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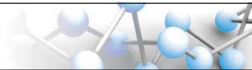

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Vaccine mandates, value pluralism, and policy diversity

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Abstract

Political communities across the world have recently sought to tackle rising rates of vaccine hesitancy and refusal, by implementing coercive immunization programs, or by making existing immunization programs more coercive. Many academics and advocates of public health have applauded these policy developments, and they have invoked ethical reasons for implementing or strengthening vaccine mandates. Others have criticized these policies on ethical grounds, for undermining liberty, and as symptoms of broader government overreach. But such arguments often obscure or abstract away from the diverse values that are relevant to the ethical justifications of particular political communities' vaccine-mandate policies. We argue for an expansive conception of the normative issues relevant to deciding whether and how to establish or reform vaccine mandates, and we propose a schema by which to organize our thoughts about the ways in which different kinds of vaccine-mandate policies implicate various values.

KEYWORDS
immunization ethics, mandatory vaccination, public health ethics, vaccine mandates, value pluralism

1 | INTRODUCTION

The fact that many countries (e.g. Australia, France, Italy, United States) have recently implemented or revised childhood vaccine mandates—while many other countries are considering similar reforms—makes it especially important to determine how best to ethically justify vaccine mandates.[1] General claims about the importance of public health, proposed tradeoffs between public health and liberty, or arguments by analogy to other kinds of justified state coercion are insufficient to provide ethical justifications for vaccine mandates. This is because these kinds of arguments presume both *too constrained* a conception of the values that vaccine mandates implicate, and *too general* a conception of vaccine mandates.

We defend two theses about how to develop a more expansive conception of the normative issues involved in deciding whether and how to establish or reform childhood vaccine mandates. First, there are many more (irreducible) values relevant to vaccine mandates than the popular and academic literatures on coercive immunization often suppose. Here, we join with others who have argued that the frameworks commonly deployed to defend public health policies often presume impoverished conceptions of the relevant normative terrains.[2] Second, arguments regarding coercive immunization usually abstract too much away from the details of particular immunization policies, and from the ways in which different kinds of vaccine-mandate policies implicate diverse ethical, social, and political values. We argue that better arguments for vaccine mandates will attend to questions about which vaccines are mandated (and under which epidemiological conditions), about the form and magnitude of sanctions for those who do not vaccinate, and about the management of enforcement and exemptions from mandates.

[1]Attwell, K., Navin, M. C., Lopalco, P. L., Jestin, C., Reiter, S., & Omer, S. B. (2018). Recent vaccine mandates in the United States, Europe and Australia: A comparative study. *Vaccine*, *36*(48), 7377–7384.

[2]Grill, K., & Dawson, A. (2017). Ethical frameworks in public health decision-making: Defending a value-based and pluralist approach. *Health Care Analysis*, *25*(4), 291–307.

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2 | VACCINE-MANDATE ARGUMENTS AND VALUE PLURALISM

Vaccine mandates can promote or undermine many things that matter in our social and political worlds. Vaccination promotes health, education, economic development, public trust, and national security, among other goods.[3] Coercive vaccination can simultaneously promote the interests of vaccinated people and prevent those who would otherwise eschew vaccination from harming vulnerable third parties. In the context of childhood vaccines, mandates can promote distributive justice by helping to fulfill society's obligations to children. Relatedly, efforts to create community protection (commonly but unhelpfully referred to as 'herd immunity')[4] can generate duties of fairness, in terms of contributing to it and not free-riding on it.[5] However, vaccine mandates can also undermine various goods, including liberty, autonomy, parental discretion, family privacy, and public trust. Vaccine mandates can also contribute to increased social and political polarization, prevent opportunities for ongoing immunization education, deny children access to formal education, limit parents' (and especially women's) labor force participation, and leave vulnerable populations of children with less state supervision.[6]

We embrace value pluralism in public health. This means not only that *many values* can be implicated by public health measures, but also that at least some of those values may not be reducible to quantities of a common supervalue, in terms of which comparative judgments between different policy options can be made.[7] We do not provide a comprehensive list of the values implicated by vaccine mandates because, as we argue below, doing so requires empirical investigations into the details of particular policies. However, we identify some of those values—and potential tradeoffs—throughout the paper. Consider, for example, that people who oppose mandatory vaccination (either generally, or in relation to a particular policy) often focus on the value of personal autonomy (or parental liberty), while those who accept vaccine mandates often invoke the value of community protection against disease. The relative importance of autonomy/liberty and community protection cannot be assessed in terms of quantities of a common value (e.g. 'quality of life', 'utility'). Tradeoffs between these values may sometimes be justified, as we discuss below, but that cannot be because doing so maximizes some overall good. We suspect that a similar kind of incommensurability is true of many of the other values that are implicated by vaccine mandates, including education, public trust, fairness, and harm prevention. Even while we accept that tradeoffs between these goods may sometimes be justified, this will not always be because these goods can be reduced to a common supervalue.

