

PARENTAL NARRATIVES OF VACCINATION PRACTICES
IN THE STATE OF OREGON

by

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In public health, vaccines are widely regarded as the most effective protection method against communicable diseases and are credited with greatly reducing incidence of diseases and their serious effects. That being said, there is a growing community of individuals who continually question the safety and efficacy of vaccines and subsequently choose to not vaccinate their children and instead claim non-medical exemption. In the state of Oregon, the 2017-2018 K-12 non-medical exemption rate was 4%, compared to the national average of 2%. Thus, as a means of exploring this complex issue, three interviews were conducted with parents who live in Oregon, do not vaccinate their children and claim non-medical exemption. These interviews were analyzed through an interdisciplinary approach, combining historical and social contexts and perspectives as a means of better understanding the drivers of vaccine refusal. It was found that in interviews with this subset of parents, there were three main themes which emerged: historical similarities of arguments against vaccination during the 1800s and the present; feelings of little to no of autonomy due to mandated, compulsory vaccination; and distrust of government and pharmaceutical companies.

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Table of Contents

Chapter One	1
Introduction	1
Literature Review: Defining Vaccine Hesitancy and Refusal	6
Literature Review: Exploring Arguments Against Vaccination	9
Methods	13
Roots of the Contemporary Anti-Vaccination Movement in the United States	16
Chapter Two	23
Historical Similarities in Arguments Against Vaccination Past and Present	23
Chapter 3	40
Vaccine Compliance: Exploring the Freedom of Choice	40
Chapter Four	48
Examining Vaccine Distrust: Profit, Safety and Bias	48
Chapter Five	58
Conclusions and Recommendations	58
Appendix A	62
List of Interview Questions – adapted from World Health Organization Vaccine Hesitancy Survey	62
Bibliography	63

List of Figures

Figure 1.1 Herd Immunity	21
Figure 2.1 “The Cow Pock” by James Gillray, 1802	36
Figure 2.2 “Vaccination” by Charles Williams, 1807	38

List of Tables

Table 1.1 Top ten Oregon counties with highest non-medical exemptions 2017-2018	3
Table 1.2 State of Oregon K-12 Vaccination Data 2017-2018	4
Table 1.3 Lane County, Oregon K-12 Vaccination Data 2017-2018	5
Table 1.4 Categorical comparison of vaccine hesitancy and refusal	8
Table 1.5 Reasons against vaccination	10
Table 1.6 Seven common arguments against vaccination	11
Table 1.7 Comparison of parent attitudes per chapter in vaccine refusal	16
Table 1.8 Benefits of vaccine use on disease, disease severity and protection	19
Table 2.1 Vaccine excipient and media summary - CDC, 2018	30
Table 3.1 Shows two official United States Supreme Court cases and their major holdings from 1905-1922	46
Table 4.1 Reactions to various vaccines	49
Table 4.2 Programs established by the National Vaccine Injury Act, United States 1986	52

Chapter One

Introduction

In January and March 2019, Clark and Rockland counties in Washington and New York States each declared a state of emergency (Lambert, 2019; NBC New York, 2019). The culprit? Measles.

Measles, also known as *rubeola*, is both a communicable and vaccine-preventable disease characterized by fever, cough, runny nose and a systemic rash. It is highly contagious and spreads through coughing and sneezing. Though it was declared eradicated in the United States in 2000 by the Centers for Disease Control and Protection (CDC), as of April 2019, 704 confirmed cases of measles were reported to the CDC from 22 states (Centers for Disease Control and Prevention, 2019). According to the CDC, while these outbreaks were linked to those who have brought measles back from other countries--Israel and Ukraine, for example, who were experiencing large outbreaks--many of those who contracted the disease were those who had not received a dose of the MMR (measles, mumps, rubella) vaccine. In Rockland County of New York alone, 79.7% of those with measles did not receive a dose of the MMR vaccine, as opposed to the 5.2% with measles who received at least one dose (Rockland County, 2019).

So why the state of emergency? And why fuss over one disease?

Vaccines are considered the “gold standard” preventative measure in public health against communicable diseases. Communicable diseases, or infectious diseases, are “caused by microorganisms such as bacteria, viruses, parasites and fungi that can be

spread directly or indirectly from one person to another” (World Health Organization, 2017). A vaccine preventable disease (VPD) is a disease that can be prevented with a vaccine (Centers for Disease Control and Prevention, n.d.-c). According to the CDC, a vaccine is a “product that stimulates a person’s immune system to produce immunity to a specific disease, protecting the person from that disease.” Vaccines can be introduced via injection, or in some cases (i.e. the flu), a nasal spray.

Immunity, however, is defined as *protection* from an infectious disease. This makes it so that people can be exposed to the disease without getting infected. The terms “vaccination” and “immunization” are the processes of introducing vaccines to produce immunity against an infectious disease for an individual and are used interchangeably (Centers for Disease Control and Prevention, n.d.-a). In the case of the measles, the MMR vaccine is used as the preventative measure.

Though public health and the medical community advocate for vaccines as the best preventative measure against communicable diseases, the safety and efficacy of vaccines is continually debated amongst a growing population of individuals globally in what is called the “anti-vaccination movement” in the United States. This population, which consists primarily of parents, can be viewed as a spectrum: on one end of the spectrum are the “vaccine-hesitant,” which according to the World Health Organization Strategic Advisory Group of Experts (SAGE), refers to “delay in acceptance or approval of vaccines despite availability of vaccination services.” On the other end of the spectrum, however, are the “vaccine rejectors” who reject vaccination completely (Dubé et al., 2013). From the 2014-2015 measles outbreak in Disneyland to the most

recent measles outbreaks in Washington and New York, anti-vaccine populations have been increasingly the subject of the media and under intense scrutiny.

In Oregon, children grades K-12 must receive a series of vaccines to attend school (Oregon Health Authority, 2017). It does not matter if this school is private, alternative, public or a charter school—they must all comply with the government-mandated, required vaccinations. By February 20th of each school year, parents must comply to the vaccination requirements for their children or claim medical or non-medical exemption, otherwise children will be sent home and unable to attend school.

In the 2017-2018 school year, the state of Oregon’s non-medical vaccine exemption rate was at 4% for grades K-12, compared to the national average of 2% (Mellerson et al., 2018; Oregon Health Authority, 2019). Locally, in Lane County alone, the non-medical exemption rate for grades K-12 was similar to that of the state average at 5%, earning a spot in the top ten Oregon counties with the highest number of non-medical exemptions.

Table 1.1 Top ten Oregon counties with highest non-medical exemptions 2017-2018

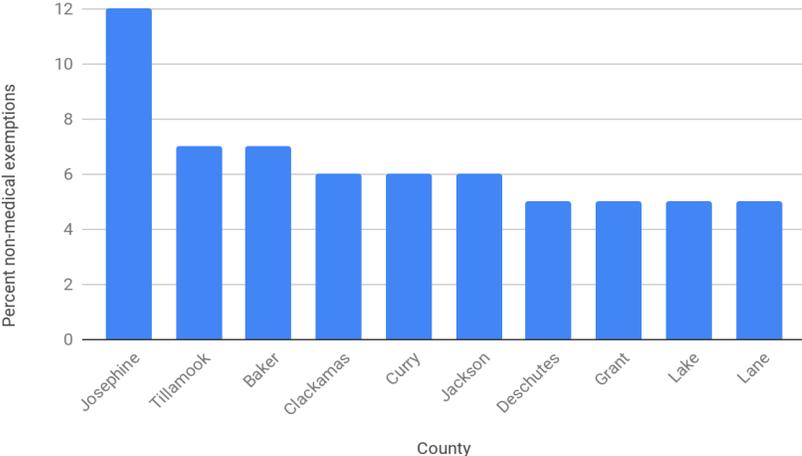


Table 1.1 Shows the top ten Oregon counties with the highest K-12 non-medical exemption rates, 2017-2018 (Oregon Health Authority, 2018)

Figure 1.1 Map of the state of Oregon and its counties

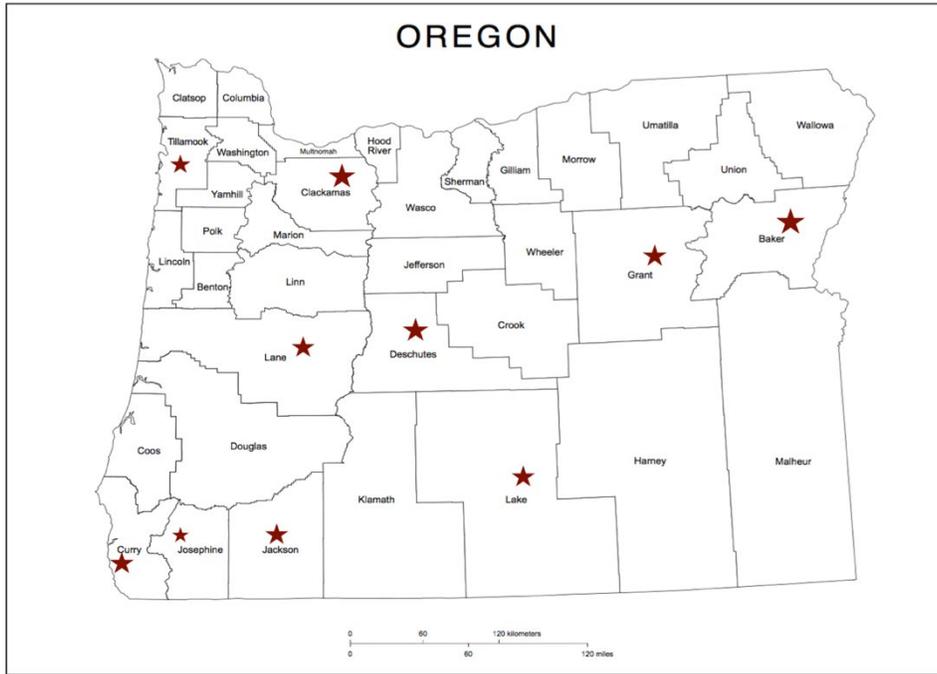


Figure 1.1 Shows a map of the state of Oregon and its counties; starred counties indicate top ten counties with highest K-12 non-medical exemptions 2017-2018 (see Table 1.1) (University of Alabama, n.d.)

