

Voluntary COVID-19 vaccination of children: a social responsibility

Margherita Brusa, Yechiel Michael Barilan

Bioethics and Law Initiative,
Tel Aviv University Faculty of
Medicine, Tel Aviv, Israel

Correspondence to

Professor Yechiel Michael
Barilan, Bioethics and Law
Initiative, Tel Aviv University
Sackler Faculty of Medicine, Tel
Aviv, Israel;
ymbarilan@gmail.com

Received 8 March 2021

Accepted 26 May 2021

ABSTRACT

Nearly 400 million adults have been vaccinated against COVID-19. Children have been excluded from the vaccination programmes owing to their lower vulnerability to COVID-19 and to the special protections that apply to children's exposure to new biological products. WHO guidelines and national laws focus on medical safety in the process of vaccine approval, and on national security in the process of emergency authorisation. Because children suffer much from social distancing, it is argued that the harms from containment measures should be factored in a broader perspective on the good of the child. Considering the available knowledge on the disease, vaccine, and coping strategies, the decision about vaccine access to children is a public responsibility. The ultimate choice is a matter of paediatric informed consent. Moreover, jurisdictions that permit non-participation in established childhood vaccination programmes should also permit choice of vaccines outside of the approved programmes. Even if vaccine supply is too short to cover the paediatric population, the a priori exclusion of children is unjust. It may also exacerbate local and global inequalities. The second part of the paper delineates a prudent and ethical scheme for gradual incorporation of minors in vaccination programmes that includes a rigorous postvaccination monitoring. This is a theoretical paper in ethics that uses the Pfizer vaccine as a stock example, without discussing possible differences among existing vaccines. The key purpose is reflection on the good of the child in emergencies and vaccine policymaking.

INTRODUCTION

The worldwide responses to the COVID-19 pandemic—travel restrictions and social distancing—originated in the Middle Ages,¹ neither validated nor standardised by controlled trials. Actual measures have varied at the state and communal levels, being adjusted on a trial-and-error basis, bringing diverse measures of success. Numerous clinical trials with drugs and other therapeutic modalities have been disappointing. The first evidence-based intervention against COVID-19 is the vaccines recently approved. Even though many questions about long-term safety and efficacy are open, the evidence in hand is robust. With every day passing, the number of people vaccinated is growing, nearing 400 million. No alarming adverse effects have been announced from a retrospective study encompassing over a million adults,² and from 600 children aged 12–16 who received the vaccine on compassionate care basis.³ While clinical trials on adolescents are going on, Canada, USA and Israel have authorised the vaccine for adolescents over twelve years old.

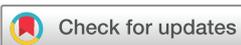
COVID-19 has affected children much less severely than adults. However, the rate of infected children and their absolute numbers seem to be increasing.⁴ About one in three children hospitalised with COVID-19 needs intensive care. Children older than twelve are at higher risk than younger children for fatal COVID-19 disease. Some experts recommend 'off-label' vaccination of children in this age group who are considered 'high-risk' (eg, Down Syndrome and Cerebral Palsy).⁵ When they get sick, children suffer from longer illness and more long-lasting symptoms and syndromes.⁶ This information was not known when the vaccine trials started. There is a higher regulatory threshold for safety data before children are exposed to new biological products. Consequently, children were not included in the vaccine clinical trials that led to their emergency approvals. Thus, our common desire to protect children has brought us to the situation in which the only effective measure against COVID-19 is out of their reach.

Even though experts question whether school closures and other mitigation strategies are necessary,⁷ children all over the world pay a high price in terms of mental health, education and socialisation.^{8,9} The COVID-19 school closures that have affected over a billion children, pose an imminent threat to child health and well-being, particularly for those living in poverty.¹⁰ Paradoxically, we rely on low-quality of evidence when harming children by school deprivation and social distancing, while we insist on a remarkably high level of safety data to benefit them with vaccination.

In this article, we present an argument in favour of the inclusion of children in the vaccination programmes and delineate an ethical way of doing so gradually. Perhaps, clinical trials on children will bring vaccine approval soon. However, the argument is worth considering, especially for future crises. This is a theoretical paper in ethics that takes the Pfizer vaccine as a stock example, avoiding comparative discussion of possible differences among vaccines.

