OPEN ACCESS

Why we should not 'just use age' for COVID-19 vaccine prioritisation

Maxwell J Smith

Faculty of Health Sciences, Western University, London, Ontario, Canada

Correspondence to
Dr Maxwell J Smith, Western University, London, Canada; maxwell.smith@uwo.ca

Received 25 March 2021
Accepted 13 June 2021
Published Online First 9 July 2021

ABSTRACT

Older age is one of the greatest risk factors for severe outcomes from COVID-19. If we believe it is important to use limited supplies of COVID-19 vaccines to protect the most vulnerable and prevent deaths, then available doses should be allocated with significant priority to older adults. Yet, we should resist the conclusion that age should be the sole criterion for COVID-19 vaccine prioritisation or that no younger populations (eg, those under the age of 60) should be prioritised until all older adults have been vaccinated. This article examines arguments that are commonly presented to abandon 'complex' vaccine prioritisation schemes in favour of 'just using age' (eg, prioritising those 80 years of age and older and then decreasing in a 5-year age bands until the entire population has had the opportunity to be vaccinated), and articulates the ethical reasons why these arguments are not persuasive.

INTRODUCTION

Older age is one of the greatest risk factors for severe outcomes from COVID-19.[1 2] For instance, 95% of COVID-19 deaths in Canada have occurred in populations aged 60 and older.[3] If we believe it is important to use limited supplies of COVID-19 vaccines to protect the most vulnerable and prevent deaths, then available doses should be allocated with significant priority to older adults.[i] Yet, we should resist the conclusion that age should be the sole criterion for COVID-19 vaccine prioritisation or that no younger populations (eg, those under the age of 60) should be prioritised until all older adults have been vaccinated. This article examines arguments that are commonly presented to abandon 'complex' vaccine prioritisation schemes in favour of 'just using age' (eg, prioritising those 80 years of age and older and then decreasing in 5-year age bands until the entire population has had the opportunity to be vaccinated), and articulates the ethical reasons why these arguments are not persuasive.

THE MYTH THAT 'OTHER JURISDICTIONS JUST USE AGE'

First, it is important to clarify a misconception. A common refrain is that prioritising populations who are at risk of severe outcomes from COVID-19 due to underlying health conditions (eg, haematological malignancy), living in congregate living settings (eg, correctional facilities), occupation (eg, health and social care workers) or socioeconomic factors (eg, Indigenous, Black and racialised populations who have experienced a greater burden of COVID-19) irrespective of age presents a level of complexity that 'other jurisdictions' have appreciated and therefore eschewed in favour of using age alone as the basis for vaccine prioritisation.[4 5] Yet, even a cursory jurisdictional scan shows that no jurisdictions have chosen to allocate vaccines on the basis of age alone. Israel is the example perhaps most often cited where age has served as a primary criterion for vaccine prioritisation, but even it has prioritised other groups on grounds other than age, like healthcare workers, populations with underlying health conditions and essential workers.[6]

The UK is another jurisdiction often heralded as 'doing the sensible thing' and allocating vaccines 'just using age'. This is not the case. The UK has prioritised front-line health and social care workers alongside those 80 years of age and older.[7] It has also prioritised 'clinically extremely vulnerable individuals' aged 16 and older (which includes at least ten distinct population groups, such as people on immunosuppression therapies, adults on dialysis and patients deemed 'clinically extremely vulnerable' based on clinical judgement),[8] who are sequenced concurrently with populations 70 years of age and older, reflecting the similar or greater risks that the clinically extremely vulnerable face relative to those in this age bracket.[7] Many Canadian provinces, like Ontario,[9] British Columbia,[10] and Alberta,[11] and Manitoba,[12] as well as US states, like New York[13] and California,[14] as just a few salient examples, have similarly prioritised relatively long lists of populations at lower ages with high-risk health conditions in addition to other populations irrespective of their age, and sequenced such populations alongside, rather than after, older adults.