Table 1.2 State of Oregon K-12 Vaccination Data 2017-2018

	Percent of K-12 aged school children in Oregon (%)	Number of K-12 aged school children in Oregon
Non-medical exemptions	4	15,498
Medical exemptions	0	780

Table 1.2 Shows Oregon K-12 vaccination data from 2017-2018 taken from 1,797 schools with a total enrollment of 604,725; 127 schools displayed no data, for 10 students or less were enrolled (Oregon Health Authority, 2018)

Table 1.3 Lane County, Oregon K-12 Vaccination Data 2017-2018

	Percent of K-12 aged school children in Lane County, Oregon (%)	Number of K-12 aged school children in Lane County, Oregon
Non-medical exemptions	5	1,376
Medical exemptions	0	28

Table 1.3 Shows Lane County K-12 vaccination data from 2017-2018 taken from 159 schools with a total enrollment of 46,405; 12 schools displayed no data, for 10 students or less were enrolled (Oregon Health Authority, 2018)

I approached this topic wondering, *why does Oregon have such a high rate of non-medical exemptions? What are the main drivers and motivators which influence parents who choose to not vaccinate their children?* Though I do not have the data to answer these questions, this thesis presents a small amount of evidence about the current vaccination climate within a subset of Oregon parents.

This thesis analyzes parental narratives from interviews with 3 Oregon parents who choose to not vaccinate their children by relying on a non-medical exemption. From these interviews, I discuss and highlight three main themes: the similarities of arguments against vaccination from the 1800s in the United States and England today; parents' contemporary distrust of government and pharmaceutical companies; and parents' concerns about limits to their autonomy due to mandatory, compulsory vaccination. This thesis takes an interdisciplinary approach with secondary historical materials and analyses of 3 interviews.

Literature Review: Defining Vaccine Hesitancy and Refusal

When speaking about the anti-vaccination movement, it is important to understand those involved. By categorizing the motivations and drivers of refusal amongst parents, one can better understand the factors which influence the decision-making process as to whether or not one vaccinates their children. That being said, it is difficult to broadly categorize these groups of parents for the arguments against vaccination are widely varied and diverse.

According to the World Health Organization Strategic Advisory Group of Experts (SAGE), vaccine hesitancy refers to the “delay in acceptance or approval of vaccines despite availability of vaccination services,” for “vaccine hesitancy is complex and context specific varying across time, place and vaccines. It includes factors such as complacency, convenience and confidence.” While the WHO suggests that these determinants be assessed in a systematic manner to “explore the individual, group and contextual influences,” researchers Eve Dubé and Caroline Laberge in the review titled “Vaccine hesitancy: an overview” claim that vaccine hesitancy models proposing acceptance or refusal are difficult to use, for despite the growing number of articles referring to vaccine hesitancy, “there are some discrepancies among publications about what exactly falls under the umbrella of ‘vaccine hesitancy’” (Dubé et al., 2013). Dubé and contributors claim that because these models are often rooted in “individual studies” and “complex interaction of social, cultural, political and personal factors in vaccine decision,” it is difficult to have a “clear picture of the range of possible attitudes about vaccination.”

That being said, past studies have categorized vaccine refusal as a dichotomous phenomenon, where parents are either “for” or “against” vaccination (McIntosh, Janda, Ehrich, Pettoello-Mantovani, & Somekh, 2016; Poland & Jacobson, 2001). However, other researchers claim that vaccine refusal should be viewed as a spectrum, for several factors influence parents’ decision-making and attitudes surrounding vaccination practices (Gust et al., 2005). In the study “Immunization attitudes and beliefs among parents: beyond a dichotomous perspective,” Gust and collaborators identify five types of parental attitudes regarding vaccination from parent responses to 44 questions involving beliefs in vaccination safety, involvement in health issues, family and friend influences on vaccination, etc. These include the “immunization advocates” and “go alongs to get alongs,” who strongly agreed immunizations are necessary; the “health advocates,” who only slightly agreed that immunizations are necessary and remained neutral to the serious immunization side effects; the “fence sitters,” who only slightly agreed that vaccines are necessary and safe; and the “worrieds,” who slightly disagreed vaccines are necessary and disagreed that vaccines are safe.

This same categorization method can be seen in another study, titled “Qualitative Analysis of Mothers’ Decision-Making About Vaccines for Infants: the Importance of Trust,” where Benin and collaborators investigate the decision-making process of vaccinating infants by addressing attitudes to vaccination, knowledge about vaccination and decision-making. It was found that the participants could also be categorized, this time into four groups: the “acceptors,” who accepted vaccination; the “vaccine-hesitant,” who accepted vaccination but had significant concerns about vaccinating their infants; the “late vaccinators,” who purposely delayed vaccinating or

chose only some vaccines; and the “rejectors,” who completely rejected vaccination (Benin, Wisler-Scher, Colson, Shapiro, & Holmboe, 2006; Dubé et al., 2013).

Table 1.4 Categorical comparison of vaccine hesitancy and refusal

Study/Researchers	Categories
Gust et al., 2005	<ol style="list-style-type: none"> 1. Immunization advocates 2. Go alongs to get alongs 3. Health advocates 4. Fence sitters 5. Worrieds
Benin et al., 2006	<ol style="list-style-type: none"> 1. Acceptors 2. Vaccine-hesitant 3. Late vaccinators 4. Rejectors

Table 1.4 Gives a comparison between the categories of vaccine hesitancy and refusal from studies by Benin et al., 2006 and Gust et al., 2005

Because existing studies have been largely quantitative or based on hypothetical decision-making about vaccination, they may not have adequately assessed the specific range of attitudes parents use when deciding to vaccinate their child (Benin et al., 2006; Gellin, Maibach, & Marcuse, 2000; Robison et al., 2003). According to Benin and researchers, a qualitative study is best for evaluating parental attitudes for “qualitative research provides a framework for describing social phenomena,” such as comprehension and behaviors that are “based on complex beliefs that may be difficult to measure in a standardized quantitative manner.” Similar methodology can be seen in the World Health Organization’s survey titled “Determinants of vaccine hesitancy,” which aims for an in-depth understanding of the issues that drive vaccine hesitancy around the globe. In this thesis, a qualitative model is used to explore the attitudes and beliefs held by Oregonian parents against vaccination. While it combines some

quantitative data to illustrate the vaccination rates throughout both Lane County and the State, the main driver of this thesis is qualitative data. Thus, by utilizing a qualitative model to evaluate the social, historical, economic and individual influences, perhaps researchers may better understand the complexity that is vaccine hesitancy.

Literature Review: Exploring Arguments Against Vaccination

As rates of vaccine refusal increase among a growing population, it is important to investigate the reasoning behind it. For research purposes, they can be categorized into broad categories in an attempt to better understand the motivations of each parent. That being said, no two arguments are alike, nor are two parents' reasoning alike. Thus, when reading through arguments that are either for or against vaccination, one should consider the spectrum of "vaccine hesitant" parents that may be included within each argument.

According to a study titled "Exploring the Reasons Behind Parental Refusal of Vaccines," researchers McKee and Bohannon propose four reasons against vaccination. These consist of religious reasons, personal beliefs or philosophical reasons, safety concerns and desire for additional education, where they argue that the greatest reason parents refuse vaccines is due to safety concerns, most of which are based on "information these parents have discovered in the media or received from acquaintances" (McKee & Bohannon, 2016). McKee and Bohannon also note that within each of these subsets, there exists a "spectrum of compliance with vaccination, including delaying vaccinations, only refusing certain ones, or refusing immunizations completely" (McKee & Bohannon, 2016).

Table 1.5 Reasons against vaccination

McKee et al, 2016	<ol style="list-style-type: none">1. Religious reasons2. Personal beliefs or philosophical reasons3. Safety concerns4. Desire for additional education
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Table 1.5 Gives reasons against vaccination from the study titled “Exploring the Reasons Behind Parental Refusal of Vaccines” (McKee & Bohannon, 2016)

At a more local level, in a study titled “What Ashland Parents Told Us About Vaccines and Religious Exemptions,” researchers from the State of Oregon Immunization Program created a Community Vaccine Survey (CVS) to better understand Ashland parents’ perceived risks and benefits of immunization, “the sources of information that parents depend upon, and how these may lead parents to consider a religious exemption to school immunization requirements for their children.” Like McKee and Bohannon, the majority of these arguments included concerns around vaccine safety, vaccine schedules and vaccine efficacy, with one parent claiming they would “trust vaccine recommendations more if they didn’t push immunizing 2-month-olds” (Robison et al., 2003). Unlike McKee and Bohannon, however, this study argues that the *decision* to not vaccinate is based on “a balance between perceived risk and perceived benefit from vaccination,” which emphasizes parents’ belief (or lack thereof) in vaccine safety.

In a review titled “Vaccine Rejection and Hesitancy: A Review and Call to Action,” Smith also cites common arguments against vaccination, however they argue that most objections are “cached in language that makes them highly palatable to parents and difficult for scientists to object to,” with terms such as “informed consent,”

“health freedom,” and “vaccine safety.” The arguments referenced are included in the following table:

Table 1.6 Seven common arguments against vaccination

Argument 1	Vaccines are “toxic” and contain antifreeze, mercury, ether, aluminum, human aborted fetal tissue, antibiotics and other dangerous chemicals that can lead to autism and an assortment of chronic health conditions
Argument 2	Vaccines are a tool of “Big Pharma;” individuals who promote them are merely profiting off of harm to children and/or paid off by pharmaceutical companies
Argument 3	A child’s immune system is too immature to handle vaccines; they are given “too many, too soon” and the immune system gets “overwhelmed,” leading to autism and an assortment of chronic health conditions
Argument 4	“Natural immunity is better;” most vaccine-preventable diseases are harmless to most children, and natural exposure provides more long-lasting immunity
Argument 5	Vaccines have never been tested in a true “vaccinated vs. unvaccinated” study; the vaccines in the current schedule have never been tested collectively
Argument 6	Diseases declined on their own due to improved hygiene and sanitation
Argument 7	Vaccines “shed;” therefore, cases of vaccine-preventable diseases in the population are driven by the vaccinated, not unvaccinated

Table 1.6 Shows seven common arguments against vaccination according to the review titled “Vaccine Rejection and Hesitancy: A Review and Call to Action;” adapted from Hausman et al, 2014; Kata, 2012; Kata, 2010; and Smith, 2016

Smith summarizes in the article that many of these arguments are due to one of three components: distrust in medical science, distrust of the pharmaceutical companies which manufacture the vaccines and the overwhelming of the immune system. She claims that arguments against medical science are those which emphasize the harms and risks associated with the ingredients in vaccines, such as aluminum and thimerosal

(Smith, 2017). Arguments against pharmaceutical companies, however (also known as “Big Pharma”), are concerned with the profit-driven motives of pharmaceuticals and associated physicians that could potentially benefit as well, while arguments against vaccines due to their effects on the immune system stem from concerns for “vaccine overload” on the immune system and advocate for natural immunity instead (Smith, 2017). Smith argues that while these arguments have “been used for well over a century,” they are “recycled and updated to better reflect the modern science landscape and language,” which could possibly explain the historical similarity and continuity of arguments against vaccination across time.

