

Prioritizing Religion in Vaccine Exemption Policies*

Mark Navin[†]

In response to recent and ongoing outbreaks of vaccine-preventable diseases in the US, many people have called for public efforts to increase vaccination rates. A great deal of attention has focused on the fact that increasing numbers of school children are receiving exemptions (also called ‘waivers’) from school vaccination requirements, because their parents have claimed to have religious or philosophical objections to vaccination. My goal in this paper is to illustrate some ways in which philosophical questions about religious exemptions are (and are not) relevant to current policy debates about exemptions for school vaccination requirements. My intent is not so much to resolve fundamental questions, but to draw connections to practical questions about vaccination laws.

One popular suggestion for lowering vaccine exemption rates (and for increasing vaccination rates) is to grant exemptions only for religious reasons. I am skeptical about the feasibility of this sort of proposal. State governments in the US have been consistently unable (and unwilling) to restrict religious exemptions to school vaccine requirements, for familiar conceptual and epistemological reasons: It is difficult or impossible for the state to determine whether an objector is in fact motivated by religious beliefs, because the law’s conception of religion is vague and because the state lacks the means and the will to determine whether objectors are sincere. In practice, this means that it is easy for parents receive vaccine exemptions by lying about the religious nature of their objections or by creating pseudo-religions. However, it is unlikely that we could significantly reduce vaccine exemptions by eliminating religious waivers and offering only philosophical waivers, since this change would reintroduce similar conceptual and epistemological problems: It is not clear what distinguishes a philosophical objection to vaccination from a merely prudential belief that vaccination does not promote a child’s interests. And even if this distinction were clear, the state lacks the means and the will to determine the sincerity of parents’ putative philosophical objections.

* Paper prepared for Bowling Green Workshop in Applied Ethics and Public Policy, “The Scope of Religious Exemptions,” April 17-18, 2015.

[†] Associate Professor of Philosophy, Oakland University, navin@oakland.edu.

Recently, a number of states have started to require parents to complete educational sessions before they are eligible for waivers. These changes have succeeded in lowering exemption rates. Making parents sit through a class about vaccines is unlikely to change their beliefs about vaccines, but distributing vaccine waivers to parents who are willing to undergo the burden of attending a class is an imperfect proxy for distributing exemptions to parents who are motivated to refuse vaccines by their deep convictions. And if states use burdensome application processes as imperfect proxies for policies to distribute waivers to parents who object because of deep convictions, there is little practical upshot to the distinction between religious and non-religious objections in vaccination policy.

Vaccine Requirements and Exemptions

Beginning in the late nineteenth century, some US states required school children to be vaccinated against smallpox.¹ By the late 1960's, many states began requiring children to be vaccinated against measles, too, as the result of federal efforts to reduce and eradicate that disease. And over the following decades, states began requiring schoolchildren to receive even more vaccines. Today, children in all fifty states must receive a long list of vaccines before they are permitted to attend state-recognized daycare centers or public, private and charter schools. Children must be usually be vaccinated against mumps, measles, rubella, polio, tetanus, diphtheria, pertussis, haemophilus influenzae type b (Hib), hepatitis A, hepatitis B, rotavirus, varicella, and pneumococcal disease. (Adult citizens are often required to have even more vaccinations if they want to attend university, or if they want to be employed in the military or in the healthcare professions, but I focus in this paper only on routine childhood vaccination.) The courts have consistently upheld mandatory school vaccination laws.²

All 50 states in the US offer *medical* exemptions. Unvaccinated children may be allowed to attend school or daycare if their physicians determine they are too immunocompromised to be safely vaccinated. I think that at least some medical exemptions should be uncontroversial, so I do not address them in this paper.

The interesting questions are about *nonmedical* vaccine exemptions. 48 states offer nonmedical exemptions to people who object to vaccines for religious reasons; these are religious exemptions. (The exceptions are Mississippi and West Virginia, which allow only medical exemptions.) Of those

48 states, 29 offer only religious exemptions to mandatory vaccination, while the other 19 states also offer exemptions to people who object for secular moral reasons; these are philosophical or personal belief exemptions (NCSL 2015). But even the 19 states that offer philosophical exemptions sometimes make the process for receiving a philosophical exemption more burdensome than the process for receiving a religious exemption. For example, California grants a vaccine waiver to anyone who states that they have a religious objection, but it requires people who want personal belief exemptions to meet with a physician to discuss vaccines (California Department of Public Health 2013b). Importantly, while the courts have permitted states to offer nonmedical exemptions, they have not compelled states to create exemption policies and, in particular, they have not defended religious exemptions to vaccine mandates as a requirement of the free exercise of religion.³

Nonmedical exemption rates are increasing in many communities (Rockoff 2010; California Department of Public Health 2013a; Butz 2014; Centers for Disease Control and Prevention 2013). The numbers matter: Herd immunity may require vaccination rates between 80% (e.g. for rubella and mumps) and 95% (e.g. for measles) (Fine 1993; Wright and Polack 2006; Meissner, Strebel, and Orenstein 2004). And consider that in the 2013-14 school year, the CDC found that most states failed to reach the target of having 95% of children entering kindergarten complete the 2-dose MMR vaccine sequence (Centers for Disease Control and Prevention 2014). This target must be met to preserve herd against measles. Some states were far below this level. For example, in Colorado, less than 85% of children entering kindergarten had received both doses of MMR.

