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Lauren McDonald

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# **Midwestern Communities' Reaction to the 1940s and 1950s Polio Epidemics**

By Lauren McDonald

Viral outbreaks, epidemics, and pandemics have occurred throughout American history. However, polio is one of the only series of epidemics where the primarily affected population is still alive. I conducted my research into the 1940s and 1950s polio epidemics to determine how Midwesterners reacted to the epidemics and how their surroundings influenced that reaction. Research existed into New York experiences and how polio affected large urban centers, but little investigation exists on the more sparsely populated regions of the U.S. like the Midwest. Through interviews with residents from Minnesota, Wisconsin, Ohio, Illinois, Missouri, and North Dakota, alongside the study of newspapers and public health reports, my study examines their perception of polio and the ways media and government alerted them to the danger. This provides insight into some urban and rural communities in the Midwest and how they responded to the viral outbreaks. In addition, information on the differences between rural and urban reactions can be helpful in understanding how media, politics, and environment influence people's actions.

This paper explores how Midwesterners reacted to polio using sources such as public health reports, newspapers, memoirs, and interviews. First, this paper will describe some of the historians' approaches to the social effects of polio. Then, it will expand upon the polio-related events and advances leading up to the final synthesis of a vaccine. This will also include an explanation of some of the notable people and organizations that influenced polio's perception and treatment. Lastly, I will explain the methodology used for this research and discuss the findings.

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Historians have taken numerous approaches to explain the polio epidemics of the mid-20th century, such as using personal accounts from victims, public health report data, medical reports,

and newspapers to show how people were affected. The publications *Polio: an American Story*,<sup>1</sup> *Living with Polio: The Epidemic and Its Survivors*,<sup>2</sup> “Historical Perspective—Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy,”<sup>3</sup> and *Polio Wars: Sister Kenny and the Golden Age of American Medicine*<sup>4</sup> showed how polio was perceived in various fields and how people of all backgrounds were affected.

David M. Oshinsky wrote *Polio: an American Story* to focus on the U.S. reactions to the poliovirus and the search for a cure using newspaper data and governmental accounts. His book highlighted the U.S. achievements as the first to discover a vaccine as well as the status of American life at this time. He placed a strong emphasis on the early New York City outbreaks and how officials and citizens reacted during the beginning of the polio epidemics. When suddenly the cleanest and wealthiest areas of New York were struck with polio, class differences and prejudices surfaced. His sources found that immigrants in the worst parts of Brooklyn had very low cases while native-born Americans living on Staten Island had the most. Oshinsky noted that this discrepancy caused suspicion towards the immigrants and lower class. Many people believed that the lower class cooks, servants, and workers spread the illness and that their lack of cases was proof of their guilt. The lower class was seen as filthy and full of germs, yet no one realized that those very germs kept the lower class safe from polio. However, he pointed out how the changes that occurred in the early 1940s due to World War II and the resulting mentality of “us against the world” aided government officials in shifting aggression away from the lower class and towards polio. Americans had grown used to working together in the war effort, which made it easier for them to work together against polio and see the fight as a group effort. A new

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<sup>1</sup> Luis Barreto, et al. “Polio Vaccine Development in Canada: Contributions to Global Polio Eradication.” *Biologicals*, Academic Press, 5 May 2006, [www.sciencedirect.com/science/article/pii/S1045105606000467](http://www.sciencedirect.com/science/article/pii/S1045105606000467).

<sup>2</sup> Wilson, Daniel J. *Living with Polio: The Epidemic and Its Survivors*. University of Chicago Press, 2007.

<sup>3</sup> Neumann, Donald A. “Historical Perspective—Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy.” *Journal of Orthopedic & Sports Physical Therapy*, vol. 34, no. 8, 2004, pp. 479–492., <https://doi.org/10.2519/jospt.2004.0301>.

<sup>4</sup> Rogers, Naomi. *Polio Wars: Sister Kenny and the Golden Age of American Medicine*. Oxford University Press, 2014.

motto, “We will conquer polio,” developed as Americans of all classes sought an end to a terrible virus.

*Living with Polio: The Epidemic and Its Survivors* was written by Daniel Wilson, a polio survivor and medical historian. His book focused on polio paranoia, hospital life, parent reaction, and the daily stressors of polio. References to memoirs and stories from polio survivors allowed his book to showcase how the years between 1940 and 1960 impacted real people. It also gave insight into how hospitals handled polio care and the way that patients viewed that care. Instead of the “Us against polio” mentality seen in Oshinsky's book where the whole U.S. united against a common enemy, Wilson focused more on what information families had on polio and how that adjusted their behavior as individuals. For example, fear of water was common during the polio epidemics due to fecally contaminated water being a common way of contracting polio. Wilson noted how it would present in different ways, like pools, lakes, or water fountains. However, water was usually associated with polio regardless of the area being studied. He brought up that not everyone knew to be cautious of water because of polio; instead, people just thought it was unsafe based on the actions of others. Articles with warnings and medical symptoms to look for in one's children were present in newspapers, making even a stiff neck or headache seem like a potential case of polio. Once a person was diagnosed with polio, Wilson outlined what would happen and how the process worked for many patients. These factors enable a glimpse into what life was like for people in the mid-1900s on a more personal level.

Similar to Wilson's book, “Historical Perspective—Polio: Its Impact on the People of the United States and the Emerging Profession of Physical Therapy” by Donald Neumann focused on the medical side of polio, especially in regards to the advancement of medicine that occurred during the 1940s in regards to polio treatments. This article did not list the personal experiences

of patients like Wilson's book did; instead, it contained a general explanation of regular life for most patients and a detailed account of the physical training techniques they experienced. This provided a rare positive glimpse of the results of polio as the field of physical therapy advanced greatly due to the work of specialists like Sister Kenny. Advancements in this field would not have been as numerous without the wide-scale effort by medical practitioners to help reduce paralysis in patients. One of Neumann's primary purposes in writing this article was to give insight into how beneficial the struggles of polio patients were to overall medical understanding. Neumann used doctor accounts and reports from the Sister Kenny Institute to provide most of the information for his article, which gave a different perspective than his fellow polio historians.

*Polio Wars: Sister Kenny and the Golden Age of American Medicine* by Naomi Rogers took a different approach than Neumann's article in explaining the benefits of polio treatment and provided a more broad perspective of the medical experiences during the mid-1900s. Rogers still highlighted Sister Kenny's achievements but did so by giving a personal account of how Sister Kenny accomplished her work rather than a more broad glimpse at her institute's advancements. Knowing the trials Sister Kenny underwent and her mindset while creating the revolutionary physical therapy practices she pioneered, gave a better idea of the depth of her accomplishments. It also strengthens a reader's understanding of polio's contribution to medicine. Rogers also used Sister Kenny's story to give insight into the political, cultural, and intellectual challenges present due to polio which is not seen in the other historians' writings. Oshinsky covered some political aspects and some similarities can be found with Rogers's book, but he focused on the political tribulations of scientists and not medical personnel as Rogers did.

Historian accounts of polio were largely focused on areas like New York and only looked into the Midwest to highlight the achievements of the Sister Kenny Institute or to show how

polio was not limited to coastal areas. This method allowed historians to give glimpses of polio's effect on the U.S. as a whole which enabled broad trends and effects to be seen. This research seeks to enhance the current understanding of polio by providing a focused look on the influence it had on midwesterners in particular. However, one cannot ignore the overall impact of this deadly virus.

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Polio impacted North America throughout the 20<sup>th</sup> century, but most notably between 1916-1960. Over the course of 50 years, it was estimated by the National Health Interview Survey that there were 254,000 people in the United States who had been paralyzed and an estimated 10-20 million worldwide. Besides the health burden of this virus, there was an enormous financial cost both to the survivors of polio and to the laboratories seeking a cure. Aid organizations and philanthropists were able to provide support to the families afflicted, and the vaccine was provided free to the public once it was produced. However, this support could not protect the public from fearing the deadly virus and much confusion surrounded polio during its early years.

Polio is believed to have existed from as early as 1300 BC since images of crooked or withered limbs can be seen in Egyptian artwork. However, the first confirmed U.S. polio cases occurred in 1894,<sup>5</sup> resulting in 18 dead and 132 paralyzed. Polio had likely existed before this in the US, but it was a rare and localized ailment. Outside of the US, outbreaks started in Scandinavia in the 1860s and continued in severity after that throughout Europe.<sup>6</sup> Polio's contagious nature was not discovered until 1905, when more significant outbreaks began to

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<sup>5</sup> "History of Polio," Edited by The College of Physicians of Philadelphia, *Timeline | History of Vaccines*, [www.historyofvaccines.org/timeline/polio](http://www.historyofvaccines.org/timeline/polio).

<sup>6</sup> "Polio through History." *Encyclopædia Britannica*, Encyclopædia Britannica, Inc., <https://www.britannica.com/science/polio/Polio-through-history>.

occur across the world. Swedish doctors first noticed the virus could be found throughout the body of infected individuals and even in those who did not appear to be infected. This happened because many of those who became infected showed few symptoms and did not experience paralysis.<sup>7</sup> Instead, these asymptomatic individuals unknowingly spread polio by contaminating food, water, and materials with infected fecal matter, allowing polio to be dispersed rapidly through communities. This made it possible for people to contract polio from swimming in rivers and lakes, eating at restaurants, or visiting a public restroom. Anywhere sewage runoff was present or where people may have gone to the bathroom without properly washing their hands was a prime place to be exposed to the poliovirus.

Called infantile paralysis or poliomyelitis, the virus causes inflammation of the central nervous system. In 80-90% of cases polio is a minor illness that passes after roughly 3 days and has flu-like symptoms (fever, muscle weakness, headache, nausea and vomiting) often accompanied by neck stiffness; however, for those that develop paralytic polio (where polio has spread to the spinal cord region), there is a 50% chance of mild to severe paralysis. If the virus goes into the spinal cord and causes swelling, this can lead to paralysis in whatever limb or limbs are controlled by that region. It can also cause paralysis of the diaphragm which leads to trouble breathing. Those with diaphragm paralysis typically would need to live in an iron lung until they regained some use of their paralyzed muscles or they passed away. In many cases this spinal inflammation can be reduced by time and treatment and some or all mobility is regained.

However, it was not until 1908 that scientists discovered how polio could infect the spinal cord and, through that infection, could cause paralysis. Misidentification and confusion surrounded polio prior to that discovery as doctors did not know how to properly respond to the

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<sup>7</sup> "History of Polio," Edited by The College of Physicians of Philadelphia, *Timeline | History of Vaccines*, [www.historyofvaccines.org/timeline/polio](http://www.historyofvaccines.org/timeline/polio).



virus. The discovery was made by Austrian doctors who were able to dissect deceased individuals and locate the areas where the virus was most prevalent depending on the severity of the person's paralysis. This aided doctors in better understanding how the specific spinal cord regions afflicted could influence the type of paralysis observed in each patient. The information learned from polio has helped in broadening the understanding of spinal injuries and paralysis as a whole. Other medical fields also influenced polio treatment. During the polio epidemics in Copenhagen, anesthetist Bjørn Ibsen was able to dramatically increase life expectancy in patients with diaphragm paralysis (breathing issues) by realizing they died from respiratory insufficiency with carbon dioxide retention and not from polio itself. Anesthetists were seen as technicians at this time and not true medical practitioners, so polio helped people like Ibsen to prove their abilities and relevancy.<sup>8</sup> The widespread nature of the illness and the resulting paralysis caused panic and fear to grow around the US, but it also enabled the advancement of neurology, physical therapy, and orthopedics.

Polio was different from many viruses in that it affected primarily middle-class families and was not a notable illness among the poor urban population like most epidemics. This happened because polio, like other viruses, is most prevalent in overpopulated areas, which allowed poor urban people to contract it at a very young age during the infrequent bouts of polio before the 1916 epidemic. This high and continued exposure to polio from the worse sanitation in inner city areas provided those living there a high chance of being exposed throughout their life. Due to this, many urban populations became naturally immunized, and herd immunity protected the young and those who may have not been as exposed in the community. Adults and children alike were protected by the continued exposure especially since polio recovery is more

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<sup>8</sup> Berthelsen, P. G., and M. Cronqvist. "The First Intensive Care Unit in the World: Copenhagen 1953." *Wiley Online Library*, John Wiley & Sons, Ltd, 4 Nov. 2003, <https://onlinelibrary.wiley.com/doi/full/10.1046/j.1399-6576.2003.00256.x>.

difficult in older patients. This is because their body's recovery rate is slower. However, unlike the urban lower class, middle-class families did not have this natural immunity since their children grew up in single family dwellings, and the spread of the virus did not occur until they or their siblings went to school. As a result, middle-class children and their parents were more susceptible to polio and transmitted it to their peers. This caused middle-class parents to take an added interest in polio research and prevention both to protect themselves and their progeny.