Similar to Smith, in the study titled “‘Poisonous, Filthy, Loathsome, Damnable Stuff’: The Rhetorical Ecology of Vaccination Concern,” researchers Hausman, Ghebremichael, Hayek and Mack explore arguments against vaccination, however they do so through rhetorical analysis, arguing that a rhetorical approach “offers a way to understand how discourses are engaged and mobilized for particular purposes in historical context.” This is done by investigating why certain arguments are “persuasive to particular people at discrete points in time, how persuasiveness might continue across historical periods, and how discourses circulate and change as they are applied to new circumstances” (Hausman, Ghebremichael, Hayek, & Mack, 2014). Like Smith and McKee and Bohannon, this study provides a qualitative basis for arguments against vaccination in the 21st century. Unlike the two studies, however, this study pinpoints where certain arguments fit in within historical context and framework and the implications of each argument for the future (Hausman et al., 2014).

Methods

Initial recruitment of subjects began in December 2018, a month shy of the January 2019 measles outbreak in Clark County, Washington. Before the outbreak, seven parents who either I contacted or reached out to me via Facebook Messenger expressed great interest in participating in the study. During and after the outbreak, however, many parents declined to participate. Parent A, who participated in this study, reached out to their social circle to gather interest. When no one returned their messages, they explained to me that it was possible that parents were fearful their words would be used against them or the research itself was biased or subjective to those who supported vaccines. Ultimately, 3 parents agreed to participate (1 in person and 2 via email) and it is these interviews that provide the basis for this thesis. This project was reviewed and approved by the University of Oregon IRB as protocol 11012018.001. I focused my attention on the Eugene Waldorf School and the Eugene Village School, the two schools with the highest non-medical exemption rates in Lane County, which I determined by publicly available data (Oregon Health Authority, 2019). I contacted both school administrations with thorough explanations regarding the background and goals of the project. I also contacted Facebook groups such as the “Vaccine Friendly Plan,” “Oregonians Against Mandatory Vaccinations,” “Oregonians for Vaccine Truth and Healthcare Choice,” and “Oregonians for Medical Freedom” and shared my project description, seeking participation.

Seven subjects were recruited by January 2019. When the measles outbreak made news and gained attention from the media, four of those parents declined to participate in the study. An amendment was then submitted to the University of Oregon

IRB and the study was opened up to the state of Oregon, where subjects were contacted solely through Facebook with the option of doing interviews in person or via email. One subject was interviewed in person at a Eugene coffeeshop and signed a written consent form. Their answers were audio recorded on an iPhone 6S and transcribed by myself. Two subjects were interviewed via email and the subject electronically signed a consent form.

Interview questions were drawn from a list of 54 questions adapted from a World Health Organization (WHO) sample survey titled “Vaccination Hesitancy” listed in Appendix A. The questions were developed by the WHO to “better understand the drivers of vaccine hesitancy in specific settings or around vaccines - specifically or in general” (SAGE Working Group on Vaccine Hesitancy, 2013). The survey consists of three sections, categorized by the type of influence. The first section, titled “Contextual Influences,” focuses on influences arising due to “historic, socio-cultural, environmental, health system/institutional, economic or political factors;” the second section, titled “Individual and Group Influences,” focuses on influences arising due to “personal perception of the vaccine or influences of the social/peer environment;” and the third section, titled “Vaccine/Vaccination Issues,” focuses on issues “directly related to vaccine or vaccination” (SAGE Working Group on Vaccine Hesitancy, 2013).

Out of the 54 questions, 17 were copied and/or modified and used for interviews; however, they were not organized in the same manner as the WHO survey. The first half of questions were organized to learn the subjects’ background, their vaccine knowledge and entities they trusted or did not trust. The second half then used this foundation of beliefs to explore their overarching beliefs about vaccines, those who

make them and those who enforce them. Questions omitted from this interview were excluded based on their redundancy; those included were either modified as a combination of two questions or left out altogether. At the end of the research process, 1 interview was conducted in person; the last 2 were collected via email.

Three semi-structured interviews were collected for this study where the key themes from the interviews were analyzed with an interdisciplinary approach. Each chapter explores one of three arguments, each seeking to connect the content to historical themes. Chapter two introduces the anti-vaccination movement in the United States and provides contextual and historical evidence of similarities of anti-vaccine arguments in American and British society during both the 1800s and the present. Chapter three focuses on parental concerns surrounding feelings of limited autonomy, and chapter four focuses on parental concerns regarding distrust of government and the pharmaceutical industry.

Throughout this thesis, parents from each interview will be referred to as Parent A, Parent B and Parent C. To maintain anonymity and privacy, demographics such as names, age, occupation, education level, location, ethnicity and number of children were not collected. However, the following table helps to describe the personalities of each parent and their main attitudes surrounding vaccines for each chapter:

Table 1.7 Comparison of parent attitudes per chapter in vaccine refusal

<i>Parent</i>	<i>In person interview or email?</i>	<i>Sex</i>	<i>Lack of autonomy</i>	<i>Distrust of government/Big Pharma/medical</i>
A	In person	Female	Large advocate for medical freedom and freedom of choice; believes that each individual should make their own decisions based on their “own genetics, religion, intuition, [and] philosophical beliefs”	Concerned with “blindly trusting” the government; believes that government organizations making decisions based on “outside influences” and “financial interests”
B	Email	Female	Unconcerned with the medical choices of others, but bothersome when vaccination practices are imposed upon them; feels people are “being brainwashed to get vaccinated”	Distrusts the government and “inappropriate relationships” between government agencies and pharmaceutical companies; believes that the government is “not an unbiased player in the vaccine game”
C	Email	Female	Believes that the choice to refuse vaccination, like any medical procedure, is a “basic human right;” concerned with lack of honesty in communicating the harms of vaccines	Believes that the “government is not making any efforts to bring safe products to market” for “they are not doing mandatory safety studies, they carry all the liability”

Roots of the Contemporary Anti-Vaccination Movement in the United States

In 1998, British enterologist Andrew Wakefield and his colleagues published a study in the *Lancet* claiming there was a purported link between the measles, mumps and rubella (MMR) vaccine and autism (Godlee, Smith, & Marcovitch, 2011). The *Lancet*, founded in 1823 by Thomas Wakley as a means of “[making] science widely available so that medicine can serve, and transform society, and positively impact the

lives of people,” has since served as the second-oldest medical journal and a reputable, trusted source of information (The Lancet, 2019). Thus, after the Wakefield study was published, it made its rounds among the general public and medical community and caused a monumental stir. For example, in Britain, vaccination rates dropped to 80%; in America, celebrities such as Jenny McCarthy endorsed these fears, suggesting that her son’s autism diagnosis at 2 ½ stemmed from a series of required vaccinations (Frontline & Public Broadcasting Station, 2015; Godlee et al., 2011). If they had not already, this caused some parents to either question or refuse vaccination, fearful their child may either develop autism or suffer from chronic side effects and issues stemming from vaccines (Stern & Markel, 2005).

In 2014, Dr. Erik Kodish, a medical ethicist from the Cleveland Clinic wrote in the *Washington Post*, saying that “The anti-vaccination movement is a relatively new one that has taken hold over the past decade. Started by a small community of parents, it is based on myths that have been perpetuated by the power of the Internet and endorsements from celebrities” (Hausman et al., 2014). The idea that the 21st century anti-vaccination movement is relatively new—new, meaning within the last thirty years—continues to crop up among those attitudes and preconceived notions in regard to public health. Especially with the rise of the Internet and social media platforms such as Facebook and YouTube, the widespread, rapid dissemination of information is prominent now more than ever. And yet, despite influences such as media, celebrities and a study such as Wakefield’s, the anti-vaccination movement is not new; arguments against vaccination predate modern arguments by at least 200 years, if not more. So long as vaccines have existed, so has its opposition. However, to better understand this

issue, it is important to examine each side—more specifically, those views of the pro-vaccine community and those of the anti-vaccine community. While the following section presents the various pro-vaccine views, the rest of this thesis will focus on those views of the anti-vaccine community.

Vaccines were initially developed as a means of protection against the recurring smallpox epidemics in England and the United States (Stern & Markel, 2005). While “vaccine” here refers to the vaccine developed by Edward Jenner based on his findings with smallpox immunity, similar practices called “inoculation” were practiced in Africa and Asia as early as the 1600s and served as the precedent to the modern vaccine (Herbert, 1975). Today, vaccines are the “gold standard” in public health as a means of protecting large communities against communicable diseases. According to researchers Andre et al at the World Health Organization, “vaccine safety gets more public attention than vaccine effectiveness” and they assert that “a comprehensive vaccination program is a cornerstone of good public health and will reduce inequities and poverty” (Andre et al., 2008). In their study titled “Vaccination greatly reduces disease, disability, death and inequity worldwide,” Andre et al discuss the various vaccine benefits against disease, disease severity and vaccine protection, claiming that “the best way in the long term is to refute wrong allegations at the earliest opportunity by providing scientifically valid data.” Thus, as an attempt to fully articulate the extent to which they believe vaccines have aided society, these benefits are outlined in the following table:

Table 1.8 Benefits of vaccine use on disease, disease severity and protection

<i>Benefit</i>	<i>How it has benefited</i>
Eradication of disease	Unless an environmental reservoir exists, an eradicated pathogen cannot emerge (i.e. smallpox), allowing vaccination to be discontinued as a preventative measure
Elimination of disease	With the use of vaccine, diseases can be eliminated locally without global eradication of the causative microorganism; for example, elimination of measles from United States in 2000
Control of mortality, morbidity and complications	Vaccines may protect those if administered before exposure and help prevent 6 million deaths annually worldwide
Mitigation of disease severity	Disease may occur in previously vaccinated individuals; however, secondary infections are usually milder than in the non-vaccinated individual
Prevention of infection	Some vaccines protect against infection (i.e. hepatitis A) and are referred to as “sterilizing immunity”
Protection of unvaccinated population	Vaccination of certain percentage of population protects unvaccinated individuals

Table 1.8 Discusses the several vaccine benefits researchers Andre et al have proposed; these benefits form the basis of many pro-vaccine arguments (Andre et al., 2008)

A large concern in the pro-vaccine vs. anti-vaccine debate is the last vaccine benefit, which involves the protection of unvaccinated populations. To ensure immunity amongst a population, a certain percentage of the community must be vaccinated. Certain diseases, depending on their contagion level, require different percentages of the population to be vaccinated. Thus, the more contagious the disease, the higher the percentage of the population needs to be vaccinated. For instance, in the case of measles, 90-95% of people must be vaccinated to ensure protection (Oxford Vaccine Group, 2016). This concept, also known as “herd immunity,” is used to protect not only

those who are vaccinated, but those who cannot be vaccinated due to immunodeficiency disorders such as HIV/AIDS, or those with cancer and undergoing chemotherapy. These people are at the highest risk for disease and rely heavily upon the rest of the population to be vaccinated so as to ensure their safety and protection, for their immune systems cannot withstand vaccines (Oxford Vaccine Group, 2016).