Some states already offer too many nonmedical exemptions, and others cannot allow any more. Some states are fine for now, but would do well to try to prevent increases in their nonmedical exemption rates. Furthermore, the fact that nonmedical exemptions are geographically-clustered means that even relatively low national or state exemption rates may result in local breakdowns in herd immunity (May and Silverman 2003; Omer et al. 2008; Gaudino and Robison 2012; Gahr et al. 2014). Douglas Diekema says:

The state of Washington, for example, reported a statewide exemption rate of 5.6% for students enrolled in kindergarten through twelfth grade during the 2011–2012 school year. Exemption rates by county, however, ranged between 1% (Garfield) and 30% (Ferry), with exemption rates exceeding 10% in 7 of 37 counties reporting data (Diekema 2014, 284).

Nonmedical exemptions may have weakened or destroyed herd immunity in Ferry County, Washington. And herd immunity is also at risk in the many Washington counties with exemption rates greater than 10%, even though the state's overall exemption rate is not nearly so high. The same can be said about county-specific vulnerabilities in many other states (see e.g. Omer et al. 2008).

Disease outbreaks are more likely in communities with higher rates of nonmedical exemptions (Yang and Debold 2014; Blank, Caplan, and Constable 2013; Omer et al. 2012; Atwell et al. 2013; D.A. Salmon et al. 1999; Lee, Rosenthal, and Scheffler 2013; Constable, Blank, and Caplan 2014). So, we have good reason to find ways to reduce the rates of nonmedical vaccine exemptions.

Religious Exemptions

One way to try to reduce the number of nonmedical vaccine exemptions is to allow only religious exemptions. For example, in 2014 the editorial board of *USA Today* – the widest circulated print newspaper in the US – called for ending personal belief waivers, but preserving religious waivers (USA Today Editorial Board 2014). As I am writing this at the end of March 2015, the following bills – which would eliminate philosophical exemptions, but preserve religious exemptions – are working their way through state legislatures: California SB 277, Vermont S 87, and Washington 2009 (NCSL 2015). We can ask important questions about the constitutionality and political morality of laws that grant special treatment to objections that emerge from religious convictions. But before we devote too much time to inquiring about whether states *should* give special treatment to religion, we should ask whether they *could* do such a thing. And it's not clear that they can, at least in vaccine exemption policies.

Religious exemption policies face a fundamental conceptual problem: The state has to decide what counts as a religion, but this is famously complicated to do (see e.g. Choper 1982). Courts and legislatures in the US have been consistently vague about what counts as a religious basis for an objection. For example, in *Seeger v. United States* (1965), the US Supreme Court determined that a belief qualifies as sufficiently religious (for the purpose of a religious objection to military service) when it is “sincere and meaningful [and] occupies a place in the life of its possessor parallel to that filled by the orthodox belief in God.” Here, the idea is that a religious objection emerges from convictions that are part of a person's ‘ultimate concerns’. Courts and legislatures in the United

States have often adopted the ‘ultimate concerns’ standard for determining whether vaccine objections are religious (Daniel A. Salmon and Siegel 2001; Daniel A. Salmon, Sapsin, et al. 2005). And states have sometimes endorsed even broader accounts of religion than the one that emerges from *Seeger*. For example, Douglas Diekema observes that “[i]n Oregon...a religion is defined as ‘any system of beliefs, practices, or ethical values’” (2014, 285).

But even if we were happy with how the state conceives of religion (for the purposes of exemptions policy), we still face an epistemological problem: It is not clear how the state could distinguish between cases when people are motivated by sincere religious beliefs and cases when people insincerely invoke religion to receive special treatment. Whether someone’s objection is sincere is an attribute of their inner life that is generally opaque to the law. And even if it were possible for the state to make reasonably good judgments about whether parents have sincere religious objections, it would likely be far too expensive for the state to undertake those efforts. For example, we could subject people who request religious exemptions to vaccine mandates to something like the review boards that conscientious objectors to military service faced in previous generations. But these efforts would require immense resources. Consider that my *county* in Michigan granted nearly 1,000 vaccine exemptions just last year.⁴ In practice, then, we are left with Daniel Salmon’s conclusion about religious exemptions: “A lot of states call their exemptions religious, but anyone who wants it, gets it” (McNeil, Jr. 2003).

Dorit Reiss has recently called for eliminating religious exemptions to vaccine requirements on the grounds that “the majority of those taking advantage of [religious exemptions] are refusing vaccines for reasons other than religion” (2014, 1557). She observes that (1) survey data show that most vaccine refusers do not object to vaccines for religious reasons; (2) no major organized religion prohibits vaccination (see e.g. Grabenstein 2013); and (3) many parents admit to lying about the religious bases of their objections to vaccines on social media and in online communities. To Reiss’s (putative) evidence of parental dishonesty about religious exemptions, we could add the fact that states that allow only religious exemptions have much higher religious exemption rates than states that allow both religious exemptions and philosophical exemptions (Centers for Disease Control and Prevention 2014). Some parents are likely claiming religious exemptions only because the law does not allow them to claim philosophical exemptions.

