POLICY MEMO TO CALIFORNIA GOVERNOR TO SUPPORT BILL ENDING PHILOSOPHICAL VACCINE EXEMPTIONS

by
Benjamin George Somers

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ABSTRACT

The number of measles infections in the United States has been consistently rising over the past decade. Public health experts agree that the rise in measles outbreaks is connected with an increase in the number of unvaccinated children and young adults, who are so mostly due to philosophical or safety concerns regarding the vaccines. Through a careful examination of the history and background of recent measles outbreaks, this capstone seeks to persuade the governor of California to support a bill eliminating philosophical exemptions in the state through a careful evaluation of the policy and political outcomes of the suggested action. By reducing the number of unvaccinated children, California will significantly reduce its vulnerability to future measles outbreaks.

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ACTION-FORCING EVENT

In December 2014, several children left the Happiest Place on Earth with more than an overpriced stuffed animal and a set of mouse ears. That month, 52 people were confirmed to have contracted measles during an outbreak at Disneyland in Anaheim, California.¹ While most of those infected with what is being called the Mickey Mouse Measles were unvaccinated—either because they were too young or their parents had refused the vaccine for their children—six had been vaccinated once during childhood and two of those six had received at least two doses, the standard recommendation.² According to the U.S. Centers for Disease Control and Prevention (CDC), 644 U.S. residents were infected with measles in 2014, more than in the previous four years, combined.³ This represented the greatest yearly total since measles elimination was documented in 2000.⁴

² Ibid.
⁴ Ibid.
STATEMENT OF PROBLEM

The rapid increase in documented measles cases in the United States poses a significant threat to the well-being of U.S. citizens, residents, and visitors. In the decade before 1963 when the measles vaccine became widely available, nearly all children were infected with measles by the age of 15. The CDC estimates that prior to the vaccine, between three and four million people in the U.S. were infected each year, leading to over 400 deaths and 48,000 hospitalizations annually, with significant costs to the healthcare system and disruption to the lives of U.S. residents and visitors.

Many public health officials attribute the recent rise in measles cases to an increase in the number of unvaccinated children, who are so mostly due to their parents religious or philosophical concerns over vaccines. The effect of parents requesting and being granted exemptions from the widely-supported vaccine schedules is that children younger than the suggested age at which a measles vaccine is administered, as well as those unvaccinated due to underlying medical, religious, or philosophical concerns, are extremely vulnerable to contract the virus.

The CDC recommends that the MMR vaccine, which prevents measles, mumps and rubella, be administered around 12 to 15 months, and then again at 4-6 years of age. Although the vaccine is estimated to be about 95% effective after the first dose and 98-99% effective after

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the second dose, vaccinated children and adults can contract measles, which is especially
dangerous for those with weakened immune systems and the elderly.⁹

Because the measles vaccine is 95% effective after one dose and 98-99% effective after
two doses, some people who have been vaccinated could still contract measles if exposed. This
suggests that measles poses a health risk to everyone, and society depends on individuals to
become vaccinated to greatly reduce the risk of outbreaks. The public health principle of
vaccinating a significant portion of society to protect the unvaccinated or those for whom the
vaccination was insufficient—termed “herd immunity”—demonstrates that a society that has a
95% vaccination rate is substantially more likely to have an outbreak than a society with a 98%
vaccination rate, even though that is only a 3% difference.

It is estimated that 90% of unvaccinated people who come in contact with someone with
measles will become infected, primarily through coughing and sneezing or touching a surface
where the virus can live for up to two hours.¹⁰ Common symptoms of measles are fever, cough,
runny nose, and red rash spots on most of the patient's body.¹¹ Complications from measles
include ear infections (1 in every 10 cases) that can result in permanent hearing loss and diarrhea
(less than 1 in every 10 cases) which can lead to dehydration.¹² More serious complications from
measles includes pneumonia (about 1 in every 20 cases), which is the most common cause of
death attributed to the measles virus, and encephalitis (1 in every 1,000 cases), which leaves the

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child deaf or mentally retarded. The death rate from measles is about one or two for every 1,000 infections.

While measles is a large problem globally, with an estimated 145,700 deaths from the virus in 2013—mostly children in developing areas of Africa and Asia—its rates in the U.S. are much lower. High rates of vaccination and better disease surveillance in the Americas led the CDC in 2000 to declare measles eliminated in the U.S., which means there was an "absence of continuous disease transmission for greater than 12 months." But around that time, some parents began to refuse vaccines for their children, mostly due to perceived concerns that an ingredient in the vaccine causes autism, with other parents citing religious objections to medical treatments for their children.

While all states require that children attending public and private schools be properly vaccinated, all but two states (West Virginia and Mississippi) allow for religious or philosophical exemptions, removing the vaccine requirement for those children. Many of the parents requesting vaccine exemptions live in close proximity to one another, which means that if an unvaccinated child contracts measles, it is likely to spread through that community very quickly.