2.1 | Value monism: The limitations of utilitarianism

In previous generations, it was often common to defend public health policies on the grounds that they promoted the overall good (utility) to a greater extent than did other possible policies.[8] Utilitarian arguments for vaccine mandates claim that a world with higher immunization rates but with more coercion contains a greater amount of good (utility) than does a world with less coercion but lower immunization rates. Even arguments for vaccine mandates that are not explicitly utilitarian often seem to presume a utilitarian framework, given the way in which they focus on the overall number of lives saved, diseases prevented, and Quality-Adjusted Life Years (QALYs) achieved by vaccine mandates.[9] Indeed, it is common for normative arguments in the social sciences to rely on utilitarian premises, sometimes explicitly, as in the case of welfare economics, but often only implicitly, i.e. 'hidden' behind appeals to seemingly value-neutral claims about efficient outcomes.[10]

A common objection to utilitarianism is that it is committed to value *monism*—the idea that there is only one fundamental value—and that this makes utilitarianism unable to grant independent moral value to any other values (e.g. individual liberty).[11] To reduce all discussion about value tradeoffs to questions about the measurement of a single supervalue (utility) would be insufficiently attentive to value pluralism. Societies should be wary of trading some people's rights in exchange for increases in overall welfare, as utilitarianism may counsel. Contemporary guidelines for public health policy, clinical medical encounters, and human subjects research in fact prohibit the translation of such reasoning into practice.[12]

2.2 | Value dualism? Liberty as a side constraint

While utilitarian arguments still appear in debates about mandatory vaccination policies, it is more common to encounter arguments that identify liberty as a distinct (and perhaps irreducible) value that demands consideration alongside (and in opposition to) the 'greater

[3]Luyten, J., & Beutels, P. (2016). The social value of vaccination programs: Beyond cost-effectiveness. *Health Affairs*, *35*(2), 212–218.

[4]Anderson, E. J., Daugherty, M. A., Pickering, L. K., Orenstein, W. A., & Yogev, R. (2018). Protecting the community through child vaccination. *Clinical Infectious Diseases*, *67*(3), 464–471.

[5]Giubilini, A., Douglas, T., & Savulescu, J. (2018). The moral obligation to be vaccinated: Utilitarianism, contractualism, and collective easy rescue. *Medicine, Health Care and Philosophy*, *21*(4), 547–560.

[6]Attwell, K., & Smith, D. T. (2017). Parenting as politics: Social identity theory and vaccine hesitant communities. *International Journal of Health Governance*, *22*(3), 183–198; Leask, J., & Danchin, M. (2017). Imposing penalties for vaccine rejection requires strong scrutiny. *Journal of Paediatrics and Child Health*, *53*(5), 439–444; Navin, M. C., & Largent, M. A. (2017). Improving nonmedical vaccine exemption policies: Three case studies. *Public Health Ethics*, *10*(3), 225–234.

[7]Mason, E. (2018). Value pluralism. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy* (Spring 2018). Metaphysics Research Lab, Stanford University. Retrieved from https://plato.stanford.edu/archives/spr2018/entries/value-pluralism/

[8]Holland, S. (2015). *Public health ethics*. Hoboken, NJ: John Wiley & Sons.

[9]Dare, T. (1998). Mass immunisation programmes: Some philosophical issues. *Bioethics*, *12*(2), 125–149.

[10]Sen, A. (1984). *Resources, values, and development*. Cambridge, MA: Harvard University Press.

[11]Rawls, J. (1999). *A theory of justice* (rev. ed). Cambridge, MA: Belknap Press of Harvard University Press.

[12]Beauchamp, T. L., & Childress, J. F. (2001). *Principles of biomedical ethics*. New York, NY: Oxford University Press, USA; Holland, *op. cit*. note 8.

good' arguments of utilitarianism. In the contemporary public health literature, the Least Restrictive Alternative (LRA) principle is the most prominent example of a framework that provides special protection for liberty in policy deliberations, and scholars often adopt such an approach without naming it.[13] According to the LRA, when choosing between policies that are equal in other respects—and, in particular, with respect to their outcomes for public health—one should choose the policy option that least restricts liberty.[14] At the very least, the LRA calls attention to liberty as a distinct value, whose importance is not (immediately) reducible to the efficacy of a particular public health policy.

