archives, Box 7, Folder 16.

This image shows Alexander Langmuir and members of the Poliomyelitis Surveillance Unit at a table, presumably analyzing data regarding the Cutter incident. I used this photo when introducing Langmuir, the EIS (Epidemic Intelligence Service), and their contributions to controlling the fallout of the Cutter incident.

*Epidemic's Children*. Produced by National Foundation for Infantile Paralysis, 1940. *Periscope Films*. Accessed 26 Feb. 2019.

This short film which was created to raise support for the March of Dimes foundation helped me to understand just how prolific the polio virus was during that time. It included many infographics and maps which track how much the virus has spread and increased over the years. I used footage of the infographics as well as polio patients in iron lungs from this short film in my documentary when talking about the growth of polio in America.

*His Fighting Chance*. Produced by National Foundation for Infantile Paralysis, 1949. *Periscope Films*. Accessed 28 Apr. 2019.

This video, which requested viewers to donate money to the National Foundation for Infantile Paralysis, depicted many polio victims and their attempts at rehabilitation. It included a small section of narration from Eleanor Roosevelt, who emphasized that progress for polio victims was slow and expensive. I used footage from this video to show how devastating polio was to the American people.

*Jonas Salk Virus Research Laboratory Photographs*. 1954. *Mandeville Special Collections Library*, [library.ucsd.edu/speccoll/findingaids/mss0001.html#aspace\\_ref6238\\_lew](http://library.ucsd.edu/speccoll/findingaids/mss0001.html#aspace_ref6238_lew). Accessed 14 Apr. 2019.

This collection of images included many pictures of Salk and other researchers handling lab equipment and working on the polio vaccine. I used many pictures from this collection throughout my documentary, especially when I was introducing Jonas Salk and the methods he used in his laboratory.

*Lab Technicians Working on Polio Vaccine*. 1954. *Smithsonian Institute*, [learninglab.si.edu/collections/triumph-and-tragedy-pittsburghs-history-of-innovation-in-science/E8pf6LUg9792tEHX#r/473702](http://learninglab.si.edu/collections/triumph-and-tragedy-pittsburghs-history-of-innovation-in-science/E8pf6LUg9792tEHX#r/473702). Accessed 5 May 2019.

This source was an image depicting two scientists handling large glass containers and other lab equipment while working on the polio vaccine. I used this image in my documentary when talking about the polio vaccine.

"National Foundation for Infantile Paralysis Television Spots." *Boston Childrens Hospital*, 1954, [www.youtube.com/watch?v=oS\\_JleTxK-k](http://www.youtube.com/watch?v=oS_JleTxK-k). Accessed 10 May 2019.

This source was a campaign film, created by the National Foundation for Infantile Paralysis to convince the public to donate more money to the foundation to fund research and production of a polio vaccine. It featured videos of polio patients walking with braces, being bathed, and lying on stretchers. I used clips from this film in the beginning of my documentary when talking about the polio virus and the devastation it wrought on the American people.

National Institutes of Health. *Researchers at Work on Biologics Control*. 1930. *U.S. National Library of Medicine*, [collections.nlm.nih.gov/catalog/nlm:nlmuid-101447514-img](http://collections.nlm.nih.gov/catalog/nlm:nlmuid-101447514-img). Accessed 9 May 2019.

This source was an image of two researchers working inside of the Laboratory of Biologics Control. The research space is small, and the technology is quite old. I used this image to help illustrate how small and primitive the Laboratory of Biologics Control was prior to when it was upgraded into the Division of Biologics Standards. Contrasting the laboratory portrayed in this image with other, more high-tech laboratories helped me to demonstrate the positive impact of the Cutter incident.

"Polio Place Archives." *polioplace.com*, 2011, [www.polioplace.org/history/artifacts/browse](http://www.polioplace.org/history/artifacts/browse). Accessed 27 May 2019.

This website contained a multitude of primary letters, photos, and legal documents, which were submitted by polio survivors. It also included many primary accounts of what living with polio was like. This helped me to understand the difficulties of living with such a debilitating disease. It also helped me to understand exactly how important the development of a polio vaccine was to many of these people, who didn't want anyone else to experience the suffering that they went through as polio victims. I used many of the photographs and videos from this website in my documentary, especially when talking about the polio virus itself.

*Polio Vaccine Experimentation on Rhesus Monkeys*. 1956. *Critical Past Historical Footage*, [www.criticalpast.com/video/65675067769\\_experiments-on-monkeys\\_snow-covered-statue\\_monkey-in-a-cage\\_monkey-eats-banana](http://www.criticalpast.com/video/65675067769_experiments-on-monkeys_snow-covered-statue_monkey-in-a-cage_monkey-eats-banana). Accessed 1 June 2019.

This source was a video of scientists running experiments on Rhesus monkeys. It included footage of them feeding the monkeys, grooming them, and injecting them with a solution. I used clips from this source when talking about the process of creating the polio vaccine, since Rhesus monkeys were mainly used as test subjects in Salk's laboratory.

*The polio medicine being prepared and tested in a Cutter laboratory in Berkeley, California.* 1955. *Critical Past*, [www.criticalpast.com/video/65675067767\\_Cutter-laboratory\\_trolley-loaded-with-crates\\_man-stack-crates\\_women-in-laboratory](http://www.criticalpast.com/video/65675067767_Cutter-laboratory_trolley-loaded-with-crates_man-stack-crates_women-in-laboratory). Accessed 27 Feb. 2019.

This video contained footage of workers in Cutter laboratories who are seen sorting papers, turning the tubes of vaccine as they are rocked, and packaging vaccines. This source gave me some insight into the procedures followed by Cutter employees as well as the conditions of the facilities themselves. Additionally, at one point a worker removes a tube of vaccine and examines it. The tube appears to contain some type of debris which would support the assertion that the incident was partly due to the lack of a proper filtration system. I used clips from this video in my documentary when talking about Cutter's procedures and the incident itself.

"Unconditional Surrender." *polioplac.org*, 1956, [www.polioplac.org/resources/unconditional-surrender](http://www.polioplac.org/resources/unconditional-surrender). Accessed 1 June 2019.

This video focused on how the polio vaccine had managed to triumph over polio, forcing it into an "unconditional surrender," hence the title of the film. It mainly contained footage of an American family living happily without having to fear polio and scientists in a factory, churning out thousands of doses of the polio vaccine. I used clips from this video when talking about the manufacturing process and mass distribution of the polio vaccine.

### **Books:**

Berg, Roland H. *Polio and the Salk Vaccine*. Public Affairs Committee, 1955.

This book provided a comprehensive look at the process of creating the polio vaccine, starting all the way from Karl Landsteiner's discovery of the polio virus in 1908, and including information on the different strains, culturing, and efforts to raise enough money to fund all the research. It also reflected back on the Cutter incident, which had happened in the year it was published, and the little-mentioned debates over whether administering vaccines over the summer — peak polio season — would be safe. The wide variety of information in this book helped to broaden my knowledge of the polio vaccine and gave me insights into lesser-known aspects of the Cutter incident.