For the 2014-2015 school year, the California Department of Public Health reported that overall, 90.4% of all children entering kindergarten in California had obtained the mandatory immunizations prior to enrollment, 6.9% had been conditionally enrolled (parents showed that students had received at least one dose of a required vaccine with evidence of a scheduled

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13 Ibid
14 Ibid.
appointment for the additional doses), 2.5% had obtained a philosophical or religious exemption, and 0.2% had been granted a medical exemption.\footnote{California Department of Public Health "Immunization Levels in Child Care and Schools". Available: http://www.cdph.ca.gov/programs/immunize/Documents/2014-15%20CA%20Kindergarten%20Immunization%20Assessment.pdf}

As shown in the California vaccine exemption rates above, a majority of vaccine exemptions are granted for philosophical or religious reasons, not medical reasons. For example, the California Department of Health reports that there were about 1,000 medical exemptions for students in California for the 2014-2015 school year, with more than 17,000 philosophical exemptions.\footnote{Levs, John. "The unvaccinated, by the numbers." CNN.com, February 4, 2015. Accessed February 6, 2015. http://www.cnn.com/2015/02/03/health/the-unvaccinated/} In Florida, the CDC reports that the state granted 800 medical exemptions and about 4,000 religious exemptions, as Florida does not allow philosophical exemptions.\footnote{Ibid.} If the trend of allowing parents to opt out of vaccinations due to philosophical or religious reasons continues, the close proximity of these children and an overall decrease in the vaccination rate will make measles outbreaks more frequent and severe.
HISTORY

In a 1999 CDC report, vaccination was labeled as the greatest public health achievement of the 20th Century, alongside nine others including increasing motor vehicle safety, fluoridation of drinking water, and recognition of tobacco as a health hazard. Through vaccination programs in the 1900s, the CDC reported that the United States effectively eradicated smallpox and poliomyelitis in the Americas, and controlled measles, rubella, tetanus, diphtheria, and other infectious diseases domestically.

Following the development of a measles vaccine in 1963, the United States undertook targeted efforts to eliminate the disease using a three-pronged approach: high vaccination coverage among preschool and school-aged children, careful surveillance of cases, and meticulous outbreak control. The success of this program can be seen in the drop of documented measles cases with an average of 1.3 cases per 100,000 people reported during 1982–1988, compared with an average of 313 cases per 100,000 during 1956–1960. But as vaccination rates rose, so did the number of parents seeking exemptions from the vaccinations, largely due to religious concerns surrounding medical interventions or philosophical concerns about the safety of the vaccines. A smaller number of exemptions are requested for medical reasons such as patients with compromised immune systems that would not be able to fight off the weakened virus in the vaccine.

Historically, efforts to protect public health have been the responsibility primarily of state and local governments, deriving from states’ general police powers, which include the authority to institute quarantine and isolation orders or establish mandatory vaccination laws. The first mandatory vaccine law was established in Massachusetts in 1809, requiring that all residents of

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21 Ibid.
Cambridge, Massachusetts, be vaccinated against smallpox. That law was challenged by Henning Jacobson, a Massachusetts citizen who in 1902 argued that the state could not compel a citizen to become vaccinated. The U.S. Supreme Court disagreed, and in Jacobson v. Massachusetts, the Court upheld a municipality's authority to curtail individual liberties in order to protect the public's health.

As of February 2015, all states and the District of Columbia require children entering schools—public or private—to provide evidence that they are vaccinated according to the CDC's suggested vaccination schedule. Most of the required vaccinations are consistent among the states—measles, mumps, rubella, diphtheria, tetanus, polio—though there can be slight variation, with some states requiring vaccinations for college or university-aged students for diseases such as Hepatitis B, meningococcus, and HPV. An important note is that states’ vaccination requirements are somewhat indirect; they don't require that all children be vaccinated, but rather require that children be vaccinated to enter school within the state.

Despite the strong emphasis that states put on vaccination programs for children, all states allow for vaccine exemptions, though there is significant variance in how frequently the vaccine waivers are granted. For example, all states grant waivers for children for whom vaccinations would pose a medical burden, such as individuals with compromised immune systems, who are allergic to vaccine ingredients, or who have experienced adverse effects to a vaccine previously. Further, nearly all states grant exemptions to those who oppose immunizations for religious reasons, which is the case in some Christian Scientist, Mennonite,

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23 Ibid.
Old Amish, and Nigerian Christian (in America) communities. Finally, exemptions based on philosophical concerns surrounding vaccines are provided by 19 states.\textsuperscript{26}

While vaccine laws in almost all states have been remarkably consistent for more than a century, states around the country have seen sharp increases in the numbers of parents requesting either religious or philosophical exemptions from vaccine requirements, especially over the past three decades.\textsuperscript{27} For example, in South Dakota, the number of students claiming a religious waiver for vaccinations increased tenfold, from 19 in 2002 to 199 in 2014.\textsuperscript{28} Nationally, non-medical exemptions increased 37 percent, according to the Centers for Disease Control and Prevention.\textsuperscript{29}

In states that permit parents to obtain all three type of waivers (medical, religious, and philosophical), personal belief exemptions tend to be most common likely because less supporting documentation is required compared to the other two types of exemptions.\textsuperscript{30} To obtain a medical exemption in South Dakota, parents must present a note from a physician indicating that a vaccine would endanger the child. But for a religious exemption, a parent simply signs a document indicating that their religious beliefs prohibit the vaccinations.\textsuperscript{31} According to a state health official, South Dakota school districts do not have the ability to strictly monitor religious exemptions, adding that "they have no basis to deny someone a religious exemption," and that they "have to believe what they're (parents) stating is true."\textsuperscript{32}

Although parents have sought vaccine exemptions for almost as long as mandatory vaccinations have been in place, the sharp increase over the past 30 years in unvaccinated

\textsuperscript{26} Ibid.
\textsuperscript{28} Ibid.
\textsuperscript{29} Ibid.
\textsuperscript{32} Ibid.
children can be attributed to two events—the publication of a fraudulent, now-retracted study by British physician Andrew Wakefield, and an ongoing concern with an ingredient once used in vaccines called Thimerosal.

In 1998, British surgeon Andrew Wakefield published a study in Lancet, one of the most respected medical journals, showing a potential connection between bowel disease, autism, and the measles vaccine.\(^3^3\) The media seized on the claims and created fear about the safety of not only the measles vaccine, but vaccines in general. After almost immediate condemnation from the medical community about the quality of the study and the release of details showing a "fatal conflict of interest" in that Wakefield was being paid by a law group seeking to find evidence to support litigation from parents that vaccines had harmed their children, the article was retracted from publication and Wakefield lost his medical license.\(^3^4\) But despite repeated studies discrediting Wakefield's studies and showing no link between vaccines and autism, a small group of parents still maintain a mistrust of vaccines.

