



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Cornelia Betsch, PhD
Media and Communication Science
University of Erfurt
Erfurt, Germany

Center for Empirical Research in Economics and Behavioral
Sciences
University of Erfurt
Erfurt, Germany

<https://doi.org/10.1016/j.jpeds.2021.08.018>

This work was supported by German Research Foundation (BE3970/12-1), Federal Center for Health Education, Robert Koch Institute, Leibniz Institute for Psychology, Klaus Tschira Foundation, Germany, and University of Erfurt, Germany (no award/grant numbers).

The study was conducted as part of Germany's COVID-19 Snapshot Monitoring (COSMO), a joint project of the University of Erfurt (C.B. [PI], Lars Korn, P.S., Philipp Schmid, Lisa Felgendreff, Sarah Eitze), the Robert Koch Institute (RKI; Lothar H. Wieler, Patrick Schmich), the Federal Center for Health Education (BZgA; Heidrun Thaiss, Freia De Bock), the Leibniz Institute of Psychology (ZPID; Michael Bosnjak), the Science Media Center (SMC; Volker Stollorz), the Bernhard Nocht Institute for Tropical Medicine (BNITM; Michael Ramharter), and the Yale Institute for Global Health (Saad Omer).

The research obtained ethical clearance from the University of Erfurt's Institutional Review Board (IRB) (#20200302/20200501), and all participants provided informed consent prior to data collection.

Data and the data analysis script are available at <https://doi.org/10.17605/OSF.IO/VTCPE>.

The authors declare no conflicts of interest.

References

1. Savulescu J, Giubilini A, Danchin M. Global Ethical Considerations Regarding Mandatory Vaccination in Children. *J Pediatr* [Internet] 2021;231:10-16. <https://linkinghub.elsevier.com/retrieve/pii/S0022347621000287>
2. Betsch C, Böhm R. Detrimental effects of introducing partial compulsory vaccination: experimental evidence. *Eur J Public Health* [Internet] 2016;26:378-381. <https://academic.oup.com/eurpub/article-lookup/doi/10.1093/eurpub/ckv154>
3. Sprengholz P, Betsch C, Böhm R. Reactance revisited: Consequences of mandatory and scarce vaccination in the case of COVID-19. *Appl Psychol Heal Well-Being* [Internet] 2021;aphw.12285. <https://onlinelibrary.wiley.com/doi/10.1111/aphw.12285>
4. Brehm JW. *A theory of psychological reactance*. Oxford, England: Academic Press; 1966.
5. Betsch C, Böhm R, Korn L, Holtmann C. On the benefits of explaining herd immunity in vaccine advocacy. *Nat Hum Behav* [Internet]. 2017;1:0056. Accessed January 6 2019. www.nature.com/nathumb/hav
6. Motta M, Sylvester S, Callaghan T, Lunz-Trujillo K. Encouraging COVID-19 vaccine uptake through effective health communication. *Front Polit Sci* [Internet] 2021;3. <https://www.frontiersin.org/articles/10.3389/fpos.2021.630133/full>

Reply

To the Editor:

We provided what we take to be the criteria that justify mandating vaccines for children. Our claim is that mandatory child vaccination is justified only if 3 conditions are

satisfied. First, there is a serious enough public health threat that can be addressed by vaccinating children. Second, the expected net benefit (considering also any risk posed to children) of mandatory policies is greater than the expected net benefit of the alternatives (for example, alternatives with lower risk for children). Third, the level of coercion is proportionate to the threat.

We did not claim that our criteria support mandatory vaccination against coronavirus disease 2019 (COVID-19) for children at this moment. We suggested instead that, at this stage, “the case for mandatory COVID-19 vaccination for children is not strong.”

Sprengholz and Betsch claim that the anger that a vaccine mandate would elicit might undermine motivation to vaccinate. We do not think that this ‘backfiring objection’ is a good reason against mandatory COVID-19 vaccination. Their backfiring objection would not be a sufficient reason against implementing mandatory COVID-19 vaccination for children, if at some point our 3 conditions are met.

Sprengholz and Betsch present the results of a survey of 244 German parents that shows that parents tend to be angry when asked to imagine mandatory COVID-19 vaccination policies and mandatory meningococcus B vaccination policies. That anger correlates with lower intention to vaccinate.