While appealing to the 'norm' or what others have done is of course not in itself a justification, it does at the very least suggest that (1) there is a degree of convergence regarding the importance of including prioritisation criteria that are not strictly age based, (2) pursuing a similar approach would not be to adopt an approach more 'complex' than other jurisdictions and (3) adopting an approach that includes a diverse range of populations outside of simple age bands can be feasible and has been done elsewhere. Doing the work of identifying

[i]This assumes that greater protection of older adults would not be conferred by vaccinating other populations, thereby reducing viral transmission leading to infections among older adults. While emerging evidence suggests that COVID-19 vaccines are effective in preventing transmission of SARS-CoV-2, it is unclear whether a vaccination strategy aiming primarily at preventing infection and/or transmission would result in the prevention of more severe illness and death as compared with a vaccination strategy aiming to vaccinate populations who are themselves at greatest risk of these severe outcomes.

Check for updates

To cite: Smith MJ. *J Med Ethics* 2022;**48**:538–541.

priority groups beyond age alone and implementing vaccine programmes capable of targeting these populations may be perceived as complex and challenging, but others have not shied away from this challenge.

APPEALS TO 'JUST USE AGE' WITH LIMITED AND ARBITRARY EXCEPTIONS

Some are willing to concede that while age should be the primary criterion for vaccine prioritisation, some limited 'exceptions' are necessary given that some populations are at great risk but do not necessarily fall into an older age category, making it untenable not to prioritise them.

The COVID-19 Science Advisory Table for the Canadian province of Ontario, which provides scientific advice to the province regarding its COVID-19 response, produced a widely publicised recommendation that vaccine distribution on the basis of neighbourhood in addition to age (ie, targeting lower age groups in neighbourhoods that have experienced higher burdens of hospitalisation and mortality) would be more efficient and equitable than vaccine distribution on the basis of age alone.[15] Such strategies have also been proposed elsewhere in the literature.[16 17] While the Science Advisory Table acknowledged that age should not serve as the sole variable for vaccine distribution, their recommendation to focus on age and neighbourhood still emboldened many to continue to argue forcefully against the prioritisation of younger adults (ie, those under 60) with underlying health conditions, populations living in congregate living settings, and essential workers. Yet, the Science Advisory Table itself acknowledged in its recommendations that special consideration should still be given to front-line healthcare workers, high-risk essential workers and specific well-defined small subgroups, such as patients on dialysis (ie, patients with high-risk health conditions) and people in homeless shelters (ie, people in high-risk congregate living settings).[18]

The selective inclusion of a limited number of priority groups to an otherwise age-based prioritisation strategy requires further scrutiny. It is easy enough to point to two population groups like dialysis patients and those in homeless shelters as populations who should be added as 'one-offs' to an otherwise age-based strategy, as such groups are clearly at greater risk and their addition will not pose significant challenges to vaccine roll-out. But, one ought to be equitable and fair when identifying other at-risk populations who might also warrant inclusion for the same reasons.[19] Why include those in shelters but not other congregate living settings that put populations at similar or even higher risk than homeless populations? Why include dialysis patients but not other high-risk health conditions that put populations at similar or greater risk than dialysis patients? If there are no principled or evidence-based reasons for prioritising some populations with high-risk health conditions, for example, and not others other than to 'keep it simple' or 'keep the list of health conditions short, even if there are additional groups at similar risk of mortality', then the decision will by definition be arbitrary. Arbitrariness is inequitable and unfair to populations with equal moral claims who end up excluded or deprioritized,[19–21] and this is to say nothing of the fact that excluding populations where evidence suggests they are at similar risk to prioritised groups could be construed as discriminatory.