A second concern that some anti-vaccine proponents raise is with the ingredient Thimerosal, a mercury-containing compound once used as a preservative in vaccines.\(^3^5\) Even with the lack of scientific evidence that the ingredient, which was added to some vaccines in low amounts as a preservative beginning in the 1930s, posed any health threat, U.S. public health and medical organizations and vaccine manufacturers agreed that Thimerosal should be reduced or eliminated from vaccines as a precautionary measure.\(^3^6\) Today, the ingredient is no longer used in vaccinations, with the exception of a few varieties of multi-dose influenza vaccines. Despite the

lack of evidence that Thimerosal poses a public health danger, and the fact that the ingredient isn't even found in vaccines anymore, several anti-vaccination information websites still claim that vaccines contain Thimerosal, linking the vaccines to autism. While the Wakefield study and concerns with Thimerosal are just two examples of issues that have led to mistrust of vaccines, the CDC identifies them as among the most significant.

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BACKGROUND

The urgency of a policy change to address the decline in vaccination rates around the country can be seen in the increase in the number of documented measles cases over the past eight years, specifically with the rapid increase in the past three years. During the first seven months of 2008, the CDC reported 131 measles cases, compared with an average of 63 cases per year from 2000 to 2007. In 2011, the CDC reported a total of 222 measles cases, which represented the highest number of documented cases the U.S. had experienced in 15 years. In 2014, the United States experienced a record number of measles infections, documenting 644 cases across 27 states, which represented the greatest number of cases since measles elimination in the U.S. in 2000. To bring the statistics current, in the first three months of 2015, there were 173 reported cases of measles infections in 17 states. Of those 173 cases, 90% of them are related to one of four outbreaks. January 2015 alone brought 102 infections reported, which is almost double the amount of new cases reported in all of 2012 (55 cases).

Public health experts attribute the rapid rise in documented measles cases to a decrease in the U.S. vaccination rate of children, due to parents citing religious or philosophical conflicts with the vaccines. These exemptions allow parents to obtain vaccine waivers for their children from state law requiring all students enrolled in school—public or private—to be vaccinated against common infectious diseases, including measles. While the federal government does have the authority to compel vaccinations for those immigrating to the United States, traveling to and

41 Ibid.
43 Ibid.
from certain regions outside the country, and for persons in the U.S. military, vaccine requirements have been recognized to be under state jurisdiction for most U.S. residents.\(^45\)

Some observers have wondered: If concerns about vaccines are not new—the infamous Andrew Wakefield study was published in 1998, for example—what accounts for the gradual increase in measles cases over the past decade? Some in the medical community believe that some anti-vaccine sentiment is driven by the overwhelming success of U.S. vaccination programs and that the public is poor at assessing risk. Public health officials have pointed out that developed countries such as the U.S. no longer have infectious diseases for which there are vaccines, hence, the risk of the vaccine is perceived to be greater than the risk of the disease.\(^46\) Further, the current generation of parents who are making decisions about vaccinating their children grew up in a cohort where measles and other infectious diseases were extremely rare.

Of the 50 states plus the District of Columbia, only West Virginia and Mississippi do not offer religious or philosophical exemptions. All states, including West Virginia and Mississippi, do offer exemptions for children for whom vaccination would pose a significant health risk. Adding to the dangers of the low vaccination rate is that the unvaccinated children live in close geographical proximity to each other, which means that if one child becomes infected, it can rapidly spread throughout the community. The difficulty in obtaining a philosophical or religious exemption can vary greatly by state. While some states such as California require the vaccine exemption form to be signed by a physician noting that the parents have been counseled on the safety of vaccines as well as the dangers of being unvaccinated, other states, such as Minnesota, only require that the parents submit an exemption request form.\(^47\)

**Major Players**

To develop policy addressing low vaccination rates, it is important to note that parents who elect not to vaccinate their children can be found on both ends of the ideological spectrum. While conservatives have frequently been out front on policy issues that appear to contradict scientific findings such as climate change or evolution, communities disproportionally composed of liberals also harbor anti-vaccination beliefs. For example, when New Jersey Governor and potential 2016 GOP Presidential candidate Chris Christie and GOP Senator Rand Paul, another potential 2016 candidate, publicly expressed concerns with the safety of vaccines and asserted that parents should have some rights over medical treatments for their children, Democrats accused the Republican Party of being, once again, anti-science. In response, many conservative commentators pointed to the presence of vaccine skeptics in liberal enclaves in California, and to skeptic opinions published in liberal magazines and journals such as *Rolling Stone, Mother Jones,* and *Salon.*

Among the most visible vaccine skeptics is Robert F. Kennedy, Jr., who traveled to Capitol Hill in 2014 to meet with U.S. senators about a connection between autism and vaccines.