I am sympathetic with Reiss's arguments, but I think they support a different conclusion than the one she reaches. I agree that many parents *believe* they are lying when they claim to object to vaccines for religious reasons. (And they also believe they are acting fraudulently when they incorporate new religions for the purpose of acquiring vaccine exemptions.) But the fact that parents believe they are lying does not mean that they are lying, since vaccine exemption laws rely on conceptions of religion that are more expansive than parents may recognize. Consider that the most common objection to vaccination is that vaccines are harmful or excessively risky (Omer et al. 2009; Dubé et al. 2013; Brown et al. 2010). Parents who refuse vaccines for these reasons may believe that they have secular reasons for refusing vaccines; they may believe that they are lying when they request religious exemptions. But there are two reasons to think that some parental concerns about vaccine safety may be properly characterized as religious, at least under the conceptions of religion that are operative in vaccine exemption laws.⁵

First, some vaccine refusing parents have worries about vaccine safety that seem to be grounded in what Jonathan Haidt has called an ethics of purity (or sanctity) (Haidt 2012). What distinguishes purity-based concerns from empirically-informed worries about physical harms is the importance that an ethics of purity attaches to protecting one's metaphysical status (the sort of being that one is). On such a view, we must be on guard to avoid contact with objects or activities that could degrade our status through 'taint' or 'contamination', e.g. through contact with industrial 'toxins'. The courts have affirmed that these kinds of value systems are religious, from the point of view of the laws governing vaccine exemptions. For example, in *Sherr and Levy v. Northport East-Northport Union Free School District*, the court found that the following parental testimony sufficed to demonstrate a religious basis for refusing vaccines:

any introduction into that process of a foreign element outside the normal processes of the body, is going to [a]ffect the body adversely and, therefore, we feel it is a violation in a sense of our nature, physical, spiritual religious nature.⁶

I have argued elsewhere that similar purity values are common among vaccine refusers (2016, chap. 3). But many parents may not recognize purity values as religious values, which would lead parents who are motivated by purity values to believe they are lying when they request religious exemptions to vaccine requirements. But from the point of view of the law, they may not be lying after all.

A second reason to doubt whether parents are lying when they claim to object for religious reasons is that some vaccine refusers seem to treat the maximization of their children's well-being as an 'ultimate concern', since they practice ways of life that are structured around the promotion of (what they imagine to be) their children's interests. Of course, almost all parents are concerned about their children's interests; but some vaccine refusers are devotees of a set of hyper-intensive birthing and mothering practices, including home birthing, attachment parenting, baby-wearing, co-sleeping, extended breastfeeding, elimination communication, organic cooking, and homeschooling (Reich 2014; Sahni, Lai, and MacDonald 2014). And acting on the basis of a commitment to one's deepest values has often been sufficient to qualify as religious for the purposes of government exemption policies. Of course, parents may believe they are lying when their commitment to these practices leads them to claim a religious objection. But it's not clear whether they are lying after all.

It is a problem if the law's notion of religion is much more expansive than popular ideas of religion, since some people will falsely believe that they cannot truthfully demand a religious exemption. But this prioritizes exemptions for people who are willing to lie, since people who do not want to lie will not seek exemptions when only religious exemptions are available. There are good reasons for the law to offer exemptions for a diverse set of reasons, but it is not clear that it is helpful to group all of those reasons under the banner of religion.

Philosophical Exemptions

Perhaps the right way to respond to problems with religious exemptions is to eliminate them in favor of philosophical (or personal belief) exemptions.⁷ Rather than have religious exemptions laws that recognize esoterically expansive conceptions of religion, we might choose to permit exemptions only on the basis of conscientious beliefs. This would mean that we wouldn't have to resolve questions about the content of religion, nor would we face problems arising from the mismatch between the notions of religion operating in the law and in common use.

But we might wonder whether everything that matters about religious objections can be reduced to questions of conscience. The free exercise of religion is not only a freedom to act in accordance with one's religiously-informed moral convictions, but may also include a broader right to religious traditions and practices. A religion may involve meaning-giving commitments that include more than moral duties or that do more than place burdens on a believer's conscience. I don't have well

worked-out views on this topic, but I am open to the possibility that there are religious reasons to offer exemptions that are not also reasons grounded in considerations of conscience. And this tells in favor of continuing to permit religious exemptions as a separate category alongside philosophical exemptions (especially since it follows from my arguments in the next section that fair and effective efforts to reduce the number of nonmedical exemptions will not directly distinguish between religious and secular objections).