Closely connected to the LRA principle is the idea that one can rank potential policies according to how restrictive they are of liberty, and that such a ranking can aid policy deliberations. For example, the Intervention Ladder, introduced by the Nuffield Council on Bioethics, shows how one can 'move up' the ladder—and impose more restrictive policies—only if the same outcomes cannot be achieved by a less restrictive policy.[15] It is not clear whether the LRA (and the intervention ladder) expresses a commitment to value pluralism. This would depend on whether one thought that the LRA sanctions tradeoffs between public health outcomes and liberty in terms of a common value. Advocates of the LRA are silent on this question. However, in light of the wide consensus that such tradeoffs are illicit—at least when it comes to fundamental liberties—we suspect that many conceive of the LRA in a way that is consistent with at least a minimal value pluralism, i.e. according to which liberty is a fundamentally distinct value from the other values associated with public health, and that it is deserving of special protection for that reason.

Regardless of its precise conception or exact interpretation, we are skeptical about the usefulness of the LRA principle and the intervention ladder for evaluating the ethics of vaccine mandates. Consider that the LRA principle can be action-guiding only in cases in which policymakers are choosing between options that are equal in *other* morally relevant ways, i.e. other than liberty. But it is unlikely that two distinct potential public health policies will ever be equal in their promotion or undermining of other values.[16] And even if there were some public health policymaking contexts in which this were true, it seems unlikely in the case of vaccine mandates. Even small differences between vaccine mandate policies can have a significant impact on values as wide ranging as education, public trust, political stability, fairness, and women's economic status. Focusing on just one ladder (the ladder of liberty restriction) ignores the relative importance or significance of these other values and the ladders on which these values sit.

On this basis, we join others in criticizing the intervention ladder and the LRA for presupposing an excessively narrow conception of the sorts of values that are relevant to public health policies such as vaccine mandates.[17] The mere fact that a possible policy promotes public health at a minimal cost to liberty is insufficient reason to embrace that policy, given the many other values that may be undermined (or promoted) by a public health policy, such as those we identified above.[18] The failure to grant significant independent weight to those other values, but to grant special status to liberty, is a significant failure of the intervention ladder and the LRA. Certainly, liberty is important, but so are fairness and the interests of children, among many other values. We agree with Dawson and Verweij,[19] who have argued that the LRA and intervention ladder express the liberty-fetishizing views of John Stuart Mill, views that are not widely embraced, since liberty cannot be the only value worthy of special protection. Even if *some* liberties should be systematically prioritized over other values, it does not follow that *all* liberties are worthy of similar protection.

Importantly, whether *childhood* vaccine mandates implicate liberty depends on the moral and political status of a parent's discretion to make suboptimal healthcare choices for their children. Some have argued that it is inappropriate to invoke parental liberty in the context of vaccine mandates because children are owed care and protection.[20] Accordingly, whether and how to think about the role of liberty in either utilitarian or LRA frameworks for defending childhood vaccine mandates depends, at least in part, on whether one accepts parental liberty as a relevant value in the context of vaccine refusal.

2.3 | Single-value analogical arguments

A third problematic kind of ethical framework for considering vaccine mandates focuses on analogies between vaccine mandates and other forms of state coercion that are widely accepted. This method of considering (and ultimately defending) vaccine mandates does not reject value pluralism, but provides too little evidence for endorsing vaccine mandates. Consider Table 1, which outlines four examples of recent analogical arguments for vaccine mandates.

These arguments all identify a single social or political value that a justified instance of state coercion promotes, and they conclude that vaccine mandates are justified because they also promote that value.

[13] Leask & Danchin, *op. cit.* note 6.

[14] Gostin, L. O., & Wiley, L. F. (2016). *Public health law: Power, duty, restraint* (3rd ed.). Oakland, CA: University of California Press; Nuffield Council on Bioethics. (2007). *Public health: Ethical issues*. London: Nuffield Council on Bioethics. Retrieved July 15, 2019, from http://nuffieldbioethics.org/wp-content/uploads/2014/07/Public-health-ethical-issues.pdf

[15] Nuffield Council on Bioethics, *op. cit.* note 12.

[16] Saghai, Y. (2014). Radically questioning the principle of the least restrictive alternative: A reply to Nir Eyal. *International Journal of Health Policy and Management*, *3*(6), 349–350.

[17] Dawson, A. (2016). Snakes and ladders: State interventions and the place of liberty in public health policy. *Journal of Medical Ethics*, *42*(5), 510–513.

