

FOCUS: VACCINES

‘Poisonous, Filthy, Loathsome, Damnable Stuff’: The Rhetorical Ecology of Vaccination Concern

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In this article, we analyze newspaper articles and advertisements mentioning vaccination from 1915 to 1922 and refer to historical studies of vaccination practices and attitudes in the early 20th century in order to assess historical continuities and discontinuities in vaccination concern. In the Progressive Era period, there were a number of themes or features that resonated with contemporary issues and circumstances: 1) fears of vaccine contamination; 2) distrust of medical professionals; 3) resistance to compulsory vaccination; and 4) the local nature of vaccination concern. Such observations help scholars and practitioners understand vaccine skepticism as longstanding, locally situated, and linked to the sociocultural contexts in which vaccination occurs and is mandated for particular segments of the population. A rhetorical approach offers a way to understand how discourses are engaged and mobilized for particular purposes in historical contexts. Historically situating vaccine hesitancy and addressing its articulation with a particular rhetorical ecology offers scholars and practitioners a robust understanding of vaccination concerns that can, and should, influence current approaches to vaccination skepticism.

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†Abbreviations: AAP, American Academy of Pediatrics; FDA, Food and Drug Administration; HPV, human papilloma virus; NVIC, National Vaccine Information Center.

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INTRODUCTION

On June 26, 2014, Eric Kodish, MD, a medical ethicist at the Cleveland Clinic, wrote in the *Washington Post* 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 such as actress Jenny McCarthy, who has suggested that vaccinations may have caused her son’s autism” [1]. This statement encapsulates mainstream public health attitudes toward vaccine skepticism in the early 21st century — that it constitutes a unified national movement, that the movement is relatively new, and that it has gained authority due to the power of the Internet and celebrity endorsements.

Indeed, it does seem as if the medical and public health consensus concerning the value of vaccination is unraveling culturally in the United States. Medical researchers routinely study health messaging about vaccination, finding most recently that popular public health promotion programs do not convince committed non-vaccinators to change their minds [2]. A discourse of crisis pervades media reporting on outbreaks of infectious disease, and every flu season brings with it a series of escalating media exhortations to be vaccinated. Physicians report increasing frustrations with parents who refuse to vaccinate their children or who seek a different vaccination schedule [3,4]. The American Academy of Pediatrics (AAP) has had to state unequivocally that it is against firing patients as a result of their vaccination status [5]; and, as with Erik Kodish, medical ethicists accuse parents who do not vaccinate their children of negligence [1,6].

Yet national vaccination rates for most routine infectious diseases of childhood in the United States remain high, suggesting that ongoing concerns about vaccination occur in tandem with the general success of

public health efforts to vaccinate children against what were once routine childhood diseases. National immunization rates suggest that there is no widespread refusal to vaccinate (see Table 1). Kodish repeats a common statistic indicating “1 in 10 parents in the United States now forgo or delay vaccinations for their kids,” yet without more information about what those parents eventually do, it is difficult to accept that statement as a threat to national public health [1]. After all, in those families are children whose parents simply delay vaccinations due to child illness at the time of the doctors’ visit or due to a specific decision to slow the pace of vaccination during infancy. In either case, Table 1 suggests that by 36 months, most children are caught up with individual vaccines and many of the national rates for those vaccines are at herd immunity levels.¹

This paper aims to reorient approaches to vaccine skepticism, currently enmeshed in discourses of crisis and accusation, by considering historical continuities in vaccine concern. Indeed, some medical writers acknowledge the “age-old” problem of vaccine skepticism, even if they tend to be disparaging of those who hold that view [7]. Public health historian James Colgrove has suggested that “the political dynamic of the vaccination battles in the 1990s bore striking similarities to the debates over the safety and efficacy of smallpox vaccination during the Progressive Era and the 1920s” [8]. In this article, we examine these similarities in more detail, using newspaper articles and advertisements mentioning vaccination from 1915 to 1922, as well as existing historical research into vaccination in the early 20th century, finding that vaccinations consistently raise questions about safety, health, the role of medicine preventing illness, and compulsory vaccination laws. Among the specific concerns about vaccination during the Progressive Era period were a number of themes or features that resonate with contemporary attitudes, namely 1) fears of vaccine contamination; 2) distrust of medical profes-

¹Although the vaccination rate for MMR is not at herd immunity levels yet (estimated to be 94 percent), it is still significantly better than the rate in 1995.

Table 1. Comparison of U.S. national vaccination rates, 1995 and 2013.