The following figure was taken from the Oxford Vaccine Group and given as a visual representation of this concept. There are two panels which represent a vaccinated population and an unvaccinated population. Each circle represents a person; those highlighted in red represent those persons that are immunodeficient, whereas those highlighted in green represent those that are vaccinated. Those that are highlighted in orange represent persons who carry disease and infect others with it, regardless of whether or not they present symptoms. In the unvaccinated population, once the orange reaches a red, immunodeficient circle, the disease can severely affect the individual and cause them to get very sick or even die. In the vaccinated population, however, once the orange reaches a green vaccinated circle, that person is protected and does not pass on the disease. Though the figure only shows a small representation of a population, it should be noted that for herd immunity to work, a certain percentage of people must be vaccinated.

Eckersberger, & Larson, 2015; Nyhan, Reifler, Richey, & Freed, 2014; Smith, 2017).

Instead of increasing vaccination rates, these pro-vaccine messages and campaigns have an opposite effect where anti-vaccine parents become increasingly frustrated and isolated for their choices.

Chapter Two

Historical Similarities in Arguments Against Vaccination Past and Present

This chapter explores the arguments against vaccination in the 1800s and the present, specifically within the United States and Britain. Prior historical research demonstrates that many of the arguments from the 18th and 19th centuries are very much similar to those seen today. It is also important to note that three hundred years of arguments against vaccination presents a large range of varying ideas, opinions and attitudes that are difficult to neatly categorize. Thus, this section is one example of historical themes and attitudes regarding vaccination in the 1800s.

In 1706 colonial America, the Atlantic Slave Trade was in full swing and smallpox frequented the region in epidemic form (Herbert, 1975). Smallpox, caused by the *Variola* virus, is a communicable disease characterized by systemic rash of small, red sores and fever (Centers for Disease Control and Prevention, 2016a). Because there is no treatment for smallpox, a person may easily contract the disease and die. Thus, as smallpox continued to ravage the Atlantic Coast, people struggled to find methods to tame the disease. Though there were very few preventative measures, some were fortunate enough to overcome the disease and were left with the scars as reminder. Many, however, were not so lucky and lost their lives in the process (Herbert, 1975).

In the same year, scientist, physician and Reverend Cotton Mather of Boston, Massachusetts was given a slave whom he named *Onesimus*. Like many slave-owners of the time, Mather inquired if Onesimus had smallpox, to which Onesimus replied that yes, he had and explained to Mather the phenomenon known as inoculation—or in other

words, the process of “transferring smallpox artificially from someone infected with the disease to someone who is not but hopes thereby to contract a mild case and subsequent immunity.” Mather later recorded this experience in his “Sentiments on the Small Pox Inoculated,” where he wrote:

And then told me, he had undergone an Operation, which had given him something of the Small-Pox & would forever praeserve him from it; adding that it was often used among the Guramantese, & whoever had the Courage to use it, was forever free from the fear of Contagion (Herbert, 1975).

His curiosity piqued, Mather’s interest prompted further investigation in smallpox inoculation, leading him to similar cases in which other slaves in the area also exhibited immunity to smallpox (Herbert, 1975). When another smallpox epidemic hit Boston in 1721, Mather was prepared to use his smallpox inoculation knowledge and further urged the colonies to adopt this method of prevention. Though the epidemic of 1721 affected over 6,000 of the 11,000 citizens and took the lives of 850, it was Mather’s use of inoculation he learned from Onesimus that was one of the first well-documented, widespread use of inoculation to combat the epidemic (Niederhuber, 2014).

Despite attempts to control the disease, Mather’s inoculation campaign prompted public criticism and opposition from the medical community. At the forefront of the anti-inoculation movement was Dr. William Douglass, one of the only men who actually held a medical degree in Boston and opposed Mather’s method based on religious reasons (Niederhuber, 2014). Douglass argued that inoculation “violated divine law” by “inflicting harm on innocent people” while also arguing that inoculation

was untested and based on folklore, for unchecked use of inoculation would ultimately quicken the spread of disease rather than contain it (Niederhuber, 2014).

Though these events took place mid-eighteenth century, the arguments against inoculation foreshadow those against vaccination today. In a 2017 review titled “Vaccine Rejection and Hesitancy: A Review and Call To Action,” Smith cites seven different contemporary arguments against vaccination (Chapter I, Table 1.6). Arguments from the review include: vaccines pose increased risk due to and contain toxic, harmful ingredients, such as aluminum and thimerosal; natural immunity is better, for “most vaccine-preventable diseases are harmless to most children, and natural exposure provides more long-lasting immunity;” and diseases declined not as a result of vaccinations, but as a result of improved hygiene and sanitation (Smith, 2017).

To better understand how Parents A, B and C viewed vaccination, they were asked if they believed there are other, better ways to prevent vaccine-preventable diseases than a vaccine. Each parent said yes. “Absolutely 100% there are better ways,” said Parent B:

In addition to researching each vaccine, I have also researched every disease there is a vaccine for, how it is contracted, the percent chance of a healthy person in the US getting the disease, the positive attributes that come about from getting the disease, the negative attributes to getting the disease, how many people in the US have died from the disease, and what western and natural treatments are indicated for prevention and treatment of the disease.

Parent C shared they prefer "Homeopathy, better hygiene, plumbing and water infrastructure, prevent social scales that reduce homelessness and refuse,” while Parent A “[thought] there are *wonderful* ways to stay healthy, yeah.

Sanitation, um, healthy eating, clean water, um [another pause to think], plumbing, those—those things have, uh, greatly reduced diseases. Hand washing, I'm a big fan of that and yeah, just, um, and definitely, I definitely use herbs and you know, natural medicines and salts and stay healthy in an alternative way... I have a lot of medical practitioners and that sort of thing that don't just go with you know, every vaccine's great and everybody should get every vaccine, and they you know, they challenge different aspects of that.

While these arguments are similar to those referenced by Smith, they also echo those arguments made by the first anti-vaccinationists from the 1800s. When the vaccine was first introduced to the United States at the turn of the 19th century, the population had suffered multiple smallpox epidemics which caused serious health and economic consequences. In 1809, Massachusetts passed the first U.S. compulsory vaccination law, which required smallpox vaccination to be administered to the entire population (Omer, Salmon, Orenstein, deHart, & Halsey, 2009). From 1802 to 1840, smallpox vaccine use became increasingly widespread. As similar legislation passed in other states, it was not long until opposition emerged and prompted repeated court cases concerning the legality of compulsory vaccination laws. States such as California, Illinois, Indiana, Minnesota, Utah, West Virginia and Wisconsin repealed all compulsory laws and similar campaigns ensued in Massachusetts, Rhode Island and Pennsylvania. From the 1850s to 1870s, anti-vaccine campaigns headed by “irregular physicians” and “unorthodox medical theories” led to the decreased use of vaccines, to the point where in 1870, smallpox re-emerged and several smallpox epidemics subsequently followed (Omer et al., 2009).

In 1879, following another bout of several epidemics, anti-vaccination campaigns evolved into organizational form; leading British anti-vaccinationist William Tebb established the Anti-Vaccination Society of America, which led to the formation

of the New England Anti-Compulsory Vaccination League in 1882 and the Anti-Vaccination League of New York City in 1885 (Wolfe & Sharp, 2002). Instead of the Internet or social media, anti-vaccinationists spread their information by passing out pamphlets and holding live demonstrations. At the time, the circulated arguments against vaccination included that vaccination did not aid the prevention of smallpox; vaccines were unsafe due to “accidents of vaccination;” sanitation should take precedence over vaccinations; and that botanical and natural remedies should be used instead of vaccines (Kaufman, 1967).

Fast forward approximately two hundred years. When examining Parents A, B and C’s responses, it is evident there is a correlation between their present-day arguments to those of the original anti-vaccinationists. In addition to each parent agreeing there are other, better ways in preventing vaccine-preventable diseases, each parent believed in the practice of alternative and natural medicine as well as alternative ways of staying healthy, such as homeopathy, hand-washing, better hygiene and improved sanitation practices. In Parent B’s case, for example, they:

[trusted that] the history of vaccination and that the deadliest diseases were not eradicated by vaccinations but by increased sanitation practices. Vaccinations are getting so much credit for removing disease from society when in actuality, it was the clean water coming in and the disease ridden sewage going away that has done the most for society.

Instead of vaccinations as preventative treatment in disease transmission, Parent B believed that sanitation was the key factor in ridding disease from society. While this suggests that vaccines were ineffective, it also suggests that bacteria and viruses were merely a result of poor hygiene and infrastructure—that by improving only these two aspects of society, diseases were essentially washed out with the water itself.

Though vaccination practices contributed to the decreased incidence of smallpox in the 1800s, some individuals noticed a link between the ill health of the working population and their living conditions compared to those of the middle and upper classes. In May 1842, British social reformer Edwin Chadwick published “A Report on the Sanitary Condition of the Labouring Population and on the Means of Its Improvement,” which provided a thorough account of the “condition of the labouring classes, in respect to their residences and the habits which influence their health.” In this report, Chadwick provided descriptions of the overcrowded, poorly ventilated and incomplete sewage systems of the labouring class villages and their correlation to disease, including testimonies from those medical officers of the villages. In addition, Chadwick compared the quality of life in different classes of the community and cited evidence of certain preventative measures, such as increased sanitation, which raised the standard of health and chances of life. He wrote:

On viewing the evidence, which shows that in most situations higher chances of life belong to the middle and higher classes of the population, an impression may be created that the higher standards of health are essentially connected with expensive modes of living... The experience of the effects of sanitary measures in banishing spontaneous disease from crowded prisons, offers further evidence of the health obtainable by simple means, under circumstances still more unfavourable (Chadwick, 1842).

It was found that despite living in “unfavourable” conditions, increased sanitation measures were not impossible to accomplish. In fact, after examining the poor, disease-ridden conditions of the imprisoned populations in England, national attention was brought to the issue and “the evils of prison management [were] removed” (Chadwick, 1842). Thus as a result, prison conditions improved tremendously and disease incidence decreased, as acknowledged by “the medical practitioners, who [were] well acquainted

with the general state of health of the population surrounding the prisons concur in vouching to the fact, upon their own knowledge, that the health of the prisoners [was] in general much higher than the health almost of any part of the surrounding population” (Chadwick, 1842).