Cutter, Robert K., and Cutter Laboratories. *Cutter Laboratories, 1897-1972: A Dual Trust*. Palala Press, 2018.

This book contained transcripts of conversations and interviews with Cutter employees, managers, and even Robert Cutter himself. This source gave a unique insight into the perspective of Cutter Laboratories and helped me to understand the inner workings of the laboratory and their goals. This source also showed me that the Cutter incident was not

the result of purposeful negligence as everyone interviewed was obviously upset by the incident, and all the employees testified that everyone involved in the creation of the vaccine was fully dedicated to making it work. The book also contained detailed recollections of the procedures used to create vaccines, including the lack of a Seitz filter which was suspected to be a contributing factor to the Cutter incident.

Nichols, Janice. *Twin Voices: A Memoir of Polio, the Forgotten Killer*. IUniverse, 2008.

This book was written by a polio survivor: Janice Nichols whose twin brother had died as a result of polio. This source helped me understand how polio impacted every aspect of one's life from health, to education, to work. This book also demonstrated the great tenacity with which many polio victims faced their situation. In Janice's case, after recovering from her own bout of paralysis, she was able to become a rehabilitation counselor to help those who were suffering the way she had. This source helped to further cement the fact that Salk's polio vaccine was a great triumph for humanity since it was able to prevent many heartbreaking stories like Janice's.

### **Interviews:**

Gottsdanker, Anne. Interview. 15 May 2019.

This source was an interview with Anne Gottsdanker who, after receiving the Cutter Vaccine when she was five years old, contracted polio, resulting in a lifetime spent in leg braces. Ms. Gottsdanker's interview helped me to truly understand the magnitude of the pain and suffering caused by the Cutter incident and the polio virus in general, especially with her description of how her life had essentially been derailed after she contracted polio. Ms. Gottsdanker also talked about the effects of Post Polio Syndrome, and her experiences during the Gottsdanker v. Cutter trial. Overall, this interview had a tremendous impact on how I viewed Cutter Laboratories and resulted in me altering my position to be less defensive of it. I used a clip from this interview in my documentary to help cement the 'tragedy' aspect of the topic. While this interview also provided helpful insight into the aftereffects of the incident, I decided not to include these clips in my documentary due to the highly personal nature of Ms. Gottsdanker's words.

Salk, Peter. Telephone interview. 11 Apr. 2019.

This source was an interview with Dr. Peter Salk, son of Jonas Salk, and President of the Jonas Salk Legacy Foundation. As an accomplished scientist himself, Dr. Salk was extremely knowledgeable about his father's work and was able to provide a wide variety of information about his father's research and personal relationships. This interview helped me to understand that from Salk's perspective, the Cutter incident was the result of the manufacturer's unwillingness to experiment and test batches to determine the ideal inactivation conditions. Dr. Salk also gave me a lot of new information on the internal

conflicts that occurred between his father and other researchers during the process of creating his vaccine. I used clips of this interview in my video while talking about the scientific explanation for the Cutter incident and the immediate response of the government to license the vaccine.

### **Government Documents:**

Chapman, A. L. "Report of Public Reaction to Poliomyelitis Vaccine Programs." Received by Otis L. Anderson, 20 May 1955. Records of Public Health Service, National Archives, College Park, Box 4. Memo.

This source was a report on the public's reaction to the polio vaccination campaign. It included both drop-out statistics and qualitative descriptions of the attitudes towards the vaccine. This source helped demonstrate the negative short-term impact of the Cutter incident on the opinion of the general public. In the areas where the Cutter vaccine was most prolific, there was a noticeable drop in requests for vaccination. In particular, the statistics for California (the location of Cutter laboratories) where requests dropped from 90% to around 60% were extremely clear about what the general public thought.

Eisenhower, Dwight. "Press Release." 30 Apr. 1955. *Eisenhower Presidential Library*, [www.eisenhower.archives.gov/research/online\\_documents/salk/Salk\\_M.pdf](http://www.eisenhower.archives.gov/research/online_documents/salk/Salk_M.pdf). Accessed 2 Dec. 2018. Manuscript.

This document was a draft of a press release to be sent out to the public in order to announce that Cutter Laboratories had released two lots of live-polio virus containing vaccines to the public. This source gave me insight into the process that was used in order to track all of the cases following the Cutter incident. It also included the names of prominent individuals, which I used as a reference list of people to conduct further research on. Additionally, I used an image of this document while talking about Scheele's meeting and request to pause distribution of the Cutter vaccine.

Haldeman, Jack, and Russel Teague. "Trip Report to Parke Davis Company, Eli Lilly and Company, Pitman Moore Company, and Wyeth Company." 4 Nov. 1955. Records of the Public Health Service, National Archives, College Park, Box 2. Memo.

This source was a report of Dr. Teague and Dr. Haldeman's visits to various polio manufacturers. It included information on the conditions of the laboratories as well as each company's answers to a set of questions. This source helped me to better understand the perspective of the manufacturing companies and how their attitudes towards government officials varied.

Langmuir, Alexander. "Report From Alexander Langmuir." Received by Leonard A. Scheele, 1 Dec. 1995. WHO Polio Committee and Correspondence, Johns Hopkins University, Alan Mason Chesney Medical Archives, Box 7, Folder 16. Letter.

This memo summarized the proceedings of a WHO conference which had been held in Stockholm to discuss and compare polio vaccination programs across the world. The memo also included a small portion on the Cutter incident while talking about vaccine safety. According to the memo, most scientists present at the conference disapproved of Jonas Salk's 'straight line theory' of polio inactivation as well as his use of the Mahoney strain of the polio virus. This helped to demonstrate how the Cutter incident affected expert opinions and future decisions regarding vaccine processing methods.

Langmuir, Alexander, et al. *Surveillance of Poliomyelitis in the United States in 1955*. AJPH, 1956. *American Journal of Public Health*, [ajph.aphapublications.org/doi/pdf/10.2105/AJPH.46.1.75](https://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.46.1.75). Accessed 10 Apr. 2019.

This report on the role of the Poliomyelitis Surveillance Unit in tracking Cutter incident during 1955 helped me to understand the aftermath of the Cutter incident from an epidemiological perspective. It also helped me to understand the methods and strategies employed by the Poliomyelitis Surveillance Unit to keep the incident contained and well-monitored. This source contained a multitude of charts, diagrams, and maps, which showed incidence rates, inactivation curves and other relevant information. I used a diagram from this source which compared the ideal inactivation curve to the one that had actually occurred while talking about the scientific reason behind the Cutter incident.

"Meeting with Six Vaccine Manufacturers to Discuss Distribution Plan." Received by Dr. Chester S. Keefer, 24 May 1955. Records of the Public Health Service, National Archives, College Park, Box 2. Memo.