Vaccine Acronym	Disease(s)*	# doses up to 36 months	% children vaccinated 2013	% children vaccinated 1995	Notes
DTaP	Diphtheria, Tetanus, and Pertussis	3+	94.1	94.7 (DTP)	Acellular pertussis vaccine introduced in 1996
IPV	Poliovirus	3+	92.7	87.9 (both IPV and OPV)	Inactivated poliovirus vaccine. Until 2000, both IPV and OPV (oral poliovirus vaccine) were used in the U.S.
MMR	Measles, Mumps, and Rubella	1+	91.9	87.8	Booster at 4-6 years
HepA	Hepatitis A	1+	83.1	n/a	1+ dose; 2 doses by 2 years for all children recommended since 2005
HepB	Hepatitis B	3+	90.8	68	Introduced as routine vaccine in 1990s
Hib	Bacterial meningitis caused by Haemophilus influenza type b	3+	92.8	91.7	
RV	Rotavirus	2+ or 3+	72.6	n/a	Rotarix® (RV1; 2+ doses; approved for use in 2008) and Rota Teq® (RV5; 3+ doses; approved for use in 2006)
VAR	Varicella or Chicken Pox	1+	91.2	25.9 (1997)	1st available 1995
PCV	Pneumococcal disease	3+	92.4	73.2 (2004)	Pneumococcal conjugate vaccine, started 2000
Series 4:3:1:3:3:1**			77.7	72.5	DTaP:IPV:MMR:Hib:HepB:VAR
Series 4:3:1:3:3:1:4**			72.6	30.8 (2003)	DTaP:IPV:MMR:Hib:HepB:VAR:PCV

Source: National Immunization Survey (NIS) - Children (19-35 months). Available from <http://www.cdc.gov/vaccines/imz-managers/coverage/nis/child/index.html>.

*Influenza vaccine is not included in this table. While it is a recommended vaccine for children, it is a yearly vaccine and does not appear to be tracked in the National Immunization Survey.

**Rates for the vaccine series are lower than rates for the individual vaccines because some children do not complete the whole series but receive most of the vaccines. These series are comprised of vaccines recommended by the CDC for all children in the U.S. by 18 months: in the mid-1990s (4:3:1:3:3:1) and in the early 2000s (4:3:1:3:3:1:4).

sionals; 3) resistance to compulsory vaccination; and 4) the local nature of vaccination concern — i.e., that it coalesces in specific communities as information is transmitted through social networks. These findings suggest that vaccine skepticism is longstanding, locally situated, and linked to the sociocultural contexts in which vaccination occurs and is mandated for particular segments of the population, rather than being a recent phenomenon spurred by misinformation spouted by celebrities on the Internet.²

RHETORICAL ECOLOGY AND VACCINATION CONCERNS IN HISTORY

We use a rhetorical approach to historically situate these themes and features of vaccination concern, examining how discourses of vaccine hesitancy and refusal operate in a given period and within certain circumstances. Rhetorical scholars investigate why certain arguments are persuasive to particular people at discreet points in time, how persuasiveness might continue across historical periods, and how discourses circulate and change as they are applied to new circumstances. Jennie Edbauer inaugurated the term *rhetorical ecology*, highlighting the importance of the social field in understanding how certain utterances or ideas both circulate and proliferate [9]. As with biology, where ecology refers to the relations between organisms and their environment, a *rhetorical ecology* suggests that words interact with their environment — what we refer to here as the social field.

Recognizing that the historical contexts of the Progressive Era and the early 21st

century are quite different, we ask what it is about the *rhetorical ecology* of each period that might help explain vaccination concern currently and in the past. In the Progressive Era, vaccination concerns circulated within a social field in which vaccination itself was a relatively new and unique method of preventing illness. Vaccine development was an immediate outcome of germ theory and the science of bacteriology [10]. Vaccines work by introducing an attenuated or killed version of the microbe (a bacterium or virus) that causes illness, training the immune system by forming antibodies that can be mobilized in the event of an outbreak of the disease. Advancements in bacteriology and vaccine development depended on the use of microscopes and other apparatuses like porcelain filters to isolate the microbes and create methods of attenuating their virulence for reintroduction as vaccines. In the early 20th century, successful vaccines were taken as proof that germ theory was true, but vaccination as a practice also conflicted with traditional ways of approaching and experiencing illness. Prevention through introduction of disease was counterintuitive and involved, among other things, conquering fears of deliberately introducing diseases into the home and the body.