Chadwick’s report was integral to the development of public health, for not only did he issue thorough evidence of living conditions in London, he was able to recognize the link between sanitation and population health while providing suggestions as to how public systems may implement simple changes to better the health of their citizens. These same principles can be seen present day, where sanitary and hygiene measures have greatly reduced incidence of disease, such as hand-washing, hand-sanitizing and improved plumbing and infrastructure. Thus, it can be argued that Parent B does raise a valid point in that increased sanitation practices have helped to greatly reduce incidence of disease.

When asked about the main, overarching attitudes surrounding vaccines, Parent B and Parent C both mentioned concerns regarding the ingredients in vaccines. “Most inactivated vaccines contain aluminum adjuvants. Safety of injected aluminum is assumed but not proven,” wrote Parent C, who cited a research article which examined aluminum hydroxide injections and their effects on motor neurons (Shaw & Petrik, 2009). Parent B wrote that “Vaccines contain ingredients known by the FDA to be toxic to humans. Other ingredients are sourced from bacterial cultures grown on petri dishes that contain glyphosate (AKA Round-Up). Round-Up has been found in the vaccine supply and no work is being done to eradicate it.” In addition, Parent B later mentioned that “I consider eating and paying bills more important than injecting a poorly

researched liquid that contains more aluminum and formaldehyde into myself than the FDA thinks is safe."

As seen in Table 1.6 from Chapter 1, these arguments and concerns are similar to those cited by Smith, which states that “Vaccines are toxic and contain harmful ingredients...which can lead to an assortment of chronic health conditions” (Smith, 2017). Like the previous sanitation argument from Parent B, the concerns of Parent B and Parent C are valid, for there are varying ingredients included in vaccines today. According to the CDC, the current ingredients added to vaccines “are added for a specific purpose” and include the following:

Table 2.1 Vaccine excipient and media summary - CDC, 2018

<i>Excipient/Media</i>	<i>Purpose</i>	<i>Example</i>
Preservatives	To prevent contamination	Thimerosal
Adjuvants	To help stimulate a stronger immune response	Aluminum salts
Stabilizers	To keep vaccine potent during transportation and storage	Sugars or gelatin
Cell culture materials	Used to grow vaccine antigens	Egg protein, various culture media
Inactivating ingredients	Used to kill viruses or inactivate toxins	Formaldehyde
Antibiotics	Used to prevent contamination by bacteria	Neomycin

Table 2.1 Shows the vaccine excipients and media added to vaccines for specific purposes, updated by the CDC in October 2018; cell culture materials, inactivating ingredients and antibiotics are “residual trace amounts of materials that were used during the manufacturing process and removed” (Centers for Disease Control and Prevention, 2018b)

Compared to those vaccines from the 18th and 19th centuries, which included only the virulent matter from smallpox lesions, current vaccines include more ingredients which cultivates concern amongst parents in regards to the safety and risk of injecting certain matter into their children. These concerns, though valid, are not new—rather, they date back to the creation of the vaccine in 1796.

While Jenner may not have been the first to vaccinate against smallpox, he was the first to scientifically and systematically report his findings in his text titled “Inquiry into the Causes and Effects of the Variolae Vaccine” (Stern & Markel, 2005). Jenner, a country doctor living in Berkeley, England, formulated this vaccine concept based on his observations of the local milkmaids in his town: visible pustules on the dairy maids’ arms from cowpox provided them immunity from the smallpox outbreaks that frequented the area. These observations served as scientific justification for one of the world’s first controlled clinical trials, where Jenner conducted a series of experiments in which he demonstrated the use of live infection from pustules and scabs from those infected with cowpox conferred immunity to smallpox. In 1796, Jenner presented these findings in his text to the Royal Society of London which consisted of twelve experiments and sixteen additional case histories which detailed his success with vaccinations (Kaufman, 1967; Stern & Markel, 2005).

Unlike Mather, the amount of public opposition to Jenner’s methods was relatively minimal. Because the amount of smallpox vaccine in circulation was so small, it is suggested that lack of opposition early on was due in part to the haphazard geographical spread of the vaccine, for its circulation was “determined largely by personal contacts and private interests” (Rusnock, 2016). Thus, vaccines were not

mandatory nor were they endorsed by the government; rather, they were heavily promoted by Jenner himself, who traveled from Berkeley to London to recruit vaccination volunteers but with no such luck (Riedel, 2005). It wasn't until aristocrats and reputable individuals—such as London surgeon Henry Cline—began promoting and recommending vaccines that vaccines were popularized in England. By 1800, vaccination practices had reached most of Europe and as many as 100,000 had been vaccinated (Stern & Markel, 2005). Despite his increasingly limited supply, Jenner continued to send samples of his vaccinations to those who requested them. One of these doctors included Dr. John Haygarth of Bath, who in 1800 sent some of Jenner's materials to Dr. Benjamin Waterhouse of Harvard University. The vaccine was subsequently introduced to New England and gained support from Thomas Jefferson, where Jefferson appointed Waterhouse as vaccine agent in the National Vaccine Institute, “an organization set up to implement a national vaccine program in the United States” (Riedel, 2005).

Despite advances in the spread of vaccination, there were still those who opposed Jenner and his vaccination methods. Vaccination was not made a mandatory practice in England until 1853, thus many of the fears surrounding vaccines in the 1800s were rooted in the potential risks and harms associated with the procedure. Among these individuals were members of the clergy, who critiqued Jenner's methods by claiming that “inoculating someone with pus from a diseased animal was not only revolting but blasphemous” (Green, 2019). When Britain passed their Vaccination Act of 1853, they did so with the stipulation that should parents object or refuse to vaccinate their infant within zero to three months of life, they were “liable to a fine or

imprisonment” (Wolfe & Sharp, 2002). As a result, several parents were imprisoned and opposition grew in several forms: riots occurred Ipswich, Henley, Mitford and other towns; books and journals were published, which included *The Anti-Vaccinator* founded in 1869, the *National Anti-Compulsory Vaccination Reporter* found in 1874 and the *Vaccine Inquirer* of 1879; cartoon propaganda became a popular method of critique, where British artists both critiqued and satirized public and political fears and the inherent evils of vaccination (see Figures 2.1-2.2). In 1885, a massive vaccination demonstration in Leicester attracted the attention of 100,000 people, causing the anti-vaccine movement to gain serious momentum and the attention from the Royal Commission, where it eventually sat for seven years “collecting testimonies from opponents and supporters of vaccination” (Wolfe & Sharp, 2002). In 1896, the commission’s report concluded that “vaccination protected against smallpox” but “as a gesture to the anti-vaccinationists it recommended the abolition of cumulative penalties” (Wolfe & Sharp, 2002).

Such opposition to Jenner’s methods can be seen in the cartoons of Charles Williams and James Gillray, who produced illustrations arguing against vaccination practices, as seen in the following figures, Figure 2.1 and Figure 2.2. These two images were taken from the Wellcome Collection online archive and were chosen based on their visual demonstration of the first wave of 1800s public opposition in response to vaccination in Britain. Though they were not the only two cartoons produced at this time—several were produced and circulated not only in England, but France as well—they are effective in communicating the initial fears individuals experienced in the early 1800s. While textual evidence is an integral component to understanding the rhetoric

and reasoning of the anti-vaccination movement, visual imagery is important as well, for it expresses vaccine concerns in a manner that text and journals cannot.

Figure 2.1 was illustrated by James Gillray, a British caricaturist and printmaker known for his satirical critiques of British and social life (Sherry, 2019). The image, titled “The Cow Pock” was published in London in 1802 and depicts a crowded scene with Edward Jenner vaccinating patients, where patients sprout cow heads from vaccination sites on various parts of their bodies. Those patients being vaccinated seem to include individuals not only from the middle and upper classes, but also those of the lower class, as seen by the dark-haired man in the tattered clothing in the front right, suggesting that not only the rich are subjected to the “evils” of vaccines but the poor as well. At the far right of the cartoon, what appears to be a pregnant woman sprouts a cow head from both her mouth and under her skirt, which could suggest that vaccination with foreign substance causes birth defects. To her left, a man with his hands raised sprouts horns from his forehead, almost resembling a devil-like appearance. In front of the horned man is another man with tattered clothing and a cow head sprouting from both his right arm and right buttock with a horrified expression on his face. A milkmaid can be seen in the center of the cartoon, representing the country milkmaids which Jenner originally gained his vaccine inspiration from, and to her left is Jenner himself, vaccinating her right arm with what appears to be a lancet, his face expressionless in contrast to her shocked one. To Jenner’s right is a short man in a blue pea coat holding a container of vaccine material labeled “Vaccine Pock Not From Cow,” and in his right pocket holds a pamphlet titled “Benefits of the Vaccine.” Behind the milkmaid, there are two men and one woman: the man on the right has his hands up and faces Jenner, a

cow head sprouting from his face; the woman to his left also has a cow head sprouting from her right eye and has a concerned look on her face; and the man to her left appears angry, with his right hand clenched and sprouting a cow head from his left ear. To the left of Jenner are roughly six men and women, each with visible smallpox on their face and bodies, lining up and crowded in a doorway and being forced to drink from a bucket labeled “opening mixture.” The man who ladles the mixture into each patient’s mouth holds the same remote, emotionless expression of that as Jenner, while those who await the drink appear terribly sick and perplexed.

When looking at the cartoon in its entirety, one can see from left to right the transformation of smallpox patients into cows themselves, symbolizing the fear of intrusion and the introduction of unknown material to the body. The crowded nature of this cartoon possibly alludes to fears of mass damage, that should several people be vaccinated, Jenner would inflict suffering on society as a whole with his harmful vaccine ingredients. This fear of vaccine ingredients can be seen in the bucket labeled “Vaccine Pock Not From Cow,” which suggests that by forcibly subjecting the body to an unnatural substance, vaccines significantly harm or betray the body. Moreover, the depiction of Jenner as robotic and expressionless suggests a lack of sympathy or no regard for a person’s feelings or personal boundaries—that nothing else matters than pushing his vaccine agenda to the masses. It could be argued here that such lack of sympathy was possibly foreshadowing of the concerns surrounding autonomy that would come with mandatory, compulsory vaccination roughly fifty years after the publication of this cartoon.

Figure 2.1 “The Cow Pock” by James Gillray, 1802



Figure 2.1 “The Cow Pock” by James Gillray, 1802; satirical cartoon depicting Edward Jenner vaccinating smallpox patients and cow heads sprouting from vaccination sites (Wellcome Collection, n.d.-b)

These same themes of fear and intrusion can be seen in Figure 2.2, a sketch titled “Vaccination” by Charles Williams in London in 1807, which depicts vaccination as a large, carnivorous beast. In the center of the cartoon is a large, brutish monster that is being fed fresh infants by three men with horns and tails. The monster, after consuming its meal, then excretes the infants where they tumble onto the ground as beasts themselves—half cow, half infant, complete with horns and tails. A man on the right, who also has horns and a tail, shovels the newly transformed creatures into a wagon while the other men continue to dump fresh infants into the mouth of the creature. This creature, given the name “Pandora’s Box,” suffers from several oozing pustules, each marking a different affliction; from left to right it reads “pestilence,”

“plague,” “leprosy,” and “fetid ulcers.” In the background, there is a small group of armed men that cower in the distance, each with an initial of the disease they are arguably meant to attack on their shields, though the horned and tailed men pay them no attention.