This memorandum regarding conversations with polio vaccine manufacturers about their distribution plans helped to illustrate the different levels of responsiveness the manufacturers had when interacting with regulators. While some companies like Eli Lilly gave long, comprehensive answers, others, like Cutter were more secretive and in some cases refused to answer the question entirely. This helped me to understand why some companies like Eli Lilly and Parke Davis were able to avoid situations like the Cutter incident while others were not.

Poliomyelitis Surveillance Unit. "Poliomyelitis Surveillance Reports." *Center for Disease Control Public Health Publications*. Accessed 26 Feb. 2019. Raw data.

This collection was a group of documents all created immediately after the Cutter incident first came to light in order to track the number of cases of polio caused by the incident. Each report contained a brief summary of what important events had happened

that day regarding the spread of polio which was usually followed by multiple pages of statistics which detailed the number of cases attributed to each laboratory, where the cases occurred, and how far they had progressed. The latter reports also included a comparison between observed cases and predicted cases. This source was extremely helpful for demonstrating the magnitude of the Cutter incident as well as the quick response of the Epidemic Intelligence Service. I used data from the tables from multiple reports in this collection to create an animated line graph which would show the increase in number of cases over time, giving the viewer a visualization of how devastating the incident was.

Poliomyelitis Surveillance Unit. "The Wyeth Problem: An Epidemiological Analysis of the Occurrence of Poliomyelitis in Association with Certain Lots of Wyeth Vaccine." 1955. Records of the Public Health Service, National Archives, College Park, Box 2. Manuscript.

This report described the possible correlation between various lots of Wyeth vaccine and cases of polio. This report helped me to understand that while Cutter's vaccine did result in more cases than any other manufacturer, the issue of inconsistent inactivation was present among multiple companies, not just Cutter. This source also helped to support the hypothesis that the issues regarding inactivation were the result of scaling up the process from a laboratory scale.

*Press release regarding the Cutter Laboratories vaccine.* Bethesda, Maryland, U.S. Department of Health, Education, and Welfare, 30 Apr. 1955. *Eisenhower Presidential Library*, [www.eisenhower.archives.gov/research/online\\_documents/salk/Salk\\_M.pdf](http://www.eisenhower.archives.gov/research/online_documents/salk/Salk_M.pdf). Accessed 7 Nov. 2018.

This source was an official press release by the Department of Health, Education, and Welfare. It summarized the events of a meeting between immunologists and public health officials after Cutter Laboratories stopped their distribution as well as the recommendations made as a result of that meeting. This source helped me to better understand the immediate response to the Cutter incident, as well as the government's approach to public health emergencies as a whole.

Salk, Jonas. *National Foundation for Infantile Paralysis Grant Application from Jonas Salk.* 1950. *Smithsonian Institute*, [learninglab.si.edu/resources/view/2248856](http://learninglab.si.edu/resources/view/2248856). Accessed 5 May 2019.

This source, which was Jonas Salk's application for a grant to conduct experiments to develop a polio vaccine, showed me what Salk's plan and thought process was. It helped me to understand that the creation of the polio vaccine was a monumental task made possible only possible through the collaboration of many different scientists and organizations. This document also mentioned Salk's straight-line theory of inactivation,

which was the model Salk used while treating polio virus in his lab with formaldehyde that later drew heat from the scientific community after many of the polio vaccine manufacturers were unable to reproduce his results.

Salk, Jonas. "Poliomyelitis Vaccine in the Fall of 1955." *American Journal of Public Health*, vol. 46, Jan. 1956. *APHA*, [ajph.aphapublications.org/doi/pdf/10.2105/AJPH.46.1.1](http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.46.1.1). Accessed 1 Apr. 2019.

This report, written by Jonas Salk, examined the state of the polio vaccination campaign and other scientists' views towards his straight-line inactivation theory following the Cutter incident. In this source, Salk clearly outlined his method for determining whether a batch was safe or not, and included diagrams of an ideal and unideal inactivation line. Salk also compared statistics from his experiments with those gathered from different manufacturers and attempted to provide explanations as to why the manufacturer's vaccines were generally less consistent. This source gave me a better understanding of Salk's views on the incident and his attempts to defend his theories after they were questioned by other researchers following the Cutter incident.

Transcript of Press Conference with Dr. Leonard Scheele, Dr. William H. Sebrell, Dr. James A. Shannon. 10 June 1955. Records of the Public Health Service, National Archives, College Park, Box 4. Manuscript.

This source was the transcript of a press conference with Surgeon General Dr. Scheele, former NIH director Dr. Sebrell, and current NIH director Dr. Shannon. In the press conference, the three answered questions about the qualifications of the Laboratory of Biologics Control, the minimum requirements sent to vaccine manufacturers, and the NIH's plans for the future. They also outlined the main bureaucratic contributing factors to the Cutter incident and admitted that the incident was a 'wake up call' to those in the NIH. This source helped me to understand how lack of proper oversight contributed to the Cutter incident, and how it acted as a catalyst for change within the NIH and other government branches. I used a quote from this press conference in my documentary to show how oversight of the vaccination campaign was greatly reduced when the Laboratory of Biologics Control took over.

U.S. Department of Health, Education, and Welfare. "Minimum Requirements: Poliomyelitis Vaccine, 1st Revision." 12 Apr. 1955. Manuscript.

This source was a document which detailed the set of requirements that manufacturers needed to pass in order to distribute their vaccines. This helped me to understand the difficult position of the manufacturers since the document was extremely vague and often gave unspecific or arbitrary values. I was able to compare this document with a version of Salk's inactivation procedure in order to assess how the procedures and requirements for

distribution were made more relaxed, and how that may have impacted the manufacturers.

U.S. Department of Health, Education, and Welfare. "Polio Packet." 1959. Records of the Public Health Service, National Archives, College Park, Box 1. Manuscript.

This source was a guide to planning polio vaccination programs, which was distributed to officials across the nation. The packet was divided into various sections regarding awareness, logistics, sustaining interest, and evaluation. It helped me to understand the immense amount of collaboration and planning required to carry out a vaccination campaign, and how small issues could easily derail a campaign. The detailed yet streamlined nature of this document also helped to illustrate how protocols and procedures have improved since 1955.

U.S. Department of Health, Education, and Welfare. *Report on Polio Vaccine Produced by the Cutter Laboratories*. 1955.

This report compartmentalized the investigation of the Cutter incident into three separate categories: cases of polio after vaccination, manufacturing processes and conditions of Cutter Laboratories, and the vaccine production industry as a whole. This helped me to understand the different angles from which the government attempted to investigate the incident. This source also included detailed information on the number of people affected by the incident, differentiating between those who had received the vaccine, and those who had presumably been infected by family members or close friends.

United States, Court of Appeals for the First Circuit. *Anne Gottsdanker v. Cutter Laboratories*. *United States Reports*, vol. 320, 12 July 1960. [www.courtlistener.com](http://www.courtlistener.com), [www.courtlistener.com/opinion/2209778/gottsdanker-v-cutter-laboratories/](http://www.courtlistener.com/opinion/2209778/gottsdanker-v-cutter-laboratories/). Accessed 9 Jan. 2019.