The measles crisis and the various policy options feature a handful of stakeholders, the largest of which is all those who reside within U.S. borders. As mentioned previously, all U.S. residents and visitors have some degree of vulnerability to measles whether they are vaccinated or not, as there is a small chance that a vaccinated person who comes in contact with someone who is infected will also contract measles. Among the most vulnerable are those unable to be vaccinated due to underlying medical conditions, who contend that those requesting religious or

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philosophical exemptions from vaccinations are imposing a negative externality upon them by reducing the efficacy of herd immunity in the U.S. In a recent poll, 78% of U.S. residents held that parents should be compelled to vaccinate their children against preventable diseases, and 60% said that unvaccinated children should be prevented from attending public school or daycare activities.51

Beyond the public, there is broad consensus within the medical and scientific communities that vaccines are safe and are the most important tool in preventing the spread of measles. Organizations that have publically touted the safety and efficacy of vaccines are the American Medical Association, American Academy of Pediatrics, U.S. Institute of Medicine, and numerous autism patient advocacy groups such as Autism Speaks, among hundreds of other mainstream medical and scientific organizations.5253 But despite the broad consensus, there are a handful of organizations that dispute claims of vaccines’ safety. Among the most vocal is the Association of American Physicians and Surgeons, a medical society of which Kentucky GOP Senator Rand Paul is a visible member, and the patient advocacy groups Autism Action Network and Generation Rescue, the latter of which was founded by actress Jenny McCarthy, who has a son diagnosed with autism.54 While Generation Rescue's website does not clearly state that vaccines cause autism, their website provides a table showing an increase in the number of CDC recommended vaccinations for children between 1980 and 2012, alongside a table showing an increase in the number of children diagnosed with autism during the same time period.55 Further, there are a handful of websites or media outlets that publish news articles questioning the safety

55 Generation Rescue FAQ page "What is the current vaccination schedule compared to the 1980's?" Available: http://www.generationrescue.org/about/faq
of vaccines, among other topics counter to the medical consensus. Despite most mainstream public health experts labeling these organizations and news outlets as peddling pseudoscience and potentially taking advantage of parents of children with autism by offering a false explanation for their diagnosis, these outlets and organizations are influential in communities that commonly seek vaccine exemptions and thus are actors in the policy area.

Although most organized religions, including Catholicism, Islam, and Judaism do not prohibit vaccinations, a few smaller sects do, such as some Christian Scientist, Amish, Mennonite, and Jehovah Witness communities. Some of these religious communities believe that vaccines interfere with "nature's genetic blueprint," opting to practice faith healing as opposed to modern medicine. Although the number of parents requesting religious exemptions from vaccines is a relatively small percentage of the U.S. population, they frequently live within close proximity to each other, worship together, and send their children to the same schools, which means that the unvaccinated community is a disease "hot spot" and extremely susceptible to an outbreak. One such outbreak occurred in 1994 when a 14-year old Christian Scientist contracted measles while on a skiing trip in Colorado, later returning home and infecting 190 people whose ages ranged from 1 to 25. In cases where there has been an outbreak in a community with a high concentration of unvaccinated individuals, U.S. courts have allowed states to override religious exemptions to protect the health of children by vaccinating.

Despite state and local governments having primary authority over public health, many national elected officials have been vocal on issues of mandatory vaccinations. President Barack Obama along with administration officials such as CDC Director Tom Frieden have promoted

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vaccines as a critical component in protecting the public from preventable diseases.60 Other elected officials to articulate the importance and safety of vaccines include former Senator and Secretary of State Hillary Clinton and Illinois Senator Dick Durban, who said that he just "pulled up short of a federal mandate" when thinking about potential national vaccine policy.61 But it is not only Democrats who speak out on the importance of vaccines. Republicans who have said that vaccinations are safe and effective include former GOP Florida Governor Jeb Bush, a front runner for the 2016 Presidential election, former Health and Human Services Secretary Tommy Thompson, Louisiana Governor Bobby Jindal, and Florida Senator Marco Rubio, commonly placed within the Tea Party Caucus, who said that "all children should be vaccinated."62 63 64 65

One caveat for some in the GOP that support vaccinations is that while the think that every child should be vaccinated, some do not think that the government should mandate that parents vaccinate their children. For example, Kentucky Senator Rand Paul told a reporter that vaccines are "one of the greatest medical breakthroughs that we have" but that they should not be universally required.66 Paul, a physician, later went on to say that he has heard "of many tragic cases of walking, talking normal children who wound up with profound mental disorders after vaccines."67 GOP New Jersey Governor Chris Christie, another potential 2016 presidential candidate, was forced to clarify remarks that appeared to question the safety of vaccines, later

67 Ibid
commenting that there should be balance between parents’ choices about vaccination for their children and the government compelling them to vaccinate. Many in the GOP appear to take a position that vaccines are important and everyone should be vaccinated, but that mandating vaccinations is not the proper role for government.

A final constituency in the vaccine debate is the venue in which policy change is likely to occur—states. As of March 13th, there have been 15 states to take up legislative proposals to strengthen immunization laws, most of them seeking to eliminate non-medical exemptions, while others are seeking to make exemptions harder to obtain or reduce their number by requiring more health education, notarization or annual renewal requirements for parents requesting them. Since many of the bills seeking to reduce nonmedical exemptions were developed following the Disneyland outbreak in December 2014, many observers note that it is still too early to know if these bills will eventually make it to the their governors’ desks for signatures. While some are speedily making their way through state lawmaking bodies such as one proposed in New Jersey, others like an Oregon bill have already been withdrawn from consideration by their sponsors.

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POLICY PROPOSAL

Policy Authorization Tool

Any member of the California legislature has authority to add, amend, or delete any state law unless that action conflicts with the state or federal constitutions, or unless the existing law was originally passed by a proposition (initiative statute) voted on by the California electorate.\(^{72}\)

Further, states have the right to regulate public health under the 10th Amendment of the U.S. Constitution, which states that the "powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people."\(^{73}\) The right to regulate public health is considered part of state government's police powers, which includes states' rights to authorize isolation and quarantine, licensure of medical professionals, and response to public health emergencies.\(^{74}\)

The state's power to compel vaccinations was affirmed by the U.S. Supreme Court decision in *Jacobson v. Massachusetts* (1905), in which the Court ruled (7-2 Justice Harlan writing for the majority) that the State of Massachusetts had sufficient power to mandate vaccinations, stating “there are manifold restraints to which each person is necessarily subject for the common good.”\(^{75}\) Drawing on the court's decision in *Jacobson v. Massachusetts*, the power of a state to impose school immunization requirements was reaffirmed in the Supreme Court decision in *Zucht v. King* (1922), which stated that a San Antonio ordinance requiring students enrolled in public schools to be vaccinated against certain diseases was legal.\(^{76}\)

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\(^{72}\) Constitution of California, Art. 4, Sec. 1

\(^{73}\) U.S. Constitution, 10th Amendment.