This sketch criticizes vaccination and its effects, implying vaccines are these mutilation agents which manipulate the inherent qualities of human beings and turn them into satanic, hellish creatures, as depicted by the horns on both the infants and the men feeding the creature. Further, by naming the beast “Pandora’s Box,” Williams emphasizes the forbidden nature of vaccines, as if vaccinations tamper with the good and evil of the world and are capable of unleashing the latter. Though both of these images represent vaccination in a separate manner, they both seem to illustrate these themes of fear and intrusion—fear of the foreign, contamination and intrusion of one’s body and autonomy.

Figure 2.2 “Vaccination” by Charles Williams, 1807



Figure 2.2 “Vaccination” by Charles Williams, 1807. Sketch depicts a monster named “Pandora’s Box” being fed human infants and excreting them with horns, symbolizing the negative effects of vaccination (Wellcome Collection, n.d.-a)

Figures 2.1-2.2 from 1802 and 1807 echo the same fears of Parents B and C, where vaccine ingredients posed potential harms and risks to individuals’ bodies. Whether it was intrusion, invasiveness, contamination of vaccine material or the sheer unknown of vaccination as a practice, many of these concerns continue into the present. According to the study titled “‘Poisonous, Filthy, Loathsome, Damnable Stuff:’ The Rhetorical Ecology of Vaccination Concern,” Hausman and researchers argue that “the rhetorical ecology that articulates contamination concern through discourses of disgust

and danger and links the two remains a persistent thread,” for “contemporary vaccine concern is permeated by a sense of uncertainty about the advances of modern medicine, especially concerning the side effects of drugs that must be accommodated as part of treatment.” Despite advances in modern medicine, opposition to vaccines remain, as there are many of the same concerns in both the 1800s and the present.

Chapter 3

Vaccine Compliance: Exploring the Freedom of Choice

This chapter explores United States and Britain compulsory vaccine laws and their effects on vaccine compliance in anti-vaccine parents by examining the history of government-mandated vaccination and its subsequent opposition. Topics that emerged in all the interviews include self-governance, “medical freedom,” “informed consent,” and power of choice (or lack thereof). I group and analyze these themes found in interviews with Parents A, B and C in accordance with historical patterns and similar themes found in secondary sources.

In the United States, there are no federal or national laws that determine which vaccinations are required, thus it is the responsibility of each state to develop and implement vaccine and immunization requirements into their legislature (Centers for Disease Control and Prevention, 2017). For schools, these laws are especially important for they determine which children can and cannot attend. In Oregon, children are required to receive vaccines which protect against diphtheria, tetanus, pertussis (whooping cough), polio, varicella (chicken pox), measles, mumps, rubella, hepatitis B, hepatitis A, and haemophilus influenzae type B (Oregon Health Authority, n.d.-b). Each family has until February 20th (also known as Exclusion Day) to comply with these requirements or their child will be sent home from school. In order for their child to return to school, families must provide one of the following: updated immunization record including all mandatory vaccinations, *or*, proof of either medical or non-medical exemption. That being said, whether parents choose to claim any type of exemption,

during the certification process they must be made aware of the fact that their child may be excluded from school in the event of an outbreak and that the exemption may not be recognized (Centers for Disease Control and Prevention, 2016b).

All states and the District of Columbia in the United States allow for medical exemption, and all but two states—West Virginia and Mississippi—offer non-medical exemptions (Mellerson et al., 2018). A medical exemption is allowed when a child has a medical condition that prevents them from receiving a vaccine, such as an immunocompromised patient (i.e. HIV/AIDS) or a patient undergoing chemotherapy. There are two kinds of medical exemptions: temporary and permanent. A temporary medical exemption is given an expiration date after which the child must receive the vaccine; a permanent medical exemption does not require for a child to ever receive the vaccine.

A non-medical exemption is claimed when a parent has religious or philosophical reasons against vaccinations. If a family chooses to claim a non-medical exemption for their child, they must become certified in an online training module, *or*, they must have a primary care provider sign off or indicate that the family has discussed with them thoroughly the risks and benefits of vaccination (Oregon Health Authority, n.d.-a).

Despite parents having the choice to claim non-medical exemption for their children, they still face social and medical scrutiny when it comes to their choices. All three parents I interviewed had claimed non-medical exemption and chose to not vaccinate their children and I was interested in whether or not they faced social implications for their decisions. Thus, I asked each parent if they feel social pressure to

vaccinate their children, to which Parents A and C replied, yes. “I’m a strong believer and advocate for medical freedom,” Parent A said.

I think everyone needs to make their own medical choices based on their own genetics, religion, intuition, philosophical beliefs and based on their own, you know health, and you know—who they are as a soul, and as an individual, and I support person's right to choose a vaccination, but I don't really think it should be pushed on, you know, like, people shouldn't be—have to, get their rights taken away from them if they don't choose the same medical care as everyone else or the person next to them.

Whereas Parent C wrote,

Vaccination is a medical procedure with very serious risks. The choice to refuse any medical procedure is a basic human right. Philosophical exemptions encompass scientific, religious, and medical concerns. Medical exemptions are difficult to obtain and often one must suffer a reaction first to qualify. There are valid reasons that are scientifically evidence based to decline vaccinations, regardless of an individual’s genetic predisposition to injury. Which my daughters have...

Here, Parents A and C argued the importance of one’s freedom to make their own, informed medical decisions in the best of their interests. Regardless of whether or not it was vaccination, they were concerned with the *choice*, rather than the *type* of treatment, procedure, etc. This desire emphasizes the importance of both autonomy and control—that rather than some governing body or medical practitioner mandating or requiring a certain policy or procedure, people should have the right to decide yes or no. Instead of forcibly being required to comply with certain regulations, individuals’ autonomy should be acknowledged rather than disregarded, for disregard of one’s autonomy could lead to feelings of isolation or abandonment. While this belief prioritizes the individual over society as a whole, it questions whether or not scientific justification holds any value in the face of mandatory vaccination. If vaccines are

scientifically researched and evidence-based, why can't scientific evidence be used as a means of defending one's decision against vaccinations?

Parents A and C's arguments for medical freedom are not new. Though exemptions for vaccination exist today, early compulsory vaccination laws did not permit the option of choice. Instead, compulsory laws mandated that each parent vaccinate their child, regardless of their views. When the United States first began to impose compulsory immunizations in the early 1800s, many who refused vaccination did so based on one of two rationales: vaccination was an unwanted governmental interference with human autonomy and liberty, and, there were valid scientific objections about vaccine effectiveness (Hodge & Gostin, 2002).

According to the article "School Vaccination Requirements: Historical, Social and Legal Perspectives," Hodge and Gostin claim that these fears were "attributable in part to overly aggressive public health practices and general public distrust of public health objectives," citing the public health vaccination programs in response to the several smallpox outbreaks throughout the 1800s. In addition to the introduction of a relatively new medical procedure, citizens were required to comply despite concerns or distrust. More often than not, individuals were vaccinated anyway with or without their consent and forcibly injected (Hodge & Gostin, 2002). For example, in 1895, the *New York Times* published a report titled "\$1,500 For Forced Vaccination," in which a man named Emil Schaefer won a lawsuit against a public health official who forcibly vaccinated him in a night raid. As Hodge recounts:

The police were frequently called upon to protect the vaccinators, and midnight raids were made by the vaccinators and the police, and people were vaccinated whether they submitted or objected.... Dr. Henry L.

Schelling visited [Schaefer's] house April 27, 1894, and said he had come to vaccinate the family. Schaefer objected, and said he was suffering with a tumor on the brain, and thought it would be dangerous to be vaccinated. According to Schaefer's story, Dr. Schelling seized him by the arm, and exclaimed: 'You shall be vaccinated, if I die for it'" (Hodge & Gostin, 2002).

In Oregon and most of the United States today, the penalty for not vaccinating children is their exclusion from attending school and even so, parents have the choice to claim exemption as a means of circumventing this requirement. That being said, there still exists the fear of government and medical infringement upon one's rights, resulting in feelings of little to no autonomy, as seen in statements made by Parents A and C. Until recently, these fears were mitigated with the choice for non-medical exemption; however, with recent events such as the 2019 measles outbreak, the costs of non-vaccination have risen. In April 2019, Mayor Bill de Blasio declared a public health emergency in New York City, requiring that "unvaccinated individuals living in Williamsburg, Brooklyn receive the measles vaccine" or else they would receive a city-issued violation and fine of \$1,000 for those who did not comply (Pager & Mays, 2019). This requirement, though confined to the limits of Brooklyn and New York, mirrors those of the very first compulsory laws and raises the question of whether or not these cumulative penalties are specific to this measles outbreak, how they are or will continue to be enforced, or if they will remain as part of immunization requirements.

This demanding nature of vaccination requirements continually frustrates Parent B, who when asked about who they trust the least for vaccine information, wrote,

We allow the makers of vaccines to tell us how great they are and they are screaming it so loudly, smart people just don't realize they are not being told the Truth. People want them to work so badly they are willing to get the jab and bully others to do so.

In this statement, Parent B presents a distinct *us vs. them* mentality—*us* being the public and *them* being the vaccine manufacturers. Though the specific “we” population the subject refers to is unknown, it reads as if there is a power imbalance between the groups, where the “makers of vaccines” have access to different information and choose to withhold some greater “Truth” that should be shared with the *us* population. Parent B seems not only fearful of *them*, the vaccine manufacturers, but that individuals capable of making good, well-thought out decisions are somehow being manipulated without even realizing it and further recruited into the *them* category—that being, supporters of vaccine manufacturers. Like Parents A and C, Parent B seems to experience feelings of infringement; however, these feelings concern the general population in regard to a threat to *their* autonomy. Instead of vaccination being a choice, it is as though Parent B feels that the public has been conditioned to believe that vaccination is the only way to prevent disease—which, in some ways, we have, specifically with the evolution of compulsory laws and their collective acceptance in society.