[18] Haire, B., Komesaroff, P., Leontini, R., & MacIntyre, C. R. (2018). Raising rates of childhood vaccination: The trade-off between coercion and trust. *Journal of Bioethical Inquiry*, *15*(2), 199–209.

[19] Dawson, A., & Verweij, M. (2008). The steward of the Millian state. *Public Health Ethics*, *1*(3), 193–195.

[20] Pierik, R. (2018). Mandatory vaccination: An unqualified defence. *Journal of Applied Philosophy*, *35*(2), 381–398; Bester, J. C. (2018). Not a matter of parental choice but of social justice obligation: Children are owed measles vaccination. *Bioethics*, *32*(9), 611–619.

TABLE 1 Single-value analogical arguments for vaccine mandates

Author	Example of justified state coercion	Value served	Relevance to vaccine mandates
Pierik[a]	Compelling parents to allow blood transfusions for their children	Children's medical interests	Prevent parents from allowing their children to be vulnerable to VPDs
Flanigan[b]	Criminalizing the discharge of firearms in populated areas	Harm prevention	Prevent parents from allowing their children to infect others with VPDs
Brennan[c]	Preventing ownership of bombs that have a very low risk of exploding	Reduction of risks that are not socially beneficial	Prevent parents from allowing their children to impose even small risks of infection on others
Giubilini[d]	Compelling payment of taxes	Ensure fair contributions to public projects	Contributions to community protection, avoidance of free-riding

VDP, vaccine-preventable disease.
[a]Pierik, R. (2018). Mandatory vaccination: An unqualified defence. *Journal of Applied Philosophy*, *35*(2), 381–398, note 20.
[b]Flanigan, J. (2014). A defense of compulsory vaccination. *HEC Forum*, *26*(2), 5–25.
[c]Brennan, J. (2018). A libertarian case for mandatory vaccination. *Journal of Medical Ethics*, *44*(1), 37–43.
[d]Giubilini, A. (2019). *The ethics of vaccination*. London: Palgrave Macmillan.

It counts in favor of vaccine mandates that they protect the health of vaccinated children, prevent children from infecting (or imposing an unreasonable risk of infection on) others, and contribute to community protection.[21] But in some cases these values may not provide the same weight for vaccine mandates as they provide for the instances of justified state coercion that these arguments invoke. For example, parental refusal of emergency blood transfusions can impose a 'significant risk of serious harm' on children, but vaccine refusal does not do this, at least not under conditions of robust community protection due to high vaccine coverage rates.[22] Vaccines and emergency blood transfusions both promote children's interests, but perhaps they do so to sufficiently different degrees that 'children's interests' counts less in favor of vaccine mandates than it does in favor of mandatory emergency blood transfusions.

In other cases, the values invoked by analogical arguments for vaccine mandates may tell equally (enough) *in favor of* both vaccine mandates and analog coercive policies. But this would not be enough for an ethical justification of vaccine mandates, because other values may tell *against* vaccine mandates, but not (or not as much) against the analog policy. These differences may be sufficiently robust to undermine our confidence that the ethical permissibility of the analog policy suffices to demonstrate the ethical permissibility of vaccine mandates. For example, suppose that the value of fairness counts equally in favor of government coercion to ensure tax payments as it does in favor of vaccine mandates. However, vaccine mandates can prevent children from receiving an education, block parents (usually mothers) from entering or remaining in the workforce, and prevent the state from engaging in supervision of unvaccinated children, for example by collecting data on who refuses vaccines.[23] These reasons against vaccine mandates do not tell (as much) against coercive taxation. Accordingly, a fairness-based argument for vaccine mandates—one that draws on a similarity with coercive taxation—may be less powerful than it initially appears to be.

Some brief statements about the evidentiary weight of analogical arguments may be helpful. In his *System of Logic*, John Stuart Mill argues that analogical arguments take the following shape: 'Two things resemble each other in one or more respects; a certain proposition is true of the one; therefore it is true of the other.'[24] Mill clarifies that analogical arguments are *inductive* arguments, since the probability of the truth of their conclusions depends on the degree to which the two things these arguments invoke resemble each other. When two things resemble each other closely, then it is very likely that a true statement about one will be true of the second. Consider how little evidentiary weight there is in the analogical arguments offered in defense of vaccine mandates. The *only* similarity offered is that both vaccine mandates and the analog policy (legal obligations to pay taxes, etc.) promote a *single* value. An analogical argument based on a single similarity cannot provide much inductive support for its conclusion, especially when there are many other possible dissimilarities between the cases under comparison. We are *not* claiming that vaccine mandates are ethically unjustified, or that analogical arguments for vaccine mandates must fail, but rather that such analogical arguments need substantial evidence to be successful. And, as we discuss in the next section, such evidence will have to include facts about the ways in which particular kinds of vaccine mandates implicate various social and political values.