Another reason why philosophical exemption policies will not be a panacea for worries about religious exemption policies is that philosophical exemption policies face similar conceptual and epistemological problems as those that plague religious exemption policies. On one hand, it is not clear what distinguishes a conscientious moral conviction from a merely prudential consideration. Of course, there are easy cases. For example, some vaccine refusers seem motivated by a desire to free-ride on herd immunity, i.e. to enjoy the community's protection from disease without contributing to the maintenance of that public good (Offit 2010, 144–146; Hoven 2012; Dawson 2007). These people refuse vaccines for merely prudential reasons and I think it's clear that these reasons should not suffice to qualify parents for philosophical exemptions. But not all parents who refuse vaccines out of a desire to promote their children's interests are acting out of mere prudence.⁸ Instead, many vaccine refusers (falsely) believe that vaccines are *so harmful* for their children that allowing their children to be vaccinated would violate a parental obligation to protect children from serious harms. A parent who refuses vaccines because she believes that she has a moral obligation to do whatever she can to protect her child from possible harms may have an objectionable understanding of parental moral obligations (and vaccine science), but she seems to have the sort of conscientious objection to vaccination that would qualify her for a philosophical exemption. So, the conceptual problems that face religious exemptions policies are not unique to religious exemption policies, and cannot be escaped by moving towards philosophical exemption policies.

On the other hand, philosophical exemption policies face familiar epistemological problems, since the state seems ill-prepared to distinguish sincere from insincere claims about parents' moral objections to vaccination. Few people who are motivated to refuse vaccines by a desire to free-ride are likely to admit to that motivation when they apply for philosophical exemptions. So, the epistemological problems that face religious exemptions policies are also not unique to religious exemptions policies.

Burdensome Exemptions

There are good reasons to care about both the scope of religious objections and the relationship between religious and conscientious objections. We also ought to consider whether and how the state may be able to police religious and philosophical exemption policies. However, these questions may not be especially pressing from the point of view of contemporary vaccine exemption policies. This is because recent developments to make vaccine waivers more difficult to receive may succeed in lowering rates of nonmedical vaccine exemptions, while sidestepping important philosophical questions.

Communities that introduce more burdensome application processes for vaccine waivers have usually continued to grant exemptions for the same reasons as they have in the past. They have not eliminated religious or philosophical exemptions, or restricted the criteria for religious and philosophical objections, or committed to a more rigorous review of exemption applications (i.e. to assess the sincerity of parents' claims about the religious or conscientious nature of their objections). Instead, they have placed greater burdens on parents who want to apply for vaccine waivers, regardless of the reasons that parents give. For example, my county health office (in Oakland County, Michigan) used to grant exemptions to anyone who stated that they had a religious or philosophical objection to vaccination. Approval was pro forma and parents did not have to complete any official documents; short personal letters sufficed. But beginning on January 1st of this year, parents in my county who want to receive a vaccine waiver must bring their child to the county health division's offices, and they must participate in a one-on-one vaccination education session with a public health nurse (Michigan Department of Public Health 2015). Parents will be able to receive a waiver only after they complete the education session, and after they submit an official waiver application form. Also, parents must set up their appointments weeks in advance and must complete a two-page survey before their education session begins. Other states in the US – including Oregon, California, Vermont and Washington – have recently passed similar laws that make the vaccine waiver application process more burdensome (Warner 2014; Moody 2014), while legislators are pushing for more restrictive nonmedical exemption laws in many other states, including Colorado (WAMC Editor 2014; Fowler 2014).

Communities with more burdensome exemption application processes have lower rates of nonmedical exemptions. For example, Blank, Caplan, and Constable found that nonmedical exemption rates are twice as high in states with permissive exemption policies than they are in states with more burdensome exemption policies (2013). And there is evidence that communities can lower their rates of higher-incidence diseases by making nonmedical exemption policies more restrictive (Yang and Debold 2014; Rota et al. 2001; Daniel A. Salmon, Omer, et al. 2005). Fewer people will receive exemptions because some people are unwilling to complete burdensome application processes (May and Silverman 2005). At the same time, these new burdens will not be insurmountable barriers for most parents who really want exemptions.

People who have advocated including education sessions in the application process for vaccine waivers have often argued that these education sessions may change people's minds, or will at least ensure that parents who receive exemptions make sufficiently informed decisions (Silverman 2003). We may hope that education sessions could cause vaccine refusers to revise their views, since people tend to become less confident in their views when they are exposed to multiple perspectives (Kahneman 2011, 87, 133; Brenner, Koehler, and Tversky 1996). And deviating from a widespread practice – like routine childhood vaccination – requires someone to sustain a great deal of confidence in their views (Thaler and Sunstein 2009, 6, 27). But there is good reason to be pessimistic about the potential for vaccine education sessions to change people's minds. For example, Brendan Nyhan et al have found that various interventions – providing people with scientific information about vaccines, or telling stories and showing pictures about vaccine-preventable diseases – occasionally lead people to endorse more accurate beliefs about vaccines (Nyhan et al. 2014). But Nyhan et al found that these interventions did not make people more likely to vaccinate and, in some cases, they made people *less* likely to vaccinate. It may matter that Nyhan et al's experiments consisted of automated responses over the internet, and we may hope that in-person interactions would be more effective. Indeed, Opel et al have shown that pediatricians can increase the rates at which parents vaccinate their children depending on how pediatricians handle discussions with parents about vaccines (Opel et al. 2013). Hendrix et al reached a similar conclusion about the potential for in-person interactions with pediatricians to increase vaccination rates (Hendrix et al. 2014).⁹ Unfortunately, there has not yet been any robust empirical research about whether vaccine waiver education sessions can change parents' minds (or about how they *might* change parents' minds).¹⁰ However, only parents who really want waivers are going to sit through

education sessions, and this fact should make us skeptical about the potential for these sessions to cause parents to decide to vaccinate their children.

