

HB0699 FWA
FAVORABLE WITH AMENDMENT
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Testimony in support of MD HB0699: State and Local Government and Public Institutions of Higher Education – Proof of Vaccination – Prohibition (Vaccination by Choice Act)

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Thank you for this opportunity to speak today. I don't have a child in the Maryland primary, secondary or higher education system but I am an epidemiologist and hold the educational system in high regard. I am speaking today because parents with children at Maryland schools really cannot. They don't want to disrupt or complicate their son or daughter's transition to the wonderful world of higher ed and adulthood. During the past two years, I have collaborated with scientists and physicians on vaccine safety in adolescents and young men. As a mother of two young men, this began as a very personal question related to the emerging signal of myocarditis, or—heart inflammation. In this testimony, I provide the risk-benefit analysis that CDC should be offering as guidance.

I encourage the legislators listening to my testimony today to consider the evidence carefully and vote in favor of vaccination by choice. The public trust in health officials is at an all-time low. My own dental hygienist—a mother of four including a newborn pandemic baby—has lost all trust in vaccine guidance. Her firstborn was fully vaccinated, on time, but she has decided her infant will not be vaccinated at all. This is the precarious nature of public trust. When

evidence is flimsy, Americans notice. There is no way to conjure a risk-benefit analysis without doing the hard work of conducting good science. There are no shortcuts.

A risk-benefit analysis is critical when considering vaccines in young people who have a very low risk for bad outcomes due to either COVID or vaccination. To do a risk benefit analysis, we need some data points. First, the number of people we need to vaccinate to prevent one hospitalization for covid. The CDC has twice estimated that this number is between 9,000 to 12,000 18-29-year-olds. This hasn't been updated to account for the decreased severity of Omicron, which would at least double this number to 30-to-40,000 boosted to prevent one COVID-19 hospitalization.¹ Second, we need to know how many serious adverse events are expected when we boost that many young adults.

The rate of post-booster myocarditis in college-age males was estimated in two recent studies to be at least one in 7,000. To prevent one COVID-19 hospitalization over a 6-month period, we estimate that 31 207–42 836 young adults aged 18–29 years must receive a third mRNA vaccine. There are 40,709 students at UMD according to the University's Division of Research. Booster mandates in young adults are expected to cause a net harm: per COVID-19 hospitalization prevented, we anticipate at least 18.5 serious adverse events from mRNA vaccines, including 1.5–4.6 booster-associated myopericarditis cases in males (typically requiring

¹ Bardosh K, Krug A, Jamrozik E, et al COVID-19 vaccine boosters for young adults: a risk benefit assessment and ethical analysis of mandate policies at universities. *Journal of Medical Ethics* Published Online First: 05 December 2022. doi: 10.1136/jme-2022-108449 <https://jme.bmj.com/content/early/2022/12/05/jme-2022-108449.citation-tools>

hospitalization). We also anticipate 1430–4626 cases of grade ≥ 3 reactogenicity interfering with daily activities (although typically not requiring hospitalization).

Those who have had covid before have twice the risk of an adverse event, and four times the risk of myocarditis, making this trade-off even worse in the post-Omicron era when 98.8% of young people this age have been infected.

Although most media reports dismiss vaccination-associated myocarditis as “mild” and followed by rapid recovery, 90% of cases are hospitalized and 69% of adolescents have a condition called late gadolinium enhancement (or scarring) on the heart 3-8 months later. The long-term implications of this scar tissue on heart conduction and the risk of sudden death remains unknown.

A recent meta-analysis² of 65 studies looked at the protection from prior infection alone—not hybrid immunity—against severe disease. Protection against severe disease remained high for all variants at 90.2% for ancestral, alpha, and delta variants, and 88.9% for omicron BA.1 through 40 weeks. Protection against symptomatic illness also remained high at 45% through 40 weeks.