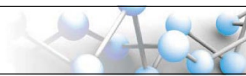
While single-value analogical arguments cannot, in our opinion, justify vaccine mandates by themselves, they can play a useful role

[21]Dawson, A. (2011). Vaccination ethics. In A. Dawson (Ed.), *Public health ethics* (pp. 143–153). Cambridge: Cambridge University Press.

[22]Diekema, D. (2004). Parental refusals of medical treatment: The harm principle as threshold for state intervention. *Theoretical Medicine and Bioethics*, *25*(4), 243–264.

[23]Leask & Danchin, *op. cit.* note 6.

[24]Mill, J. S. (1882). *A system of logic: Ratiocinative and inductive, being a connected view of the principles of evidence, and the methods of scientific investigation* (8th ed.). New York, NY: Harper and Brothers, pp. 393–394.



in broader strategies for defending mandates. In particular, they can undermine libertarian arguments against vaccine mandates. For example, some have argued that vaccine mandates are unjust because parents should have a nearly absolute right to make medical decisions for their children.[25] This argument can be defeated by (analogical) evidence that, in other contexts, the state may permissibly overrule parental discretion about their children's healthcare, for example regarding life-saving blood transfusions. Of course, whether particular vaccine mandates are justified requires further evidence and argument, and attention to the broader set of values implicated by that particular policy.

2.4 | Summary

A first step towards making better arguments about vaccine mandates is to recognize value pluralism in public health, and not to attempt to reduce all things that matter to a single value or to a tradeoff between only two values. It is fortunate that some of the most prominent frameworks for public health ethics incorporate principles that express a plurality of values.[26] In keeping with such an approach, arguments for vaccine mandates should not focus narrowly on single values (e.g. children's medical interests, harm prevention) while neglecting the impact that state coercion has on a broader set of values.

3 | VALUES AND MANDATE POLICY COMPLEXITY

A second step toward making better arguments for vaccine mandates is to focus on the different ways that particular vaccine-mandate policies operate. Rather than attempt to identify a complete list of potential vaccine-mandate policies—along with the ways in which each impacts a set of values—we offer an analysis of vaccine mandates in terms of the following set of central questions.

1. Which vaccines should be required?
2. What should be done to vaccine-refusers?
3. How should mandates be enforced or people exempted?

A set of possible vaccine-mandate policies can be constructed by considering the unique combinations of different answers to these (and other) questions, which we elaborate in a separate publication.[27] Here, though, we address the ways in which some answers to each of these questions raise distinct issues relevant to the ethical justification of vaccine mandates.

3.1 | Specific vaccines

A single value can provide different levels of support for mandating different vaccines. For example, paternalistic concern for the interests of children counts in favor of mandating all recommended vaccines, since they all provide benefits to the vaccinated child. However, concern for the interests of the (un)vaccinated child will provide more or less support for mandating different vaccines, since some vaccine-preventable diseases can be more or less harmful to unvaccinated children than can other vaccine-preventable diseases. This insight is embraced (perhaps only implicitly) by those who make disease-specific arguments for (reforming) vaccine mandates, for example those who have focused their attention on mandates for measles.[28]

A more important point is that specific vaccines can implicate different values in divergent ways. Consider how the values of the health of the (potentially) vaccinated child and preventing unvaccinated children from infecting vulnerable third parties can provide different levels of support for mandates for different vaccines. For example, tetanus is not contagious, but it can cause serious complications for an infected child. Accordingly, paternalistic concern for the vaccinated child counts in favor of tetanus mandates, while the value of preventing others from being infected by an unvaccinated person does not. In contrast, third-party harm prevention is a comparatively weightier reason for rubella vaccine mandates, since rubella is a serious threat to fetuses but is less serious for the unvaccinated adults or children who might infect pregnant women.

Whether and how a particular vaccine—or vaccine mandate—transfers or redistributes risks can cause the value of fairness to provide more or less support for coercive measures to promote that vaccine. For example, some have argued that widespread uptake of varicella vaccine can lead to higher rates of shingles infections over an interim period, due to the phenomenon of 'exogenous immune boosting'.[29] One reason why some societies, for example the U.K.,[30] have refused to add varicella vaccine to their lists of recommended or required vaccines is because they refuse to transfer risks from children (who will become immune from chickenpox and shingles) to older people (whose previous chickenpox infection makes them liable to shingles).