President Franklin Delano Roosevelt (FDR) was very sympathetic to those afflicted due to his own personal experience with polio. As a result of the slow nature of government spending and the precedent of private donations set by World War I, FDR tried to find a way to help raise money for polio without involving the government. FDR's public relations manager was given credit for the first major U.S. fundraising event for polio at the President's Birthday Ball; the slogan "dance so that others can walk" was used to entice extra donations.<sup>9</sup> Over one million dollars was raised from this event which went to support those who had contracted polio. FDR established the National Foundation for Infantile Paralysis (NFIP) in 1938 with his own money after seeing the President's Ball's success.<sup>10</sup> The March of Dimes, which the NFIP started, became a hallmark of the mid-1900s and was run primarily by middle-class mothers who were fearful for their children's health and wanted to fundraise for a cure.

The NFIP and March of Dimes organizations raised money to pay for the medical and rehabilitation bills of polio victims as well as funded vaccine research by hosting dances and other social events like the President's Ball. The payment of all medical bills was possible because thousands of people donated small amounts (dimes) to the foundation, which added up.

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<sup>9</sup> Marc Shell, *Polio and Its Aftermath: the Paralysis of Culture*. Harvard University Press, 2005, 117

<sup>10</sup>Barreto, "Polio Vaccine Development in Canada: Contributions to Global Polio Eradication." *Biologicals*, Volume 34, Issue 2, 2006, Pages 91-101, ISSN 1045-1056. <https://doi.org/10.1016/j.biologicals.2006.03.008>.

Many students were encouraged to participate in fundraising efforts at school and numerous communities across the U.S. created chapters of these organizations.<sup>11</sup> As Carl Byoir, a public relations expert for the U.S. government, stated, “who wouldn’t contribute something to see a crippled child walk again?”<sup>12</sup> This new occupation of professional fundraisers used dramatic stories of paralyzed children to get Americans to give aid when few had money to spare. Most people in the U.S. at this time had had some exposure to polio victims or had a family member who had contracted polio, so they would rally to support the NFIP at its events. This enabled even lower-income families to afford hospitalization and treatments for their children. Without the support of middle-class parents, particularly mothers, the aid available to children with polio would have been dramatically lower. However, because of the widespread support for polio funding, it was possible for almost every afflicted person to receive near-total support in regards to medical/funeral expenses as well as for additional money to go towards researching a vaccine.

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<sup>11</sup> “March of Dimes Dance Planned.” *The Post-Crescent*, Appleton, Wisconsin. 29th Jan., 1954, 7

<sup>12</sup> Oshinsky, David M. *Polio: An American Story*. The Easton Press, 2005, 51



March of Dimes Advertisement taken from the Ames Daily Tribune 25th January 1954<sup>13</sup>

<sup>13</sup> March of Dimes. "1954 March of Dimes Benefit Sale." *Ames Daily Tribune*, Iowa 25 Jan. 1954.

Fortunately, the series of polio epidemics occurred at a time when medicine was advancing and pharmaceuticals had been invented to deal with other illnesses. Vaccines were understood after the discovery of the smallpox vaccine in 1796 that had paved the way for future advancements in pharmaceuticals.<sup>14</sup> The discovery that antibodies could be collected from healthy individuals who had been sick and then given to people to make them resistant against certain viruses was critical in vaccine development and gave the basis needed for all future vaccine related studies.<sup>15</sup> The creation of a smallpox vaccine allowed for a great improvement of the understanding of viruses and allowed for a much quicker creation of new vaccines when an epidemic occurred. Later vaccines were created both for humans and animals that granted pharmaceutical companies the expertise needed for polio vaccine production.

Jonas Salk of the U.S. built upon the discoveries of the smallpox vaccine and managed to synthesize a vaccine for polio in 1955 that was utilized around the globe and saved countless lives. Harvard scientists developed the ability to make cultures of poliovirus in petri dishes in 1949 which was pivotal to the possibility of wide scale vaccine production, and this aided Salk's progress in the following years. The work he did to find a vaccine was encouraged by the NFIP such that in the fall of 1955, the NFIP already had plans to perform a trial of his not yet created vaccine.<sup>16</sup> The reason that the NFIP and Jonas Salk himself were working so rapidly was to prevent another serious epidemic on the levels of the 1916 and 1952 outbreaks.<sup>17</sup> During those times, more than 58,000 people had become ill and this signified a dire need for children to be

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<sup>14</sup> "History of Smallpox." Edited by CDC, *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 30 Aug. 2016, [www.cdc.gov/smallpox/history/history.html](http://www.cdc.gov/smallpox/history/history.html).

<sup>15</sup> "Passive Immunization." Edited by The College of Physicians of Philadelphia, *History of Vaccines*, [www.historyofvaccines.org/content/articles/passive-immunization](http://www.historyofvaccines.org/content/articles/passive-immunization).

<sup>16</sup> Paul A. Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*. Yale University Press, 2007, location 1339-1350

<sup>17</sup> Indiana Historical Society, editor. "Eli Lilly and Company and the Salk Polio Vaccine." *Indiana History*, [www.indianahistory.org/wp-content/uploads/2321ed1b90a01ad2e9934b96b58101f9.pdf](http://www.indianahistory.org/wp-content/uploads/2321ed1b90a01ad2e9934b96b58101f9.pdf).

vaccinated to slow or stop the spread.<sup>18</sup> This number dramatically diminished after the vaccine was given to children across the U.S.

The NFIP signed on four pharmaceutical companies to aid Salk in creating a vaccine in the early 1950s and used future compensation to encourage their participation. These companies were Eli Lilly, Parke-Davis, Wyeth Laboratories, Pitman-Moore, and Cutter Laboratories.<sup>19</sup> To convince them to sign on and to incentivize them to be able to produce the amount of vaccine needed, the NFIP offered to buy 27 million doses.<sup>20</sup> This payment and the deal made with the NFIP reduced the risk of researching and developing the vaccine since the companies were being paid even if it failed, but at a lower amount. In early 1954, Salk had figured out a process to make the drug, but had not published his findings. The reason for this was discovered years later by analyzing his lab reports where he stated his concern for the varying degrees of viral inactivation present between small and large batches of polio vaccines. The methods were never published for peer review which is usually customary for scientists, but a 55-page protocol was given to those five pharmaceutical companies in February of 1955 to account for his findings. This protocol, however, intentionally omitted specific details such as exact amounts, filter types, and the safest size to produce to, in Salk's wording, allow them to develop their own method that would work best for their production capacity.<sup>21</sup>

The pharmaceutical companies did not enjoy the forced research on their part as it made them experiment with each batch produced and slowed the production time. A researcher at Cutter Laboratories is quoted saying "the name Salk is a dirty word around here. Every batch is a

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<sup>18</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 525

<sup>19</sup> Indiana Historical Society, editor. "Eli Lilly and Company and the Salk Polio Vaccine."

<sup>20</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, 56

<sup>21</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 540-555

damned research project”.<sup>22</sup> The language used by the researcher shows the aggression felt towards Salk’s methods and hints at the researcher’s own impatience. The reason for the impatience was that the companies were in competition to produce the most of the 27 million vaccines paid for by the NFIP to ensure they received the greatest payout. Parke-Davis and Eli Lilly created the most vaccines since they had produced vaccines before, while Cutter Laboratories had numerous difficulties in the production. During production, Cutter Laboratories had two batches that were missing one of the three types of polio required for the vaccine. However, there was no increase in cases after a field trial of the batches, so it was considered a successful trial.

The fanfare and anticipation for the vaccine to be produced outside of field trials put pressure on the United States Public Health Service to license it as quickly as possible to ensure that children were immunized before polio season (late summer/early fall).<sup>23</sup> Politicians hoping to gain support by publicly aiding the NFIP to get the vaccine into production added further pressure to the United States Public Health Service which was still a new agency and did not have well established protocols.<sup>24</sup> The leaders of the NFIP had been in control of the fate of the vaccine in every step before the licensing, and they were reportedly apprehensive to give power over it to the federal government and its limited understanding of the vaccine.<sup>25</sup> This concern was valid since the requirements given to pharmaceutical companies from the government was five pages long compared to the fifty-five page long protocol given by Jonas Salk and the NFIP. These five pages contained loopholes such as the fact that companies were not required to inform the government of batches that failed safety checks or contained live poliovirus. This made it

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<sup>22</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 636

<sup>23</sup> Troan, John. “POLIO IS CONQUERED.” *Pittsburgh Press*, 12 Apr. 1955, 2

<sup>24</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 691

<sup>25</sup> Oshinsky, *Polio: an American Story*, 240

impossible to keep track of the success ratio of the companies and kept the public in the dark about the percentage of faulty vaccines that were produced.<sup>26</sup>

Prior to the successful licensing of the vaccine, Bernice Eddy, a researcher at the United States Public Health Service, had informed her bosses that all the monkeys tested with Cutter Laboratories polio vaccine had been paralyzed and had active polio found in their spinal cords.<sup>27</sup> This information was not shared at the licensing meeting and the vaccine was cleared for production by all the pharmaceutical companies, including Cutter Laboratories. Eddy was documented as saying “This is going to be a disaster. I know it” when she was told the news of the successful licensing. Cutter Laboratory was not blind to the errors in their methods and brought in Julius Youngner, an accredited scientist who studied both polio and influenza, to help them figure out why their virus was not being inactivated. He found that their lab was growing live viruses in the same place as it synthesized the inactivated vaccine, had sloppy notebooks, and had cramped facilities. Youngner later met with Salk to discuss what he had seen in the lab, and both declared their plan to write a letter to officials to inform them of the inability of Cutter Laboratories to produce the vaccine, but these letters were either never written or never received.

As a consequence of this oversight, Cutter Laboratories along with the other companies began public production and distribution on April 13<sup>th</sup>, 1955 and six lots of vaccines were sent from them to hospitals across the country. Eight days after the vaccine had been sent, the first victim, a one-year-old infant, became a paraplegic.<sup>28</sup> The next day two more children were reported as paralyzed permanently in their arms. William Workman had received six calls about paralyzed children in the span of two days and all of them had been given the same brand of

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<sup>26</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 708

<sup>27</sup> Offit, “Why Are Pharmaceutical Companies Gradually Abandoning Vaccines?” 625.

<sup>28</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 756-760



vaccine: the Cutter vaccine.<sup>29</sup> This prompted an emergency meeting between government officials, CDC doctors, and employees at the National Institute of Health who decided that it was possible these children simply contracted polio naturally and that it was not necessarily the fault of the vaccine. This view was based on review of the Cutter protocols and notes for the vaccine, but they were not aware Cutter Laboratories had only sent them notes from batches that had formerly passed inspection and had not provided the actual records from those six specific lots. This information combined with the worry of undermining the whole system if they made the public aware of this issue caused the group to wait for more information.<sup>30</sup> Telegram transcripts revealed that the assistant surgeon general, the director of the field trial, and three other polio experts were aware of this issue, including that 82,000 children had already been injected by the Cutter vaccine. However, they did not know how to react and chose to do nothing.

All the men did agree that the decision on what to do rested on the shoulders of the Surgeon General who was rather limited in his options since the rushed license given to the pharmaceutical companies did not contain a clause that allowed the government to recall the vaccine or stop its production.<sup>31</sup> A telegram sent to Cutter Laboratories on April 27<sup>th</sup>, 1955 reads as follows: “You are requested to discontinue distribution and withdraw all issued unused packages from the market”. Thankfully, Cutter Laboratories complied by sending this telegram to all health departments and drug stores, “Urgent. No further injections of Cutter vaccine are to be made. Immediately advise physicians and return unused supplies”. Press statements were made following this that assure the public that this was simply a precaution and how little risk was present. However, the next day two more children were found ill with polio and one of them

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<sup>29</sup> “A Science Odyssey: People and Discoveries: Salk Produces Polio Vaccine.” Edited by PBS, *PBS*, Public Broadcasting Service, [www.pbs.org/wgbh/aso/databank/entries/dm52sa.html](http://www.pbs.org/wgbh/aso/databank/entries/dm52sa.html).

<sup>30</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 774

<sup>31</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 783

died nine days after his injection. Forty-eight hours after the recall twenty-five children were either paralyzed or dead. Employees of Cutter Laboratories and physicians at various hospitals panicked following the reports of sick/dying children since many had gone against protocol and vaccinated their own families and friends with the faulty vaccine.