In contrast, the CDC shared data last week at its ACIP meeting regarding vaccine effectiveness. Among young children 3 to 5 years of age, who have the most robust immune

² COVID-19 Forecasting Team. Past SARS-CoV-2 infection protection against re-infection: a systematic review and meta-analysis. *Lancet*. February 16, 2023. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)02465-5/fulltext#.Y-70gpr4FtM.twitter](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)02465-5/fulltext#.Y-70gpr4FtM.twitter)

responses to vaccination, two doses of the monovalent Moderna vaccine was 36 to 40 percent effective against symptomatic illness 3 to 4 months after vaccination.³ Pfizer was 31 to 40 percent in the same population. In children ages 5 through 17, maximum relative effectiveness of the new bivalent booster against symptomatic infection (compared to those with primary series only) was 65 percent immediately after vaccination, waning to 53 percent by 4 to 5 months. In young adults ages 18 to 48, effectiveness was 51 percent at peak, waning to 41 percent by 4 to 5 months. In adults 50 to 64 years, the numbers are 46 to 28 percent; and for those over 65 years, 38 to 21 percent.

Bioethicists consider vaccine mandates for young people to be problematic for many reasons. Coercion erodes trust, and these are the parents of tomorrow. How will we convince them that vaccination is the right thing to do when nearly 5% are adamant about not receiving a booster? Doctors struggle for a decade to gain a 5% increase in pediatric vaccination, and we've lost ground with COVID already. Vaccination is the cornerstone of public health. My first position out of grad school was preventive health program management, and I also worked for Merck Vaccine Division in the Northeast. During this time, I focused on barrier reduction and targeted outreach to improve preventive health program engagement. I encourage you to think similarly about student health. Roll back coercive policies and pivot to investing in student and faculty *wellness*.

³ <https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2023-02/slides-02-24/COVID-07-Britton-508.pdf>

As you reflect on my testimony and your vote, consider that half the country never had vaccine or booster mandates. Other countries, including the UK and most of Europe, never mandated Covid-19 vaccines for university students. In my opinion, a better use of resources would be to focus on outreach to the students who are medically vulnerable, ensure they are linked to student health services, have ready access to testing and a ride to the clinic if needed, and case management when ill to catch worsening conditions promptly. You could also embed trained counselors in dorms to address the mental health crisis. To address the dropout disaster—more than 40% of students never graduate, disproportionately young men—think about embedding academic and life coaches who can support students in regaining wellness and finding purpose in life. I am personally pivoting to investing myself in the young generation, hoping to make a difference even if for a single person who feels invisible, undervalued, unimportant and useless.

Going forward, pushing vaccines makes less sense than ever due to the more durable protection conferred by prior infection and the compounding of risks. Focus, instead, on a future which respects students as adults, promotes personal agency and risk assessment, and engages the entire community in physical and emotional wellbeing.

Thank you for your consideration.