Many other social and political values can count in favor of mandates, but will often provide different levels of support for different vaccines. For example, personal responsibility weighs more heavily

[25] Fisher, B. L. (1997). The moral right to conscientious, philosophical and personal belief exemption to vaccination. Retrieved July 15, 2019, from http://www.nvic.org/informed-consent.aspx

[26] Childress, J. F., Faden, R. R., Gaare, R. D., Gostin, L.O., Kahn, J., Bonnie, R. J., ... Nieburg, P. (2002). Public health ethics: Mapping the terrain. *The Journal of Law, Medicine & Ethics*, *30*(2), 170–178; Powers, M., & Faden, R. R. (2006). *Social justice: The moral foundations of public health and health policy*. New York, NY: Oxford University Press.

[27] Attwell, K., & Navin, M. (forthcoming). Childhood Vaccination Mandates: Scope, Sanctions, Severity, Selectivity, and Salience. *Milbank Quarterly*.

[28] Bester, *op. cit*. note 20.

[29] Marangi, L., Mirinaviciute, G., Flem, E., Tomba, G. S., Guzzetta, G., de Blasio, B. F., & Manfredi, P. (2017). The natural history of varicella zoster virus infection in Norway: Further insights on exogenous boosting and progressive immunity to herpes zoster. *PLOS ONE*, *12*(5), e0176845.

[30] National Health Service. (2019, January 23). Chickenpox vaccine FAQs. Retrieved Apr 30, 2019, from https://www.nhs.uk/conditions/vaccinations/chickenpox-vaccine-questions-answers/

against some vaccine mandates than others, since it is easier for infected persons to control transmission of some vaccine-preventable diseases. While it is nearly impossible for a person to prevent herself from infecting others with measles, human papillomavirus (HPV) is transmitted only through intimate skin-to-skin contact, and a sexually active teen or adult who receives regular screenings for sexually transmitted infections can radically reduce her chances of infecting others. *Ex ante* coercion is therefore more justified in the case of measles vaccine than in the case of HPV vaccine, on the grounds that there is greater reason to protect liberty when people have an opportunity to take responsibility for preventing themselves from harming others.[31]

The relative weightiness of reasons for mandating (particular) vaccines will also vary (in different directions) depending on background vaccination rates. As vaccination coverage for a particular vaccine is lower, and as there is a higher risk of infection and outbreaks, paternalism and third-party harm prevention provide greater support for mandating vaccines for contagious diseases. Also, if community protection is vulnerable or nonexistent due to low vaccine coverage, then people who are unvaccinated are not free-riders. So, the value of fairness provides a less weighty reason for vaccine mandates in such circumstances. The relative weights that these values provide for vaccine mandates will move in opposite directions if vaccination coverage increases. For example, consider that the oral polio vaccine once achieved massive net short-term reductions in polio infection, but does not do so now, since rates of wild polio virus infection are so low (and have recently been exceeded by rates of vaccine-derived polio).[32] Therefore, someone will better defend this kind of vaccine mandate (e.g. for oral polio vaccine) if they can offer an account of the importance of mandatory vaccination for ensuring a fair distribution of the costs of maintaining and increasing community protection against polio.

It is striking that (arguments for) vaccine-mandate policies rarely rely on this kind of *dynamic justification*, since whether and how particular vaccine mandates promote or undermine various values depends, in part, on background immunization rates. A notable (and commendable) exception is the United States' policy for requiring immunization for immigrants, which since 2009 has stated that a vaccine can be required of immigrants to the United States only if it 'protect[s] against a disease that has been eliminated or is in the process of being eliminated in the United States'.[33]

3.2 | Diverse sanctions

Questions regarding how many and which vaccines mandatory policies should require implicate diverse values. The same is true of the means by which governments impose mandatory policies. In a separate paper,[34] we provide a detailed description of these diverse sanctions. Here, we consider some of the values that different kinds of sanctions can implicate.

The most extreme sanction is forcible vaccination, in which the state vaccinates children without their parents' permission and against their wishes. No state currently employs this kind of sanction for noncompliance, and no political community seems likely to adopt it any time soon, although New York City's government has crafted an opening for this kind of policy in its recent response to the Brooklyn measles outbreak.[35] The ethical benefits of this kind of sanction are clear: it will protect vaccinated children, promote community protection, keep children in school and daycare, and maintain parents' access to formal work. However, the ethical downsides are stark. Forcible vaccination disrupts the norms of parental liberty and consent, including by preventing parents from interfering with the state's handling of their children.