The argument for the vaccination of children

Contemporary childhood vaccines have been developed in circumstances of small eruptions and overall low rate of disease incidence. The harm-benefit balance has been divided into 'direct' versus 'indirect'. Direct benefits are reductions in morbidity and mortality from the disease; indirect benefits include protection of others by reducing spread.¹¹ Reduction of overall stress and economic damage may be considered indirect benefits too. Vaccine regulation and clinical trials have focused on direct benefits and harms. We contend that the



© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Brusa M, Barilan YM. *J Med Ethics* Epub ahead of print: [please include Day Month Year]. doi:10.1136/medethics-2021-107370

circumstances of the COVID-19 pandemic compel us to consider school closures, social distancing, and the economic toll on families as direct burdens on children.

Section 351 of the 1944 US PHS Act, and the WHO's Guideline for the Clinical Evaluation of Vaccines (last version 2017),¹² whose standards have been adopted by the EU and numerous other countries, share the paradigm according to which vaccine safety is a balance between medical risks from a disease and medical risks from the vaccine.¹³ Section 564 of the Federal Food, Drug and Cosmetic Act, which is the legal source for the Emergency Use Authorization, allows the regulator to consider national security in the dissemination of vaccines and other therapeutics.

In the circumstances of the pandemic, a worrying gap has opened between harm-benefit-assessment of a vaccine by expert bodies, and the best interest of the child as a holistic value encompassing physical, psychological, social, and spiritual well-being.¹⁴ Expert panels are capable of delineating 'red lines', warning the public from specific dangers and of estimating risks. When diverse and incommensurable risks are at play, and the medical risk is vague and low, there is no scientific method for evaluating the best interest of the child. Even if this was possible epistemologically, the law compels the regulators to focus on direct benefits and harms only. Yet, the pandemic compels choice between tough alternatives. People are forced to choose between the medical risk-benefit of vaccines, and the medical, psychological, and social risks of containment measures. We do not argue for an alternative reading of the WHO guidelines and existing laws, but for a complementary conceptualization of 'harm/benefit' in times of crises. Precisely because the law does not invest the The USA Food and Drug Administration (FDA), and similar regulatory bodies with the responsibility for monitoring the harms of containment, children's access to the COVID-19 vaccine should be a matter of public policy. Furthermore, when public policy cannot help but harming children, the public has a moral duty to empower children in relation to this harm.

The initial response to the COVID-19 pandemic was harsh and blunt. It was a novel emergency about which we knew little, and no treatment existed. A year later, the emergency has evolved into a new routine; vaccines are available. The harms to children from the pandemic and the harms visited on them by measures of containment call for re-evaluation, especially in relation to social distancing, whose harm to children is universal (all children are affected) and cumulative (the longer schools are closed, the more harm accrues). Children's daily life under restrictions is not a new stable state, but a snowball that might be accelerating beyond control. These issues loom large over the future of the next generation. They will also have to defray the debts we incur while fending the pandemic off.¹

Research emerging from the year of the pandemic indicates that children and adolescents are at a higher risk than adults to suffer from anxiety and depression.¹⁵ One report from London, describes a 10 times fold rise in abusive head trauma during the lockdown.¹⁶ Suicide ideations and attempts have increased in correlation with COVID-19 stressors.¹⁷ Such publications should set off alarms as much as vaccine safety events would shock the world. Past issues and present worries about vaccine safety need be incorporated in a broader, more holistic approach to children's protection.

In this light, focus on potential biological harms of both disease and vaccines is too narrow. Medical expertise is necessary to validate data on morbidity, mortality, and vaccine safety. It is also necessary for providing a theoretical framework for reflection on vaccine risks (Russo-Williamson adaptation of the

Brad-Hill Hypothesis).¹⁸ All vaccines currently in use are given to babies and children, with an excellent safety profile.¹⁹ Validated concerns about vaccines stemmed from failures in vaccine purity, rather than biological side effects. Product purity does not seem to be an issue in contemporary well-regulated pharmaceuticals.

The new COVID-19 vaccines rely on a novel technology that does not exist in other vaccines. There is no empirical knowledge about the technology's long-term effects. Specific concerns are about triggering Multisystem Inflammatory Syndrome in Children, which is also a rare complication of COVID-19 infection. Anaphylaxis is an immediate, extreme and potentially fatal allergic reaction, which may occur following exposure to any food and drug. Such concerns should be openly communicated to the public and discussed with parents and mature children.²⁰

Imposition of social distancing might be acceptable because children can infect others; vaccination promises to benefit children by reducing or even eliminating the risk of serious disease and by rendering them much less harmful to others.²¹ Coping measures that do not pose risk to others, such as vaccination, must be left to the individuals involved. Proper paediatric informed consent should be carried out as in any other medical procedure offered to minors.