This transcript of the Gottsdanker v. Cutter court case helped me to understand the grievances of those who had been affected by the Cutter incident. It also made the exact nature of Cutter's wrongdoings clear by stating that Cutter had not been neglectful since it had complied with all federal protocol, however it was still bound by an implied warranty to its customers that the product it was delivering would not cause polio. I used this case to support my thesis that the Cutter incident eventually led to regulations and safety protocols which were beneficial to society since it demonstrates that the legal action taken after the incident could potentially have some effect on future manufacturers.

### **Letters:**

Combs, Andy. Letter to Robert C. Byrd, Jennings Randolph, and John Slack. 11 Feb. 1959. Records of the Public Health Service, National Archives, College Park, Box 1.

This source was a letter from Andy Combs, the organizer of a local West Virginia polio vaccination program, requesting funding in order to secure a third round of Salk's vaccine for a group of disadvantaged school children. The source helped me to understand that despite the Cutter incident, the public opinion of the polio vaccine remained favorable in the long run. It also helped to show the contrast between modern and historical attitudes towards vaccines.

Cutter, Robert K. "Correspondence from Robert K. Cutter." Apr. 1962. *Museum of Osteopathic Medicine*, [momicoh.pastperfectonline.com/archive/BD1A9B52-77D3-47FB-BD28-004893262078](http://momicoh.pastperfectonline.com/archive/BD1A9B52-77D3-47FB-BD28-004893262078). Accessed 1 Mar. 2019. Letter.

This letter which was written by Robert K. Cutter after the Gottsdanker v. Cutter trial helped me to understand what the Cutter perspective of the ordeal was. According to this source, Cutter believed that they were unfairly targeted, partially because they were one of the first laboratories to put out a vaccine, but partially because they were less well known and it would frighten the public less if they were found to be guilty. This source also included a reference to the implied warranty argument used during the court case. I used this source in my documentary when talking about the fallout of the Cutter incident.

Langmuir, Alexander. "Letter from Alexander Langmuir to Dr. W.L.M. Perry." Received by Walter Laing MacDonald Perry, 3 Oct. 1995. WHO Polio Committee and Correspondence, Johns Hopkins University, Alan Mason Chesney Medical Archives, Box 7, Folder 16. Letter.

This letter was a thank-you note from Dr. Alexander Langmuir to Dr. Walter Perry, an English scientist who had invited Langmuir to visit London and swap advice after the Stockholm conference. This helped to demonstrate the amicable relationship between doctors internationally, and the diverse network of people who were all dedicated to finding and refining a polio vaccine. Additionally, this source mentioned the Poliomyelitis Surveillance Reports which I was able to find online after reading the letter.

Sabin, Albert. Letter to Howard Fieldsteel. 9 June 1955. *Ohio Digital Resource Commons*, [drc.libraries.uc.edu/bitstream/handle/2374.UC/680142/fieldsteel\\_1950-62\\_035.pdf?sequence=1](http://drc.libraries.uc.edu/bitstream/handle/2374.UC/680142/fieldsteel_1950-62_035.pdf?sequence=1). Accessed 1 Mar. 2019.

This letter from Sabin to Dr. Fieldsteel, who was an employee at Cutter Laboratories, showed me what members of the medical community thought about the incident and what caused it. According to Sabin in the letter, the fault for the incident lay with those who drew up the safety procedures, a sentiment which was echoed in various other sources such as Dr. Offit's book. This helped me to better understand the events behind the Cutter incident. Additionally, this source helped to demonstrate the sense of camaraderie between professionals in the medical field.

Langmuir, Alexander. Letter to Otis L. Anderson. 11 May 1955. Records of the Public Health Service, National Archives, College Park, Box 2.

This memorandum, which outlined the various indicators that the Poliomyelitis Surveillance Unit would look out for, helped to show the multiple levels of threats posed by a biological disaster such as the Cutter incident. This helped me to understand that the impact of the incident stretched beyond those who had received the vaccine, as close friends and family members would also be at risk, especially if the child were infected with asymptomatic polio. This source also helped to demonstrate the effectiveness of the EIS, which gained a positive reputation after the Cutter incident.

Scheele, Leonard A. "Letter from Leonard A. Scheele to Sir John Charles." Received by John Charles, 24 Oct. 1955. WHO Polio Committee and Correspondence, Johns Hopkins Medical Archives, Alan Mason Chesney Medical Archives, Box 7, Folder 16. Letter.

This source was a letter from Surgeon General Leonard Scheele to the United Kingdom's Chief Medical Officer. In it, Scheele described the events that had happened so far that year regarding the development of the polio vaccine, including a brief summary of the results from the 1954 polio field trial. Scheele also mentioned the Cutter incident in the last paragraph and how it was a wake up call for the U.S. government. This source helped demonstrate how the Cutter incident was able to become a catalyst for change within the regulatory agencies. I also used this letter in my documentary when discussing the legacy of the Cutter incident.

### **Newspaper Articles:**

"Cutter Trials Begin; Laboratories Are Sued Over Faulty Vaccine Charges." *New York Times*, 21 Nov. 1957. *New York Times*, [www.nytimes.com/1957/11/21/archives/cutter-trials-begin-laboratories-are-sued-over-faulty-vaccine.html](http://www.nytimes.com/1957/11/21/archives/cutter-trials-begin-laboratories-are-sued-over-faulty-vaccine.html). Accessed 2 Feb. 2019.

This newspaper report on the Gottsdanker v. Cutter trial provided me with specific details about the trial, and helped me to understand what the public sentiment towards both sides was. For the most part, the article sided with the Gottsdanker family, painting them in a sympathetic light.

Collection of Newspaper Clippings Regarding Salk Vaccine and Cutter Incident. 1955. Records of the Public Health Service, National Archives, College Park, Box 2.

This source was a collection of newspaper clippings from the mid-1950s. The content of the clippings was mainly related to the distribution of the Salk vaccine and the Cutter incident. This collection gave me a better understanding of the public's initial reaction to the Cutter incident. I used many of the clippings from this collection in my documentary when talking about the devastating effect of the Cutter incident.

"Dr. Sebrell Is Honored at Retirement Ceremonies." *NIH Record*, 8 Aug. 1955. *NIH Archives*, [nihrecord.nih.gov/PDF\\_Archive/1955%20pdfs/19550808.pdf](http://nihrecord.nih.gov/PDF_Archive/1955%20pdfs/19550808.pdf). Accessed 4 May 2019.

This newsletter article describing the circumstances of Dr. Sebrell's departure from the NIH helped me to understand how serious the consequences for the Cutter incident were for those in the higher up positions. According to the article, Oveta Culp Hobby, the person who had licensed the vaccine was also resigning. This article also helped me to understand why the government chose to make reforms to the NIH and Laboratory of Biologics Control. Since many of the people at the top were leaving anyway, it would have been easier for Scheele and others to organize a change in the operating structure of their agency.