The Cutter Incident, as this catastrophe was labeled, impacted around 380,000 children who the Cutter vaccine had been used on.<sup>32</sup> Produced by Cutter Laboratories, this vaccine contained active poliovirus and resulted in 40,000 cases of polio in those who received it. It was found that the poliovirus contained in two of the vaccine lots had ten times the infection rate of the other Cutter vaccines and was monumentally more dangerous than typical polio.<sup>33</sup> However, the incident didn't end with the vaccine. Parents, neighbors, and friends of those who were vaccinated began to show symptoms and spread polio themselves. This error in the vaccine caused a man-made polio epidemic to spread that caused many cases of permanent paralysis and death.<sup>34</sup> Blame for this incident was difficult to determine, but officials placed most of the responsibility on Cutter Laboratories and the Public Health Service.<sup>35</sup>

The response from the public to this incident was a decreased involvement in the NFIP and a shift of polio victims from the middle to lower classes. While many children had been given placebo vaccines that did not protect them from polio, hundreds of thousands of young children did receive working vaccines. This slowed the spread of polio and made it more prevalent in urban poor areas where those who hadn't been vaccinated would exist in greater numbers. Middle-class mothers who had been the foundation of support for the NFIP were both

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<sup>32</sup> Fitzpatrick, Michael. "The Cutter Incident: How America's First Polio Vaccine Led to a Growing Vaccine Crisis." *Journal of the Royal Society of Medicine*, The Royal Society of Medicine, Mar. 2006, [www.ncbi.nlm.nih.gov/pmc/articles/PMC1383764/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1383764/).

<sup>33</sup> Offit, *The Cutter Incident: How America's First Polio Vaccine Led to the Growing Vaccine Crisis*, location 966-971

<sup>34</sup> Louis Gebhardt, "LIVE POLIO VIRUS FOUND IN CUTTER SALK VACCINE." *Independent-Journal*, 4 June 1955.

<sup>35</sup> Robert Plumb, "SCIENCE IN REVIEW; Cutter Polio Vaccine Report Highlights Difficulties in Dealing With Viruses." *New York Times*, 28 Aug. 1955.

put off by its involvement in the Cutter Incident and were less impacted since their own children were now vaccinated. The NFIP had to eventually shift to a new children's illness to regain the support it had lost and it no longer fundraised for polio after 1959, but some aid would still be given if it was requested.<sup>36</sup> Americans, who had been at the forefront of polio research, had moved on to new projects while the rest of the world was still dealing with the polio crisis.

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However, before a vaccine was synthesized and tested, the people of the U.S. spent nearly fifty years living with the constant threat of polio. Newspapers, radio, and even early women's magazines ran stories on polio regularly, but it was newspapers that were the primary media source for people living in the 1940s and 1950s. Newspapers updated citizens of developments in an age where TVs and radios lacked the news potential they have today. *The New York Times* published numerous articles to keep their readers updated, and one that was released on March 12<sup>th</sup>, 1954, gave an update on the status of a vaccine and stated that "polio will join other dreaded diseases as plagues finally tamed and conquered by man".<sup>37</sup> This statement was not unique to *The New York Times*. Numerous newspapers sprouted the headline "Polio is Conquered", including *The Pittsburgh Press*,<sup>38</sup> *Arkansas Democrat*,<sup>39</sup> and the *Herald Express*.<sup>40</sup>

This mentality of polio as some sort of entity to be dominated by humanity helped the American public feel united and in control. Polio was not seen as a force of nature or natural event; instead, it was seen as an enemy to mankind. Headlines like "Dr. Salk Kills Polio" and

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<sup>36</sup> Oshinsky, *Polio: an American Story*, 256

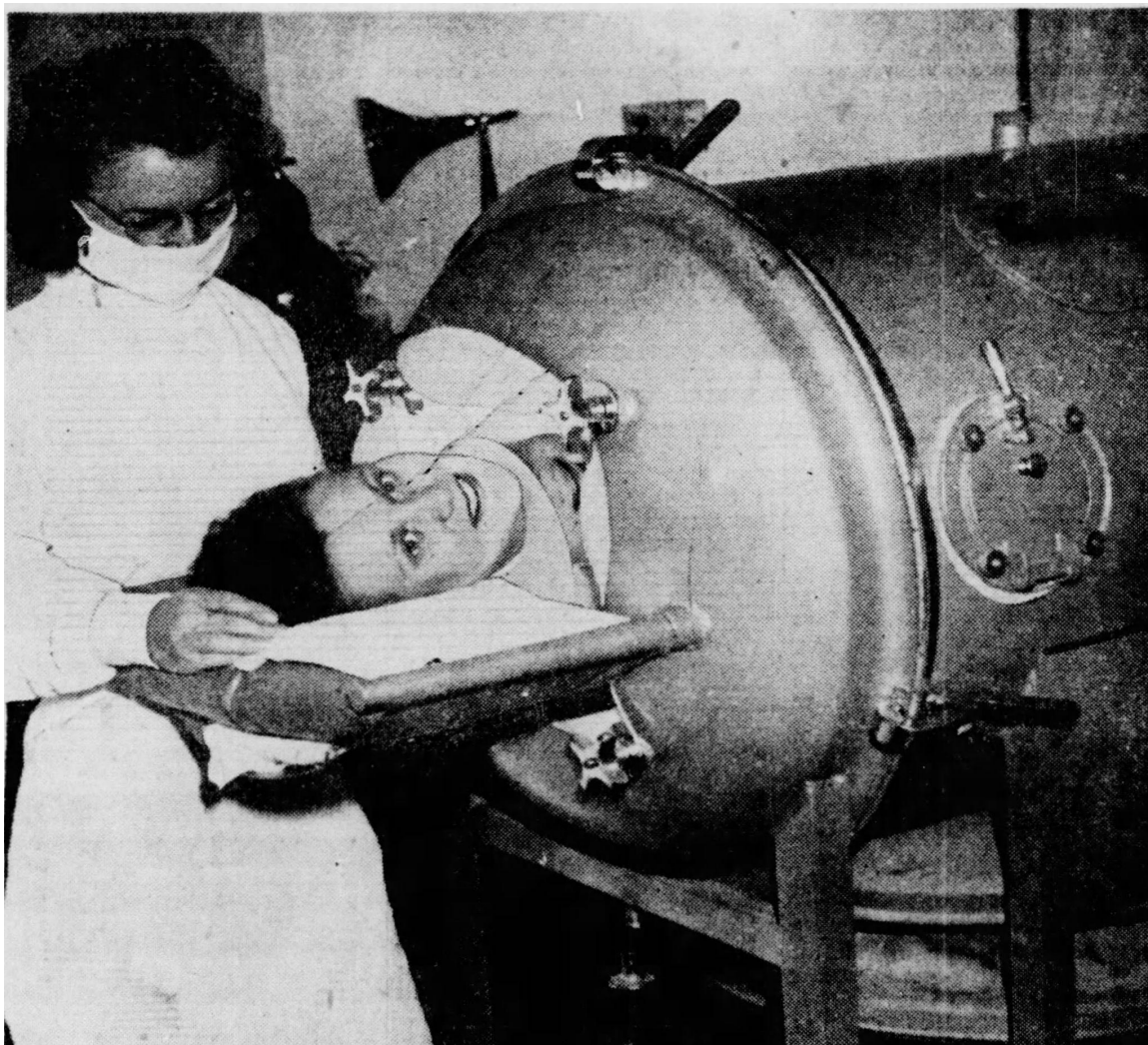
<sup>37</sup> William Laurence, "Lasting Prevention of Polio Reported in Vaccine Tests." *The New York Times*, 1954.

<sup>38</sup> John Troan, "POLIO IS CONQUERED." *The Pittsburgh Press*, 1955.

<sup>39</sup> Alton Blakeslee, "Polio Threat Conquered by Salk Vaccine." *Arkansas Democrat*, 1955.

<sup>40</sup> Alton Blakeslee, "Polio Terror Defeated; Vaccine IS Successful." *Herald Express*, 1955.

“Polio Terror Defeated” depict the aggression felt towards the virus. This aggression was not limited to housewives inspired by the media to fundraise for the cure or to those who donated; the bulk of the American population felt it. This happened due to the images of people in wheelchairs, crutches, and iron lungs frequenting the front pages for all to see.



**Image of an Iron Lung from *The Minneapolis Star*<sup>41</sup>**

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<sup>41</sup> Dreiman, David. “More Iron Lungs Here to Aid Polio Battle.” *The Minneapolis Star*, 8 Aug. 1946.

If a person did not have a family member afflicted, then they were likely exposed by the media to the devastation that this virus caused. Images like the one above frequented newspapers especially in months following summer outbreaks of the virus. The result of this heightened anxiety and desperation felt by the public was an enhanced pressure on officials to satisfy their need for a “win” against polio. The fifty years of struggle against poliovirus caused the years leading up to the 1955 vaccine to be fraught with demands for a solution; the general public was tired of the constant worry for their children’s safety.

This worry and the way media portrayed polio was not consistent in all regions of the US. Rural and urban areas had varying levels of intensity in their coverage of polio as well as how it was described in the papers. Rural papers tended to show the personal aspect by describing the exact person/family afflicted as well as give continuous updates on the person’s journey towards recovery. This enabled community members to be aware of what their fellow townspeople were dealing with and stay updated on the person’s health regardless of where they were hospitalized.<sup>42</sup> For example, in a rural small town in Wisconsin, five-year-old Curtis’s story was shared in an article taking up a large portion of the front page of the local paper in 1950.<sup>43</sup> It provided an update on his treatment, family, and recent birthday as well as celebrated his achievements in surviving polio. In contrast, urban papers focused more on informational articles that included methods to be safer during polio as well as numerical case information. These articles were usually mentioned in the front page, but the bulk of the information was placed farther into the paper itself. It was less personalized, but served to provide more information to the public who might not be as interested in a single community member’s recovery.<sup>44</sup>

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<sup>42</sup> *The Journal of Burnett County*. “Polio Patients Return Home for Christmas.” Vol. 56, NO 22, 1950.

<sup>43</sup> *The Journal of Burnett County*. “March of Dimes ‘Hop-a-Long Cassidy.’” 1950.

<sup>44</sup> Red Cross. “Seasonal Pattern.” *Minneapolis Star Tribune*, 12 Oct. 1946

While newspapers provided useful information and encouraging recovery stories, there was a great deal of misinformation present. This influenced how people saw polio and skewed the perceptions on how it was spread as well as the risk to children. As a result of the asymptomatic cases present, polio paralysis numbers looked far larger than they were. The *Minneapolis Star Tribune*, as well as other papers, reported the Red Cross information of an 18% permanent paralysis rate and 3% death rate for those afflicted.<sup>45</sup> The real values were likely closer to 5% being paralyzed and less than 1% dying.<sup>46</sup> In addition to the numerical values being quite different from reality, newspapers published unsubstantiated facts about how polio was spread. The Grantsburg, Wisconsin area paper (*The Journal of Burnett County*) published an article warning people away from kissing during polio season by writing “Smooching considered dangerous during polio outbreak” and then going on to give an update on those recovering from polio.<sup>47</sup> Since polio is spread by fecal contamination, this is not accurate and gives the impression that those currently recovering were infected from kissing instead of other means. Rumors, misinformation, and faulty statistics caused many people to gain a false sense of the risk and means to contract polio. This led to each area and family gaining its own specific ideas on how to be safe.

Governmental data from public health reports had more accurate information especially in regards to the areas most impacted by polio. While still not completely accurate due to the asymptomatic cases, public health reports provided a U.S.-wide view of polio outbreaks. It was during the 1940s that the government began to pressure all states to provide standardized information on polio cases as well as the areas from which they arose. Prior to this time, New

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<sup>45</sup> Red Cross. “Polio by Age Groups.” *Star Tribune*, 7 Aug. 1946, p. 3.

<sup>46</sup> “What Is Polio?” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 28 Sep. 2021, <https://www.cdc.gov/polio/what-is-polio/index.htm>.

<sup>47</sup> “News of Long Ago From Files of the Journal.” *The Journal of Burnett County*. 23 Aug. 1951.

York and a limited number of other states were the only ones to provide regular statistics. Other states adding their polio case data allowed for a comprehensive view of the regions to be observed. The Midwest was the worst of any region in the U.S. with close to double the cases of the U.S. average.<sup>48</sup>

The reasons for this dramatic difference between the Midwest and the U.S. average likely arose from the same reasons why polio is considered a middle-class plague. The Midwest had few large community dwellings and instead had primarily single-family homes with space present between each property. This kept urban midwestern areas from experiencing the same herd immunity seen in New York urban communities where numerous people lived in close proximity. Dr. Frederick Kottke, a medical professor in Minneapolis, believed the higher sanitation standards in his area were also contributing to the increased risk of polio.<sup>49</sup> He determined this after a trip to Scandinavia where he saw how unsanitary their conditions were but noted how low their polio cases also happened to be. Midwestern families more closely resembled the average middle-class family in other U.S. regions because spacious, single family houses were more affordable. Fewer apartment complexes existed and most families lived with some separation from others which decreased childhood exposure to polio and put more Midwesterners at risk regardless of their income. This likely contributed to the higher than average polio cases observed.