\(^{75}\) *Jacobson v. Massachusetts* 197 U.S. 11 (1905), Page 197.

\(^{76}\) *Zucht v. King* 260 U.S. 174 (1922).
The office of the California Governor should draft legislation that removes the personal belief exemption from current California law, along with few other associated details. This legislation should then be introduced by a legislator in the California assembly and Senate on the Governor’s behalf.

Policy Implementation Tool

California Senate Bill 277, a bill to end personal belief vaccine exemptions in California, was introduced into the California legislature on February 19th, 2015, by Dr. Richard Pan, a pediatrician and Senator representing Sacramento, Senator Ben Allen, the former Board President of the Santa Monica-Malibu Unified School District, and Assembly Member Lorena Gonzalez, who represents San Diego.77

Current California law “prohibits the governing authority of any public or private elementary or secondary school, child care center, day nursery, nursery school, family day care home, or development center from unconditionally admitting a child unless that child has been fully immunized against various diseases, including measles, mumps, and pertussis.”78 There are two exemptions from this requirement. One is a medical declaration from a doctor that the vaccination would pose a danger to a child due to an underlying medical condition. Second is when the vaccination conflicts with the personal beliefs of the parents. California SB277 would remove the exemption for “personal belief” from California's school vaccination statutes, which would also include a personal belief exemption due to religious concerns.

Formally, this bill would amend Sections 120325, 120335, and 120370 of, add Section 120338 to, and repeal Section 120365 of the California Health and Safety Code, which relates to

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The effect of this legislative action would be to remove language from the current California state health regulations that allows vaccine exemptions for non-medical reasons. This would prevent any non-vaccinated child from entering child care, kindergarten, or seventh grade within the state, unless they are unvaccinated due to medical issues. However, the bill would only remove the philosophical exemption for students entering childcare, kindergarten, or seventh grade after SB277 is enacted, effectively “grandfathering in” current students whose parents have successfully obtained a philosophical exemption. Additionally, the bill only removes the option for a philosophical exemption for the ten vaccinations currently required for all California school children. If a new vaccination is required by the California Department of Public Health, parents would be able to obtain a philosophical exemption unless prevented by future regulations. Finally, children who are home-schooled are exempt from the vaccine requirements.

According to the bill, the new regulations are to be enforced by the “governing board of each school district” or the “authority of each other private or public institution responsible for the operation and control of the institution.” This is the same authority that enforces current California public health regulations related to schools. Current enforcement includes the verification of a student’s immunization status and the exclusion of students who are not vaccine compliant. As written, the bill is not anticipated to have a budgetary cost. While a previous version required the school districts to notify parents of the vaccination rates of each school at a cost of $50,000 per year for the state, the current version of the bill does not include the

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81Ibid.
84Ibid.
85Ibid.
communication of vaccination rates to parents, which allowed the bill to bypass the California Senate Appropriations Committee.86

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POLICY ANALYSIS

Pros

Centers for Disease Control and Prevention statistics indicate that the number of documented measles cases has steadily increased across the country over the past eight years, with a sharp increase over the past three years.87 Concurrent with the increase in measles outbreaks has been an increase in the number of parents who obtain a vaccine exemption for their children. In California, the rate has grown exponentially, from about 0.75% of kindergarteners with vaccine exemptions in 2000, to about 2.5% in 2014.88 California public health officials indicate that out of 18,000 granted exceptions for the 2013-2014 school year, 17,000 are philosophical exemptions.89 Therefore, a bill that targets the 17,000 students unvaccinated due to philosophical concerns would raise the state’s vaccination rate, which enables the principles of herd immunity to protect those unvaccinated due to underlying medical issues or those for whom the vaccine was ineffective. Further, an investigation by California state public health officials found that most measles infections occurred in pockets of students with low immunization rates that corresponded to a higher incidence of personal belief exemptions.90 Hence, eliminating the philosophical exemption targets the population that, if vaccinated, would most efficiently raise the state’s vaccination rate.

Another epidemiological study of a comparable infectious disease, pertussis (whooping cough), found that states offering parents the option of obtaining a non-medical exemption, unsurprisingly, had higher levels of parents obtaining such exemptions, compared to states that

did not. But, most critically, the researcher, Saad Omer, an associate professor of global health and epidemiology at Emory University, also found that the states with higher rates of non-medical exemption also had a higher incidence of pertussis, demonstrating the connection between higher rates of non-vaccination and incidence of infectious disease. Omer found that the two biggest groups affected by pertussis were those unvaccinated for philosophical or religious reasons and those too young to be vaccinated, concluding that “vaccine exemptions and refusals increase risk for [those refusing] but also those who are too young to be vaccinated.”

Most public health experts assert that not only is the measles vaccine effective, it is also likely cost-saving. As of March 2015, the cost for a provider to obtain a measles vaccine, which is 95% effective after the first dose, and 98-99% effective after the second dose, is $19.91 per pediatric dose and $37.04 for an adult dose in the public sector, and $59.91 for pediatric or adult dose in the private sector. However, the Affordable Care Act requires that the measles vaccine be fully covered without cost sharing to the patient as part of the ACA’s coverage of preventive services.