First, different types of mandates can be differently effective. “Mandatory vaccination” is a broad term. It indicates that some penalty or limitation of freedom is attached to the decision not to vaccinate. It can refer to very different policies. One example is withholding state childcare benefits from families who do not vaccinate their children against certain diseases (as happens in Australia with the ‘no jab, no pay’ policy). Another is preventing unvaccinated children from attending certain schools (such as in the US, or again in Australia with the ‘no jab, no play’ policy). Yet another example is fining parents of unvaccinated children who attend school (such as in Italy). Sprengholz and Betsch discuss what they call “mandatory vaccination” without further specification. It is not clear what conclusion we can draw with regard to a possible mandatory COVID-19 vaccination for children, given the different forms that this might take.

Second, there is conflicting evidence about the effectiveness of mandatory vaccination policies. In California there was a 2.8% increase in vaccine uptake among children 1 year after the introduction of school mandates.¹ When Italy introduced a 500 euro fine for parents of unvaccinated children attending school, there was a 4.4% registered increase of vaccine uptake the following year, with the actual effect of the law likely to be even greater.² However, some evidence suggests that increases in vaccine uptake after the introduction of school mandates might be a short-lived phenomenon.³ The evidence on either side of the debate is far from conclusive. The survey by Sprengholz and Betsch involves hypothetical mandatory vaccination scenarios. It is not clear that this does much to tip the balance in the interpretation of the evidence available about the real world.



Third, Sprengholz and Betsch claim that “the results were drawn from hypothetical decisions; the detrimental effects of mandatory regulations on the overall vaccination program may be even stronger in reality.” We do not see why this pre-supposition is any more plausible than the opposite one: the backfiring effect of mandatory regulations might be much weaker in reality, because people would be confronted with actual penalties. For example, suppose someone is opposed to vaccines. However, the only way to have their child enrolled in a school is by having the child vaccinated. This person might well end up vaccinating their child when they would otherwise have not done so. This hypothesis is as speculative as the one Sprengholz and Betsch put forward. But the point is that a speculation that is as plausible as its opposite does not seem a very solid basis to inform vaccination policies.

We think Sprengholz and Betsch too quickly dismiss an option - mandatory vaccination for children - that might be necessary and ethically justified at some point, even if it is not now, according to the 3 criteria we provided.

Alberto Giubilini

Oxford Uehiro Centre for Practical Ethics
University of Oxford
Oxford, United Kingdom

Julian Savulescu, PhD

Oxford Uehiro Centre for Practical Ethics
University of Oxford
Oxford, United Kingdom

Murdoch Children’s Research Institute
Melbourne, Victoria, Australia

Margie Danchin, PhD

Department of General Medicine
The Royal Children’s Hospital and Vaccine Uptake Group
Murdoch Children’s Research Institute
Melbourne, Victoria, Australia

Department of Pediatrics
University of Melbourne
Melbourne, Victoria, Australia

<https://doi.org/10.1016/j.jpeds.2021.08.019>

J.S. is funded by the Wellcome Trust (WT104848 and WT203132), and UKRI/ AHRC Ethics Accelerator (AH/V013947/1). Through his involvement with the Murdoch Children’s Research Institute, J.S. also received funding from the Victorian State Government through the Operational Infrastructure Support (OIS) Program. J.S. is a Partner Investigator on an Australian Research Council Linkage award (LP190100841, Oct 2020-2023), which involves industry partnership from Illumina and does not personally receive any funds from Illumina. A.G. was funded by UKRI/AHRC (AH/V006819/1). M.D. was funded by a David Bickart Clinician Scientist fellowship at the University of Melbourne. The other author declares no conflicts of interest.

References

1. California Department of Public Health, 2017. 2016-2017 Kindergarten Immunization Assessment—Executive Summary. Accessed July 24, 2021. <http://eziz.org/assets/docs/shotsforschool/2016-17KindergartenSummaryReport.pdf>
2. D’Ancona F, D’Amario C, Maraglino F, Rezza G, Ricciardi W, Iannazzo S. Introduction of new and reinforcement of existing compulsory vaccinations in Italy: first evaluation of the impact on vaccination coverage in 2017. *Euro Surveillance* 2018;23:1800238.
3. Abrevaya J, Mulligan K. Effectiveness of state-level vaccination mandates: evidence from the varicella vaccine. *J Health Econ* 2011;30:966-76.