In 1915, there were only three viable human vaccines available (smallpox, rabies, and typhoid) and a diphtheria toxin-antitoxin formulation used during epidemics, with only one in widespread use among civilians (smallpox). During the Spanish flu pandemic in the fall of 1918, a variety of vaccines were developed, all of them targeting the bacteria that caused secondary infections, although that

²This project was carried out in conjunction with a National Endowment for the Humanities Digging Into Data Challenge research initiative: An Epidemiology of Information: Data Mining the 1918 Influenza Pandemic (Principal Investigator E. Thomas Ewing; CoPrincipal Investigators Bernice L. Hausman, Bruce Pencek, and Naren Ramakrishnan). To study vaccination concern during 1915-1922, we examined 14 newspapers from across the United States, available in two digital databases: *Chronicling America* (Library of Congress) and *America's Historical Newspapers* (Readex). We searched articles with the keywords "vaccine" and "vaccination," compiling all articles, advertisements, and other notices using these terms. The selected newspapers represent both rural and urban locales across the country. In examining the articles, advertisements, and other notices, we identified common themes, rhetorical figures, and other features. We chose these dates because we were interested, initially, to see if the 1918 influenza pandemic (so-called Spanish flu) affected popular views of vaccination. We did not find evidence to suggest that lasting changes in public attitudes toward vaccination were a result of the pandemic in fall 1918. However, we did begin to see similarities to contemporary vaccination concern, which altered the focus of our research.

was not well understood at the time [11,12]. In 1918, it was not possible to isolate influenza virus (a successful vaccine was not available until the 1940s). During the pandemic, people did not clamor for vaccines, but scientists were avid to develop them in order to stem morbidity and mortality of the deadly flu. Vaccination appeared in the pages of the nation's newspapers rather regularly. While most mentions of vaccination in America's newspapers during this period were positive, heralding them as examples of the success of modern medicine, both reporting and paid advertisements indicated concerns about vaccines, many of these related to smallpox.

What is the current rhetorical ecology of vaccination concern? It is articulated through a social field that includes transformations of the role of health insurance companies in making medical decisions; the growth of the pharmaceutical industry and its direct address to medical consumers through advertising; changing perceptions of patient autonomy and participation in treatment decisions; managed care and the decrease in physician time with patients; widespread medicalization; and the availability of medical information on the Internet (among other changes not mentioned here) [8]. Most importantly, the social field is one permeated by uncertainty and risk [13] and in which potential negative side effects of vaccination capture public attention.

Thematic continuities demonstrated across historical periods reveal that vaccine concerns are persistent and long-lived. Vaccination skepticism circulates, at least in the United States, within discourses of fear, distrust, resistance, and locality and is articulated in historically specific ways that are nevertheless available to rearrangement and reconstitution throughout its historical development. Thus, what feels new in contemporary vaccine skepticism may in fact be a reworking of longstanding concerns — the apparent novelty is an effect of differences in the rhetorical ecology through which the concerns are articulated.

Contamination

Concerns about contamination were widespread and expressed in several ways

in the early 20th century. Some news reporting suggested that vaccines were dirty, contaminated with pus or bacteria. Others suggested that vaccines contaminated the blood of those vaccinated: "The fact is that many, even among physicians, regard vaccination as a pollution of the blood, which not only doesn't prevent smallpox, but makes the victim of the virus susceptible to numerous other ailments" [14]. Vaccines were linked to septicemia [15] and described as loathsome: "I was vaccinated in 1878. 'It took,' settled in my eyes, and I have been a sufferer from the poisonous, filthy, loathsome, damnable stuff ever since" [16]. Many advertisements for physicians or pharmacies emphasized how "pure, fresh, and clean" vaccines were, clearly providing a direct counterargument to contamination concerns [17-23]. A common method of getting these views into newspapers was to purchase advertising space. One such ad published in *The Commoner* (Nebraska) in 1919 invoked religious views as a way to articulate a concern with the contents of vaccines: "What profiteth your babies if their God-made blood is periodically tainted with pus vaccine?" [24]. Other concerns about altering the composition of blood, injecting someone with an actual disease, or causing discomfort through vaccination are apparent [25]. Some writers invoked conspiracy theories about vaccination measures in tandem with arguments about contamination: a brief report with a Memphis byline suggests "a nation-wide plot to kill soldiers by poisoning vaccine serum with tetanus germs is believed to have been uncovered by five deaths traceable to vaccinations here" [26].

These concerns about contamination were not unfounded, as early vaccine developers faced significant challenges to create and distribute sterile products. Contaminated smallpox vaccine was thought to cause sore arms and worse [27]. Tetanus was a known contaminator of smallpox vaccine, and, until 1924, there was no reliable vaccine for tetanus. There was some controversy about how tetanus developed subsequent to smallpox vaccination, with many consistently claiming that any tetanus infection after vaccination was always

caused by inadequate wound care [28-31], but it seems clear that some tetanus outbreaks following smallpox vaccination must have been caused by contamination of the vaccine itself [27,32]. One such outbreak in 1901 led to the Biologics Control Act of 1902, a precursor to the founding of the Food and Drug Administration (FDA†) [27].