Engel, Leonard. "The Salk Vaccine: What Caused the Mess?" *Harper's Magazine*, Aug. 1955, pp. 27-33.

This article heavily criticized the handling of the Cutter incident, accusing those in charge of sensationalizing the field trial to the point where the public expected unrealistic results before suddenly halting the vaccine program. It also included information on the negative impacts of the vaccine shortage, something which was rarely touched on by other sources. This article helped me to understand that even though Langmuir, Scheele, and others handled the situation admirably, there were still some aspects of the incident which they overlooked. This source also showed that while the majority of the population was willing to overlook the Cutter incident as a one-time ordeal, there were people whose opinions towards vaccines were impacted forever.

Furmanspecial, Bess. "U.S. Blames Its Own Tests In Cutter Vaccine Incident; 'Inadequacy of Virus Inactivation' in Plant Also Cited by Report." *New York Times*, 25 Aug. 1955. *New York Times*, [www.nytimes.com/1955/08/26/archives/us-blames-its-own-tests-in-cutter-vaccine-incident-inadequacy-of.html](http://www.nytimes.com/1955/08/26/archives/us-blames-its-own-tests-in-cutter-vaccine-incident-inadequacy-of.html). Accessed 7 Feb. 2019.

This article about the US government's stance on whose fault the incident was helped me to understand that the laboratories were not completely at fault in this case, and that some of the blame should also be assigned to those who were in charge of safety tests. This article also demonstrated the difficult position of directors like Oveta Culp Hobby who were stuck between letting Cutter take all the blame unfairly or sacrificing their own leadership positions.

"Jonas Salk." *Jonas Salk Legacy Foundation*, [www.jonassalklegacyfoundation.org/jonassalk.html](http://www.jonassalklegacyfoundation.org/jonassalk.html). Accessed 9 Mar. 2019.

This website focused specifically on Jonas Salk and his contributions to the eradication of polio. This source helped me to better understand Salk's achievements and the struggles

he had to endure in order to succeed in creating an effective polio vaccine. Specifically, the source talked about how Salk's quest to develop an inactivated, or killed virus, vaccine went against the popular belief that only a live-attenuated, or weakened virus, vaccine would be effective against polio. This source also contained many photographs of Salk which I used in my documentary when talking about the process of creating the polio vaccine.

Kihss, Peter. "Further Polio Shot Delay Urged Pending New Check; U.S. Still Supports Vaccine." *New York Times* [New York], 9 May 1955. *The New York Times*, [timesmachine.nytimes.com/timesmachine/1955/05/09/issue.html](http://timesmachine.nytimes.com/timesmachine/1955/05/09/issue.html). Accessed 20 Apr. 2019.

This newspaper article described the state of confusion after the news of possible faulty vaccines leaked to the public. It focused on the dilemma of those in charge of administering the vaccine who wanted to vaccinate as many people as possible before the summer polio season but did not want to accidentally vaccinate people with a live virus. The specific doctor mentioned in the article: Dr. Baumgartner expressed worries about a lack of vaccine supply. This article helped to highlight another facet of the Cutter incident. While Scheele and Langmuir are praised nowadays for their quick decision to suspend vaccine distribution, the suspension of vaccine distribution also meant that people were left vulnerable during the summer polio season, further amplifying the tragedy of the Cutter incident.

"Salk Vaccine Shots Ordered Halted In West As Efficiency Is Questioned." *Madera Tribune*, 27 Apr. 1955. *California Digital Newspaper Collection*, [cdnc.ucr.edu/?a=d&d=MT19550427.2.11&srpos=2&e=-----en--20--1--txt-txIN-cutter+laboratories-----1](http://cdnc.ucr.edu/?a=d&d=MT19550427.2.11&srpos=2&e=-----en--20--1--txt-txIN-cutter+laboratories-----1). Accessed 2 Feb. 2019.

This article which reported on the halt of the distribution of Cutter polio vaccines helped me understand the confusion of the public immediately after the suspension of the vaccines. The article expresses an optimistic view of the situation and states that there is likely no correlation between the suspension and recent post-shot polio cases. This source also showed me how much faith the public put in their pharmaceutical companies at the time, since it hesitated to make any accusations as opposed to modern day newspapers which would probably already be implicating Cutter.

## Secondary Sources

### **Audiovisual:**

"America's Youth Recruit Elvis in the Fight against Polio." *Youtube*, uploaded by Cambridge University, 23 Apr. 2016, [www.youtube.com/watch?v=EZ7IL7Pzcws&t=1s&pbjreload=10](http://www.youtube.com/watch?v=EZ7IL7Pzcws&t=1s&pbjreload=10). Accessed 6 June 2019.

This video described some of the tactics used by advertisers in order to promote the polio vaccination campaign. Specifically, this video talked about the usage of pop culture figures like Elvis Presley to draw the attention of teenagers. This helped me to understand how much time and effort went into the polio vaccination campaign, and how it was only through the collaboration of thousands of individuals and organizations that America was able to succeed in driving polio out of the country. It was interesting to see how the publicity side of the campaign required as much, if not more manpower than the scientific and manufacturing side of the campaign.

CDC. *Epidemic Intelligence Service (EIS): A Snapshot of Public Health Achievements*. PDF file, Apr. 2015. Infographic.

This booklet gave an overview of the history of the Epidemic Intelligence Service, which was an organization founded by Alexander Langmuir and first put to use domestically to monitor the Cutter incident. This helped me to understand the impact of monitoring the Cutter incident on the EIS's credibility, and how the meticulous documentation helped to bolster the reputation of the new organization. The timeline provided by this source extended beyond the scope of the 1950s into the present day, which helped to demonstrate how reforms made within the CDC and NIH as a result of the Cutter incident allowed these agencies to flourish, providing more evidence for the long-term effects of the Cutter incident.

"Conquering Polio in America: The Cutter Incident and Beyond." *Centers for Disease Control and Prevention*, 6 Feb. 2017, [www.youtube.com/watch?v=zvhAOag8LWU](http://www.youtube.com/watch?v=zvhAOag8LWU). Accessed 9 May 2019.

This video featured a lecture on the events of the Cutter incident by Neal Nathanson, who was a member of the Poliomyelitis Surveillance Unit. It provided a detailed summary of the Cutter incident through the eyes of the government, which was a perspective I had not encountered before. This source also included specific information about government actions during the incident, such as the exact date of suspension for the IPV, which was commonly glossed over by other sources. This source gave me a better understanding of the role of government agencies in the incident, and by extension, a better understanding of how important the ensuing changes to the NIH were. This source also led me to multiple pictures and newspaper articles which I used in my documentary.

*Der Erlkönig*. Performance by Hilary Hahn, adapted by Schubert, composed by Ernst, MP3 file, 2016.