References

1. Bardosh K, de Figueiredo A, Gur-Arie R, Jamrozik E, Doidge JC, Lemmens T, et al. The Unintended Consequences of COVID-19 Vaccine Policy: Why Mandates, Passports, and Segregated Lockdowns May Cause more Harm than Good. SSRN. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4022798 Accessed on March 28, 2022.
2. Golembeski D. These Are the Colleges Requiring Vaccine Boosters Now. Updated March 18, 2022. Available at <https://www.bestcolleges.com/news/2021/12/14/what-colleges-require-covid-vaccine-booster-omicron/> Accessed on March 28, 2022.
3. Burt C. Calls for end to COVID-19 vaccine booster mandates growing in higher ed. January 21, 2022. Available at <https://universitybusiness.com/calls-for-end-to-covid-19-vaccine-booster-mandates-growing-in-higher-ed/> Accessed on March 28, 2022.
4. Block J. US college covid-19 vaccine mandates don't consider immunity or pregnancy, and may run foul of the law *BMJ* 2021; 373 :n1397 doi:10.1136/bmj.n1397
5. Food and Drug Administration. Emergency Use Authorization (EUA) for an Unapproved Product. September 21, 2021. Available at https://www.fda.gov/media/152432/download_page_5. Accessed on March 28, 2022.
6. Krause PR, Fleming TR, Peto R, Longini IM, Figueroa JP, Sterne JAC, et al. Considerations in boosting COVID-19 vaccine immune responses. *The Lancet*. 2021;398(10308): pp1377-1380. doi: [https://doi.org/10.1016/S0140-6736\(21\)02046-8](https://doi.org/10.1016/S0140-6736(21)02046-8)
7. Doshi P, Godlee F, Abbasi K. Covid-19 vaccines and treatments: we must have raw data, now. *BMJ* 2022;376:o102. Available at <https://www.bmj.com/content/376/bmj.o102.short> Accessed March 28, 2022.
8. Oliver S. Updates to the Evidence to Recommendation Framework: Pfizer-BioNTech and Moderna COVID-19 vaccine booster doses. ACIP Meeting. November 19, 2021. (Slide 29, 37) Available at <https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-11-19/06-COVID-Oliver-508.pdf> Accessed on March 28, 2022.
9. Oliver S. Evidence to Recommendation Framework: Pfizer-BioNTech COVID-19 Booster Dose. ACIP Meeting September 23, 2021. (Slide 45) Available at: <https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-9-23/03-COVID-Oliver.pdf> Accessed on March 28, 2022.
10. Andrews, N., Stowe, J., Kirsebom, F. et al. Effectiveness of COVID-19 booster vaccines against COVID-19-related symptoms, hospitalization and death in England. *Nat Med* (2022). <https://doi.org/10.1038/s41591-022-01699-1>
11. Bar-On YM, Goldberg Y, Mandel M, Bodenheimer O, Freedman L, Alroy-Preis S, et al. Protection against Covid-19 by BNT162b2 Booster across Age Groups. *N Eng J Med*. 2021; 385:2421-2430. DOI: 10.1056/NEJMoa2115926
12. Andrews N, Stowe J, Kirsebom F, Toffa S, Rickeard T, Gallagher E, et al. Covid-19 Vaccine Effectiveness against the Omicron (B.1.1.529) Variant. *N Eng J Med*. DOI: 10.1056/NEJMoa2119451
13. Accorsi EK, Britton A, Fleming-Dutra KE, Smith ZR, Shang N, Gordana D, et al. Association Between 3 Doses of mRNA COVID-19 Vaccine and Symptomatic Infection Caused by the SARS-CoV-2 Omicron and Delta Variants. *JAMA*. 2022;327(7):639–651. doi:10.1001/jama.2022.0470.
14. Singanayagam A, Hakki S, Dunning J, Madon KJ, Crone MA, Koycheva A, et al. Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and