Considering the strong, yet incomplete safety and efficacy data in hand, we conclude that as long as children are harmed by containment measures, the vaccines should be available to minors. The ultimate decision requires integration of incommensurable factors—medical, social, psychological and personal. In such circumstances, decision is a matter of individual informed consent within a regulatory framework of scientifically informed public policy.

Five supportive arguments

We have argued that, even though no paediatric clinical trials can endorse the vaccination of younger population, there is already sufficient knowledge about the disease, mitigation strategies and vaccines to render the decision a reasonable personal choice. Five additional arguments support this claim:

1. The argument of consistency in relation to respect for autonomy. Usually, when the range of risk is narrow, decision is a matter of personal choice. Most countries allow parents to opt out of well-established childhood vaccination programmes. The risk of childhood vaccine refusal could be higher than the risk of vaccinating children against COVID-19. Hence, it would be inconsistent not to allow choice of vaccines that are outside of the established programme.
2. An argument of consistency in drug studies and approval. Most vaccines have been first tested and given to children. Rather, the varicella vaccine was first tested on leukaemic children, and once proved safe and effective, coverage was expanded to the whole population.²² Incidents and scandals related to drug and vaccine purity have led to a series of laws, mainly the 1902 Biologics Control Act and the creation of the Department and Division of Biologicals in 1955. The 2002 Best Pharmaceuticals for Children Act encourages paediatric clinical research and regulation.²³ The WHO launched its own programme on the development and regulation of medicines for children. However, most drugs prescribed to children have never been tested in paediatric clinical trials.²⁴ It will be inconsistent to pose stricter standards for the authorisation of the COVID-19 vaccine.
3. The argument of local justice. Children from low socio-economic backgrounds and ethnic minorities are espe-

- cially prone to COVID-19 morbidity and to the harms of social distancing.²⁵ Vaccination could mitigate these disparities.
4. The argument of global justice. The greater the number of vaccinated people, the closer society is to herd immunity and to the protection of the most vulnerable in it. In low-income and middle-income countries up to one-third of the population is under age 14. The rate reaches 50% in Niger, Mali, Chad and Angola.²⁶ Delay in the vaccination of children may stymie recovery from the pandemic and may deepen socio-economic gaps.
 5. Utilitarian considerations. Currently, emergence of mutations is the most worrisome COVID-19 related development. Waiting with children's immunisation increases the risk of mutations that outpace and evade vaccination. When the adults are already vaccinated, selection pressure will operate in a paediatric reservoir, thus cultivating variants that spread among children, and even undermine herd immunity.

A roll-down scheme for vaccinating adolescents

The maturation of the human immune system is a long and gradual process.²⁷ It is prudent to begin children's immunisation by an age group close to adults, gradually expanding coverage under active monitoring.

Laws and regulations rely on sharp boundaries. Any age limit set on access to a treatment is a legal necessity that poorly reflects biological fluidity and variability. Currently, it is legal to offer the COVID-19 vaccine to a person who is sixteen years old; but illegal to offer it to a person who is merely one month short of his or her sixteenth birthday. There is an age group close enough to the legal limit, which may wish to be vaccinated, while the reasons for its exclusion verge on the formal. When this subgroup is suffering from burdensome containment measures, there is a moral reason to invite it to trickle into the circle of vaccination.

In jurisdictions that approve vaccination above age sixteen, the first age stratum to be invited to join in will be 15 years old. Because the Emergency Authorization requires 2-month follow-up of monitoring safety data,²⁸ it is reasonable to suggest the same interval before a new, younger, age group is incorporated in the roll-down. The continuation of the roll-down and its pace will be determined by the incoming safety data, the evolution of the pandemic, and public response.

Age de-escalation is a research method in which early phase trials are conducted on a discrete age group. At a certain stage of the study, younger participants are included, especially for monitoring immune response.²⁹ In contrast, we propose gradual age de-escalation of actual access to vaccine. We refer to this scheme as a roll-down. Whereas age de-escalation is a product of research methodology, the roll-down is a product of combining public policy in emergencies with personal choice in the face of incommensurable factors. Age de-escalation seeks to gain medical knowledge; the roll-down is about citizens' empowerment in times of adversity.