The original 1809 Massachusetts compulsory law was not settled until its constitutionality was upheld in 1905 in the landmark case, *Jacobson v. Massachusetts*, where the U.S. Supreme Court “endorsed the rights of states to pass and enforce compulsory vaccination laws” and has since “served as the foundation for public health laws,” including those required for school (Omer et al., 2009). In 1922, it was found in the *Zucht v. King* case that school immunization requirements were constitutional and did not infringe upon rights of liberty, and further, “upheld mandatory vaccinations as a contingency for school admission” (Torre-Fennell, 2013). In 1969, 17 states passed

laws which required children to be vaccinated against measles before entering school in efforts to control the high prevalence of measles in the United States (Omer et al., 2009). In addition to the 17, 12 states “legally mandated requirements for vaccination against all six diseases for which immunization was carried out at the time,” and throughout the 1970s, state and local health officials worked to enforce immunization laws by excluding students from school who did not have the required vaccinations to attend, which helped control the number of outbreaks but received much backlash. By the early 1980s, all 50 states had immunization requirements, for efforts by public health and other immunization advocates resulted in the enforcement of immunization requirements for all vaccines (Omer et al., 2009). These official cases and their holdings can be seen in the following Table 3.1, which were “decided by the United States Supreme Court and federal and state courts concerning governmental vaccination policies” (Hodge & Gostin, 2002):

Table 3.1 Shows two official United States Supreme Court cases and their major holdings from 1905-1922

Year	Case	Major Holdings
1905	<i>Jacobson v. Massachusetts</i>	The City of Cambridge may require its citizens to be vaccinated for smallpox provided certain protections for the individual are accommodated consistent with liberty principles under the Due Process Clause.
1922	<i>Zucht v. King</i>	States may delegate to a municipality the power to order vaccination and the municipality may then give broad discretion to the board of health to apply and enforce the regulation.

Table 3.1 Shows the two previously discussed United States Supreme Court cases from 1905 and 1922 with their major holdings (Hodge & Gostin, 2002)

Because vaccines have become so widely accepted and ingrained in society by public health and medical communities, it is difficult to imagine a society without them—which is perhaps why Parent B raises the question as to whether or not the public is blindly accepting vaccination due to their prolonged presence in government and medical practice. With instances such as the continued measles outbreak in 2019, we are encouraged as a society to think about how to draw the boundary between public safety and constitutional freedoms, and whether or not pre-existing legislation is truly effective amongst populations such as the anti-vaccine community.

Chapter Four

Examining Vaccine Distrust: Profit, Safety and Bias

This chapter explores the possible drivers and motivators of parental distrust toward entities involved in the processing, manufacturing and regulating of vaccinations and vaccination programs. From these interviews, there appear to be two main drivers which fuel Parent A, B and C's concerns. These concerns include vaccine safety, and the compromised relationships between government, pharmaceutical companies and the medical community. Similar to chapters two and three, I will present the concerns expressed by each parent and provide current systemic or historical context which could possibly contribute to these feelings of distrust.

In public health, vaccines are widely regarded as the most effective protection method against communicable diseases and are credited with greatly reducing incidence of diseases and their serious effects. That being said, there are some side effects and risks involved when it comes to vaccination, which are listed in the table below and cover side effects from the following vaccines: chickenpox (varicella), DTaP (diphtheria, tetanus and pertussis), haemophilus influenzae B, hepatitis A and B, human papilloma virus (HPV), influenza virus, MMR (measles, mumps, rubella), meningococcal, polio virus, pneumococcal, rotavirus and tuberculosis (Seattle Children's Hospital, 2019).

Table 4.1 Reactions to various vaccines

<i>Symptom</i>	<i>Description</i>
Local reactions	Shot sites can have swelling, pain and redness. Most often, symptoms develop 24 hours after shot and last 3-5 days. With DTaP, symptoms can last up to 7 days.
Fever	Fever with most vaccines begins within 24 hours after shot and lasts 1 to 2 days.
Delayed reactions	With MMR and chickenpox shots, fever and rash can occur but these symptoms start later, within 1 and 4 weeks.
Anaphylaxis	Severe allergic reactions are rare, but can occur with any vaccine and start within two hours.

Table 4.1 Shows the different symptoms of vaccine reactions to various vaccines – adopted from Seattle Children’s Hospital (Seattle Children’s Hospital, 2019)

As a means of monitoring vaccine safety, the CDC and FDA established a vaccine monitoring system called “Vaccine Adverse Event Reporting System” (VAERS), which serves as “an early warning system to detect possible safety issues with U.S. vaccines” by “collecting information about adverse events that occur after vaccination” (Centers for Disease Control and Prevention, 2015). This database was created in 1990 in response to the 1986 National Childhood Vaccine Injury Act (NCVIA) and allows doctors, nurses, vaccine manufacturers and the general public to submit a report in the event of any health problems occurring after vaccination (Centers for Disease Control and Prevention, 2015).

When initial recruitment of subjects began, I was pointed several times in the direction of the VAERS website as a reference for vaccine safety. More often than not, it was found that the risks and harms associated with vaccine safety outweighed concerns regarding vaccine efficacy. When asked about if they thought that vaccine benefits outweigh the risks, Parent A said:

Well, that is my biggest concern I think, is that—is that the risks are underreported? And the risks are you know, they *suppress* that information. I don't know if you're familiar with the CDC, HHS, department of HHS, asked Harvard to do a study about vaccine risks and how many were actually reported. And Harvard came up with one percent, or actually reported and the federal government, since you know, since late 1980s have paid out 4 billion dollars in vaccine damages. So if that's just one percent? And that's just the payouts, you know, so I am worried that the risks of vaccination are underreported, not really understood.

Parent A was concerned with not only vaccine injury, but that the risks have been under-reported and the agencies involved are inaccurate or untrustworthy. As an agency involved in vaccine risk and injury, whether it be government or medical, there is little to no room for error or mistakes. When individuals such as Parent A are concerned that these risks fail to be mitigated or that their reporting is inaccurate, it cultivates a sense of distrust, or potentially, skepticism. If the risks are under-reported, then the agencies involved could potentially be withholding important information which could negatively impact those seeking vaccination.

Parent A was not the only one concerned with vaccine risk and injury. At the conclusion of each interview, I asked parents what their overarching views were regarding vaccines as an opportunity to share anything they felt they had forgot to mention earlier in the interview. While Parent C did not necessarily express concern in vaccine risks being under-reported, they did explain their concerns with how risks were

conveyed at the public health level based on personal experience. This involved the concern that the agencies involved in vaccination development and production withhold important vaccine information or fail to maintain transparency in the associated risks with vaccination. Thus, in response, Parent C wrote:

I used to work in public health for several years, the training I received for answering phone calls regarding vaccine safety was straight from Paul Offit's training of public health nurses in this country. None of it was accurate in conveying the risks of the medical procedure instead I was trained on marketing points from pharmaceutical companies.

When examining these two statements, there are two perceived issues at play: the first being, that the harms and risks of vaccination are underreported; the second being, that these risks are disregarded as a means of promoting the pharmaceutical industry's marketing agenda. No monitoring system is perfect; because the VAER system operates and relies on self-reporting, it is possible that the harms and adverse effects of vaccines are underreported. The CDC acknowledges this too, citing certain limitations to the VAER system which include the "rate of reports may increase in response to media attention and increased public awareness" and that it "is not possible to use VAERS data to calculate how often an adverse reaction occurs in a population" (Centers for Disease Control and Prevention, 2015). The VAER system is simply a government run, CDC surveillance system which publicly presents vaccine data. From a marketing perspective, however, it is plausible to share certain pieces of information and withhold some as a means of selling product. There is a delicate union between the business aspect of pharmaceuticals versus maintaining their clinical integrity. Thus, should conflict arise between the two sides, those individuals who are on the receiving end—those receiving the vaccines—are entitled to questioning the product.

In the early 1980s, major legislative reform in the United States revolved around liability for injuries resulting from the use of vaccines. Like Parents A and C, some individuals grew increasingly weary of vaccinations to the point where vaccine manufacturers saw an increase in vaccine-induced injuries. In turn, manufacturers claimed that “substantial tort costs would discourage research and innovation,” to which consumer groups argued that “it was morally wrong to make parents prove that manufacturers were at fault” before “obtaining compensation for vaccine-induced injuries” (Hodge & Gostin, 2002). Thus, as a result of these complaints from 1982-1986, United States Congress established the National Vaccine Injury Act which established four different programs seen in Table 4.2 below:

Table 4.2 Programs established by the National Vaccine Injury Act, United States 1986

<i>Program</i>	<i>Purpose</i>
The National Vaccine Program	Responsible for most aspects of vaccine policy; examples include research, development, safety and efficacy testing, etc.
The Vaccine Injury Compensation Program	Compensates persons who suffer from vaccine-induced injuries according to values set in the Vaccine Injury Table; highly controversial, for nearly three-fourths of cases have been dismissed
The Vaccine Adverse Events Reporting System	Requires health care providers and manufacturers to report adverse events from vaccines
The Vaccine Information System	Requires all health care providers to give parents standardized, written information before administering certain vaccines

Table 4.2 Shows the four different programs established in 1986 by the National Vaccine Injury Act as a means of mitigating vaccine manufacturer liability in response to increased vaccine-injury lawsuits (Hodge & Gostin, 2002).

Despite such measures to accommodate the varying range of parental belief systems, parents continue to either question their trust in these programs, or, do not trust them altogether. In these interviews, I was particularly interested in where parents placed their trust when it came to vaccines. Thus, I asked each parent who they trusted the most and who they trusted the least for information regarding vaccines. When asked who they trusted the least for information regarding vaccines, Parent A said:

I am concerned about blindly trusting the government. I don't do that. I feel like the level of corruption and, and self-preservation... The, you know, the CDC's own scientists who've come forward talking about concerns, so I don't like following orders of people who are following orders and people who are following orders. When I talked to Lane County Public Health, they said they're following Oregon Health Authority orders, and when I talked to Oregon Health Authority, they said they're taking orders from the CDC, right? So, I don't just kind of blindly follow with it, what everyone says to do, because just simply cause someone's just saying to do it, so I kind of trust my own self, I guess, to gather my own information.

In addition to Parent A's concerns regarding vaccine safety, they also expressed concern in their trusting of the government—specifically, “blindly” trusting and going along with it “just simply cause someone's just saying to do it.” Though this statement reads as though there are feelings of isolation from the government, Parent A has sought out this sense of individualism or even liberation from the constraints of authority. Perhaps they fear that the government is working in the interest of benefitting themselves rather than the good of the people; or, perhaps they fear government took advantage of them. Nonetheless, though it is unknown what specific event caused Parent A to lose their trust in the government, it has tasked them with the responsibility of “gathering [their] own information,” and making their medical decisions based on their own needs.

