dimensions of well-being or other goods, in this context we are talking about the state and parents making an ethically unconvincing tradeoff with the well-being of children. Such a tradeoff would be intended by the policy if school can only be attended when vaccinated. This tradeoff would be a burden to a particularly vulnerable group that needs any society's best attention: children. Rather than allowing tradeoffs of essential dimensions of well-being by policy design, more energy and resources have to be spent so that children get both: measles immunization and decent school education.

No doubt, during a local measles outbreak it may be necessary to close schools temporarily or, arguably, exclude nonimmunized children. Such eventualities must be followed by efforts to limit the resulting educational setback. Also, access to cinemas, amusement parks, or concert halls could be limited for nonimmunized people. Yet, to prevent children from attending school is ethically questionable, potentially discriminating against those of lower sociodemographic status who cannot organize adequate alternative education or receive exemptions.

From an ethical perspective, we conclude that herd immunity to protect against measles outbreaks is the right public health goal. However, when it comes to achieving herd immunity we are doubtful that immunization should be a prerequisite for attending school. We remain unconvinced that this is a necessary or a sufficiently effective intervention; it may be more effective to focus on other interventions that include all nonimmunized individuals, including adults. We also see ethical reasons against this unjust policy—not only because wealthier parents might de facto still be able to receive exemptions from immunization. With such a policy the state trades off, in principle, the right to decent education with the right to health. Yet both education and health present irreducible dimensions of well-being. Instead, we should strive to realize both—the right to health and the right to decent education—for everyone.

References

- Demicheli V, Rivetti A, Debalini MG, Di Pietrantonj C. Vaccines for measles, mumps and rubella in children. *Cochrane Database Syst Rev*. 2012;2(2):CD004407.
- Constable C, Blank NR, Caplan AL. Rising rates of vaccine exemptions: problems with current policy and more promising remedies. *Vaccine*. 2014;32(16):1793-1797.
- Majumder MS, Cohn EL, Mekaru SR, Huston JE, Brownstein JS. Substandard vaccination compliance and the 2015 measles outbreak. *JAMA Pediatr*. 2015;169(5):494-495.
- Robert Koch Institute. Measles: on the measles outbreaks in Berlin and Bosnia Herzegovina [in German]. *Epidemiologisches Bulletin*. 2015;5:37.
- Schröder-Bäck P, Duncan P, Sherlaw W, Brall C, Czabanowska K. Teaching seven principles for public health ethics: towards a curriculum for a short course on ethics in public health programmes. *BMC Med Ethics*. 2014;15:73.
- Schröder-Bäck P, Brand H, Escamilla I, et al. Ethical evaluation of compulsory measles immunisation as a benchmark for good health management in the European Union. *Cent Eur J Public Health*. 2009;17(4):183-186.
- Nuffield Council on Bioethics. *Public Health: Ethical Issues*. London, England: Nuffield Council on Bioethics; 2007.
- O'Neill O. Public health or clinical ethics: thinking beyond borders. *Ethics Int Aff*. 2002;16(2):35-45.
- Komrad MS. A defence of medical paternalism: maximising patients' autonomy. *J Med Ethics*. 1983;9(1):38-44.
- Gostin LO. Law, ethics, and public health in the vaccination debates: politics of the measles outbreak. *JAMA*. 2015;313(11):1099-1100.
- Powers M, Faden R. *Social Justice: The Moral Foundations of Public Health and Health Policy*. New York, NY: Oxford University Press; 2006.

Rebuttal From Prof Silverman and Dr Hendrix

Ross D. Silverman, JD, MPH; Kristin S. Hendrix, PhD; Indianapolis, IN

We agree with much of what Drs Schröder-Bäck and Martakis¹ argue in their counterpoint editorial. The benefits of vaccination outweigh any individual and societal risks accrued by remaining unvaccinated. Ethical arguments in favor of mandating measles vaccination may outweigh appeals to liberty or individual or parental autonomy. Furthermore, mandates would minimize free-riding and maximize public fairness by appropriately imposing shared burdens across society. Where we largely diverge is how we

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CONFLICT OF INTEREST: R. D. S. has, in the past 3 years, received funding for his work as a mentor in a Robert Wood Johnson Foundation/Georgia State University program on public health law education and has spoken publicly on the issue of vaccine law, policy, and ethics. K. S. H. has received grant funding from the National Institutes of Health and The Indiana University Clinical and Translational Sciences Institute Pediatric Project Development Team to study vaccine attitudes and decision-making. She has also been quoted by various public news and media outlets on the topic of childhood immunization and parental attitudes.