In addition to, but not because of, the high polio cases in the Midwest, Minneapolis was home to the prime specialist in terms of paralysis recovery, Sister Elizabeth Kenny. Sister Kenny was originally from Australia but moved to the U.S. to continue her work in polio treatment

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<sup>48</sup> Serfling, R. E., & Sherman, I. L. (1953). Poliomyelitis distribution in the United States. *Public health reports (Washington, D.C. : 1896)*, 68(5), 463.

<sup>49</sup> Minneapolis Star Tribune. "Cleanliness Linked to High Rate of Polio." 1952.

since the U.S. was experiencing more cases than Australia during this time. She earned the title “Sister” as a result of her work as a nurse in the Australian military.<sup>50</sup> In 1911, she saw her first case of polio and diagnosed it as a stiffening of the limbs.<sup>51</sup> Since she had not been exposed to polio before and did not know of the normal procedure at this time, she treated it as she would normal stiffening, with heat and stretching. This helped her patients regain mobility at a rate not seen by other practitioners at the time. She attempted to settle in New York in 1940, yet was scorned by the male doctors practicing there, and the local hospitals lacked the materials needed for her treatments. Her status as a female nurse with little formal training as well as the fact that her treatments went against the popular method made it difficult for her to relate to American doctors. However, two Saint Paul doctors, Dr. Williamson and Dr. Cole, were present in New York at the same time as she was and invited her to Saint Paul to practice. These two doctors' willingness to give Sister Kenny a chance went beyond the actions of any other doctor in the U.S. and secured Minnesota's future as a beacon of hope for polio victims.

Sister Kenny worked with Dr. Williamson and Dr. Cole until the value of her methods was seen in their patients. After that, Dr. Cole introduced her to doctors at the University of Minnesota Medical School, where she could begin teaching her treatment style.<sup>52</sup> In addition to her work there, she aided doctors at the Minneapolis General Hospital. Once rumors of her success spread, parents began to request her care for their children, but neither hospital was able to house all the patients requesting care. Soon after, the Minneapolis Board of Public Welfare donated and remodeled a rheumatic fever hospital to allow for Sister Kenny to address the demand for her services. In 1942, she set up the Sister Kenny Institute in Minneapolis using this

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<sup>50</sup> “Sister Elizabeth Kenny Biography.” *Watson Institute*, 11 Mar. 2020, <https://www.thewatsoninstitute.org/about-us/history/sister-elizabeth-kenny-biography/>.

<sup>51</sup> MN Historical Society. “Sister Kenny Institute.” *MNopedia*, <https://www.mnopedia.org/thing/sister-kenny-institute>.

<sup>52</sup> Kenny, Elizabeth. “An Update on My Journey.” Received by Friends of Sister Kenny, Elizabeth Kenny Papers. Minnesota Historical Society., 1946.



building for the treatment and rehabilitation of polio.<sup>53</sup> This was her base of operations for the training of staff who would later create treatment facilities using her methods throughout the world.

The training of nurses and healthcare providers in the Kenny method was not limited to white nurses. Sister Kenny's training was open to those of any race seeking to help her in her mission, but few non-white nurses had the means to travel and be trained in Minnesota. In 1948, a newspaper article highlighted three "negro" women who were in training at the Sister Kenny Institute in Minneapolis.<sup>54</sup> One of those women, Ruth Hill, was interviewed and asked about why she traveled from Chicago to be trained in Minneapolis. She explained how she had applied and been accepted for a financial scholarship to enable her to make the journey and afford to stay for the year-long course. Her training in Minnesota would give her necessary skills to be immediately hired at most hospitals once she returned home.<sup>55</sup> These three women, two of whom were from Illinois, were the only African American women officially sponsored by the Institute itself for their training.

The Sister Kenny Institute was renowned across the world for its different take on polio treatment. Most hospitals focused on using braces to fix paralyzed limbs in place and teaching children how to function while paralyzed. Sister Kenny focused on increasing mobility and flexibility in the limbs of paralysis victims to make it possible for movement to be regained.<sup>56</sup> As a result, her treatment style of hot packs, steam baths, stretching tools, and physical therapy enabled many afflicted people to regain some or all of their mobility. It was hardly a pleasant experience as her methods were often harsh and extreme in her attempt to loosen tense muscles,

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<sup>53</sup> "Courage Kenny Rehabilitation Institute." *Allina Health*, 2020, <https://account.allinahealth.org/servicelines/815>.

<sup>54</sup> Smith, Helen. "Chatter Patter." *Minneapolis Spokesman*, 1948, p. 6.

<sup>55</sup> Smith, Helen. "Chatter Patter." *Minneapolis Spokesman*, 1948, p. 6.

<sup>56</sup> "Sister Kenny Institute." *MNopedia*, <https://www.mnopedia.org/thing/sister-kenny-institute>.

but the results were worth it to the patients who became able to walk again after visiting her institute.<sup>57</sup> Despite the positive results of her care and the training of specialists, many hospitals found her methods prohibitively expensive. This led to the various areas in the Midwest sending their paralyzed patients to Minnesota to receive the rehabilitation treatment not possible in their own states. Still, this option was not available to areas distant from Minnesota, which led to the states surrounding it having a higher standard of treatment compared to the rest of the U.S. due to the Sister Kenny Institute being nearby.

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Minnesota and its neighboring states benefited greatly from the Sister Kenny Institute being nearby and it helped them to combat the higher case numbers seen in the Midwest. The degree of difference in case numbers was found by researching public health reports. They aided the study of case distribution across America and allowed for an overall picture of polio's distribution to be evaluated. They also provided specific information into each state's cases, morbidity, and mortality to be observed. This gave a baseline idea of what the polio environment was like for those interviewing during the years they were growing up. Public health reports lent insight into when and where polio hit during the 1940s and 1950s. Details like the months with the highest caseloads were reported that made it easier for questions to be formulated for each participant depending on their state of residence. These reports were located from both historical societies and government databases where the relevant states and their information was taken from and then transitioned into usable data for this study.

Similarly, newspaper analysis was conducted to provide an understanding of what information was available to people during this period. A review of small-town newspapers from

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<sup>57</sup> *Small Steps: The Year I Got Polio*. Albert Whitman & Company, 2019.

areas where interviewees lived was done to provide a comparison to larger city papers like the *Star Tribune* in Minneapolis. This gave more of an insight into what the participants' parents might have been hearing about polio. Unlike the public health reports where numbers and statistics were present, newspapers were harder to quantify. As such, newspaper data was used to supplement the other data found in the course of this research.

Additionally, outside newspaper analysis was utilized to add further understanding to what differences existed between rural and urban newspapers. A content analysis of Minnesota newspapers by Julia Corbett found that a “utilitarian” theme (designed to be useful or practical rather than attractive) will be more common in rural newspapers than in urban papers, while a “stewardship” theme will be more common in urban newspapers than in rural ones. This means that urban papers will work to connect their audiences to the topic and show how important human management is to the topic's success. In contrast, rural newspapers will focus on how the topic is useful/beneficial for human success. Corbett also found that public interest articles (anything affecting the community as a whole) are much more prevalent in rural newspapers or in specialized sections of urban newspapers.<sup>58</sup> However, it was noticed that conflict related stories are more likely to be published in urban papers as opposed to rural ones. This suggests that larger papers are more interested in publishing “eye-catching” stories while rural papers are more interested in stories that benefit their audiences.

Another analysis was done by Rachel Young and her associates titled “Localized Health News Releases and Community Newspapers: A Method for Rural Health Promotion”. Young focused on health-related stories and found that health organizations that tailor their message for individual media outlets have a higher chance of being published. This study was a part of a

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<sup>58</sup> Corbett, Julia. “Rural and Urban Newspaper Coverage of Wildlife: Conflict, Community and Bureaucracy.” *Sage Journals*, 1 Dec. 1992, <https://journals.sagepub.com/doi/abs/10.1177/107769909206900412>.

two-year public health effort to promote health coverage through newspapers. It found that rural community papers responded well to tailored stories (stories aimed at catching a particular population's attention) and articles written specifically for that region. Young believed that adjusting the way newspapers or reports structured articles in rural areas could allow for these lesser reached areas to have an improved quality of health-related promotion.<sup>59</sup>

Despite the useful information provided in public health reports and newspapers, their main purpose was to provide background for the most important aspect of this research, personal accounts. Interviews and memoirs gave a depth to the study of polio's effects not possible without human participation. The goal of this research was to better understand how people from the Midwest responded to a viral outbreak given that they experienced more cases than any other region during the 1940s and 1950s. The Midwestern reaction to polio was under-documented in favor of large urban centers which ignores a large population of Americans. For this reason, I sought volunteers over the age of seventy who grew up in the Midwest to participate in this study to give a personal account of their experiences with polio. I reached out to nursing homes, retirement communities, and local libraries with flyers, emails, and used word of mouth from those already participating to find volunteers. All of the interviewees had different memories of polio and each had their own perspective on how the virus influenced their childhoods; however, for the purpose of this project, their answers were categorized by the length of time they were affected, the impact polio had, the amount of restrictions they experienced, where they lived at the time, and how that area responded. They were also asked to list where they had heard about polio, beyond their parents, to see how the media influenced them as they were only children during this period.

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<sup>59</sup> Young, Rachel, et al. "Localized Health News Releases and Community Newspapers: A Method for Rural Health Promotion." *Sage Journals*, 9 Apr. 2015, <https://journals.sagepub.com/doi/full/10.1177/1524839915580538>.

These answers were achieved by a conversational interview where each participant was asked a starting question of “what do you recall about polio” to avoid them being led in any specific direction by the researcher. It also allowed them to recall such distant memories slowly. Then, through the course of the session, follow-up and more precise questions were asked to elicit specific information that could then be coded. None of the interviews were recorded, but detailed notes of the conversations were taken at the time of the interview and later transcribed. In addition, I researched Midwestern memoirs, and reviewed them to answer the same questions as in my interviews. This provided more details on their experience and allowed this study to include reports from those personally afflicted with polio. These personal reports, paired with newspaper data, and public health reports, allow for a better view of the way polio was viewed during this time.

Categories of responses were used to code the variety of interview answers into data points. First, each participant listed their town of birth and age which was later coded as either urban or rural based on the population size during the 1940s or 1950s depending on when they were born. A population limit of 2,500 was considered for rural areas with anything exceeding that being considered urban based on the Census classification of rural and urban populations.<sup>60</sup> Those that lived outside towns/cities without belonging to suburbs were also considered rural. Following that, during the course of the individual's dialogue and my own prompts, questions on the influence of polio were answered.

Polio caused a lot of fear and uncertainty in many communities which sometimes resulted in restrictions being placed on youth to prevent exposure. Questions on whether participants were able to attend classes or camps, visit pools, hang out with non-neighbor friends, and related

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<sup>60</sup> “Defining Rural Population.” *Official Web Site of the U.S. Health Resources & Services Administration*, 5 Oct. 2021, <https://www.hrsa.gov/rural-health/about-us/definition/index.html>.

prompts were asked after the initial open-ended conversation with each person. This revealed whether or not their schools, communities, parents, or friends' parents were imposing restrictions on their activities at any point in their childhood. These restrictions were then coded as none, mild, moderate, or severe. Mild would be if they could not do a small activity like visit a classmate they were not that close to or go to the pool one weekend a year. These were things that inconvenienced the person but not in a serious or overly upsetting way. Moderate restrictions were usually those imposed by their parents that changed their day-to-day life or impacted an enjoyable annual event like going to the lake or camp. Severe restrictions were those that caused a dramatic shift in their lives and kept them from experiencing their childhood as they had before polio's influence began.

The duration and number of these restrictions were relevant to record as they provided context to the severity noted for each person. A severe single restriction for a small amount of time may not be as impactful as moderate restrictions over a longer period. The number of restrictions was recorded as none, mild (1-2), moderate (3-5), or severe (5+). Depending on their responses, the duration was listed as none, single summer/less than three months, two summers/one year, and multiple summers/years. Multiple restrictions that took place in different years were considered two summers/one year.

The impact polio had on each individual's childhood was coded as none, mild, fair, moderate, severe, or complete impact due to the complexity found in the interviewee's answers and experiences. No impact would be if they recalled very little of polio, had no restrictions, no fear of it, and had no personal connection to anyone who was afflicted. Mild was for anyone with some exposure but still no personal fear or connection. Fair was for those personally connected through a friend or family member, yet still had no personal fear and only minimal restrictions to

daily life. Moderate was used for people with restrictions that either inconvenienced them for a longer period of time or were more intensive for a shorter duration with some to moderate connection to polio. Severe effects were seen from those who either had personal polio experience themselves or a close family member afflicted, causing a dramatic change in their day-to-day lives. If they were paralyzed or permanently affected, then it was categorized as complete.