The fact that vaccine education sessions are *burdensome* may be enough to deter some people from completing an application for a vaccine waiver. When vaccine exemptions are easy to receive, some parents apply for exemptions because that is easier to do than getting children vaccinated, which can involve setting up doctor's appointments, taking kids out of school, and missing work to attend appointments (Omer et al. 2012; Rota et al. 2001). Or, parent apply for exemptions because they have mild objections to vaccination. Making it more burdensome to receive vaccine exemptions than to become vaccinated will incentivize these parents to get their children vaccinated, while leaving exemptions available for those who *really* want them. Indeed, some have argued that making the application processes burdensome is what matters most (rather than educating parents). For example, Constable, Blank, and Caplan argue that states ought to impose financial liabilities on people who receive vaccine exemptions, since financial liabilities are especially powerful deterrents (2014).

It follows that the people who are most likely to be discouraged by more burdensome waiver application processes are likely to be people who have the least claim to receive exemptions in the first place: parents who seek waivers out of convenience or because of only mild objections. In this way, burdensome application processes for vaccine waivers serve as *imperfect proxies* for policies that distribute exemptions to people who object to vaccines for especially deep reasons. They are proxies because people who have especially deep reasons for objecting to vaccines are likely to tolerate significant burdens in order to have their children exempted from vaccine mandates. And in a world where vaccine waivers are a scarce resource, we need a method that both limits the number of exemptions that we distribute, and that distributes exemptions to people who have greatest claim to receive them. But, of course, the proxy policies I have described cannot distinguish between religious and (merely) conscientious objections, and they do not require the state to police the sincerity of parental objections. Burdensome nonmedical exemption policies can decrease nonmedical exemption rates while sidestepping these otherwise pressing questions.

I acknowledge that if the state had an easy way to determine whether someone had a religious or conscientious objection to vaccination, then it would be more fair to offer those people waivers

without making them withstand a burdensome exemption process (see e.g. Swaine 2008). But, I think the state is generally unable to make these sorts of decisions in the case of vaccine refusal (and perhaps more generally). (Among other reasons, this is because vaccine refusal does not correlate with particular forms of religious, political, or cultural identity) (Kahan 2014). So, we may have to make the waiver application process burdensome if we want to lower exemption rates while ensuring that people with a stronger claim on vaccine waivers will have the best chance of getting them.

I have described an *imperfect* proxy policy. On one hand, it may give waivers to people who do not find vaccines very objectionable, but who are willing to tolerate the burdens of the application process. On the other hand, it may deny waivers to people who are too socially disadvantaged to bear the burdens of a more burdensome application process (Wynia 2006; Sutton and Upshur 2010). For example, parents who work multiple jobs or have limited access to transportation may be unable to bring their children to the county health division offices for mandatory education sessions. Also, parents who lack internet access or computer literacy will face greater burdens when they attempt to complete vaccine webinars. Therefore, vaccine laws that require parents seeking exemptions to complete burdensome tasks may shift the burden of creating and maintaining herd immunity further onto the backs of the worst off members of society.¹¹ This is a real problem, but it may be unavoidable if we are going to reduce vaccine waiver rates.

¹ This paragraph benefited from both Conis (2015) and Colgrove (2006).

² The paradigm case is *Zucht v. King*, 260 U.S. 174 (1922), which draws on a broader defense of coercive vaccination from *Jacobson v. Massachusetts* 197 U.S. 11 (1905).

³ For a helpful summary of the relevant jurisprudence, see Reiss (2014, sec. I.A).

⁴ From personal correspondence with Kathleen Forzley, Oakland County Health Officer.

⁵ Furthermore, it is often easier for parents to latch on to popular narratives about supposed vaccine harms (e.g. ‘vaccines cause autism’) than it is to explain their true motivations, which may be opaque even to them (and which may be properly characterized as religious). Mark Largent and Elena Conis both make this point (Largent 2012; Conis 2015).

⁶ 672 F. Supp. at p. 93, quoting the parents’ complaint (alteration in the original).

⁷ Reiss (2014) favors this approach.

⁸ I discuss this further in Navin (2016, chap. four)

⁹ It is notable that Hendrix et al found that pediatricians can increase vaccination rates by emphasizing the direct benefits to the child, but that mentioning the social benefits of vaccination does not lead to increases (or decreases) in vaccination rates.

¹⁰ Along with Mark Largent and Aaron McCright (both of Michigan State University), I'm currently collecting data from Oakland County Health Division to assess whether (and perhaps why) parents who complete vaccine waiver education sessions sometimes decide to vaccinate their children. Unfortunately, our preliminary data indicate that very few parents who go through the effort of making an appointment, completing a survey, bringing their child to the public health department's offices, and sitting through an education session are willing to reconsider their decision to request waivers.