Even though it might be possible to accommodate requests for vaccinations by means of compassionate care, off-label, and case-by-case deliberation, the roll-down will convey the message that vaccination of teenagers is a mainstream option, rendering the progressive expansion of coverage integral to the public health operation.

The proposal maintains the distinction between scientific evaluation of medical products on one hand, and the responsibility invested in the public and individual people

under duress, on the other hand. It might also exemplify how empowerment of personal autonomy may be part of an ethical and effective strategy in public health emergencies.

Promoting the vaccination of children when supply is too short might seem utopian. It might be possible that children will not be prioritised relative to other sections of society. However, a priori and universal exclusion of children in the name of their protection rather than by explicit processes of fair resource allocation might blind us to the full extent of their suffering from the crisis. Exclusion of pregnant women from the vaccines trials has led to similar second thoughts.³⁰ Considerations of safety need clear differentiation from considerations of justice, lest the former bias the latter. Besides, since most childhood vaccines have become cheap and accessible around the globe, the COVID-19 vaccination might also fast become affordable and practicable.

The seam between research and practice

The COVID-19 vaccines have received emergency authorisation, not approval, because the exigency of the pandemic had compelled action prior to having the evidence usually requested in terms of efficacy and safety. Good medical science and practice must strive to fill up this gap. It might be argued that the emergency authorisation has not terminated the period of clinical research, but embodies a hybrid of clinical research and clinical practice.

Whereas current monitoring of vaccine safety depends on voluntary and disperse reporting of suspected vaccine adverse effect to a controller, such as The USA Vaccine Adverse Effects Reporting System, the emergency authorisation requires an active follow-up and sharing of large-scale medical data.²² This already existing legal responsibility (at least in the USA) reasonably fits the safety concerns associated with the proposed roll-down.

Israel, which is a world pioneer in the vaccination of its adult population, signed a contract with Pfizer for sharing data on vaccinated citizens.³¹ One may argue that systematic collection of such data constitutes medical experiments on humans, necessitating approval by an Institutional Review Board,ⁱ that an 'opting out' choice should be offered to people who do not wish their data shared, and that such data must be public domain, not property of a single manufacturer. Rejecting neither of these claims, the Israeli case is an example of postvaccination active surveillance during an epidemic.

In this article, we have advocated for a holistic evaluation of the good of the child in relation to the new COVID-19 vaccine. Whereas the regulators are entrusted with the medical aspects of the vaccines, society has the political responsibility to factor in the overall impact of the pandemic on children's well-being, especially the direct harms perpetuated by the containment measures. In these unusual circumstances of vaccine introduction, we know enough about the disease, vaccine, and coping measures to envision a prudent and reasonably safe programme of children's vaccination. The roll-down proposal promotes a continuity in population coverage and protection, by involving citizens' personal choices in emergencies.

Contributors The authors wrote the paper together and revised it together.

ⁱThe first academic publication about the Israeli vaccination effort (reference 2) declares that the National IRB exempted the research from the requirement of informed consent.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article and in its references.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