Finally, the last question to be answered was whether their parents and/or they responded to polio in a personal manner or if it were a community-conducted response. If people noted that their parents were not concerned about polio, did not restrict their activities regardless of what their neighbors/community suggested, or if their family imposed restrictions on their own without it being a community encouraged behavior, it was considered a personal response. If the community encouraged a specific restriction that their parents followed or their parents reacted based on the community's reaction, it was a community response. This is important because it shows why certain parents responded with either restrictions or no restrictions for their children, and it enables an analysis of how related rural/urban status is to how people chose to respond to threats like the polio epidemics.

While the coding was done to limit bias and make this project as accurate as possible, limitations existed in all aspects of this research, primarily in the demographics of people who volunteered. This research was conducted during the COVID-19 pandemic which limited the available places to look for interviews as nursing homes and assisted living facilities were not open to visitors. Instead, the participants were mostly from independent retirement communities near Minneapolis, Minnesota or from the community of Grantsburg, Wisconsin due to them being accessible which restricted the variance among participants. This meant that the population

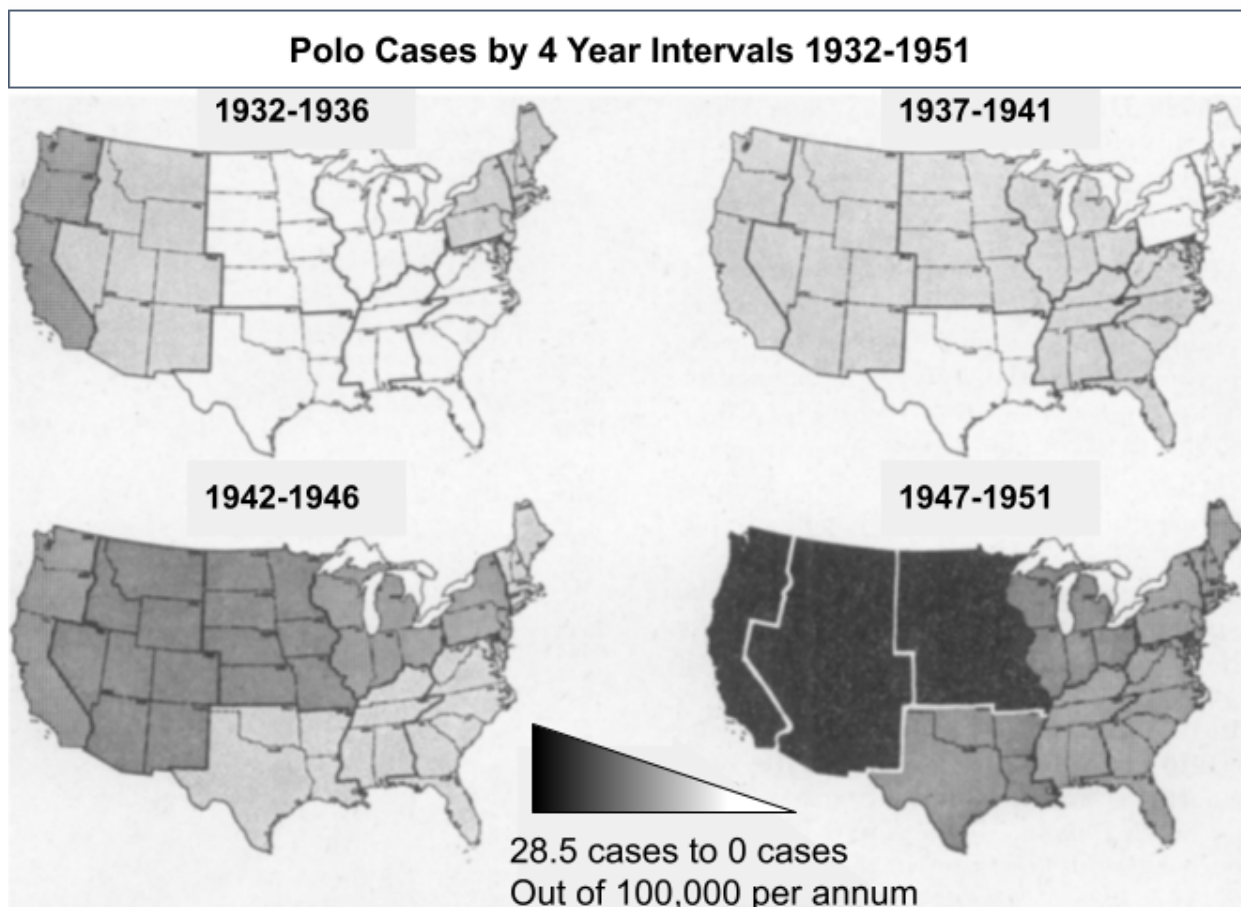
of the Midwest was not fully represented as only white, relatively well-off individuals were interviewed. It also meant that a large degree of the participants were from Minnesota and Wisconsin with only a scattered few from other states. The only large urban center studied was Minneapolis which also imposes some limitation on how representative the results are.

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From this research and the coding that followed, preliminary connections were found. Twenty-seven personal accounts (three memoirs and twenty-four interviews) were coded. The results from the public health reports, newspapers, and then each interview question will be explored in this section before a discussion of the overall trends noted in this project will begin.

Public health report data provided evidence on Midwesterners' added polio risk compared to the rest of America, especially in the 1940s and 1950s. As seen below in Figure 1, polio cases in the Midwest surged from zero to a few cases in the 1930s to 1940s to around 28.5 cases out of every 100,000 people per year. No region of the U.S. exceeded the Midwest in case rates after the 1940s, and as Figure 1 shows, more cases occurred as the years went on. In Figure 2, the red line representing the West North Central states, the bulk of the Midwest, had almost double the cases of the U.S. average and experienced cases over a longer period. This supports the idea that the Midwestern lifestyle of more spread apart homes and less urbanized areas indeed resulted in a higher risk of polio. This data also allows the time frame of polio to be seen with the highest caseload in late July to September, with declining numbers as the winter season approaches.



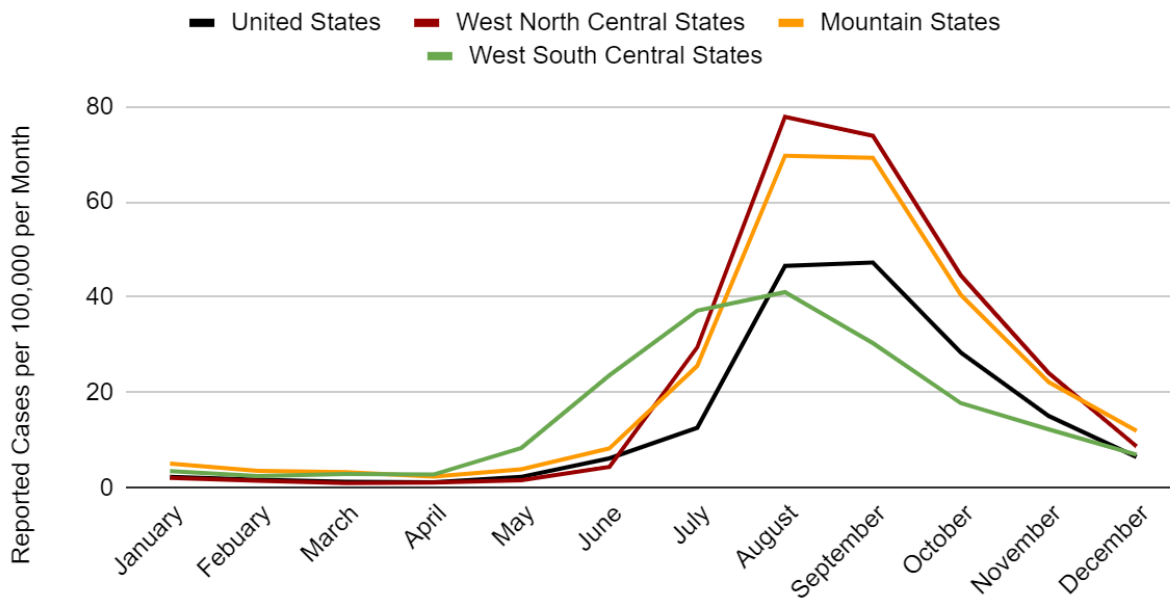


**Figure 4: Polio Cases by Four Year Intervals 1932-1951**

US map depicting the worsening case rates as the years neared 1951. The darker portions signify a larger incidence of polio in the given state/region.<sup>61</sup>

<sup>61</sup> Serfling, R. E., & Sherman, I. L. (1953). Poliomyelitis distribution in the United States. *Public health reports (Washington, D.C. : 1896)*, 68(5), 463.

## Polio Cases by Month, 10-year Average Rates by Major Geographic Divisions



**Figure 2: Polio Cases by Month, 10-year Average Rates by Major Geographic Divisions**  
1941-1951

West North Central States (red line): Iowa, Missouri, Nebraska, North Dakota, South Dakota, Minnesota, and Kansas. These states make up the bulk of the states studied in this project. Mountain States: Idaho, Montana, Wyoming, Colorado, New Mexico, Arizona, Nevada, and Utah. West South Central States : Arkansas, Louisiana, Oklahoma, and Texas. This region is included due to its peculiar seasonal incidence when compared to the rest of the US.<sup>62</sup>

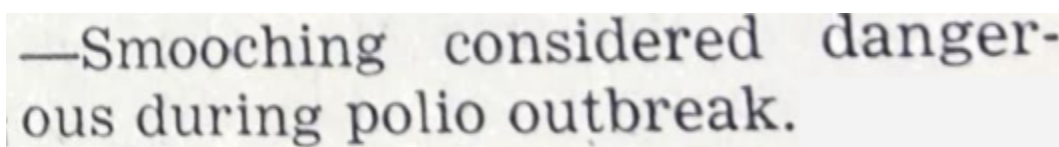
Public Health reports also gave an idea on the different case rates in the five states that interviewees were from. Minnesota had the highest with an average of 31 per 100,000 people getting polio during the 1940s and 1950s while Wisconsin had 20, Illinois had 25, Missouri had 13, and Ohio had 13.4 per 100,000.<sup>63</sup> The overall average of all Midwestern states had a value of 25.6 out of 100,000 which was above the next highest region, the Mountain states, that had a value of 20.7 cases per 100,000. For additional comparison, New York had 16.55 cases per 100,000, Florida had 9.6 cases per 100,000, and California had 22.5 cases per 100,000 during

<sup>62</sup> Serfling, R. E., & Sherman, I. L. (1953). Poliomyelitis distribution in the United States. *Public health reports (Washington, D.C. : 1896)*, 68(5), 463.

<sup>63</sup> Serfling, R. E., & Sherman, I. L. (1953). Poliomyelitis distribution in the United States. *Public health reports (Washington, D.C. : 1896)*, 68(5), 461.

this period. This shows that while the Midwestern states individually were not always higher, they were still at least 5 cases per 100,000 higher than any other region.

Newspapers in the Midwest differed by the population size of the area represented. Rural/small-town newspapers provided a more personal retelling of polio news by sharing pictures and information on any local children who had been or were currently ill with polio. These local papers also pushed ways to give back and proudly shared how much local charities or children had raised for the March of Dimes. Metropolitan newspapers tended to have more general stories and only occasionally provided the names or statistics of local cases. This created more distance between readers and polio as they were not seeing pictures and names of neighbors or acquaintances in the paper. There was also a variation in the validity of information posted in urban papers compared to rural ones. Urban papers referenced organizations like the Red Cross for their statistics and recommendations, while rural papers would include statements like the one seen in Figure 3 that were not reviewed by any outside organization and could lead to the spread of misinformation since polio is not in fact spread by kissing.