A study published in the journal Vaccine used various modeling techniques to estimate the public cost of adding a personal belief exemption to Iowa’s state health regulations (the state currently only allows a religious exemption, which is difficult to obtain). By estimating the number of parents that would seek a philosophical exemption if offered, as well as the likely increase of pertussis cases as the state-wide vaccination rate drops, the 2012 article states that the public costs would increase 66%, from an estimated $273,000 a year without the philosophical

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92 Ibid.
exemption to around $410,000 with a philosophical exemption spent state wide. These costs would be associated with hospitalization, isolation of patients, and contacting those that might have been exposed during the outbreak. Public health commentators have hypothesized that in a state as populous and expansive as California, the health care costs of reducing vaccine exemptions could be more significant, though advanced analyses have not investigated that yet.

Offering a case study in how much a measles outbreak could cost California, a study published in the journal Pediatrics indicates that a 2008 measles outbreak in San Diego cost the public health department $124,517, or around $10,376 per person, including 1,745 person hours spent on “investigation and containment efforts.” The study noted that the figures do not include costs incurred by the patient, as measles can require hospitalization, nor the expense of missing work, nor a rise in insurance premiums of healthy individuals, which would greatly inflate the total cost of a measles outbreak to the state.

Regarding the legality of eliminating the philosophical exemption, the U.S. Supreme Court has confirmed that states have the right to compel parents to obtain necessary vaccinations as part of their police powers. In enforcing these vaccine mandates, states have promoted the principle of equality, allowing those too young to be vaccinated, those for whom a vaccination would be dangerous, and those for whom the vaccination was insufficient to participate in society without fear of becoming infected. Further, the bill is composed to consider personal liberty, as it is not mandatory vaccine legislation. In requiring vaccination of only those children enrolled in

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99 Ibid.

daycare and public or private school, parents still have the option not to vaccinate their children for philosophical reasons; parents just have to home school them, where they are less likely to transmit an infectious disease to another student.\textsuperscript{101}

Finally, California has sufficient infrastructure to manage the change in vaccine compliance. Current California regulations require schools and childcare centers to enforce immunization requirements, maintain immunization records of all children enrolled, and submit reports to the state.\textsuperscript{102} After the new law is in place, any new students enrolled in public or private school or childcare centers will be required to demonstrate that they are vaccine compliant. Because students already enrolled with a personal belief waiver are exempt from the new requirements, administration officials only need to focus on the incoming students to public and private childcare, kindergarten, and seventh grade.\textsuperscript{103} Finally, according to the U.S. CDC, there are no shortages of the measles vaccine.\textsuperscript{104}

\textbf{Cons}

While the CDC statistics demonstrating a rise in measles cases and news stories about outbreaks at amusements parks require some policy response, SB277 as proposed has several weaknesses. Several public health observers note that overall national vaccination rates and acceptance of vaccines have not declined in recent years.\textsuperscript{105} Rather, they note, the recent outbreaks have been caused by the fact that those opposing vaccines increasingly tend to live within close geographical proximity to each other, creating pockets of susceptibility where herd immunity is low.\textsuperscript{106} Therefore, a policy that aims to immunize the entirety of California’s children

\textsuperscript{101} Ibid.
\textsuperscript{102} "Shots for Schools" Website developed by California Department of Public Health. Available: http://www.shotsforschool.org/laws/
\textsuperscript{103} SB277 Text. Available: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB277
\textsuperscript{104} CDC Current Vaccine Shortages or Delays. Available: http://www.cdc.gov/vaccines/vac-gen/shortages/
\textsuperscript{105} Plait, Phil "Disneyland, Measles, and Blame," Bad Astronomy Blog, Slate, Feb 2, 2015. Available:
\textsuperscript{106} Ibid.
who are unvaccinated due to philosophical reasons would be less effective or efficient than if they targeted specific communities within California with the highest non-vaccination rate.

A second weakness is that mandating vaccinations may prevent students from obtaining an education. The California Constitution guarantees all its citizens a quality public education.107 By restricting access to a public education due to a philosophical or religious concern regarding medical views or a religious conflict, the state is illegally depriving children of their constitutional rights.108 Soon after hearing that SB277 was introduced into the California assembly, some California parents testified that they would withdraw their children from school, adding that they likely could not afford to home-school their children.109 Without a less restrictive education solution, the result of enacting this legislation is that it would put unvaccinated children in a limbo outside of the school system while placing a financial hardship on parents.110

Third, the policy may be viewed as a gross overreaction. Writing about the proposal to eliminate the non-medical vaccine exemption in a *L.A. Times* op-ed, David Ropeik, an author on issues of risk perception and communication, wrote that the “preferred solution need not be to entirely eliminate choice,” and that the public’s interest must be balanced with principles of liberty.111 In essence, the goal is to reduce the number of people opting out of vaccines in order to increase the vaccination rate to achieve herd immunity and reduce the size of the unvaccinated clusters. To achieve this, California could increase the level of difficulty of obtaining an exemption beyond current requirements—obtaining the signature of a physician indicating that parents understand the risks of not vaccinating their kids.112 One way to reduce the number of parents requesting a non-medical exemption might be, in addition to obtaining a form

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107 California Constitution, Article IX, Section 5.
109 Ibid.
110 Ibid.
112 California Department of Public Health; Vaccine Waiver. http://www.cdph.ca.gov/Pages/NR13-051.aspx
demonstrating that they are aware of the dangers of not vaccinating, to also require an essay
detailing their philosophical beliefs and how they apply those beliefs to how they live. Ropeik
notes in his article that in Florida, Texas and Minnesota, where the administrative burden of
opting out is high, fewer parents obtain an exemption than in Connecticut, Wisconsin and
Missouri where the requirements are lower. Writing in the New York Times, a pair of British
physicians agreed with Ropeik that eliminating the exemption all together, as opposed to making
it more difficult to obtain, is likely to backfire. The authors assert that as people are
increasingly “less accepting of authority and do not expect to do something because the
government says so, trying to enforce immunization may actually make matters worse and create
martyrs.”