Concern about contaminants in vaccines is still a pressing issue, although the specific contaminants identified have shifted from microbes to heavy metals and adjuvants, which can be linked to a broader rhetorical ecology of concerns about environmental contamination. In the 1970s, environmental agencies identified mercury as having neurotoxic effects in children, in particular, the mercury content found in fish. In the 1990s, significant concern about the preservative thimerosal, which functions as an antifungal and antiseptic in multi-dose vials of vaccine, emerged. Thimerosal, an ethylmercury compound, has been added to vaccines since the late 1920s; it thwarts microbial growth in vials of vaccine and was developed, in part, to protect against tetanus. In the 1990s, the concern about mercury alighted on thimerosal use in vaccines. Due to the public outcry, the ethylmercury preservative was hastily removed from all single-dose vials in 1999, as per order of the FDA, even though government agencies asserted that thimerosal was safe in the amounts found in vaccines. This action taken by government agencies led to further confusion regarding the safety level of thimerosal, as the decision to remove the preservative sent mixed messages as to whether vaccines with thimerosal were actually safe [33].

In the rhetorical ecology of concern about vaccination in the early 20th century, the fact that smallpox vaccine was produced from the glycerinated pus of infected cows created a powerful representation of cross-species disgust. Tetanus was also associated with dirt and dirty infections; in this way, disgust was linked to concerns of contamination. Today concern about contamination is more likely to be related to perceptions of damaging heavy metals (like the mercury in

thimerosal), but concerns are also raised about the fact that some vaccines have been developed from the cell lines of aborted fetuses or the production of vaccines in monkey kidneys, although current techniques involve significant efforts to ensure purified products [34-38]. These kinds of concerns link disgust with fears of contamination, raising the dual specters of improper use of abject human tissue and cross-species contamination. Movie renditions of vaccines gone awry compound this connection — in *I Am Legend*, a cancer vaccine engineered from a measles virus ends up killing 90 percent of the population and turning the survivors into aggressive zombies intent on killing [39]. The rhetorical ecology that articulates contamination concern through discourses of disgust and danger and links the two remains a persistent thread.

Distrust

Medicine in the Progressive Era was undergoing tremendous changes, as bacteriology drove the development of chemotherapies and increasing state power to enforce public health measures introduced government mandates into people's personal health decisions. The 1905 Supreme Court decision in *Jacobson v. Massachusetts* allowed localities to use vaccination mandates for the protection of the public's health, but demanded opportunities for exemption for those who might be injured by vaccination [27]. Tensions between rival forms of medical theory and practice also continued in this period and are evident in news items on vaccination concern [10]. For example, many chiropractic advertisements attacked the core tenet of vaccine therapy — germ theory — stating that disease was not the result of germs but rather “the result of interruptions and misalignments in the body.” Ads claimed that chiropractors trained to treat these interruptions and misalignments “can cure the ‘flu’” [40]. In 1915, a U.S. senator with a Christian Science background from California criticized vaccination, “denounc[ing] efforts of the old school physicians to set up what he terms a medical monopoly” [41].

In 1917, a retail store employee writing to *The Day Book*, an Illinois paper, suggested that his employer required vaccination in a ploy orchestrated by a doctor in cahoots with the store's owner: "every year it has been 10¢ for examination and 35¢ for vaccination, and it is taken from the week's pay. ... It seems the doctor every year needs a vacation he can't afford or his business may be slack the same as ours, so his good friend [the store owner] helps him by having all his employees taxed the 10 or 35 cents to fatten his purse" [42]. Physicians were also criticized in a column called "Eugenic Marriage," in which the author accused them of setting up an association to "boost business" and "protect prices," as well as saying vaccination was a practice foisted upon the "boobs" who were gullible enough to accept it [43]. Conspiracy theories were another way to articulate distrust in the medical profession, with medical journals and speakers identified as deceptive through withholding information regarding the dangers of vaccination because "they don't want people to know the truth" [44]. Historian Michael Willrich argues, "American doctors had been concerned about vaccine quality since the first wave of the turn-of-the-century smallpox epidemic spread across the southern states in 1898 and 1899. But doctors had kept their worries mostly to themselves, maintaining a solid (if occasionally splintery) defense of vaccine to the public. Their own medical society minutes and journals told a different story. Physicians and health officials ... complained that contaminated tubes and points were producing sore arms and open rebellions" [27].