This source was an audio file of Hilary Hahn's performance of *Der Erlkönig*, which I put in my documentary. I used this piece at the beginning of my documentary in order to grab the audience's attention and build tension. I also thought the minor key and dark tone of the piece was appropriate since I was introducing the main tragedy of my topic.

*Fly*. Composed by Ludovico Einaudi, MP3 file, 2006.

This source was a recording of Ludovico Einaudi's "Fly," which was first released as part of his album *Divenire*. I used it as background music while giving context on Salk, the polio virus, and the Cutter incident. I felt that the piano background would help to set the tone of my documentary without drawing the viewer's attention away from the content.

Hovern, Danya. "The Trials and Triumphs of the American Polio Vaccine (Poster)." 2018. *Rowan University Digital Works*, 2018, [rdw.rowan.edu/cgi/viewcontent.cgi?article=1005&context=cmsru\\_capstones](http://rdw.rowan.edu/cgi/viewcontent.cgi?article=1005&context=cmsru_capstones). Accessed 7 Apr. 2019.

This infographic focused on the changes in public opinion towards the polio vaccine throughout its journey. It included information on FDR's role in the start of polio vaccination campaign and the impact of the Cutter incident on the American psyche. This was helpful for building a better understanding of the public opinion towards vaccines during the 1950s. This source also hypothesized that there was a connection between the Cutter incident and the start of the anti-vaccination movement, however, this assertion remains contested, as some of my other sources maintain that the anti-vaccination movement only truly came into being after the 1970s and the Vietnam War when the public began to lose faith in the government.

*Kubelik String Serenade Op. 22 Tempo di Valse*. Composed by Dvořák, MP3 file, 2011.

This source was a recording of the Valse from Dvořák's *Kubelik String Serenade*. I used this as background music when talking about the aftermath and reforms made as a result of the Cutter incident. The use of strings as opposed to piano also provided a change of tone from my two previous sections.

*"Raindrop" Prelude in D flat Major*. Composed by Chopin, performance by Vladimir Horowitz, MP3 file, 2010.

This source was a recording of Chopin's *Prelude in D flat Major*. I used this as background music for the conclusion of my documentary in order to give it a bittersweet feeling. I thought this piece had a good blend of melancholy and hopefulness, and I

decided to end my documentary on the final Major chord of this piece to leave the audience with a more satisfied feeling.

*Schubert's Fantasy in F minor for Piano Four Hands*. Composed by Schubert, performance by Maria João Pires and Ricardo Castro, MP3 file, 2013.

This source was a recording of a performance of Schubert's Fantasy in F minor for Four Hands, which I used in my documentary when talking about the events of the Cutter incident itself. I felt that this piece was a good fit since its rapidly changing tone mirrored the events of the Cutter incident, but it wasn't overpowering or complex enough to draw attention away from actual documentary.

*The Polio Crusade*. PBS, 2009.

This documentary on the story of the polio vaccine gave me a more complete understanding of the timeline of events surrounding the development of the polio vaccine. It also helped to put into perspective how terrifying the polio virus was to those who lived during the 1940s and 1950s with primary footage. This source also included valuable information on the March of Dimes campaign, which was not something I had thoroughly researched beforehand. I used many clips from this source in my documentary, including a couple videos of the production of the polio vaccine in Cutter Laboratories.

*The Polio Story: The Vaccine That Changed the World*. Directed by Tjardus Greidanus, BBC, 2015.

This documentary helped me to better understand the internal conflicts that occurred during the production of the polio vaccine. Specifically, the documentary went into great detail about the feud between orthodox scientists who believed that live-attenuated vaccines were superior like Albert Sabin, and newer scientists who wanted to explore the potential of inactivated vaccines like Salk. This helped me to see exactly how determined and driven Salk was. It also helped me understand the importance of funding in the creation of a vaccine by introducing figures like Basil O'Connor, who was the head of the March of Dimes and the one who gave Salk the resources he needed in order to succeed. I used footage from this documentary while talking about the development process for the polio vaccine as well as the 1954 field trial.

### **Books:**

Abraham, Thomas. *Polio: The Odyssey of Eradication*. C. Hurst and Co., 2018.

This book which contained an overview of polio history from FDR's time until the present day helped me to understand how politics has slowly crept into the realm of

public health. The book uses the specific example of Pakistan, a country where the eradication of polio was rendered unattainable by the Taliban. The book covered the impact of domestic politics on public health as well. It talked about how various administrations approached the task of vaccination and how that both positively and negatively impacted the research of scientists and manufacturers who try to develop vaccines.

Offit, Paul A. *The Cutter Incident*. Yale University Press, 2005.

This book provided a comprehensive account of the Cutter incident, the development of the Polio vaccine prior to the incident, and the *Gottsdanker v. Cutter Laboratories* case that followed. In addition to presenting a timeline of events, the book also included many anecdotes from primary interviewees like Julius Youngner and Anne Gottsdanker, some of which I used to enhance my documentary. This book was extremely useful for building a general understanding of the topic, and the chapters regarding the impact of vaccine regulation and litigation helped shape my thesis statement. The book also led me to a variety of useful primary sources, such as the CDC's 1955 reports of the Cutter incident.

Oshinsky, David. *Polio: An American Story*. Oxford University Press, 2005.

This book provided a comprehensive timeline of polio in America, and how our perceptions and attitudes towards it has evolved over time. It focused specifically on the social aspect of the battle against polio which included the creation of organizations like the March of Dimes. This source helped me to gain a better understanding of the politics involved in fighting polio and how those who are able to motivate the general public to help out are equally as important as those who are in the lab. This also helped me understand why the polio vaccine was so widely celebrated, even in communities that didn't have common outbreaks: the vaccination campaign was turned into a project for the entire nation to contribute to.

## **Interviews:**

Offit, Paul. Telephone interview. 15 Feb. 2019.

This source was an interview with Paul Offit, who was the author of a book which focused on the Cutter incident, a licensed doctor who was involved in the creation of a rotavirus vaccine, and part of the CDC's advisory committee for polio. Offit was extremely knowledgeable about the topic and provided many new perspectives about where the 'blame' for the incident should lay. This interview helped to shape my view of the topic since I had not previously considered the side of the vaccine manufacturers. Additionally, Offit provided accounts of his childhood in the 1950s and his experience with the fear of polio, which gave me a better understanding of exactly how oppressive living with the threat of polio could be. Offit also affirmed that the Cutter incident was

crucial to the improvement of government organizations like the Laboratory of Biologics Control which were in charge of vaccine supervision. I used clips from this interview in my video in order to provide support for my points.

### **Newspaper Articles:**

Beaubian, Jason. "Wiping Out Polio: How The U.S. Snuffed Out A Killer." *NPR*, 15 Oct. 2012, [www.npr.org/sections/health-shots/2012/10/16/162670836/wiping-out-polio-how-the-u-s-snuffed-out-a-killer](http://www.npr.org/sections/health-shots/2012/10/16/162670836/wiping-out-polio-how-the-u-s-snuffed-out-a-killer). Accessed 12 Oct. 2018.