REFERENCES

- 15th century Florence. *Watss S. Epidemics and history: disease, power and imperialism*. New Haven: Yale University Press, 1997.
- 2 Dagan N, Barda N, Kepten E, et al. BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting. *New England Journal of Medicine* 2021;384(15):1412–23.
- 3 The Guardian, 2021. Available: <https://www.theguardian.com/society/2021/mar/10/israel-says-600-children-given-covid-jab-had-no-serious-side-effects> [Accessed 10 Mar 2021].
- 4 CDC. COVID-19 update, 2020. Available: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/pediatric-hcp.html#print> [Accessed 30 Dec 2020].
- 5 Wong BLH, Ramsay ME, Ladhani SN. Should children be vaccinated against COVID-19 now? *Arch Dis Child* 2021. doi:10.1136/archdischild-2020-321225. [Epub ahead of print: 05 Jan 2021].
- 6 Thomson H. Children are getting long covid and being left with lasting problems. *New Scientist*, 2021. Available: <https://www.newscientist.com/article/mg24933233-600-children-are-getting-long-covid-and-being-left-with-lasting-problems/>
- 7 Tenforde MW, Fisher KA, Patel MM. Identifying Covid-19 risk through observational studies to inform control measures. *JAMA* 2021;325(14).
- 8 Lewis SJ, Munro APS, Smith GD, et al. Closing schools is not evidence based and harms children. *BMJ* 2021;372:n521.
- 9 UNICEF. COVID-19: Are children able to continue learning during school closures? 2020. Available: <https://data.unicef.org/resources/remote-learning-reachability-factsheet/> [Accessed Aug 2020].
- 10 Masonbrink AR, Hurley E. Advocating for children during the COVID-19 school closures. *Pediatrics* 2020;146(3):e20201440.
- 11 Gallagher ME, Sieben AJ, Nelson KN, et al. Indirect benefits are a crucial consideration when evaluating SARS-CoV-2 vaccine candidates. *Nat Med* 2021;27(1):4–5.
- 12 WHO. Guidelines on clinical evaluation of vaccines: regulatory expectations. Available: https://www.who.int/biologicals/expert_committee/WHO_TRS_1004_web_Annex_9.pdf?ua=1
- 13 Baylor NW, Marshall VB. Regulating and testing of vaccines. In: Plotkin SA, Orenstein W, Offit PA, eds. *Vaccines: expert consult*. 6th ed. New York: Saunders, 2012: 1427–46.
- 14 UN Committee. *UN Committee on the rights of the child. General Comment No. 14*, 2013.
- 15 Loades ME, Chatburn E, Higson-Sweeney N, et al. Rapid systematic review: the impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *J Am Acad Child Adolesc Psychiatry* 2020;59(11):1218–39.
- 16 Sidpra J, Abomeli D, Hameed B, et al. Rise in the incidence of abusive head trauma during the COVID-19 pandemic. *Arch Dis Child* 2021;106(3):e14.
- 17 Hill RM, Rufino K, Kurian S. Suicide ideation and attempts in a pediatric emergency department before and during COVID-19. *Pediatrics* 2020.
- 18 Russo F, Williamson J. Interpreting causality in the health sciences. *Int Stud Philos Sci* 2007;21(2):157–70.
- 19 Dudley MZ, Halsey NA, Omer SB, et al. The state of vaccine safety science: systematic reviews of the evidence. *Lancet Infect Dis* 2020;20(5):e80–9.
- 20 Blumenthal JA, Burns JP. Complexities of the COVID-19 vaccine and multisystem inflammatory syndrome in children. *Pediatr Investig* 2020;4:299–300.
- 21 Thomson MGet al. Interim estimates of vaccine effectiveness of BNT162b2 and mRNA-1273 COVID-19 vaccines in preventing SARS-CoV-2 infection among health care personnel, first responders, and other essential and frontline workers — eight U.S. locations, December 2020–March 2021. *MMWR* 2021;70 <https://www.cdc.gov/mmwr/volumes/70/wr/pdfs/mm7013e3-H.pdf>
- 22 Baker JP, Katz SL. Childhood vaccine development: an overview. *Pediatr Res* 2004;55(2):347–56.
- 23 Field MJ, Boat TF. *Safe and effective medicine for children: pediatric studies conducted under the best pharmaceuticals for children act and the pediatric research quality act*. Washington DC: Institute of Medicine, .
- 24 FDA. Drug research and children, 2016. Available: <https://www.fda.gov/drugs/information-consumers-and-patients-drugs/drug-research-and-children>
- 25 CDC. Health equity considerations and racial and ethnic minority groups, 2021. Available: <https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html> [Accessed 12 Feb 2021].
- 26 The world bank website. Available: https://data.worldbank.org/indicator/SP.POP.0014.TO.ZS?most_recent_value_desc=true
- 27 Simon AK, Hollander GA, McMichael A. Evolution of the immune system in humans from infancy to old age. *Proc Biol Sci* 2015;282(1821).
- 28 FDA. Emergency use authorization for vaccines explained. Available: <https://www.fda.gov/vaccines-blood-biologics/vaccines/emergency-use-authorization-vaccines-explained>
- 29 Kulkarni PS. Current topics in research ethics in vaccine studies. *Perspect Clin Res* 2013;4(1):80–3.
- 30 Kampmann B. Women and children last? Shaking up exclusion criteria for vaccine trials. *Nat Med* 2021;27(1):8–9.
- 31 The full contract, with some parts blacked-out. Available: <https://govextra.gov.il/media/30806/11221-moh-pfizer-collaboration-agreement-redacted.pdf>