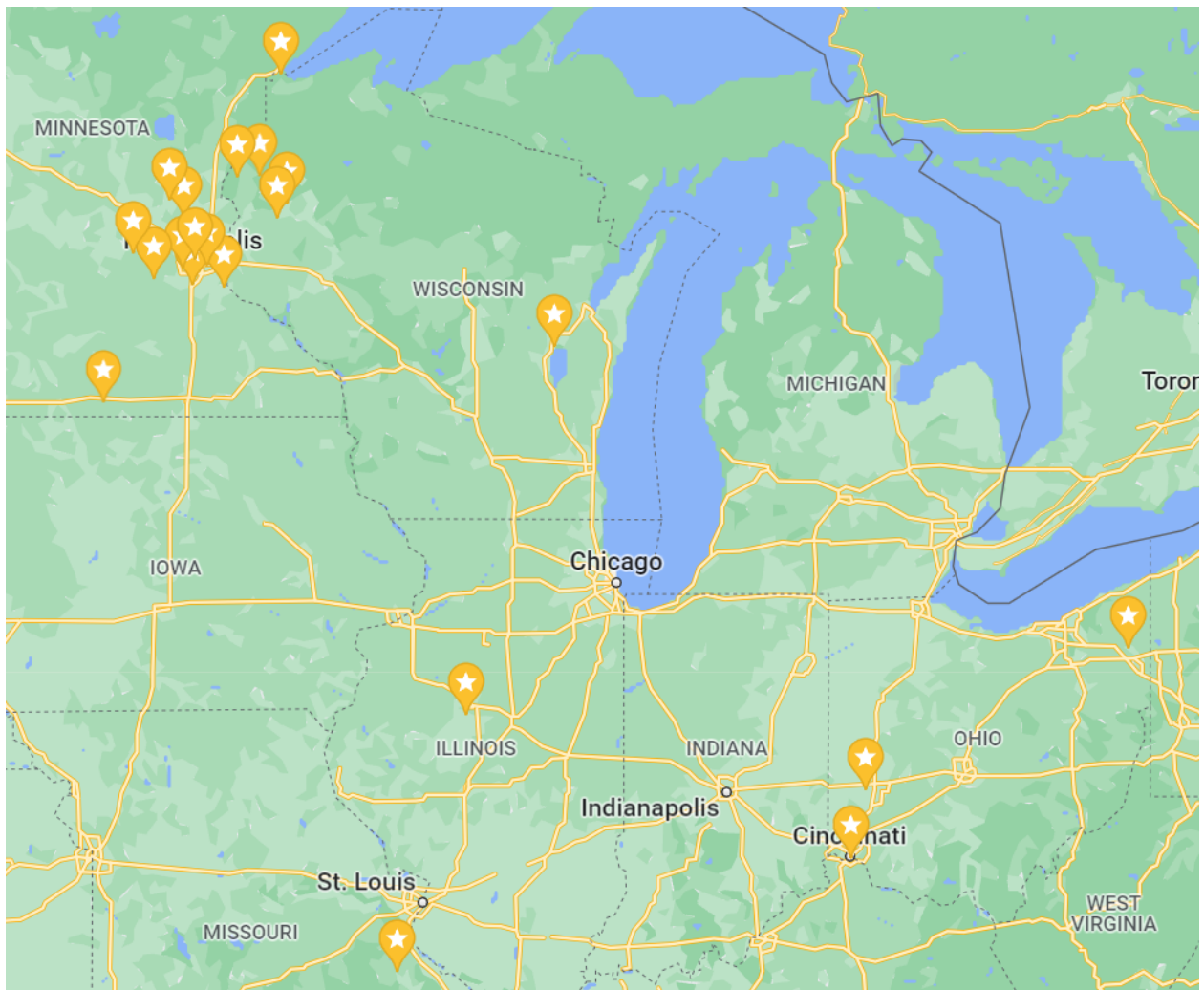
—Smooching considered dangerous during polio outbreak.

**Figure 3: Midwestern Newspaper Clipping**  
Gossip section in the Grantsburg, WI area paper, the *Journal of Burnett County*<sup>64</sup>

The demographics of this study provide information on the gender, state of residence, population density, and age of the various participants. Gender was very even, with thirteen identifying as male and fourteen as female. The state of residence during the 1940s and 1950s was more uneven, as can be seen in Figure 4, with twelve individuals being from Minnesota, nine from Wisconsin, four from Ohio, and one each from Illinois and Missouri. Five of these

<sup>64</sup> "News of Long Age From Files of the Journal." *The Journal of Burnett County*, 23 Aug. 1951.

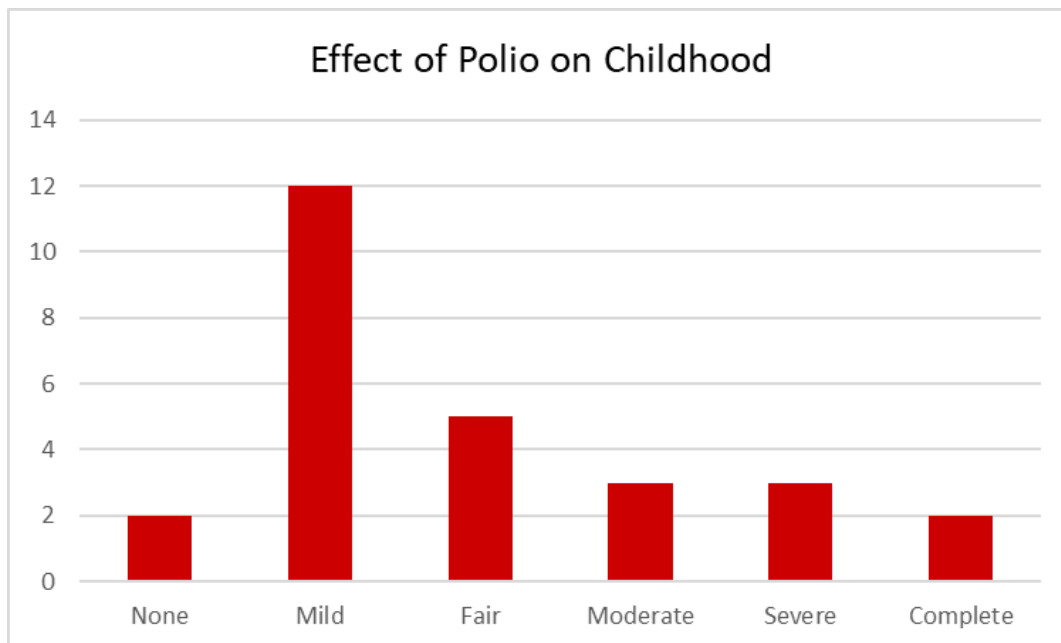
people had been afflicted with polio themselves, while five others had a close relative who had dealt with polio. Three of the five with personal polio experience wrote memoirs detailing their struggles during their illness, and two of the three experienced hospitalizations. One interviewee had caught polio as a baby and could not depict her experience of the disease but described how it felt to grow up partially paralyzed. All the interviewees were born before 1948 and were between the ages of 74-89.



**Figure 4: State Demographics**

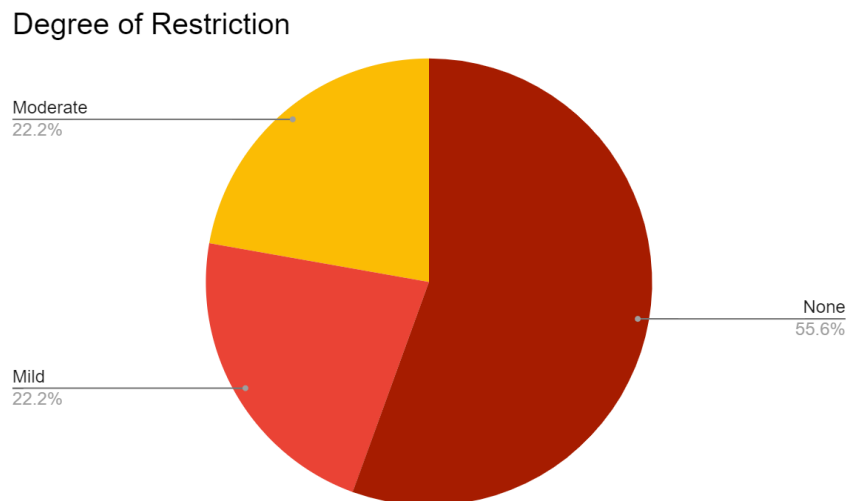
The locations of interviewees that participated in the research study (Appendix A-X). The majority of participants are from Minnesota and Wisconsin.

Many of the other participants had seen friends, neighbors, or distant relatives deal with polio's effects, which played varying roles in their experiences as children. However, most interviewees felt polio was distant to them and did not believe they could contract it. Instead, they recalled being upset about the restrictions or complications that polio posed on them, not the risk. For example, one interviewee had an aunt with polio who lived in an iron lung. He recalled how inconvenient it was to have her present and hated polio for causing her to be in their lives. While his story was the clearest view of the dissociation children have towards illness and death, many others noted how concerned their parents were but stated that they felt it unnecessary to worry since they could not envision being crippled or dying. For this reason, there is a wide disparity between the effect and the number of restrictions since many children were exposed to polio through sick friends and family but did not feel a strong sense of fear due to it not directly affecting them. This can be seen in Figures 5 and 6, where the majority experienced mild to no restrictions with a predominantly mild effect from polio in their life.



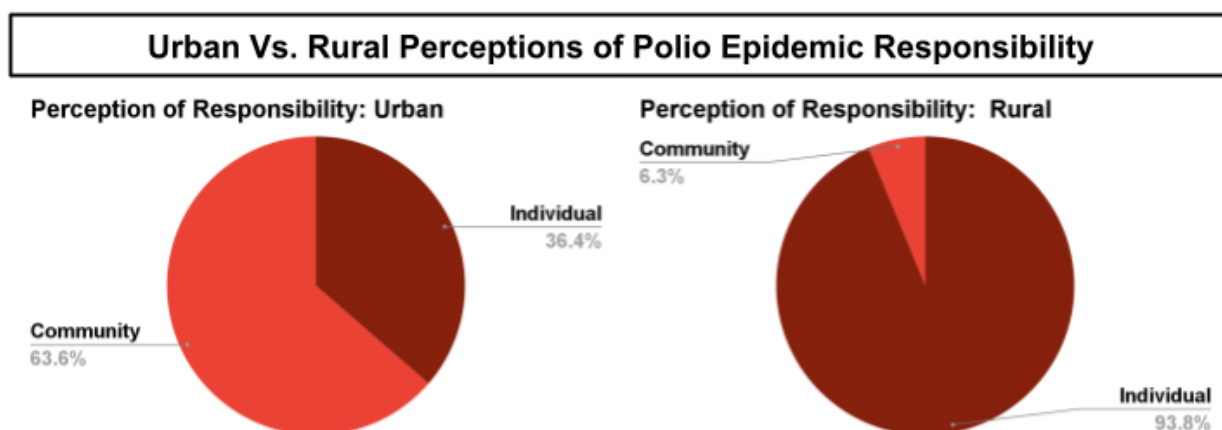
**Figure 5: Effect of Polio on Childhood**

The values coded from all 27 personal accounts are based on the severity of polio's influence on their childhood activities and mindset (Appendix A-X).



**Figure 6: Degree of Restriction**  
Values found from coding of the personal accounts (Appendix A-X)

The last question was about each family's polio perceptions and whether they viewed it as a personal or community issue. Surprisingly, people rarely hesitated when answering this question as most had a good understanding of their parents' preferences and knew which response best suited their family. Eighteen of the twenty-seven answered that they felt it was each family's personal responsibility to react to polio as they saw fit. Eight felt like it was the community's job to help dictate the response, while one individual felt like neither quite fit. These values by themselves are not very significant, but when paired with each interviewee's status as rural or urban, certain connections can be seen (Figure 7). When connected, 93.8% of rural-raised people felt that it was a personal/individual responsibility to react to polio, while 63.6% of urban people felt it was a community responsibility.



**Figure 7: Midwestern Polio Response vs Population Size**

Twenty-eight personal accounts of the 1940s-1950s polio epidemics were analyzed in order to determine the ways in which various communities responded to polio outbreaks. Sixteen individuals were from rural communities with a population size during the 1940s-1950s of less than 10,000 people while twelve individuals were from areas exceeding that population. Made from the data sourced from interviews conducted during the course of this project as well as data obtained from memoirs.

These data points can only explain so much about the multitude of tribulations people in the 1940s and 1950s experienced. Meeting with participants and giving them a space to explore their childhood memories was extremely satisfying as it gave them a voice to share their stories. One interviewee noted how he had not been allowed in puddles as his mother thought they contained polio but had no other restrictions.<sup>65</sup> Another had to avoid his polio-infected friend yet could mingle with everyone else. One participant whose sister had gotten polio recalled that everyone blamed it on a wild animal she had played with and did not think about it coming from another person.<sup>66</sup> Every parent, rural or urban, had their own ideas on polio and their preconceptions were imprinted in the minds of those interviewed.

Memoirs provided an interesting contrast by allowing a glimpse into society by detailing what reactions those afflicted noticed from those around them. It also gave a startling glimpse into hospital and home life. Of the three memoirs analyzed in this study, two were of people who

<sup>65</sup> Trumpy, Franklin. Interview. Conducted by Lauren McDonald, 17 July, 2021

<sup>66</sup> Newgord, Robert. Interview. Conducted by Lauren McDonald, 17 July, 2021, Appendix I

had to spend over a year hospitalized. The third person lived too far from a city or town to go see a doctor and was not paralyzed badly enough to be sent to live in a hospital, so instead his recovery took place at home. In the memoir *Small Steps: The Year I Got Polio* by Peg Kehret, Peg details what happened after she collapsed at school in early September and three days later was sent to the hospital.<sup>67</sup> Meanwhile, life went on back home. She was too far for her parents to visit and no friends ever came to see her. School wasn't canceled and events like homecoming went by without her. Peg got to visit home briefly for Christmas, a luxury few children had, but she found the experience more stressful than anticipated due to her inability to even ride in a car comfortably, walk upstairs to her room, remain standing around her excited dog, and so many other small issues she would not have foreseen when healthy. The hospital she was living at, Sheltering Arms in Minneapolis, had become her home and she shared a room with other paralyzed girls who understood what it was like to be recovering from polio. Finally, in the spring, she had recovered enough to walk with braces and even unaided for brief periods of time which enabled her discharge from the hospital. However, her trials did not end there as acclimating to life back home was its own challenge. She had to reconnect with friends who had moved on, readjust to her family, and figure out how to survive as the only polio victim in her neighborhood.