This article provided a general overview of the story of the polio virus and various efforts to stop it from the mid 1900s till the present day. Although it provided no specific information on the Cutter incident, it went rather in depth into the Salk vs. Sabin debate. This article also included information on the present day efforts to eradicate the polio virus. Additionally, this article had images of polio victims and children receiving the polio vaccine which I used in my documentary.

Latson, Jennifer. "The Vaccine Everyone Wanted." *Time Magazine*. *Time Magazine*, [time.com/3714090/salk-vaccine-history/](http://time.com/3714090/salk-vaccine-history/). Accessed 11 Feb. 2019.

This article detailed the story of the polio vaccine from the perspective of the American people and compared the almost universal acceptance of vaccines back then to its contentious nature today. The article also briefly mentioned the Cutter incident and how it led to "stricter oversight" of the polio vaccine, allowing it to continue its lifesaving role in American history. This source helped me understand exactly how terrible the polio virus was for parents to have such unwavering trust in the vaccine, even after an event like the Cutter incident, which would undoubtedly stop a vaccine from being made available to the public today.

McNeil, Donald G., Jr. "Measles Cases Surpass 700 as Outbreak Continues Unabated." *New York Times*, 29 Apr. 2019, [www.nytimes.com/2019/04/29/health/measles-outbreak-cdc.html](http://www.nytimes.com/2019/04/29/health/measles-outbreak-cdc.html). Accessed 3 May 2019.

This article described the severity of the recent measles outbreak in America. It stressed the role of vaccines as a tool that could be used to fight against preventable illnesses such as measles. This article helped me to understand the importance of educating and maintaining awareness even for diseases that are considered nearly eradicated. I used an image of this article's title in my documentary when discussing the modern-day impacts of the Cutter incident.

Okie, Susan. "Scientific Experimentation, Debate and Selflessness on the Way to Today's Vaccines." *Washington Post*, 23 June 2017. *Washington Post*, [www.washingtonpost.com/opinions/scientific-experimentation-debate-and-selflessness-on-the-way-to-todays-vaccines/2017/06/23](http://www.washingtonpost.com/opinions/scientific-experimentation-debate-and-selflessness-on-the-way-to-todays-vaccines/2017/06/23). Accessed 26 May 2019.

This article talked about the evolution of vaccine experimentation and production throughout the past sixty years and the many controversies which have surrounded the production of vaccines for rabies, rubella, polio, and others. While the article did not focus on the Cutter incident specifically, it did reference Bernice Eddy, the woman who had warned her superiors in the Laboratory of Biologics Control about the Cutter vaccine, but was ignored and moved to a different unit. This article helped me understand that the polio vaccine was not the only one to encounter many hardships along its path, and that even with improved regulation and safety standards, unintended consequences are unavoidable with each new scientific advancement that is made.

### **Reports:**

E. Juskewitch, Justin. "Lessons from the Salk Polio Vaccine: Methods for and Risks of Rapid Translation." Aug. 2010. *US National Library of Medicine*, [www.ncbi.nlm.nih.gov/pmc/articles/PMC2928990/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2928990/). Accessed 1 Mar. 2019.

This article explored the impact of the strict time constraints associated with the development of the Salk vaccine and how that contributed to some of the more relaxed regulation of manufacturers. This helped me to understand how the pressure exerted by the general public on Salk and others unintentionally led to the Cutter incident. The article maintained that the ideal time frame for developing, testing, licensing, and distributing a vaccine was approximately six years, which was significantly longer than the time it took Salk to do all of the aforementioned tasks.

Franklin, Marc A., and Joseph E. Mais, Jr. "Tort Law and Mass Immunization Programs: Lessons from the Polio and Flu Episodes." PDF file, 31 July 1977.

This article explored the legacy of vaccine-related legislation and how suits against vaccine companies have both helped and hindered the vaccine industry. This source gave a very thorough explanation of the legal aspect of vaccine production and how the definition of 'negligence' with regard to vaccine production has changed through the years. This gave me a better understanding of the legal implications of the Gottsdanker v. Cutter case and how the concept of implied warranty has been used as a precedent in many other vaccine cases.

*Principles of Vaccination*. CDC, 2008. [cdc.gov](http://cdc.gov), [www.cdc.gov/vaccines/pubs/pinkbook/downloads/prinvac.pdf](http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/prinvac.pdf). Accessed 5 Apr. 2019.

This source was an educational booklet on the different types of vaccines and their uses. This was extremely helpful for understanding a lot of the medical terminology I encountered throughout my research. This also helped me to better understand the difference between live-attenuated vaccines and inactivated vaccines and how the two different types of vaccines fit into the rivalry between Salk and Sabin. Additionally, the source helped me to understand how the Cutter incident posed a threat, even after all vaccine distribution had been suspended since those who were infected could also transmit the disease to others, even if they themselves exhibited no symptoms.

Williamson, Samantha. "The Congressional Polio Vaccine Hearings of 1955." Johns Hopkins University, 2008.

This article focused on the Polio Hearings, an event where many of the leading vaccine experts gathered together to determine what course of action should be taken regarding the rest of the vaccination program. This source gave me a better understanding of the internal debates that occurred during and after the incident, and how the appearance of a unified group of medical professionals was essential to keeping the public's faith. Additionally, this source helped to showcase how all the personalities of the medical professionals clashed with each other, demonstrating that even in times of crisis, some rivals, like Salk and Sabin, were so polarized by existing feuds that they were unable to concentrate on the task at hand.

### **Webpages:**

Brofin, Daniel R. "Childhood Immunization Controversies: What Are Parents Asking?" *The Oschner Journal*, Fall 2008. *National Center for Biotechnology Information*, [www.ncbi.nlm.nih.gov/pmc/articles/PMC3096324/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3096324/). Accessed 6 Nov. 2018.

This source was an article which detailed some of the modern day concerns that parents have over vaccine safety and efficacy. It mentioned the Cutter incident while addressing concerns of vaccine-caused illnesses. This was helpful for understanding how the incident remains relevant in the minds of many parents, even after half a century. It also provided reliable statistics on trust in vaccines.

CBS. "Polio vaccine: A look back." *cbsnews.com*, 2013, [www.cbsnews.com/pictures/polio-vaccine-turns-58-a-look-back/](http://www.cbsnews.com/pictures/polio-vaccine-turns-58-a-look-back/). Accessed 11 Jan. 2019.

This source was a webpage which included a set of 16 primary images associated with the polio virus and the polio vaccination campaign along with a small explanation of the image. This helped me to understand how the fight against polio evolved over time from

a government side project to a privately funded massive undertaking. I used images from the set, specifically the image of many polio pioneers lining up, and the Jonas Salk image in my documentary.

"Cutter Laboratories." *Bayer AG*, [ihop-karlsruhe.de/cutter-laboratories/](http://ihop-karlsruhe.de/cutter-laboratories/). Accessed 6 Apr. 2019.