The rise of patient-centered decision-making in the second half of the 20th century and the waning of paternalism in medicine mean that parents and others are more and more involved in making decisions about their own care — it is the norm rather than the exception [8]. Yet vaccination remains one area, especially in the United States, in which parents' involvement in decision-making is *not* sought. Contemporary distrust in mainstream medicine

and its continued support for vaccination and vaccine development must be understood within this context. As James Colgrove remarks, broad social changes initiated in the 1960s led to a situation in which "deference to medical expertise and other elite knowledge was replaced with skepticism and even hostility" [8]. In addition, significant concerns about corrupt relationships between recommended medical treatments and pharmaceutical companies have emerged in recent years, as is evident in the initial backlash against the human papilloma virus (HPV) vaccine Gardasil.

Gardasil, which protects against infection by four HPV variants (the two most likely to cause cervical cancer and the two most likely to cause genital warts) is produced by the pharmaceutical corporation Merck, which had received a lot of negative press when it withdrew the pain reliever Vioxx in 2004 after having withheld studies demonstrating its potential harms [45]. The roll out of Gardasil in 2006 was fraught with controversy, in part because Merck lobbied to have the vaccine made mandatory for school entry for middle school-aged girls. Merck's already tarnished reputation caused suspicion, especially as Gardasil protects against a sexually transmitted disease. Poor public perception of the pharmaceutical giant therefore framed Merck's campaign to market a vaccine that was seen by at least some as facilitating young girls' early entry into sexual relations. Sociologist Jennifer Reich argues that although parents in her study did not express this concern, they did "view the HPV vaccine development, review, and market process as corrupted by the politics and through lobbying efforts funded by pharmaceutical companies," which affected their trust in the science behind the vaccine [46].

Compulsion

Resistance to compulsory vaccination is as old as vaccine mandates. The term "conscientious objector" was originally coined to describe those who resisted compulsory vaccination in Britain in the late 19th century [47]. In the Progressive Era in

the United States, compulsory smallpox vaccination was handled primarily in three ways: for immigrants upon entry to the United States; for specific communities in the instance of an outbreak (with some individuals being vaccinated at gunpoint in their own homes [27]); and for children attending school.

The public health argument for mandating vaccination for school entry, whether in the midst of an outbreak or otherwise, was that if children were required to attend school, it was improper to do so without safeguarding their health against communicable disease. Yet resisters often argued that attending school was a right of citizenship that should not be hindered by vaccine status and decisions about children's health and welfare were family, rather than state, matters: "the school is public, but I want to say that the child is not. He is not to be exploited by any individual who happens to have an opinion" [48]. A New Jersey father refused to allow his daughter to be vaccinated and sued the Board of Education in Jersey City to admit her to school, "declar[ing] that he has not allowed his daughter to be vaccinated because it is an invasion of the bodily rights of his child" [49]. Some resistance to compulsory vaccination referred to American values: "compulsory vaccination should be condemned as un-American" [50]. This type of resistance often referred to the U.S. Constitution; one article reported a member of the Coast Guard quitting to avoid vaccination because he did not want to "submit to what I consider an infringement upon individual constitutional rights" [51].

Resistance based on compulsion also combined with resistance based on fears of contaminating one's body: "All true Americans must help to estop our governmental policy of poisoning the blood of babies and grownups with putrid blood" [24]. This type of argument uses a strong sense of individual rights and links it to skepticism about the bacteriological approach to disease. Another example, a letter to the editor, also links individual rights to a criticism of vaccination as a preventive health strategy, raising fears of introducing disease by vaccination and referring to smallpox vaccine as pus:

Has any man or body of men the right to say that you shall be treated by a certain method?

Has anyone the right to say that you must be treated at all if you do not want to be?

Has any doctor the right to lacerate your body without your consent?

Does it pay to take chances of having some constitutional disease introduced rather than taking chances of smallpox?

Does it look reasonable that by introducing pus into a normal person to create more pus is a beneficial way to offset disease? [52].

In this last excerpt, the term "constitutional disease" seems to refer to chronic systemic illness rather than infectious disease. Such a concern links Progressive Era questions about vaccination with contemporary concerns that vaccination leads to neurological or developmental disorders that are chronic and ongoing, such as autism.