¹¹ The fact that coercive vaccination policies have historically shifted burdens onto the less well-off gives us further reason to worry about the fairness of burdensome exemption policies (Colgrove 2004, 364).

Bibliography

- Atwell, Jessica E., Josh Van Otterloo, Jennifer Zipprich, Kathleen Winter, Kathleen Harriman, Daniel A. Salmon, Neal A. Halsey, and Saad B. Omer. 2013. "Nonmedical Vaccine Exemptions and Pertussis in California, 2010." *Pediatrics*, September, peds.2013–0878.
- Blank, Nina R., Arthur L. Caplan, and Catherine Constable. 2013. "Exempting Schoolchildren From Immunizations: States With Few Barriers Had Highest Rates Of Nonmedical Exemptions." *Health Affairs* 32 (7): 1282–90.
- Brenner, Lyle A., Derek J. Koehler, and Amos Tversky. 1996. "On the Evaluation of One-Sided Evidence." *Journal of Behavioral Decision Making* 9 (1): 59–70.
- Brown, Katrina. F., J. S. Kroll, M. J. Hudson, M. Ramsay, J. Green, S. J. Long, C. A. Vincent, G. Fraser, and N. Sevdalis. 2010. "Factors Underlying Parental Decisions about Combination Childhood Vaccinations Including MMR: A Systematic Review." *Vaccine* 28 (26): 4235–48.
- Butz, Dolly. 2014. "Vaccination Exemptions on the Rise in Woodbury County." *Sioux City Journal*, January 4. http://siouxcityjournal.com/news/local/a1/vaccination-exemptions-on-the-rise-in-woodbury-county/article_9c92f125-6ce9-55bf-b4a6-d0ba937a7b9e.html.
- California Department of Public Health. 2013a. *2012-2013 Kindergarten Immunization Assessment Results*. <http://www.cdph.ca.gov/programs/immunize/Documents/2012-2013%20CA%20Kindergarten%20Immunization%20Assessment.pdf>.
- . 2013b. "Personal Beliefs Exemption to Required Immunizations." <http://eziz.org/assets/docs/CDPH-8262.pdf>.
- Centers for Disease Control and Prevention. 2013. *Vaccination Coverage Among Children in Kindergarten — United States, 2012–13 School Year*. 62(30). Morbidity and Mortality Weekly Report (MMWR). <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6230a3.htm>.
- . 2014. *Vaccination Coverage Among Children in Kindergarten — United States, 2013–14 School Year*. 63(41). Morbidity and Mortality Weekly Report (MMWR). <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6341a1.htm>.
- Choper, Jesse H. 1982. "Defining Religion in the First Amendment." *U. Ill. L. Rev.*, 579.
- Colgrove, James Keith. 2004. "Between Persuasion and Compulsion: Smallpox Control in Brooklyn and New York, 1894-1902." *Bulletin of the History of Medicine* 78 (2): 349–78.
- . 2006. *State of Immunity: The Politics of Vaccination in Twentieth-Century America*. Berkeley; New York: University of California Press.
- Conis, Elena. 2015. *Vaccine Nation*. Chicago: University Of Chicago Press.
- Constable, Catherine, Nina R. Blank, and Arthur L. Caplan. 2014. "Rising Rates of Vaccine Exemptions: Problems with Current Policy and More Promising Remedies." *Vaccine* 32 (16): 1793–97.
- Cusack, Catherine. 2013. "Religious Exemption Bid Is Last Sting in Anti-Vaccine Bag of Tricks." *Daily Telegraph*. May 26. <http://www.dailytelegraph.com.au/news/opinion/religious-exemption-bid-is-last-sting-in-anti-vaccine-bag-of-tricks/story-fni0cw15-1226650426023>.
- Dawson, Angus. 2007. "Herd Protection as a Public Good: Vaccination and Our Obligations to Others." In *Ethics, Prevention, and Public Health*, edited by Angus Dawson and Marcel Verweij, 160–78. New York: Clarendon Press, Oxford.
- Diekema, Douglas S. 2014. "Personal Belief Exemptions From School Vaccination Requirements." *Annual Review of Public Health* 35 (1): 275–92.
- Dubé, Eve, Caroline Laberge, Maryse Guay, Paul Bramadat, Réal Roy, and Julie A. Bettinger. 2013. "Vaccine Hesitancy: An Overview." *Human Vaccines & Immunotherapeutics* 9 (8): 1763–73.
- Fine, Paul E. M. 1993. "Herd Immunity: History, Theory, Practice." *Epidemiologic Reviews* 15 (2): 265–302.