A fourth consequence is that the policy restricts personal liberty and freedom. With the
policy, the government is requiring school-aged children to undergo a medical activity, spend
money and time to travel to a doctor’s office, complete administrative tasks demonstrating
vaccination status, and engage medical professionals that, according to some opponents, “force
families who rely on complementary and alternative medicine to have to engage with medical
providers that are philosophically opposed to their vaccination beliefs and that they would not
otherwise pay to provide health care to their families.” Further, no medical activity is without
risk, and, although quite rare, there is the possibility of an allergic reaction or other consequence
to any vaccination. A final personal liberty with the potential to be violated is that, while the
U.S. Constitution and the Constitution of California do not guarantee the free exercise and
enjoyment of philosophical beliefs without discrimination or preference, they do guarantee those

113 Ibid.
114 Ibid.
116 Ibid.
117 2012 National Vaccine Information Center Letter to California Assembly

rights with regards to religion. Therefore, an effort to remove the philosophical exemption without creating a religious exemption could be unconstitutional.

A final weakness of the policy is that there is some likelihood that it will not achieve its goal of reducing measles outbreaks. Among the reasons is that, at least in the short term, the bill does nothing to vaccinate the students currently in childcare through high school that are unvaccinated, as they are allowed to maintain their philosophical exemption status even after the legislation is enacted. Further, if a parent refuses to vaccinate their child, either for philosophical or religious reasons (because the bill doesn’t create a new religious exemption), some students would be withdrawn from the school while maintaining their unvaccinated status. In addition, the bill does not contain any incentives for parents to vaccinate their children, only disincentives to not vaccinating, nor does it include public service or education campaigns to increase awareness of the safety of vaccinations and refute false claims popular on the Internet. Finally, the bill, as currently written, fails to clarify how parents would be notified of the change in vaccination policy.

POLITICAL ANALYSIS

The recent rise in measles outbreaks has placed vaccinations on the national policy agenda, as well as revealed the major players in the policy issue. Nearly all national polls indicate that a large majority of American adults support mandatory vaccinations for healthy individuals against diseases such as mumps, measles, rubella, and polio. For example, a February 2015 poll conducted by CNN found that 78% of those polled agreed that parents should be required to vaccinate their healthy child against preventable diseases, while only 22% disagreed. Further, the poll found that older Americans appeared most supportive of the vaccinations (84% of those 50 years of age or older versus 72% of those under 50), and 70% percent of parents with children under age 18 also agree with the requirement. The CNN poll also documented that around 60% of those polled indicated that unvaccinated children should be barred from public school, although opinion was split when asked if unvaccinated children should be barred from private schools (51% barred versus 48% not barred).

A second poll from the Pew Research Center confirms that a majority of U.S. adults support mandatory vaccinations (68%) and identified several interesting demographic trends. The February 2015 poll found that younger adults are more likely to support allowing parents to make a decision about whether to vaccinate their children (41% of 18- to 29-year-olds); while a much smaller minority of adults 65 or older echo this opinion (20%). The Pew poll contends that support for mandatory vaccinations is higher among older Americans due to the fact that there were measles and polio outbreaks in their lifetimes and in those of their parents. Despite

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121 Ibid.
122 Ibid.
124 Ibid.
125 Ibid.
some assertions linking the anti-vaccination movement to more affluent, highly educated parents, Pew found little difference in opinions based on income, with a consistent 30% against mandatory vaccinations when high, middle, and low income adults were polled.\textsuperscript{126}

While the Pew poll did indicate some slight differences along political lines, with 76% of Democrats, 65% of Republicans, and 65% of independents supporting mandatory vaccinations, it revealed that opposition to them can be found on both end of the political spectrum.\textsuperscript{127} As mentioned in an earlier section, when 2016 GOP Presidential candidates Governor Chris Christie and Senator Rand Paul publicly expressed concerns with the safety of vaccines, Democrats accused the Republican Party of being anti-science. In response, many conservative commentators pointed to the presence of vaccine skeptics in liberal enclaves in California, and skeptic opinions published in liberal magazines and journals such as \textit{Rolling Stone, Mother Jones}, and \textit{Salon}, adding that among the most visible vaccine skeptics is Robert F. Kennedy Jr., who in 2014 traveled to Capitol Hill to meet with U.S. senators about a connection between autism and vaccines.\textsuperscript{128,129} Numerous actors, actresses, and musicians, many of whom live and work in California, have spoken about the dangers of vaccinations, or at least about offering parents the choice to vaccinate, including Alicia Silverstone, Bill Maher, Jenny McCarthy, Mayim Bialik, and Donald Trump, among others.\textsuperscript{130}

The public debate surrounding SB277 has revealed that many of the major national players and stakeholders are also present within California, specifically. While there is broad consensus within the medical and scientific community—including the American Medical

\textsuperscript{126} Ibid.
\textsuperscript{127} Ibid.
Association, American Academy of Pediatrics, U.S. Institute of Medicine, numerous autism patient advocacy groups such as Autism Speaks, and hundreds of other mainstream medical and scientific organizations—that vaccines are safe and effective, many California residents have formed loose coalitions to publically protest the proposed passage of SB277. While experts contend that there is no clear leader, groups like California Coalition for Vaccine Choice and California Coalition for Health Choice, and blogs such as Living Whole, Mommypotamus and Mercola, among others, have regularly published articles and organized public protests outside the California State Capitol and in front of the offices of individual members who have publically supported ending the philosophical exemption to vaccinations. These loose coalitions of parents and other concerned citizens have diverse rationales, but generally coalesce around concerns regarding the safety of vaccines, a distrust of the medical and pharmaceutical community, and overall chemical-free living. While those opposed to vaccine mandates are a clear minority, they have been successful in derailing pro-vaccine bills around the country, including most recently in Oregon and Washington.