Resistance to compulsory vaccination in this period must be considered in the context of Progressive Era health reforms. Many major Progressive Era public health successes were not biomedical in nature but involved infrastructure changes such as piped water and clean dairy milk, basic household hygienic practices, and common preventive measures such as bans on public spitting. During this period, some aspects of public health were linked directly to state control of bodies, often through the explicit Americanization of foreign immigrants, and as a result were not always appreciated by the public, which at times resented the intrusion on traditional domestic authority and the family as a province outside of state interest and control [10]. Willrich demonstrates that unvaccinated children in multi-ethnic New York City were invariably native born, as immigrants were required to be vaccinated upon entry to the United States [27]. Some immigrant parents hid their native-born children from vaccinators in efforts to re-

tain familial control over health care practices [27]. Vaccination, especially as it was enforced on children through school entrance requirements during smallpox epidemics or in neighborhood efforts to vaccinate families, was often bitterly fought by parents who felt requiring vaccination was an intrusion on their domestic authority or an affront to their children's right to public education [8,10,27].

Some parents today continue to assert that health is a family issue and parents (not the state) are the authorities entitled to make decisions about their children's medical care, including vaccination. Jennifer Reich demonstrates this point in her chapter on parental views of the HPV vaccine [46]. Other prominent arguments against compulsory vaccination include concerns about vaccine safety and possible side effects. A recent Op-Ed piece published by vaccine safety advocate Barbara Loe Fisher in *USA Today* received numerous comments when reposted to the National Vaccine Information Center (NVIC) website. Arguing against the new *USA Today* position against personal belief exemptions for immunizations, Fisher's own argument is based in the potential harms of vaccines. The NVIC is a prominent, web-based organization focusing on vaccine safety and parents' right to choose medical care — thus, it is to be expected that those commenting on Fisher's opinion piece on this website generally mention vaccine safety as a reason that compulsory vaccination is improper [53]. Indeed, "vaccine freedom of choice" is a watch-phrase for the organization, which monitors legislative action across the country to lobby for personal belief exemptions from mandatory vaccination [54].³

Locality

Most of the newspapers in this study contained only sporadic anti-vaccination sentiment. Only one among the 14 examined, the *Saint Joseph Observer* in St. Joseph, Missouri, included sustained resistance, demonstrating the local nature of vaccination skepticism. Without more in-depth historical research, we can only speculate about the cause for this localized sentiment, but it does suggest that semi-random selection of newspapers, as was conducted in this study, might miss important local emphases and, therefore, important articulations of vaccination concern.

Vaccination concern in the *Saint Joseph Observer* was often expressed through reporting on vaccination controversies in other states (California, Massachusetts), as well as letters to the editor and articles written by individuals opposed to vaccination. In a letter by Mrs. R. N. Malone in 1920, the author articulates a number of arguments against vaccination, including questions about whether vaccination renders the individual immune to the disease and if anyone has the right to enforce a particular medical treatment on another person [52]. Another letter expressed concern about "faulty toxin, anti-toxin for the prevention of diphtheria" which seemingly caused the death of a 4-year-old [57]. Yet later that year, the newspaper published a report of the Buchanan County Medical Association endorsing vaccination as "the only known protection against smallpox" [58]. Thus, even in a newspaper reporting more anti-vaccination sentiment than others, published material was variable. In another example, advertisements for vaccines against hog cholera in 1915 were prominent. Articles encouraging typhoid

³There is some evidence that organizations like the NVIC do motivate the development of safer vaccines or at least responses on the part of governmental agencies to concerns about vaccine ingredients. The NVIC began in the early 1980s as an organization called Dissatisfied Parents Together (DPT), and it was prominent in a television news program, *DPT: Vaccine Roulette*, that aired in 1982. The program targeted whole-cell pertussis vaccine in the then-current version of the diphtheria-tetanus-pertussis trivalent vaccine as causing irreparable neurological damage to children. There is some evidence that rollout in the 1990s of the currently used acellular pertussis preparation in DTaP and Tdap is one result of agitation by vaccine safety groups in the 1980s, as medical researchers disagreed about the actual risks of the whole-cell pertussis vaccine [55,56]. In addition, even though there is considerable debate about whether thimerosal is a dangerous additive to vaccines, the FDA removed it from all single-dose vials of vaccine in the late 1990s out of an "abundance of caution" and in part due to agitation on the part of vaccine safety groups [33].

vaccination appeared as the United States entered World War I: “Follow Uncle Sam’s example and be vaccinated against typhoid fever. Then you won’t be a ‘health slacker’ this summer” [59]. Two and a half years later, a short, untitled article encouraged vaccination by portraying it as the latest fashion: “If you have not been vaccinated, just fall into the procession. It will render you immune — and that is something — besides keeping you in fashion” [60].