Another lever to promote compliance is to make it a crime to refuse required vaccines. In this case, vaccine-refusers cannot be members in good standing of the political community, but are criminals, since they fail to perform an unescapable legal obligation. This kind of vaccine mandate may seem to require a weighty justification because of the potential for criminal sanctions to undermine liberty, particularly if imprisonment is a possible consequence. However, the devil may lie in the details of the sanctions. While there can be a strong expressive or symbolic connotation to the criminalization of certain behaviors, criminalization can lose much of its ethical cost if the consequences are minor or easily avoidable, such as a small fine paid only once.

Another policy option conceives of vaccine refusal as a possible instance of criminal or tortious negligence.[36] In this kind of vaccine mandate, vaccination is a legally recognized duty of care rather than a legal obligation. Vaccine-refusers remain members in good standing of the political community. However, if a vaccine-refuser's intentional failure to fulfill their duty to vaccinate results in harm to other people, then the refuser may be subject to criminal or civil liability. This kind of legal sanction does not involve *ex ante* compulsion, but it uses the threat of criminal or civil liability to hold vaccine-refusers responsible for the harms they cause. This may have a significant impact on liberty, since it insists on personal responsibility for discharging a duty of care to vaccinate, and it imposes liability for harms that result from a failure to discharge that duty.

A further model for vaccine-mandate policies involves the exclusion of vaccine-refusers from social spaces to which they would otherwise have (the opportunity to) access. This includes requiring vaccination for enrollment in childcare or school, or for application

[31] Malm, H. (2015). Immigration justice and the grounds for mandatory vaccinations. *Kennedy Institute of Ethics Journal*, *25*(2), 133–147.

[32] Jorba, J., Diop, O. M., Iber, J., Henderson, E., Sutter, R. W., Wassilak, S. G. F., & Burns, C. C. (2017). Update on vaccine-derived polioviruses — worldwide, January 2016–June 2017. *MMWR. Morbidity and Mortality Weekly Report*, *66*(43), 1185–1191. https://doi.org/10.15585/mmwr.mm6643a6

[33] Centers for Disease Control and Prevention. (2009). Criteria for vaccination requirement for U.S. immigration purposes. In *Federal Register* (Vol. 74, No. 218, p. 58634). Government Printing Office. Retrieved from http://www.gpo.gov/fdsys/pkg/FR-2009-11-13/pdf/E9-27317.pdf.

[34] Attwell and Navin, *op. cit.* note 27.

[35] McNeil, D. G. (2019, April 24). New York City is requiring vaccinations against measles. Can officials do that? *The New York Times*. Retrieved from https://www.nytimes.com/2019/04/09/health/measles-outbreak-vaccinations-brooklyn.html.

[36] Caplan, A. L., Hoke, D., Diamond, N. J., & Karshenboyem, V. (2012). Free to choose but liable for the consequences: Should non-vaccinators be penalized for the harm they do? *The Journal of Law, Medicine & Ethics*, *40*(3), 606–611.

for various kinds of employment, for example military service, healthcare, education. In the case of this kind of vaccine mandate, refusers remain members in good standing of the political community, and their bodies and property are not directly threatened by the state. They are neither imprisoned nor fined, and their property is not seized if they refuse to pay fines. However, vaccine-mandate sanctions that deny people access to social goods to which they would otherwise have a right may implicate questions about distributive justice, i.e. about which social goods the state owes to its citizens, and which of those goods can be forfeited for failure to vaccinate.

3.3 | Different methods of enforcement and exemption

A further question about the ethics of vaccine-mandate policies focuses on the circumstances in which some vaccine-refusers may be excused from these policies' sanctions. Here, we can make a distinction between *selective enforcement* of vaccine mandates and legally protected *exemptions* from vaccine mandates that are protected within vaccine-mandate policies. Selective enforcement involves state agents having discretion to excuse parents from the requirement to comply with vaccine mandates, often on a case-by-case basis. By contrast, legally protected exemptions are clearly laid out in law or regulations, and parents can know in advance whether they will be able to acquire an exemption.