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would balance societal burdens when implementing policy to achieve such goals.

Implicit in their argument is an assumption that innovative implementation of incentives, societal “nudges,” or both could lead to successful attainment and maintenance of vaccination levels high enough to protect against outbreaks (herd immunity) if not ultimately eradicate measles. They state, “Our societies can afford incentives.” We have several concerns about using such an approach for measles control.

It is unclear how nudge-based policies differ from the array of public health measures² already undertaken to encourage measles vaccine uptake³ or whether such interventions are effective absent already existing public policies encouraging the healthy behavior (as with smoking bans).⁴ The direct⁵ and indirect costs society would bear while aspiring to achieve nudge-induced herd immunity are high. Public health initiatives are undertaken in systems with rationed, sometimes austere, resources. Increasing funding for resource-intensive public health campaigns, aiming to nudge the population to increase its acceptance of a vaccine long demonstrated to be highly safe and effective, demands that funding be further diverted away from other core public health and government functions, including costs associated with responding to outbreaks that would surely continue during the interim until such innovative interventions might take hold. Furthermore, absent a mandate, vaccination levels are more likely to be at risk for a precipitous drop should public confidence in measles vaccination⁶ again waver.

Our colleagues also argue their approach avoids an ethical tradeoff between education and health. We disagree, as the burden of making such tradeoffs would be shifted to those least capable of self-protection. Children living in a high exemption cluster who are unable to be vaccinated against measles would be forced to make such choices, as their public school classroom would subject them to a potentially deadly, ongoing risk. Their approach preferences the right of otherwise able families to forgo parental and societal duties and opt out of vaccination over the needs of more vulnerable populations who cannot opt in and must rely upon the rest of the community for protection.

The weight and the strength of moral, scientific, legal, and economic evidence strongly supports measles vaccine uptake. Although we support pursuing innovative approaches to foster widespread

measles vaccine acceptance, as well as narrowly crafted exemption policies as an effort to balance public health and public trust, a default of an evidence-based measles vaccine mandate for children best protects public health and prioritizes the needs of the vulnerable.

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References

1. Schröder-Bäck P, Martakis K. Counterpoint: should childhood vaccination against measles be a mandatory requirement for attending school? No. *Chest*. 2015;148(4):854-856.
2. Bonell C, McKee M, Fletcher A, Wilkinson P, Haines A. One nudge forward, two steps back. *BMJ*. 2011;342:d401.
3. Jarrett C, Wilson R, O’Leary M, Eckersberger E, Larson HJ; SAGE Working Group on Vaccine Hesitancy. Strategies for addressing vaccine hesitancy: a systematic review [published online ahead of print April 17, 2015]. *Vaccine*. doi:10.1016/j.vaccine.2015.04.040.
4. House of Lords, Science and Technology Select Committee. 2nd report of session 2010-12: Behaviour change. UK Parliament website. <http://www.publications.parliament.uk/pa/ld201012/ldselect/ldsctech/179/179.pdf>. Published 2011. Accessed May 4, 2015.
5. Ortega-Sanchez IR, Vijayaraghavan M, Barskey AE, Wallace GS. The economic burden of sixteen measles outbreaks on United States public health departments in 2011. *Vaccine*. 2014;32(11):1311-1317.
6. Larson HJ, Cooper LZ, Eskola J, Katz SL, Ratzan S. Addressing the vaccine confidence gap. *Lancet*. 2011;378(9790):526-535.

Rebuttal From Drs Schröder-Bäck and Martakis

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We agree with Prof Silverman and Dr Hendrix¹ that the risks of measles outbreaks are to be taken very seriously and call for action to raise the immunization rate. We disagree, however, about how to approach this challenge. The question is if measles vaccination should be a

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CONFLICT OF INTEREST: None declared.

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