The local nature of vaccination concern is a significant public health issue today, primarily because national vaccination rates are high. Colgrove argues that high national vaccination rates in the early 2000s demonstrate “the efficacy of the broad systemic efforts undertaken in the 1990s to improve access and delivery,” and he points out that in the wake of the MMR-autism controversy, “rates of coverage for the vaccine increased slightly in the United States” while rates in Britain diminished significantly [8]. Nevertheless, there is continued concern about seemingly vocal national anti-vaccination groups and celebrity individuals, even though disease outbreaks tend to be largely local affairs. That is, clusters of unvaccinated children and adults endanger specific communities, and some states with easier mechanisms of vaccination exemption have high rates of non-vaccination in certain areas. As Nancy Berlinger and Alison Jost write, “because families with similar beliefs and values may choose to live together, worship together, send their children to the same schools, or take part in the same homeschooling networks, local rates of immunization refusal, when couples with lenient exemption policies, may be much higher than national averages” [61].

Our research, uncovering significant anti-vaccination sentiment in one newspaper analyzed among 14 during 1915-1922, concurs with research conducted in Bangladesh, India, the Philippines, Ethiopia, Malawi, and the Netherlands that suggests that both “local vaccination cultures” and “wide social and polit-

ical processes” must be taken account of in vaccination belief and practice today. The authors argue that parents have particular experiences and ideas, live among others with particular experiences and ideas, experience specific constraints, and make decisions that are embedded in these and other identifiable contexts [62]. Lawrence, Hausman, and Dannenberg agree with this scenario, arguing that much current research on vaccine refusal misconstrues the individual decisions that parents make concerning childhood vaccination by linking them to a national movement that may not motivate specific practices (or even exist) [63]. Local news reporting provides one set of discourses both reflecting and contributing to the circulation of ideas in a particular community; that is, local news reporting is one important element of the rhetorical ecology of vaccination concern in a given community.

OVERALL SUPPORT FOR VACCINATION

Most reporting across all the newspapers evinced a positive attitude toward vaccination. A large number highlighted vaccination as being fast, simple, convenient, and harmless, describing vaccines as lifesaving and effective. Every newspaper was filled with reports on the vaccination of large groups, vaccination laws, and the progression of vaccine development and delivery. While neutral in appearance, these reports implied vaccination’s mass use and demand and implied a general approval of vaccination. Some newspapers published health columns that routinely touted the value of vaccination for cure of everything from typhoid to allergies to acne.⁴

Newspapers used a variety of language features to create this positive representation of vaccination. Reporting on vaccination was often in the imperative mood, especially during the fall of 1918, with headlines such as “Will Vaccinate Town” [65], “Chicago

⁴For example, “Health Talks” in the *Idaho Statesman*, by William Brady, MD, appeared often. In the July 19, 1917, edition of the paper, he writes, “The purpose of vaccine treatment of asthma, as of any other disease in which a specific germ or germs can be isolated from the disease focus, is, of course, to stimulate natural resisting power in the patient, to aid nature in healing, to rouse the blood to activity on the patient’s behalf” [64].

Will Use New ‘Flu’ Vaccine” [66], and “Be Vaccinated Against ‘Flu’” [67]. Many articles implied that everyone was getting vaccinated, therefore implicitly urging readers to join in. One article suggested the unvaccinated should “just fall into the procession” [68]. Medical practices advertised the “latest Serums, Vaccines, Antitoxins, Bacterins, Intravenous Specific Remedies, and the latest and best appliances for the speedy cure of stubborn diseases” [69].

Newspapers also used scare tactics and suggested terrible consequences for the unvaccinated, thereby framing vaccination as the only credible treatment for specific illnesses. The results of illness were often described in detail to elicit fear; one article described typhoid as leaving “the patient maimed for life” with an impaired memory [70]. Another article directed toward the unvaccinated warns “these large number of deaths ... should be a special warning to the unvaccinated” [71]. Scare tactics also dramatized the risks as a way to persuade the reader to be vaccinated: “by neglecting to do your part [getting vaccinated] you may be the means of bringing needless misery to those you love” [72].

Support for vaccination could be couched in curious ways. *The Commoner*, a weekly periodical published and edited by William Jennings Bryan, proffered a progressive, populist Christianity. In the period under examination, three mentions of vaccination can be found. One is a plea for vaccinating pigs against hog cholera, sent in by a veterinarian in 1915 [73]. Another is a paid anti-vaccination advertisement for a pamphlet written by an “autologist” in Highland Park, IL, in March 1919 [24]. The last is an article on April 1, 1921, “The Menace of Darwinism,” written by Bryan himself, which interprets anti-vaccination sentiment

in Darwin’s publications as an indication of the “brute” nature of his theories. Criticizing Darwin for indicating that “vaccination has preserved thousands who from weak constitutions would have succumbed to smallpox,” Bryan claims that “science has rendered an invaluable service to society” and that “medicine is one of the greatest of the sciences and its chief object is to save life and strengthen the weak” [74]. Such support for vaccination from a politicized Christianity counters the avowedly anti-vaccination advertisement published 2 years previously.