- Fowler, Kelsey. 2014. "Colorado Health Organizations Recommend Making It Harder to Opt-out of Vaccinations." *The Summit Daily*, January 12. <http://www.summitdaily.com/entertainment/9720851-113/colorado-district-exemptions-personal>.
- Gahr, Pamala, Aaron S. DeVries, Gregory Wallace, Claudia Miller, Cynthia Kenyon, Kristin Sweet, Karen Martin, et al. 2014. "An Outbreak of Measles in an Undervaccinated Community." *Pediatrics*, peds – 2013.
- Gaudino, James A., and Steve Robison. 2012. "Risk Factors Associated with Parents Claiming Personal-Belief Exemptions to School Immunization Requirements: Community and Other Influences on More Skeptical Parents in Oregon, 2006." *Vaccine* 30 (6): 1132–42. doi:10.1016/j.vaccine.2011.12.006.
- Grabenstein, John D. 2013. "What the World's Religions Teach, Applied to Vaccines and Immune Globulins." *Vaccine* 31 (16): 2011–23.
- Haidt, Jonathan. 2012. *The Righteous Mind: Why Good People Are Divided by Politics and Religion*. Penguin.
- Hansen, Jane. 2013. "Real Churches Denounce Cult of Anti-Vaccine." *DailyTelegraph*, June 9. <http://www.dailytelegraph.com.au/news/nsw/real-churches-denounce-cult-of-anti-vaccine/story-fni0cx12-1226660589245>.
- Hendrix, Kristin S., S. Maria E. Finnell, Gregory D. Zimet, Lynne A. Sturm, Kathleen A. Lane, and Stephen M. Downs. 2014. "Vaccine Message Framing and Parents' Intent to Immunize Their Infants for MMR." *Pediatrics* 134 (3): e675–83. doi:10.1542/peds.2013-4077.
- Hoven, Mariëtte van den. 2012. "Why One Should Do One's Bit: Thinking about Free Riding in the Context of Public Health Ethics." *Public Health Ethics* 5 (2): 154–60. doi:10.1093/phe/phs023.
- Kahan, Dan M. 2014. *Vaccine Risk Perceptions and Ad Hoc Risk Communication: An Empirical Assessment*. SSRN Scholarly Paper ID 2386034. Rochester, NY: Social Science Research Network. <http://papers.ssrn.com/abstract=2386034>.
- Kahneman, D. 2011. *Thinking, Fast and Slow*. Farrar, Straus and Giroux.
- Largent, M. A. 2012. *Vaccine: The Debate in Modern America*. Johns Hopkins University Press.
- Lee, Emily Oshima, Lindsay Rosenthal, and Gabriel Scheffler. 2013. *The Effect of Childhood Vaccine Exemptions on Disease Outbreaks*. Center for American Progress. <http://americanprogress.org/issues/healthcare/report/2013/11/14/76471/the-effect-of-childhood-vaccine-exemptions-on-disease-outbreaks/>.
- May, T., and R. D. Silverman. 2003. "Clustering of Exemptions' as a Collective Action Threat to Herd Immunity." *Vaccine* 21 (11-12): 1048–51.
- . 2005. "Free-Riding, Fairness and the Rights of Minority Groups in Exemption from Mandatory Childhood Vaccination." *Human Vaccines* 1 (1): 12–15.
- McNeil, Jr., Donald G. 2003. "Worship Optional: Joining a Church to Avoid Vaccines." *New York Times*, January 14. <http://www.nytimes.com/2003/01/14/science/worship-optional-joining-a-church-to-avoid-vaccines.html>.
- Meissner, H. Cody, Peter M. Strebel, and Walter A. Orenstein. 2004. "Measles Vaccines and the Potential for Worldwide Eradication of Measles." *Pediatrics* 114 (4): 1065–69. doi:10.1542/peds.2004-0440.
- Michigan Department of Public Health. 2015. "Immunization Waiver Information." Accessed March 23. http://www.michigan.gov/mdch/0,4612,7-132-2942_4911_4914_68361-344843-,00.html.
- Moody, Jennifer. 2014. "Exclusion Day Coming up Feb. 19." *Albany Democrat Herald*, January 28. http://democratherald.com/news/local/exclusion-day-coming-up-feb/article_7a038050-87ea-11e3-9062-0019bb2963f4.html.