One powerful ethical reason for selective enforcement or exemptions is to protect conscience. A person can experience serious emotional or psychological distress if compelled to act contrary to their conscience, of if they are compelled to sacrifice something of value (e.g. their children's access to education) in order to follow their conscience. These are good reasons to think that the state should sometimes be willing to excuse conscientious objectors, i.e. as a matter of 'legislative grace', even if the 'objectionable' instance of state coercion is otherwise justified.[37] However, whether these reasons suffice to justify exemptions depends, at least in part, on the degree to which exempting objectors undermines the goals at which the 'objectionable' policy aims.[38] Community protection requires relatively high vaccination coverage rates—sometimes upwards of 90%— such that existing exemption programs may already tolerate rates of vaccine refusal that compromise community protection.[39]

States can allow people to be excused from the sanctions associated with immunization noncompliance in ways that promote other values. For example, since 2015 the state of Michigan has imposed an education requirement as part of its nonmedical exemption program.[40] The introduction of this requirement likely caused a 35% reduction in Michigan's nonmedical exemption rate between 2014 and 2015, but this reduction was mostly due to parents choosing to vaccinate, in lieu of applying for exemptions, because there is little evidence that education sessions led to behavioral changes for those who attended them.[41] But that does not mean that the education sessions served only to deter people from applying for exemptions, since education sessions allowed public health officials to cultivate *informed* refusal of vaccines, increase surveillance of vulnerable children, and promote other public health initiatives.[42]

When we are considering selective enforcement or exemption programs, a pressing question is to identify which reasons should suffice to excuse vaccine-refusers from sanctions. Perhaps religious reasons should not count, since almost no organized churches require vaccine refusal.[43] But this places the state in the position of adjudicating between a citizen and her church about how best to practice her religion, violating liberal neutrality and upsetting the division of responsibility between church and state. Accordingly, if a particular political community decides that it is all-thing-considered ethically justified to protect parents' rights to reject vaccines, then the reasons that should suffice for exemptions—and the methods used to assess objections—should be consistent with the core values and practices of that community.

Finally, we may have reasons to prefer exemptions over selective enforcement, or vice versa. The rule of law counts in favor of pre-determined categories of exemptions, since this makes legislators (or the other authors of administrative rules) responsible for identifying candidates for being excused from vaccine-mandate sanctions. We should want the state's use of its power to be predictable and stable, which tells in favor of exemptions rather than of selective enforcement. In contrast, the values of context-sensitivity and flexibility tell in favor of allowing selective enforcement of vaccine-mandate sanctions. Allowing senior public health officials or individual magistrates to make case-by-case determinations (perhaps using designated criteria) may better serve mercy and justice by empowering lower-level state authorities some discretion in enforcing laws.

4 | CONCLUSION: BETTER ETHICS ARGUMENTS ABOUT VACCINE MANDATES

We have made both negative and positive claims about the ethics of vaccine mandates. Our negative thesis is that ethics arguments about

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[42]Navin, M. C., Kozak, A. T., & Clark, E. C. (2018). The evolution of immunization waiver education in Michigan: A qualitative study of vaccine educators. *Vaccine*, *36*(13), 1751–1756.

[43]Grabenstein, J. D. (2013). What the world's religions teach, applied to vaccines and immune globulins. *Vaccine*, *31*(16), 2011–2023.

vaccine mandates are often insufficiently attentive to the diverse values implicated by vaccine-mandate policies, and to the different ways that diverse vaccine-mandate policies can implicate these values. Our positive thesis suggests corrections to these deficits. This paper consists largely of an attempt to identify the diverse values implicated by vaccine mandates, and to organize our thinking about the different ways in which vaccine-mandate policies can impact those values.

We have tried to correct what seems to be a widespread deficiency in the literature about vaccine mandates. While our aim was not to provide practical guidance for making ethics arguments about vaccine mandates, some concrete suggestions may be helpful. First, advocates of mandates should focus their arguments as narrowly as possible on particular policies or reforms within a political community. This will help to clarify which values are at stake. For example, one might focus on ethics arguments for adding HPV to a list of required vaccines, or for increasing the amount of an existing fine for people who refuse required vaccines. This kind of 'narrowing' can be easier to do by focusing on real-world policy deliberations in particular societies, since the 'live options' for introducing or reforming policies are often limited by context-specific political facts.

Second, and relatedly, when possible it is best to structure one's arguments around pairwise comparisons between potential mandate policies or reforms. When so many incommensurable values are at stake, we should not hope for arguments that provide complete rank orderings of mandate policies. However, when all our arguments need to do is to support a decision to prefer one potential policy over one or two others, then our arguments have a greater chance of success.

Finally, the arguments we make in this paper—and in a policy-focused sister paper[44]—provide additional reasons for conducting fine-grained empirical research into vaccine mandates.[45] Whether and how particular kinds of vaccine mandates implicate various social and political values depends on facts about how those policies function that are often not well known. Accordingly, ethicists may have to wait on social scientists—or do some social science, themselves—if they want to advance our understanding of the ethics of vaccine mandates.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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