Similarly, Richard Maus who wrote *Lucky One: Making It Past Polio and Despair*<sup>68</sup> had to fight his way to recovery, but his journey started as a baby. He contracted polio at four months old and spent thirteen years going back and forth between hospital and home as surgeons, doctors, and physical therapists tried to fix his paralysis. Unlike Peg whose experience was overall positive and she was able to mostly recover, Richard had numerous failed surgeries and

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<sup>67</sup> Kehret, Peg. *Small Steps: The Year I Got Polio*. Albert Whitman & Company, 2019.

<sup>68</sup> Maus, Richard. *Lucky One: Making It Past Polio and Despair*. Anterior Publishing, 2006.



infections. He also lacked a supportive family and noted how his parents would never mention his time at the hospital and changed the subject if it was brought up. Because of this, he was very isolated and would spend months in the hospital only to be ignored at home. His depiction of polio allowed for the psychological side to be clearly seen. He was treated as an outcast in his own family and struggled with depression for most of his adolescent years.

Lastly, *Limping through Life: A Farm Boy's Polio Memoir*<sup>69</sup> by Jerry Apps told the story of those who were either too healthy or too distant to be sent to polio hospitals. At twelve, Jerry was one of the rare people who got polio in the late fall, and he experienced paralysis in only one leg. He lived on a farm a mile or two away from a small isolated town. As a result, after a country doctor confirmed his diagnosis, his parents simply let him recover downstairs for the winter until his help was needed for spring planting. Once spring came, they no longer let him mope about his immobile leg and instead made him contribute as his labor was needed. Jerry reported how he had to use a chair as his crutch to tend to the animals and help plant the fields. His father even made him use the tractor, which he quickly crashed through a fence due to his inability to use both feet on the pedals to turn/slow the machine properly. However, this became a great form of therapy since his father kept making him drive it, and fear, use, and necessity made him slowly regain some use of that leg. Eventually, he regained some mobility from the long walks to school, farm labor, and tractor use. He may not have had Sister Kenny's treatments, yet he attributed his recovery to all his work on the farm.

Life continued after kids were sent to the hospital, and even parents' lives continued while their children's life was put on pause. Thousands of children across the U.S spent days, months, and even years in hospitals trying desperately to regain the mobility they once had.

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<sup>69</sup> Apps, Jerold W. *Limping through Life: A Farm Boy's Polio Memoir*. Wisconsin Historical Society Press, 2013.

While these three people could eventually leave the hospital, or in Jerry's case, his house, many others were not that lucky. Polio was a brutal illness that not only took a person's strength away, but also a portion of their life and even their future. Post-polio syndrome is a relapse of symptoms that occurs later in life for those afflicted and can cause muscle weakness and skeletal deformities among other symptoms.<sup>70</sup> It happens due to the motor neurons being permanently stressed from polio even if they seemingly recovered; post-polio syndrome can lead to lasting weakness recurring decades after initial recovery. So even those who survived polio once to achieve normal mobility may lose it later in life to the long-lasting damage caused by the poliovirus.

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Polio was not the only illness to plague American citizens throughout the 20th century and it would not be the last. An enhanced understanding of how people reacted to a series of epidemics like what occurred with polio could allow for better methods of communication to be utilized in future illnesses. The dissociation between how rural people viewed polio responsibility and how urban people viewed it is not unique to polio. The sense of personal responsibility and choice for rural people can be seen in politics, lifestyles, environmental decisions, and healthcare.<sup>71</sup> This includes vaccination; following 1955, a lack of polio vaccination was seen more in rural isolated areas and it was these areas that had a resurgence of polio cases later on.<sup>72</sup> In contrast, those in urban environments are more willing to follow the lead of governmental officials or their local community leaders in how best to protect themselves and are more likely to fully vaccinate. The number of restrictions present was also higher in

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<sup>70</sup> "Post-Polio Syndrome Fact Sheet." *National Institute of Neurological Disorders and Stroke*, U.S. Department of Health and Human Services, <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Post-Polio-Syndrome-Fact-Sheet>.

<sup>71</sup> Bonnie, Robert, et al. "Understanding Rural Attitudes toward the Environment and Conservation in America." *Nicholas Institute*, Duke Nicholas Institute for Environmental Policy Solutions, 8 July 2021, <https://nicholasinstitute.duke.edu/sites/default/files/publications/understanding-rural-attitudes-toward-environment-conservation-america.pdf>.

<sup>72</sup> Minnesota Department of Health. "Recommendations of the Public Health Service Advisory Committee on Immunization Practices." *105.E.1.8F*, 1, Accessed 29 Jan. 2022.

people from urban areas as was the impact of polio in their lives which suggests a more active approach taken by urban leaders when compared to rural individuals.

Interestingly, individuals who either got polio themselves or had a family member contract it noted that their parents did not react to that by imposing greater restrictions. Instead, they may have been restricted from seeing the person with polio but were otherwise allowed to continue their lives unimpeded by safety precautions. This was true even for families where the parent themselves was the one afflicted. This was different than expected and was seen primarily in rural families.

These trends have been seen in other illnesses like COVID-19 where vaccination and compliance with governmental mandates is higher in urban areas and lessens as you get more rural. Rural communities have also been found to have a higher mortality rate during epidemics and pandemics than urban communities due to the lesser medical care present and the tendency of rural people to avoid preventive care methods such as avoiding social gatherings or going to the doctor when ill.<sup>73</sup> This goes with the previously noticed trend of rural families being affected more but not reacting with additional protective measures. Rural vaccination for the coronavirus was about 7% lower than urban vaccination across the U.S.; Minnesota had the closest urban to rural vaccination rate of any other Midwestern state with only 3% while Ohio had the worst with 9.5%.<sup>74</sup> With polio, the values found during this study show that rural people favor an independent attitude towards health concerns which has also been seen in the political tendencies and ideologies of rural Americans during the COVID-19 pandemic.

This study can be enhanced by either expanding this research to examine other regions in

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<sup>73</sup> Callaghan, Timothy, et al. "Rural and Urban Differences in Covid-19 Prevention Behaviors." *Wiley Online Library*, John Wiley & Sons, Ltd, 22 Feb. 2021, <https://onlinelibrary.wiley.com/doi/10.1111/jrh.12556>.

<sup>74</sup> Murthy, Bhavini Patel, et al. "Disparities in Covid-19 Vaccination Coverage between Urban and Rural Counties - United States, December 14, 2020-April 10, 2021." *MMWR. Morbidity and Mortality Weekly Report*, Centers for Disease Control and Prevention, 21 May 2021, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8136424/>.

the U.S. to determine whether comparable findings can be found or doing a more comprehensive study of the Midwest. Expanding the research to other areas will allow for regional differences or similarities to be seen across the U.S. to help improve the understanding of how people from different regions respond to viruses like polio. Further research into the Midwest would allow us to see if these results are still present with a broader interview base and whether the same high disparity exists. The data from this research provides an insight into the Midwestern perspective, and further interviews might strengthen these findings. Public health offices could use this information to better target communities to create media resources that people from various areas would use and learn from. Improved outreach could help connect some of the divergence between rural and urban responses like what was seen in polio as well as improve the high rural mortality and low vaccination rates seen with COVID-19. This could result in a higher quality of health information present and thus a more informed and receptive populace.

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Appendix A

A., Bruce. Interview. Conducted by Lauren McDonald, 17 July. 2021

Bruce's parents were lower class and worked a lot. His mother was a waitress and his father dug ditches. They were very busy during his youth and he had the freedom to spend his days how he wanted. He had never heard of Polio during his childhood and no one had had it that he knew of. He lived right in town and played/lived without restriction during his childhood. He did not recall being vaccinated.

He had heard of the March of Dimes but did not associate it with Polio. Beyond that, he had no knowledge of any media exposure to polio until he became an adult.

## Appendix B

A., Jerry. Interview. Conducted by Lauren McDonald, 15 June. 2021

He had no family members who got polio to his knowledge and did not recall any shutdowns, but a friend of his, Tom, got polio and was paralyzed. Despite his friend being paralyzed, Jerry reported that while polio was around him growing up, it did not seem that big of a deal. As far as he recalled, his parents did not stop him from hanging out with Tom at all, and Tom helped make polio real to him.

In the interview, Jerry mentioned that he had not heard about polio in the news, but immediately remembered watching the march of dimes on the tv at around age ten. He went on about the entertainment and how it was one of the few things on tv. His whole family watched.

Interestingly, he did not associate it with polio as a youth even if he now knows that it was to fund polio which is why he did not mention it in regards to news of polio. He noted that back then it wasn't advertised with polio directly and to people like his family who weren't victims of polio, it was easy to miss.

## Appendix C

B., Judy. Interview. Conducted by Lauren McDonald, 21 July. 2021

Judy was young during the polio era and had been 7 when the vaccine came out. Despite her mother having suffered from polio and having a bad leg, Judy had no memories of any restrictions as a child and cited that as due to her sister suffering from juvenile diabetes (type 1) which took precedence. She also commented that polio was something her mother went through, but not something that defined her which also played a role in it not being a big concern at home.

She went to the lake swimming often as a young child and while her mother would not swim, it was a family event to go. She recalled no restrictions from the community and did not remember anyone she knew getting polio besides her mom. She did not recall ever not knowing about polio since her mother's condition made it a general, if under discussed, topic in their lives. She said "It was a given, but they did not worry about it." It was an external concern and like many children, her and her siblings followed their mother's example. She wasn't concerned so neither were they.

When the vaccine came, she got her shot right away and there was no further prevalence of polio in her life other than her mom's leg having more strength and arthritis related issues as she aged.

Appendix D

B., Dina. Interview. Conducted by Lauren McDonald, 21 July. 2021

She grew up on a farm going to a small one room country school with few kids. She did not hear about polio until adulthood when she was pushed to get the vaccine in her first job. Her parents were not the type to take them to the doctor or drive them to town so she had no opportunity to hear of polio. There were no closings for her school and she did not have activities that could have been canceled since she worked on the farm all summer. Her walk to school was the most travel she did and if anyone had gotten Polio near her, she had not learned of it.

Appendix E

D., Susan. Interview. Conducted by Lauren McDonald, 16 July. 2021

Her parents talked about polio at home and were concerned if they heard of cases in the area. However, her mom didn't restrict her movements mostly because they knew everyone around them very well and were pretty isolated in the country outside of town. She did not know of anyone who got it or had it. She went to a farm school and all of them were pretty relaxed due to lesser exposure and few kids being around.

She worried about polio as she saw images of iron lungs and recalled collecting dimes to mail into the march of dimes. Her family also did easterseals to fundraise.

Appendix F

H., Dale. Interview. Conducted by Lauren McDonald, 21 July. 2021

He was not personally affected by polio. There was no one he recalled from school having it or looking crippled, no neighbors got it, and his parents never mentioned it. He did recall the beaches being closed for at least one year which was a bother for him. However, he recalled no school closings and knew his parents wouldn't have stopped him from going to the beach, pool, or anything had the community not mandated it. He was vaccinated and thought little of polio growing up or as an adult.

## Appendix G

H., Linda. Interview. Conducted by Lauren McDonald, 21 July. 2021

She never got polio, but her mom had gotten it when pregnant with her younger sister around 1946 or 1947. She was permanently stooped afterward as her stomach muscles were weakened. Despite having had polio, her mother did not express any worry that she could recall about them getting it. There were no restrictions and she did not even know it was polio that had caused her mom to be stooped until later in life.

Additionally, her Dad's sister had gotten polio and was in an iron lung for 7 years. Her aunt was kept in her other aunt's living room and she recalled seeing the iron lung and her aunt frequently. It was very scary to see the lung and hear her aunt complaining. She also recalled posters and being vaccinated at school. At the time Hopkins was a decent sized town, and she lived in a close neighborhood. However, each family handled their own affairs so she did not recall any community measures.

## Appendix H

J., Mensor. Interview. Conducted by Lauren McDonald, 17 July. 2021

He grew up on a large farm with 11 siblings. His mother was Norwegian and the farm was 3.5 miles from school. His dad was on the school board and used his position to keep sick kids out of school as much as possible to protect the healthy kids. Because they lived on an isolated farm, there wasn't much interaction with other people beyond school. His mother was also very protective and cautious so she kept them from leaving the farm much. His neighbors had been afflicted with polio, so he saw crippled people in his childhood, but it wasn't a big deal for him. He went to school to get the shot and was not scared about it.