- Navin, Mark. 2016. *Values and Vaccine Refusal: Hard Questions in Ethics, Epistemology and Health Care*. New York: Routledge.
- NCSL. 2015. "States with Religious and Philosophical Exemptions from School Immunization Requirements." *National Conference of State Legislatures*. March 3. <http://www.ncsl.org/research/health/school-immunization-exemption-state-laws.aspx>.
- Nyhan, Brendan, Jason Reifler, Sean Richey, and Gary L. Freed. 2014. "Effective Messages in Vaccine Promotion: A Randomized Trial." *Pediatrics*, March, peds.2013–2365.
- Offit, Paul A. 2010. *Deadly Choices: How the Anti-Vaccine Movement Threatens Us All*. Basic Books.
- Omer, S.B., K.S. Enger, L.H. Moulton, N.A. Halsey, S. Stokley, and D.A. Salmon. 2008. "Geographic Clustering of Nonmedical Exemptions to School Immunization Requirements and Associations with Geographic Clustering of Pertussis." *American Journal of Epidemiology* 168 (12): 1389–96.
- Omer, S. B., Jennifer Richards, Michelle Ward, and Robert Bednarczyk. 2012. "Vaccination Policies and Rates of Exemption from Immunization, 2005–2011." *New England Journal of Medicine* 367 (12): 1170–71.
- Omer, S.B., D.A. Salmon, W.A. Orenstein, M.P. deHart, and N. Halsey. 2009. "Vaccine Refusal, Mandatory Immunization, and the Risks of Vaccine-Preventable Diseases." *New England Journal of Medicine* 360 (19): 1981–88.
- Opel, Douglas J., John Heritage, James A. Taylor, Rita Mangione-Smith, Halle Showalter Salas, Victoria DeVere, Chuan Zhou, and Jeffrey D. Robinson. 2013. "The Architecture of Provider-Parent Vaccine Discussions at Health Supervision Visits." *Pediatrics*, November, peds.2013–37.
- Reich, Jennifer A. 2014. "Neoliberal Mothering and Vaccine Refusal: Imagined Gated Communities and the Privilege of Choice." *Gender & Society* 28 (5): 679–704.
- Reiss, Dorit Rubinstein. 2014. "Thou Shalt Not Take the Name of the Lord Thy God in Vain: Use and Abuse of Religious Exemptions from School Immunization Requirements." *Hastings Law Journal* 65: 1551–1602.
- Rockoff, Jonathan D. 2010. "More Parents Seek Vaccine Exemption." *Wall Street Journal*, July 6, sec. New York. <http://online.wsj.com/news/articles/SB10001424052748703322204575226460746977850>.
- Rota, J. S., D. A. Salmon, L. E. Rodewald, R. T. Chen, B. F. Hibbs, and E. J. Gangarosa. 2001. "Processes for Obtaining Nonmedical Exemptions to State Immunization Laws." *American Journal of Public Health* 91 (4): 645–48.
- Sahni, Vanita, Florence Y. Lai, and Shannon E. MacDonald. 2014. "Neonatal Vitamin K Refusal and Nonimmunization." *Pediatrics* 134 (3): 497–503.
- Salmon, D.A., M. Haber, E.J. Gangarosa, L. Phillips, N.J. Smith, and R.T. Chen. 1999. "Health Consequences of Religious and Philosophical Exemptions from Immunization Laws." *JAMA: The Journal of the American Medical Association* 282 (1): 47–53.
- Salmon, Daniel A., Saad B. Omer, Lawrence H. Moulton, Shannon Stokley, M. Patricia Dehart, Susan Lett, Bryan Norman, Stephen Teret, and Neal A. Halsey. 2005. "Exemptions to School Immunization Requirements: The Role of School-Level Requirements, Policies, and Procedures." *American Journal of Public Health* 95 (3): 436–40. doi:10.2105/AJPH.2004.046201.
- Salmon, Daniel A., Jason W. Sapsin, Stephen Teret, Richard F. Jacobs, Joseph W. Thompson, Kevin Ryan, and Neal A. Halsey. 2005. "Public Health and the Politics of School Immunization Requirements." *American Journal of Public Health* 95 (5): 778–83.
- Salmon, Daniel A., and Andrew W. Siegel. 2001. "Religious and Philosophical Exemptions from Vaccination Requirements and Lessons Learned from Conscientious Objectors from Conscription." *Public Health Reports* 116 (4): 289.

- Silverman, R. D. 2003. "No More Kidding Around: Restructuring Non-Medical Childhood Immunization Exemptions to Ensure Public Health Protection." *Annals Health L.* 12: 277.
- Sutton, Erica J., and Ross EG Upshur. 2010. "Are There Different Spheres of Conscience?" *Journal of Evaluation in Clinical Practice* 16 (2): 338–43.
- Swaine, Lucas. 2008. *The Liberal Conscience: Politics and Principle in a World of Religious Pluralism*. New York: Columbia University Press.
- Thaler, Richard H., and Cass R. Sunstein. 2009. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Penguin Books.
- USA Today Editorial Board. 2014. "Vaccine Opt-Outs Put Public Health at Risk: Our View." *USA Today*, April 13. <http://www.usatoday.com/story/opinion/2014/04/13/vaccines-measles-misinformation-risks-editorials-debates/7682093/>.
- WAMC Editor. 2014. "Debate In Colorado Grows Over Child Vaccinations." *WAMC Northeast Public Radio*. January 20. <http://wamc.org/post/debate-colorado-grows-over-child-vaccinations>.
- Warner, Trevor. 2014. "New Law Changes Immunization Rules for Children." *Paradise Post*, January 24. http://www.paradisepost.com/breaking-news/ci_24988268/new-law-changes-immunization-rules-children.
- Wright, James A., and Clare Polack. 2006. "Understanding Variation in Measles–mumps–rubella Immunization Coverage—a Population-Based Study." *European Journal of Public Health* 16 (2): 137–42.
- Wynia, Matthew K. 2006. "Ethics and Public Health Emergencies: Rationing Vaccines." *The American Journal of Bioethics* 6 (6): 4–7.
- Yang, Y. Tony, and Vicky Debold. 2014. "A Longitudinal Analysis of the Effect of Nonmedical Exemption Law and Vaccine Uptake on Vaccine-Targeted Disease Rates." *American Journal of Public Health* 104 (2): 371–77.