CONCLUSIONS AND OUTLOOK

Concerns about contamination, distrust in the medical profession, resistance to compulsory vaccination, and the situated locality of vaccine resistance are themes that resonate with contemporary vaccination skepticism. Recently, commentators on vaccination resistance have tended to see these themes as historically new in the late 20th century, believing that vaccination success has led to the diminishment of fears of infectious disease, which in turn makes the risks of vaccination seem more consequential [1]. Yet that view is historically inaccurate, and it obscures the fact that there has always been resistance to vaccination. Such resistance cannot be explained only with reference to recent history, such as the 1998 Wakefield study that fraudulently linked the MMR vaccine to autism in the late 1990s [75,76]. Even Wakefield’s retracted study, which has generated so much debate, demonstrates another longstanding theme that has only been touched on in this article — the notion that vaccines can cause diseases or chronic conditions other than those they are meant to prevent.⁵

⁵For example, resistance to Gardasil has coalesced in recent years around the injuries that it has purportedly caused. Vaccines also are implicated as a cause for some cancers; in one article, aluminum was identified as being in excess in the nipple fluid of women with breast cancer, and vaccines were targeted as the source of excess aluminum in the human body [77]. This concern links contamination with disease causation and is similar to concerns about thimerosal in vaccines. The original research articles referred to do not mention vaccines as a source for the excess aluminum in the nipple aspirate fluid of women with breast cancer, identifying instead possible exposure to aluminum salts in anti-perspirants or “preferential accumulation of aluminium [sic] by breast tissues” [78]. Finally, concerns about simian virus 40, known to have contaminated polio vaccine from the 1950s into the early 1960s, and cancer persist in the alternative health literature and are investigated in medical research [79,80].

Contemporary vaccination 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 [81]. While pro-vaccine educators attempt to portray the benefits of vaccination in terms of clear risk/benefit scenarios, parents may not be making decisions along these lines [13].⁶ Some contemporary vaccine skeptical groups, such as the NVIC, use alternative risk/benefit scenarios to suggest that risks to individuals are unacceptable “for the greater good” [82]. In a social field in which there is heightened attention to the risks of childhood — car seat usage, infant sleep position, baby food ingredients, for example — it is no wonder that vaccines do not represent the straightforward good to parents that they do for physicians and health care workers. Vaccines can be perceived to introduce risks into the child and into the family, even as they are a way of mitigating risk across the population for the purposes of public health.

We have shown that there are historical continuities in vaccination concern from the early 20th century to the early 21st. Studying these historical continuities demonstrates that current vaccine skepticism is not a new phenomenon stoked by the power of Internet social movements and the influence of Hollywood celebrities; rather, such skepticism has been a longstanding response to vaccination since its inception as a state-supported public health practice. A contemporary rhetorical ecology that includes the Internet and the power of celebrity voices changes the way in which such skepticism is articulated and circulated, but much of the content of anti-vaccine skepticism remains consistent over time. Thus we might say that rhetorical ecologies of vaccination concern shift as the social field of medicine changes, but the concerns themselves appear to be largely the same.

Strong rates of vaccination compliance today do not suggest a national crisis in vac-

cine confidence, although doctors’ perceived frustrations with parental questioning may be a better indication of public concern than compliance enforced by school entry mandates. But the crisis discourse, often articulated by the medical profession and public health officials, is an element of the rhetorical ecology of vaccination concern that must be changed. Vaccine skepticism is too easily characterized as irrational and needing of rectification through improved scientific literacy, and the responding discourse of crisis offered by physicians and public health officials seems only to escalate vaccination concerns rather than address them. Together, these tendencies work to create the stalemated communication scenarios we see today: angry or confused parents and frustrated doctors and health care workers, divided over a practice that, at least for the latter group, demonstrates the advances of modern medicine and the bacteriological approach to illness.

Understanding the rhetorical ecology of vaccine concern offers all of us an opportunity to reframe our discursive and practical responses, as we can begin to acknowledge how resistance to vaccination is informed by specific values, ideas, and embodied knowledge. Once vaccine resistance is understood as meaningful rather than meaningless, real communication about the public and personal impacts of vaccination and non-vaccination in a democratic society can begin.

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