Appendix I

N., Robert. Interview. Conducted by Lauren McDonald, 17 July. 2021

Bob's sister got Polio and was hospitalized. She ended up wearing braces to walk, but he was too young to remember her being sick. She got a room on the first floor to avoid stairs. She eventually recovered and could walk unaided. Bob himself did not recall any community restrictions and his family was not worried about the rest of the kids getting Polio. He did note that the family always told it as if she got polio from playing with wild animals and placed the blame more on her than anything else. Besides his sister, he had no memories of polio.

Appendix J

K., Natalie. Interview. Conducted by Lauren McDonald, 6 June. 2021

Before 1953, she recalled fearing once when a friend was sick that she may have gotten polio, but no epidemics hit her town and she didn't get sick personally so it wasn't a big deal. In 1953-1954, she recalls when polio went through her town and one of those summers (she wasn't sure which) her town instituted distancing and stay at home protocols along with the closure of churches, pools, and theaters. She didn't get polio, but recalls praying for church members who had contracted it.

She knew about polio, but did not recall hearing much about deaths. News-systems were different and it wasn't bad until it hit her town.

She did not think the vaccine had come out until the 1960s and didn't get her own until after her children had been vaccinated.

Appendix K

L., Gordan. Interview. Conducted by Lauren McDonald, 31 July. 2021

He never got it as a kid, but knew many people who had had it and grew up with people with paralysis. He got vaccinated at 7 in school. He recalled seeing iron lungs in the local hospital and in the news which scared him. His parents were not worried and he had no restrictions. It wasn't a community issue during his time either as there were no huge outbreaks and families kept more to themselves.

He recalled how he used to get little plastic crutches for donating to the march of dimes.

## Appendix L

P., Betty. Interview. Conducted by Lauren McDonald, 1 Aug. 2021

Her family only came into town on Sundays and so they had very little exposure to the outside world beyond their farm. She rarely saw people other than her direct family which made them less concerned about polio. None of her family members got polio, they had no restrictions, but did talk about it at home. Her parents were worried about it and discussed it with her/her siblings. She recalled that her family talked about how Luck, WI was the hotspot for polio and her parents would not go there. Otherwise, it was seen as a family concern and since they lived rurally, they handled everything themselves regardless of if it was an illness or just normal farm life.

There were no school cancellations since they only had 17 kids in the country school. She was vaccinated in school.

Appendix M

P., Stanley. Interview. Conducted by Lauren McDonald, 31 July. 2021

He had heard of Polio from his parents and he knew they had wanted a vaccine to come out as soon as possible. He recalled hearing of people going to the Sister Kenny institute, but no one he was close to ever got sick.

Because he lived on a farm, he was naturally isolated from people and did not go to pools, fairs, etc.. As a result, he did not recall any restrictions in his childhood. His parents believed in keeping to themselves and their own business. If one of them would have gotten sick then his family would have dealt with it.

He was vaccinated in a clinic and recalled that his arm got stiff afterward for a bit. There was no question that he would get vaccinated.

Appendix N

P., Mary. Interview. Conducted by Lauren McDonald, 14 June. 2021

Mary's father was a doctor at the Minneapolis general hospital and dealt a lot with polio. She recalled him mentioning that they had opened more beds for polio and remembered being scared of the term infantile paralysis when he would talk about it at home. He also worked with Sister Kenny who provided more holistic care and she remembered him complaining about her and disliking her. She did not recall exact details on why though.

Her father also gave a speech about good sanitation at her camp as a young kid which she reported as being mortifying, but he did it to help kids stay safe from polio which she appreciates now as an adult.

Mary did not know anyone who had had polio, but had heard about it frequently. In 1944, when she was 11, camp was canceled at Lake Harriet. She was also not allowed to swim for many summers but could not recall the exact dates.

## Appendix O

P., Gail. Interview. Conducted by Lauren McDonald, 31 July. 2021

She had one second cousin be placed in an iron lung which left him alive but crippled. Iron lungs were the only part of Polio that scared her. Polio itself had no influence on her childhood other than iron lungs triggering her claustrophobia.

She recalled some kids being gone from school due to polio and then coming back. One girl had to go down a grade due to how much time she missed. There were also crippled kids in class that she saw.

Her parents were not very big on sharing information with her, so she never recalls and is fairly certain that they did not discuss polio with her. It was as she said “their way of protecting her”. However, they never restricted her actions or what she did during her polio years. She reported that there were also not any community restrictions so it was more of a family by family deal since each family made their own rules on what was okay or not okay to do.

She remembered cards that you could put dimes in as a kid and the school organized many fundraisers. It went for polio research, she recalled. She was proud of getting hers filled with dimes. It was a big deal back then. “Everyone wanted to contribute.”

She was vaccinated and it was a “big deal”. It was done in the school and she recalled how she stood in line and even though she wasn’t scared of shots, the hysteria of other kids built while they waited. Parent permission was needed to get the shot. She later got the Sabin pink sugar cube vaccine as well.

## Appendix P

R., Dennis. Interview. Conducted by Lauren McDonald, 17 July. 2021

Dennis's cousin had been afflicted with Polio in 1953. His cousin was born in 1941. They lived right near each other in the same town with neighboring farms. Rodger, his cousin, was in an iron lung for a while after he got polio. The iron lung was placed in Rodger's parents' dining room. Sister Kenny treatments were used, but Rodger never walked again. Dennis saw his cousin go through it and they weren't allowed to hang with him or that family until a bit of time had passed. Rodger adapted some to be able to drive with hand controls but was permanently disabled after he had polio.

Dennis's dad was a pharmacist in the Navy, but besides not wanting their own son to be crippled, he didn't hear his parents talk of being worried about polio in any capacity.

When the vaccine came out, they went to the high school to get it. He remembered it hurting and not wanting to do it, but he had no choice." It wasn't an option back then." He was 9 when he got vaccinated.



## Appendix Q

R., Sue. Interview. Conducted by Lauren McDonald, 30 July. 2021

Suzie got Polio in 1951 and was the first case in Douglas County for that year. She was from a close knit neighborhood and was close to the kids she lived by. When she got polio, her three siblings also got it. It was assumed at the time that she got it swimming in Tatterson park which was the popular swimming place for their area. Her parents took her and her siblings up to Duluth to St. Luke's Hospital where they were all put in the same room and treated. She recalled that her parents visited many times during the week. Her grandfather cried whenever their polio was brought up and had a hard time with it. She recalled hearing the nurse yell at them to put their feet on boards at the end of their bed. Her right side was weaker and she recalled itchy rags being put on.

She remembered that when she got home that the neighborhood kids were restricted to their yards all summer and she couldn't interact with the other kids besides her family. She also noted that it was a community thing. She had an uncle get polio, but never recalled her parents talking about polio before or after she got it. In fact they seem to avoid the topic. She also recalled seeing people in iron lungs and hearing of those who spent their entire life in them. She was vaccinated for polio in the local clinic and recalled her brother freaking out and needing nurses to hold him down. She has no polio related issues now.

## Appendix R

S., Barbara. Interview. Conducted by Lauren McDonald, 17 July. 2021

Her father managed a huge swimming pool, the largest recirculating pool in the country (Coney Island Sunlite Pool), and polio threatened his livelihood. To her memory, it stayed open but business slowed down during high polio times.

She was too young to be involved in full conversations and barely was exposed to her dad as he worked till her bedtime most days. Not being involved in the conversations due to being a child limited her awareness and worry of polio.

Her dad had also been quarantined as a child in 1918 though she did not know if it had been polio or the spanish flu. Her parents kept her out of the pool her dad worked at which she was sad about at the time. Her brother was born in 1952 and she recalls her parents worrying for him. Her mother worked in a TB hospital and so was distracted from polio some as they fretted over TB and their kids' safety in that regard.

## Appendix S

S., David. Interview. Conducted by Lauren McDonald, 17 July. 2021

He recalled that he could not go to the pool or out normally in 1952. He also noted that seeing the advertisements of crippled children made him fearful. The image of iron lungs, with or without children, used to scare him immensely.

He mentioned that one parent in his neighborhood would not let his kids out the entire summer, but relented about the church festival and finally let his children leave the house to go. The eldest daughter got Polio from that and was in a wheelchair as a result. This scared David as he saw how one exposure ruined that girl's ability to walk. Yet, he still only dealt with moderate restrictions in his own life.

He got the vaccine as soon as he could and noted that his family happily waited in line at the school for it. He didn't like the shot much but it was worth it.

Appendix T

S., Doug. Interview. Conducted by Lauren McDonald, 16 July. 2021

Doug had his neighbor's son pass away from polio and also one of his good friend's father got polio and was crippled. His family had no restrictions, but Grantsburg itself did restrict all kids under 17 to their home for a bit one year. This was bothersome, but only lasted a short while, but since he lived outside of town it didn't affect him. His parents also never talked about polio with him and he did not know of any afflicted kids.

## Appendix U

S., Patricia. Interview. Conducted by Lauren McDonald, 23 July. 2021

During our interview she began with, "People were petrified of it" and how people she knew had been put in an iron lung. One of her friends had been in an iron lung and one of her coworkers later on had as well. She did not recall seeing crippled kids at school but she went to a small religious school with few kids. She did not get the Salk vaccine but got the Sabin sugar cube one right away when it came out.

She did not remember any media telling her about Polio itself but had heard of the March of Dimes which became a bigger thing as she got older.

She faced restrictions throughout her childhood and could not swim (which led to her being unable to swim as an adult), she also could not go out at night because mosquitoes were thought to spread it. The neighborhood adults enforced this on other kids as well, not just her family, and would report on those who failed to follow the rules. It was a close neighborhood.

## Appendix V

S., Terry. Interview. Conducted by Lauren McDonald, 24 July. 2021

Terry got Polio when she was an infant (a little over a year old). She had a high fever and cried a lot which her mother told to her later. Doctors weren't used much, but her mother did call the doctor and he diagnosed it (remotely) as polio. He claimed there was nothing medically that they could do and just to 'wait and pray'. It took over a week, but Terry's fever did break and she was left unable to move much. After a time, she was able to walk again and gained a near recovery. Still, she has dealt with a weak spine and chronic pain for most of her life.

It was later as an adult during a school reunion (middle & high school since small-town and all went through both together) that she learned that most of her friends from childhood had also had Polio when young. They were dealing with similar issues to herself as adults which she reported as surprising to hear. They had never mentioned it growing up and neither had she. It was "not something you talked about".

Her school was not handicapped accessible and she did recall that 2 kids struggled with the stairs due to being partially paralyzed. One of them, Patricia, had her mother come in to help her throughout the day because she could not use the bathroom alone and needed help with other issues. The second kid was a boy who had to drop out. He was wheelchair-bound.

There were no restrictions for her or anyone she could remember in her community. She reported that if someone got sick, whether it was polio, measles, mumps etc..., they were just kept home and that was that. Most of the time since few people went to the doctor and most parents wouldn't let their children miss school, the illness went around to everyone.

Appendix W

S., Marge. Interview. Conducted by Lauren McDonald, 13 July. 2021

She remembered seeing posters with images of children on crutches in the grocery store. During the summer, particularly August, of 1944 she was unable to use the pool or swim at the local lakes. This was hard for her as she used to swim twice a week during the summer. Instead, she had to play at home and in her neighborhood. However, her parents had no issue with her hanging out with neighborhood children or visiting them. She commented that if the pools would have been open, then they would have had no issue with her going. They never mentioned polio to her. There was also no one she knew of growing up who got it. As a result, She was not scared as she did not understand what polio was or the risk it posed. She mentioned that no one knew much so it was not something those around her worried about.

She also noted that children were not able to participate in adult conversations at that time and were encouraged to go out and play rather than disturb the adults. During guest visits or meals, she was situated with her siblings and not with adults where she may have been able to hear about issues like polio.

## Appendix X

T., Franklin. Interview. Conducted by Lauren McDonald, 17 July. 2021

Franklin lived in Pekin, Illinois. A population of 20,000 in 1945. He had two cousins get Polio. Micky (girl) got it before he was born and ended up with a crooked leg. Richard, his other cousin, got it too and died from it in midlife. Richard and Frank hung out a lot growing up. However, he was not allowed to visit his uncle when his cousin was sick (Richard) for fear of exposure. Richard's body was permanently crooked and bent after polio. His family called him crippled and he got to watch his cousin get progressively worse as he aged.

He recalled seeing around 3-4 crippled kids in class but no wheelchaired kids. He was also scared of the images of iron lungs on TV. However, he felt that it wouldn't affect him. His parents were worried about having their kid be crippled after seeing how it was for his cousins.

The municipal pool was closed every year from July-August. His mother thought that it could be spread by water in general (rain) and would not let him play in puddles as a child.

He got the vaccine right away in 1955. He was scared and didn't want to get it, but his parents would not have it. There was "no question" in their minds that he would get it.

School never closed and no distance.