- unvaccinated individuals in the UK: a prospective, longitudinal, cohort study. *The Lancet*. 2021;22(2):183-195. doi: [https://doi.org/10.1016/S1473-3099\(21\)00648-4](https://doi.org/10.1016/S1473-3099(21)00648-4).
15. Stefan Pilz, Verena Theiler-Schwetz, Christian Trummer, Robert Krause, John P.A. Ioannidis, SARS-CoV-2 reinfections: Overview of efficacy and duration of natural and hybrid immunity, *Environmental Research*. 2022;209:112911. <https://doi.org/10.1016/j.envres.2022.112911>. (<https://www.sciencedirect.com/science/article/pii/S0013935122002389>)
 16. Krug A, Stevenson J, Høeg B. BNT162b2 Vaccine-Associated Myo/Pericarditis in Adolescents: A Stratified Risk-Benefit Analysis. *Eur J Clinical Inv*. 2022. <https://doi.org/10.1111/eci.13759>.
 17. Rosenblum HG, Gee J, Liu R, Marquez PL, Zhang B, Strid P, et al. Safety of mRNA vaccines administered during the initial 6 months of the US COVID-19 vaccination programme: an observational study of reports to the Vaccine Adverse Event Reporting System and v-safe, *The Lancet Infectious Diseases* 2022. [https://doi.org/10.1016/S1473-3099\(22\)00054-8](https://doi.org/10.1016/S1473-3099(22)00054-8). (<https://www.sciencedirect.com/science/article/pii/S1473309922000548>)
 18. Sharff KA, Dancoes DM, Longueil JL, Lewis PF, Johnson ES. Myopericarditis after COVID-19 Booster Dose Vaccination. *Am J Card*. March 26, 2022. <https://doi.org/10.1016/j.amjcard.2022.02.039>
 19. Friedensohn L, Levin D, Fadlon-Derai M, et al. Myocarditis Following a Third BNT162b2 Vaccination Dose in Military Recruits in Israel. *JAMA*. Published online March 17, 2022. doi:10.1001/jama.2022.4425.
 20. Beatty AL, Peyser ND, Butcher XE, et al. Analysis of COVID-19 Vaccine Type and Adverse Effects Following Vaccination. *JAMA Netw Open*. 2021;4(12):e2140364. doi:10.1001/jamanetworkopen.2021.40364
 21. Barda N, Dagan N, Ben-Shlomo Y, Kepten E, Waxman J, Ohana R. Safety of the BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Setting. *N Engl J Med* 2021; 385:1078-1090. <https://www.nejm.org/doi/full/10.1056/nejmoa2110475>
 22. CDC. Grading of Recommendations, Assessment, Development, and Evaluation (GRADE): Pfizer-BioNTech, Moderna, and Janssen COVID-19 booster doses. October 29, 2021. Available at <https://www.cdc.gov/vaccines/acip/recs/grade/covid-19-booster-doses.html#table-03a>
 23. Ulloa AC, Buchan SA, Daneman N, Brown KA. Estimates of SARS-CoV-2 Omicron Variant Severity in Ontario, Canada. *JAMA*. Published online February 17, 2022. doi:10.1001/jama.2022.2274.
 24. Hause AM, Baggs J, Marquez P, et al. Safety Monitoring of COVID-19 Vaccine Booster Doses Among Adults — United States, September 22, 2021–February 6, 2022. *MMWR Morb Mortal Wkly Rep* 2022;71:249–254. DOI: <http://dx.doi.org/10.15585/mmwr.mm7107e1>
 25. [Preprint] Sharff KA, Dancoes DM, Longueil JL, Johnson ES, Lewis PF. Risk of Myopericarditis following COVID-19 mRNA vaccination in a Large Integrated Health System: A Comparison of Completeness and Timeliness of Two Methods. medRxiv. <https://www.medrxiv.org/content/10.1101/2021.12.21.21268209v1.full.pdf>
 26. Witberg G, Barda N, Hoss S, Richter I, Weissman M, Aviv Y, et al. Myocarditis after Covid-19 Vaccination in a Large Health Care Organization. *N Engl J Med* 2021; 385:2132-2139. <https://www.nejm.org/doi/full/10.1056/NEJMoa2110737>
 27. Schauer J, Buddhe S, Gulhane A, Chikkabyrappa SM, Law Y, Portman MA, et al. Persistent Cardiac MRI Findings in a Cohort of Adolescents with post COVID-19 mRNA vaccine myopericarditis. *The J of Pediatrics*. 2022. In Press. Available at <https://doi.org/10.1016/j.jpeds.2022.03.032> Accessed on March 28, 2022.

28. Patone M, Mei XW, Handunnetthi L, Dixon S, Zaccardi F, Shankar-Hari M, et al. Risk of myocarditis following sequential COVID-19 vaccinations by age and sex. medRxiv. Available at <https://www.medrxiv.org/content/10.1101/2021.12.23.21268276v1> Accessed on March 28, 2022.
29. Bridget M Williams, The Ethics of Selective Mandatory Vaccination for COVID-19, *Public Health Ethics*. 2021;; phab028, <https://doi.org/10.1093/phe/phab028>
30. Havergal C. No Plans to Require Vaccines at English Universities. *Inside Higher Ed*. August 6, 2021. Available at <https://www.insidehighered.com/news/2021/08/06/no-plans-require-vaccines-english-universities> Accessed on March 28, 2022.

Footnotes:

Restricted academic and social services:

Olivier, M. Emory restricts WiFi for students noncompliant with booster requirements, sees slight increase in COVID-19 cases. *The Emory Wheel*. 2022; 4: 6. Available from <https://emorywheel.com/emory-restricts-wifi-for-students-noncompliant-with-booster-requirements-sees-slight-increase-in-covid-19-cases/> [Cited April 6, 2022.]

Deportation:

Braganca, D. Stanford to International Students: Get the Booster or Face Deportation | Opinion. *Newsweek* March 31, 2022. Available at <https://www.newsweek.com/stanford-international-students-get-booster-face-deportation-opinion-1693073>

Lack of compensation for vaccine injury:

Haelle T. Why is it so hard to compensate people for serious vaccine side effects? *National Geographic* March 11, 2022. Available at <https://www.nationalgeographic.com/science/article/why-is-it-so-hard-to-compensate-people-for-serious-vaccine-side-effects> Accessed on March 28, 2022.