This webpage from Bayer AG, the company which absorbed Cutter Laboratories in the 1970s, described Cutter's poor handling of the blood donating and selling process. According to the source, Cutter had sold untreated blood to other countries during the AIDS epidemic which eventually resulted in Bayer paying \$660 million in damages. This showed me that despite the remorseful attitude shown by Cutter after the Cutter incident, it continued to be somewhat lazy with its safety procedures. This also helped me to understand that despite the forward steps taken after the Cutter incident, we still have a long way to go in terms of keeping products outside of the vaccine industry safe.

"Cutter Laboratories." *revolv.com*, [www.revolv.com/page/Cutter-Laboratories](http://www.revolv.com/page/Cutter-Laboratories). Accessed 4 Mar. 2019.

This article gave a general overview of the history of Cutter laboratories. It mentioned how the family-owned Cutter was much newer and much smaller than the other polio manufacturers who were mostly well-established and respected by the general public, which could have contributed to it being singled out after the Cutter incident, despite the fact that other companies like Wyeth also had the same issue with their inactivation procedures. This source gave me a better understanding of Cutter's background and helped me to develop a more balanced thesis that did not place the blame solely on the manufacturers.

Ehrlich, Katie, and Clinton Johnson. "Mass Inoculation or: How New York Learned to Stop Worrying and Love the Polio Vaccine." *NYC Department of Records and Information Services*, [www.archives.nyc/blog/2018/5/24/mass-inoculation-or-how-new-york-learned-to-stop-worrying-and-love-the-polio-vaccine](http://www.archives.nyc/blog/2018/5/24/mass-inoculation-or-how-new-york-learned-to-stop-worrying-and-love-the-polio-vaccine). Accessed 18 May 2019.

This article focused on the political side of the polio campaign, and how those in charge of the campaign used publicity stunts and other methods in order to convince the public to participate in the mass-vaccination. This gave me a better understanding of the important role played by publicists in the vaccination campaign since they were able to keep the public opinion of the polio vaccine positive, even after the Cutter incident. This source also contained images of posters and children receiving vaccinations which I used in my documentary.

Matysiak, Angela. "The Myth of Jonas Salk." *MIT Technology Review*, 1 July 2005, [www.technologyreview.com/s/404390/the-myth-of-jonas-salk/](http://www.technologyreview.com/s/404390/the-myth-of-jonas-salk/). Accessed 1 Nov. 2018.

This article provided a unique perspective on the Salk vaccine — that it was never going to be truly effective which by extension would put the responsibility for the Cutter incident on the shoulders of Jonas Salk, not the manufacturers themselves. I found this to be quite interesting since most sources pin the majority of the blame on the laboratories for negligence or inability to follow Salk's instructions, not Jonas Salk. This source also provided extremely detailed information on the nature of the vaccine itself.

Milstien, Julie B. *Regulation of Vaccines: Strengthening the Science Base*. *Journal of Public Health Policy*, 2004. *Springer*, [link.springer.com/article/10.1057%2Fpalgrave.jphp.3190016](http://link.springer.com/article/10.1057%2Fpalgrave.jphp.3190016). Accessed 10 May 2019.

This source provided a detailed overview of the history of vaccine regulation in the United States covering all the way from the Laboratory of Hygiene, which later evolved into the Laboratory of Biologics Control, to modern-day organizations like the Center for Biologics Evaluation and Research (CBER). This gave me a better understanding of how the governments view of vaccines has evolved over time. This source also helped to support the assertion that the Cutter incident was an important factor in improving the quality of vaccine regulation in the United States.

Offit, Paul A. "The Cutter Incident, 50 Years Later." *New England Journal of Medicine*, 7 Apr. 2005, [www.nejm.org/doi/full/10.1056/NEJMp048180](http://www.nejm.org/doi/full/10.1056/NEJMp048180). Accessed 1 Oct. 2018.

This online article provided a retrospective look at the Cutter incident. It mainly examined how the event could have turned out differently had the circumstances surrounding the manufacture of the polio vaccine been better. This was extremely helpful since it pointed out specifically what went wrong at Cutter laboratories and what could have been done to prevent those wrongdoings. This source helped me to build a better understanding of the incident itself, and it also allowed me to refine my thesis statement since it detailed specific improvements that were made.

"Timeline of History of Vaccines." *The History of Vaccines*, edited by College of Physicians of Philadelphia, [www.historyofvaccines.org/timeline#EVT\\_100328](http://www.historyofvaccines.org/timeline#EVT_100328). Accessed 8 Nov. 2018.

This website provided a comprehensive history of vaccines and vaccinations all the way from Edward Jenner and the first smallpox vaccine. This helped me to build up a general idea of how vaccines have been developed and received in the past, and how the both the creation and reception of polio virus were on a much larger scale than any other vaccine before. This source also contained primary photos and documents, some of which pertained to the polio vaccine and the Cutter incident.

Theerman, Paul. "Polio: A Fearful Disease Nears Its End." *New York Academy of Medicine*, 23 Oct. 2014, [nyamcenterforhistory.org/tag/polio/](http://nyamcenterforhistory.org/tag/polio/). Accessed 10 Apr. 2019.

This article talked about the emergence of polio in the United States, likening it to the Ebola Outbreaks which had been occurring in Africa at the time the article was written. It also discussed the possibility of eradication for polio, citing the decreasing number of cases and endemic countries as reasons to be hopeful. This source provided information on attempts to combat polio prior to Salk's vaccine, which included long quarantines and encouragement of better hygiene. This source also contained links to primary maps, reports, and other documents, many of which I used in my research.

"Vaccine Development, Testing, and Regulation." *historyofvaccines.org*, [www.historyofvaccines.org/index.php/content/articles/vaccine-development-testing-and-regulation](http://www.historyofvaccines.org/index.php/content/articles/vaccine-development-testing-and-regulation). Accessed 13 Mar. 2019.

This webpage provided me with information on the process of vaccine development, testing, and licensing, and how government oversight of that process has changed throughout history. It also included a clip of Paul Offit explaining the steps to making a vaccine, which allowed me to compare modern day procedures to those used in the 1950s and draw conclusions about how evolving safety protocols have changed those procedures. The extremely long and meticulous process outlined in this webpage helped to show me how far vaccine regulation has advanced from the practically nonexistent protocols from before the Cutter incident.

World Health Organization. "Poliomyelitis." *who.com*, 25 Jan. 2019, [www.who.int/biologicals/areas/vaccines/poliomyelitis/en/](http://www.who.int/biologicals/areas/vaccines/poliomyelitis/en/). Accessed 24 Apr. 2019.

This webpage gave a general overview of the polio virus and its history. The descriptions of polio symptoms in this source gave me a better understanding of why people were so afraid of the virus and helped to show me that the creation of a polio vaccine was indeed a great triumph for the American people. This source also included definitions for medical terms, which was helpful for understanding some of the more technical sources I encountered. There were also some images on this site of polio victims and researchers which I used throughout my documentary.