According to the article titled ““Poisonous, Filthy, Loathsome, Damnable Stuff: The Rhetorical Ecology of Vaccine Concern,” this sense of individualism is a relatively recent development in the social context of the United States. As the era of paternalistic medicine waned in the late 1900s, patient-centered decision-making emerged as more parents became more involved in the matters of their healthcare (Hausman et al., 2014). That being said, with the requirement of compulsory vaccination looming over individuals’ heads, it could be argued that vaccination remains one of the current areas of medicine in which both the government and medical community retain this paternalistic mindset.

As parents become more involved in their healthcare decisions, the more they learn about the systems and organizations they are dealing with as well as their relationships with one another. In the realm of vaccination, these systems include government organizations such as the FDA and CDC, pharmaceutical companies and medical professionals, where “significant concerns about corrupt relationships between recommended medical treatments and pharmaceutical companies have emerged in recent years” (Hausman et al., 2014). In the case of Parent B, the relationships between these organizations were most troublesome, specifically those between the CDC and the pharmaceutical company, Merck. “I don't trust the people who make the vaccines, I don't trust anyone that holds patents on vaccines (the CDC holds patents on vaccines). I don't trust because the companies who are going to profit from the product are doing the research,” they wrote.

First I read that research, saw how crappy it was, and then discovered the pharmaceutical companies have a super cozy relationship with the only organization that comes between them and their customer base... Take

the CDC's Director Julie Gerberding for example. She worked as director for the CDC from 2002 to 2009 and then, in 2009 went from directing the CDC to being the president of Merck's vaccines division. That is an unacceptable relationship in my opinion. We need unbiased leaders at the Center for Disease Control and not a family-like relationship. The CDC is charged with approving or denying products based on the research done by the company that wants the product approved... We need unbiased leaders at the Center for Disease Control and not a family-like relationship.

Like Parents A and C, Parent B questioned those with control of regulation and manufacturing of vaccines. However, unlike Parents A and C, Parent B was more concerned with the close nature of the relationships between government and pharmaceutical companies. From this compromised relationship, their concerns were rooted in worry about how these relationships influence vaccine recommendations for the public good. They were concerned that rather than making decisions in the best interests of the public, this relationship relies on profit and motivations for money instead.

By the time a new vaccine hits the market, it has already undergone several phases of clinical trials and testing before being added to the United States recommended immunization schedule. According to the CDC, the FDA sets rules for three phases of clinical trials which work to ensure the safety of the volunteers. Researchers from the FDA and CDC test vaccines on adults first, transitioning from 20-100 volunteers to hundreds or thousands of volunteers, testing the vaccine's safety and efficacy. If the vaccine becomes approved and licensed by the FDA, the Advisory Committee on Immunization Practices (ACIP) carefully reviews the product based on the available data from clinical trials or other research studies and continues to monitor the safety of the vaccine, even after its routine use (Centers for Disease Control and

Prevention, 2018a). Parent B's need for "unbiased leaders" emphasizes certain feelings of exploitation and fear that these organizations, rather than manufacturing products meant to improve health, produce poorly-researched medical treatments which pose more harm than good in hopes of driving up profit margins. Not only are these fears reminiscent of those previously discussed regarding vaccine safety, they also indicate trust issues with the bureaucracy of the vaccine manufacturing process itself.

Take, for instance, the 2006 controversy over the human papillomavirus (HPV) vaccine, Gardasil. After its licensure in 2006, many states worked to incorporate the HPV vaccine as part of the required immunizations for middle school, sparking opposition from religious conservatives who regarded the vaccine as the "promiscuity vaccine" (Colgrove, Abiola, & Mello, 2010). Though it had been proposed in twenty four states, the bill was either been abandoned or stalled; it wasn't until 2007 that the situation became "politically explosive," after Texas Governor Rick Perry "bypassed the legislature and issued an executive order" which made the vaccine mandatory for girls entering the sixth grade. Because Texas was a conservative state with a steadily increasing anti-vaccine community, this executive order was quite unusual. Perry was subsequently accused of being influenced by a Merck lobbyist, and ultimately, the tensions over vaccine policy "pitted physicians against parents and advocacy groups against vaccine manufacturers," and "skeptics bemoaned the influence of business marketing and the power of the state over its citizens" (Colgrove et al., 2010). By the time Merck emerged on the other side of the controversy, it was perceived poorly by the public; parents who participated in a study by sociologist Jennifer Reich viewed the "HPV vaccine development, review, and market process as corrupted by the politics and

through lobbying efforts funded by pharmaceutical companies” and negatively affected their trust in the science behind the research process (Hausman et al., 2014).

It is difficult to neatly categorize the various drivers of distrust when it comes to vaccines and their development and manufacturing process. Significant concerns regarding the overly close relationships and their ability to jeopardize neutral regulation between pharmaceutical companies and government organizations such as the FDA and CDC will continue to exist so long as vaccines do. With controversies such as the 2006 Gardasil controversy, which provide evidence of pharmaceutical lobbying and its political influence, these fears will be present and perpetuated in society. While it is important to remember these events, it is also important to rebuild trust with the anti-vaccination community—not as a means of increasing vaccination rates, but as a means of establishing open and trusted communication.

Chapter Five

Conclusions and Recommendations

As a result of the 2019 measles outbreak, those who opt out of vaccination and their communities have been under extended scrutiny by media and their peers. When Mayor Bill de Blasio declared a public health emergency and required that citizens of Williamsburg, Brooklyn get vaccinated or face \$1,000 fine, certain historical themes were reintroduced into the modern anti-vaccination movement—specifically, those of government infringement upon personal autonomy.

Essentially, all mandatory vaccinations and their enforcement are paternalistic. This mindset is rooted in the notions of public health's mission to ensure population health at both the state and national level. In the case of vaccinations, public health mandates their use as a means of preventing communicable diseases based on the precedent set by the 1905 United States Supreme Court Case *Jacobson v. Massachusetts*, which deemed mandatory vaccination constitutional at the state level (Hodge & Gostin, 2002). As a result, each state is responsible for reinforcing their own vaccination laws, whether it be through government or police forces. Though parents are now given the choice to opt out of vaccination and claim exemption, in the event of an outbreak such as the measles outbreak, that exemption is essentially disregarded by public health (Centers for Disease Control and Prevention, n.d.-b). This may exacerbate feelings of little to no autonomy, and further, isolate anti-vaccination communities to the point where they may not feel safe or valued as members of the greater population.

With events such as the 2019 measles outbreak, we are given the opportunity to better understand the possible motives of those who refuse vaccines. By listening carefully to vaccine hesitant parents, we are able to learn about their specific concerns, whether it be vaccine risk and harms, the close relationships between government and pharmaceutical companies, or lack of medical freedom. These concerns, which influence this subset of parents' decisions, provide a small glimpse into the possible challenges these parents face when it comes to their choice to not vaccinate.

That being said, there are certain limitations with a topic this complex. For this thesis specifically, the main limitations faced were the lack of subjects interviewed, geographical constraints and the time frame in which the research needed to be completed. Because I had roughly six months to collect and analyze interviews and write this thesis, I was limited in my subject pool. Thus, as a result of working with a limited population, interview data could not be generalized to a broader subset of other like-minded individuals. Instead, analyses were limited to each individual parents' beliefs and the similarities drawn between them. Ideally, a larger subset of parents would be interviewed and specific to the local population in Lane County, for I was initially interested in the local vaccination climate and its high rate of non-medical exemptions. In addition to a smaller subject pool, I was limited in my historical analyses. Based on readings of secondary sources, I knew the two cartoons by Charles Williams and James Gillray fit into a wider pattern of critique. However, there were no other primary sources or historical data about how vaccines were widely understood or accepted historically. If I were to recreate this project, I would like to look into archival material specific to the New England and United Kingdom regions to better understand

the public response to vaccinations or how they were understood. In addition, I would like to dedicate more time in recruiting subjects locally as a means of finding patterns or similarities in vaccination attitudes and beliefs specific to the area.

Not only is vaccine hesitancy a widely debated topic, it is a relevant one. While the timing of this project coincided with the 2019 measles outbreak, I was able to witness a health crisis in real-time and follow its subsequent outbreak measures, which included Mayor de Blasio's vaccine mandate in New York City. With measles cases mounting to over 700 in the past five months, the need to mitigate the threat of disease was heavily pressed on by public health departments and their vaccination agendas (Centers for Disease Control and Prevention, 2019). In addition, distrust of pharmaceutical companies skyrocketed as a result of the recent 2019 conviction of Insys Therapeutics' founder John N. Kapoor, who was found guilty of bribing medical doctors to prescribe opioids in high doses (Richer, 2019). With events such as these that fuel distrust in government, pharmaceuticals and the medical community, it becomes increasingly difficult to convince others of vaccination and continues to reinforce historical patterns in the contemporary anti-vaccination movement.

The topic of vaccine hesitancy and refusal is complex, for it integrates social, historical, cultural and individual attitudes. So long as vaccines exist, its opposition will subsequently follow. By historically situating contemporary arguments amongst their predecessors, perhaps the drivers behind modern vaccine refusal might be better understood. From these interviews, it is apparent that those who choose to not vaccinate will not change their minds and it is ineffective to convince them otherwise. In addition, it can be argued that narrative and anecdotal evidence are just as important as empirical

evidence. Thus, from interviews with this subset of parents, I have concluded there are two components which help influence their decisions to not vaccinate. These include distrust of government and pharmaceutical companies, as well as feelings of little to no autonomy in the face of mandatory vaccination. Instead of attempting to increase vaccination rates or alter the mindset of those who do not choose vaccination, we must work on mending the trust and relationships between those who do not vaccinate and the corresponding agencies involved in vaccination by not only carefully listening, but acknowledging what they have to say.

Appendix A

List of Interview Questions – adapted from World Health Organization Vaccine Hesitancy Survey

1. What is your definition of a vaccine?
2. Can you give a brief description of how you believe a vaccine works?
3. What is the most common information source you turn to for information about vaccines?
4. Who do you trust the most for information? Who do you trust the least?
5. Do you trust the vaccine advice your main health care provider gives you? Has your best interests at heart?
6. Have you yourself ever been vaccinated?
7. Did your parents ever get vaccinated? Did you have any discussions growing up surrounding vaccines?
8. Do you believe that there are other (better) ways to prevent vaccine preventable diseases than with a vaccine?
9. Do you think that vaccine benefits, in general, are larger than their risks?
10. Do you know anyone who has a child who has had a serious reaction to a vaccine?
11. Are most people you know being vaccinated/are getting their children vaccinated?
12. Do you feel social pressure to get vaccinated?
13. Do you consider other activities (going to the market, work, etc.) more important than getting a vaccine?
14. Is access to immunization easy for you? Convenient in location? Is the process of being immunized welcoming?
15. Do you trust that your government is making decisions in your best interest with respect to what vaccines are provided?
16. Do you trust the motives of the pharmaceutical industry?
17. What are your main attitudes surrounding vaccines?

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