While the minority opposition to the bill appears more vocal, proponents of the bill have also expressed concerns that lawmakers have watered down the bill to allow parents who have successfully obtained a philosophical exemption to maintain their exemption status while their child is in school. In allowing currently exempted children to maintain their status, SB277 co-sponsors California Senators Richard Pan and Ben Allen concede that the bill “will not reach everyone,” but that a political compromise was necessary in which “a fair balance was struck that

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provides more options to parents who are concerned about vaccinating their children.”

Additionally, policy makers raised concerns that excluding children from public education due to religious or philosophical concerns may violate the California State Constitution which guarantees California residents the right to a proper public education. Some lawmakers have suggested that the bill could be modified to allow parents to send their unvaccinated children to homeschooms with multiple families or independent study programs overseen by the state education board, which are also eligible for public funding.

As of May 28, 2015, the bill passed the California Senate and was introduced in the State Assembly, where it was referred to only one committee, the Assembly Health Committee, and is expected to have an easier time passing California’s lower house than it did in the Senate. Once it passes the Assembly Health Committee, it goes to the full Assembly floor, and then to the office of the California Governor. Governor Brown has not released a statement on a mandatory vaccine bill since February, when a spokesperson stated that the Governor “believes that vaccinations are profoundly important and a major public health benefit and any bill that reaches his desk will be closely considered.”

138 Ibid.
POLICY RECOMMENDATION

California is vulnerable. In December 2014, a vacationer with an active case of the measles, likely from the Philippines, traveled to an amusement park in the Golden State, infecting 147 people around the country, including 131 in California.\(^{140}\) Reports indicate that many of those infected were not immunized against measles, with some citing personal reasons for refusing shots, while others were too young to get the measles vaccine.\(^{141}\)

Public health experts agree that the recent rise in measles cases around the country is strongly linked to the decrease in vaccination rates—reducing herd immunity—which has been caused by an increase in the number of non-medical exemptions to vaccine mandates.\(^{142}\) Therefore, office of California Governor Jerry Brown should draft legislation that removes the personal belief exemption from current California law. Once this bill is introduced by a legislator in the California Assembly and Senate on the Governor’s behalf and passed by both chambers, the Governor should sign the bill into law.

One such bill, SB277, will increase the state’s vaccination rate by requiring most students without a current philosophical vaccine exemption to be vaccinated prior to enrolling in a public or private school or daycare in California. This policy narrowly targets the unvaccinated population statewide, which is important to increasing herd immunity within the state. Some might argue that the concern is not the state’s overall vaccination rate, but rather that unvaccinated California residents live within close geographical proximity to each other. While this is potentially true, it would likely be more difficult, and potentially unconstitutional, for the California Governor to enact legislation that focuses enforcement of vaccine mandates for only a very small number of California residents, some of whom carry considerable political power.

Further, research in another state on a comparable infectious disease (whooping cough) demonstrated that states that allow easy access to non-medical exemptions, unsurprisingly, have a higher rate of unvaccinated children. But most importantly, the study also found that states with higher rates of non-medical exemptions for whooping cough vaccinations had a higher incidence of whooping cough. Additionally, public health experts also assert that vaccines are not only lifesaving; they are also cost-saving. While two doses of pediatric measles vaccine would cost around $40 (though the Affordable Care act requires it to be free to patients), the cost to treat and contain each measles infection in a 2008 San Diego measles outbreak was more than $10,000, not including the personal cost of missing work or school for those infected.

Regarding its legality, the U.S. Supreme Court has consistently confirmed that states have the right to compel vaccination as part of their police powers, which has promoted equity by allowing all citizens to participate in society, including those for whom a vaccination would be dangerous, without fear of being infected with measles. However, some parents have expressed concerns that legislation restricting students’ access to education could violate the California Constitution. In response, it is important to note that the legislation is not mandatory vaccine legislation, as parents have the option to home school their children so they are less likely to transmit an infectious disease to the rest of the population. These home schooling programs are eligible for public support.

Finally, following repeated investigations, there is a near consensus of all medical and scientific professionals that vaccinations are safe. While it is possible that the legislation will not achieve its goal of reducing measles outbreaks because it allows students with current non-medical exemptions to maintain their exemption status, thus reducing the speed at which the vaccination rate will be boosted, including this allowance was a necessary political compromise to advance the bill through the California legislative process.
Therefore, given all of the policy’s strengths and weaknesses, the office of the California Governor is encouraged to support and sign legislation eliminating the non-medical vaccine exemption.
BIOSKETCH

Benjamin George Somers, born September 14, 1982, Washington, D.C.

Benjamin Somers is currently a Program Operations Coordinator in the Research Competitiveness Program of the American Association for the Advancement of Science. As a program operations coordinator, Ben supports RCP through a variety of activities, including the management of international and domestic grant proposal programs for academia and the federal government, assisting in the development of RCP marketing resources, and maintaining the Program's website.

Prior to his current position, Ben was a writer in the Office of Public Programs where he wrote about science policy, education, peer-reviewed research and other AAAS efforts to advance science and serve society. Originally from the Washington, D.C., area, Ben received a B.A. in Government, with a minor in Judaic Studies, from Franklin & Marshall College in Lancaster, Pa., and is pursuing a M.A. in Public Management at Johns Hopkins University.