EQUITY AS THE ENEMY OF SPEED AND SIMPLICITY

Failing to establish any priorities or mechanisms for prioritisation in the context of limited vaccine supply is inefficient, inequitable and unfair. So is distributing vaccines in whatever way is simply fastest.[22] Every jurisdiction that has been fortunate enough to have initiated their vaccination programmes to date has accepted trade-offs between speed in vaccine roll-out and allocating vaccines to those at greatest risk of exposure, transmission or severe outcomes. For example, it is no doubt slower to send vaccinators into long-term care homes to vaccinate elderly residents as compared with opening mass vaccination clinics and accepting all comers. Yet, this is a trade-off we are willing to accept given commitments to equity; that is, deploying vaccines in accordance with need/risk. It is also clear that if mass vaccination clinics do not incorporate equity considerations into eligibility criteria and sign-up processes, they may end up failing to maximise benefits by ignoring the disparate risks in underserved communities.[23] Furthermore, because it may take time to build capacity to vaccinate hard-to-reach or underserved populations, starting vaccination programmes earlier among these populations (via prioritisation) is likely to more rapidly achieve maximal population coverage and population health objectives. This illustrates that speed, while critically important, is not a primary aim. Rather, primary aims of vaccination programmes should consist of substantive objectives like preventing death, hospitalisation, severe disease, infection or transmission (see the section below on 'Acknowledging a plurality of vaccination programme objectives'). Speed only enters into the equation given the urgency of pursuing these objectives as rapidly as possible.

Consequently, if the primary aim of a COVID-19 vaccination programme is, for example, to prevent death, available evidence should be used to identify where risk of death is greatest. If similar or greater risk of death exists among younger individuals with a range of underlying health conditions as compared with those 60–69 years of age, for example, then equity and fairness require that we vaccinate both of these population groups as quickly as possible, not prioritise whichever group may be simpler or quicker to vaccinate to the detriment of the other, as may be the case by simply using age as a prioritisation criterion. Evidence suggests that there are a number of health conditions that place individuals at similar or greater risk than some advanced age groups. For instance, as one prominent study suggests, whereas the fully adjusted hazard ratio (HR) for COVID-19-related death for those aged 60–69 is reported as 2.40, the fully adjusted HR for organ transplant recipients (of any age) is higher at a reported 3.53, haematological malignancy diagnosed <1 year ago at 2.80, kidney function with an estimated glomerular filtration rate <30 at 2.52, and so forth.[2]

But what about circumstances where the pursuit of equity and vaccinating the 'right' population interferes with the speed of the vaccine roll-out such that another vaccination programme objective, for example, preventing the most deaths, is jeopardised? There is certainly merit in the contention that prioritising the 'right' populations can at some point begin to have marginal returns and jeopardise the benefits afforded to other populations (or the entire population) in the roll-out. In a way, this represents the classic trade-offs that must be made when simultaneously pursuing two goals, like improving overall population health and reducing inequities.[24] While present space does not permit a full exploration of this issue, it is critical to consider whether equity, speed and other vaccination programme objectives are truly at odds, or rather whether a more equitable approach is being rejected because it is more challenging. In other words, is the pursuit of speed and overall vaccination programme objectives being privileged over considerations of equity because attention to equity and inclusion of other at-risk populations are truly not possible or will severely jeopardise the vaccination programme

itself, or is it simply less burdensome to pursue a vaccine roll-out that does not grapple with the challenges of vaccinating populations who are harder to reach or whose needs are more difficult to address? Equity can be challenging to pursue and even more challenging to achieve. However, if we commit ourselves to equity, we commit ourselves to these challenges. Yet, strictly focusing on age before any other populations at similar risk are considered for vaccination would seem to neglect equity entirely.

ACKNOWLEDGING A PLURALITY OF VACCINATION PROGRAMME OBJECTIVES

Establishing vaccination programme objectives requires that we answer the following question: Where are the harm-reducing powers of COVID-19 vaccines most urgently needed?[25] Once the answer to this question is settled, vaccination priorities should be developed such that they work to achieve the objective(s).

In reality, there are many values, and therefore many objectives, that we might reasonably hope to pursue with COVID-19 vaccination programmes. While we might choose to privilege the prevention of deaths as an objective given that, unlike other harms (eg, economic deprivation), death cannot be compensated for later,[2] one must also carefully consider risks that other populations may experience with respect to severe disease, hospitalisation, infection and transmission, and account for those within a prioritisation scheme, even if this plays a more attenuated role when informing priorities. Privileging the prevention of death does not mean that we cannot also value the prevention of risks of exposure faced by essential workers, for example, or that we cannot seek to fulfil reciprocal obligations to protect healthcare workers. And it certainly does not mean that these goals cannot be pursued alongside other goals, like equity and fairness. Consequently, even if the aim of a vaccination programme was to prevent overall deaths, and even if vaccine prioritisation on the basis of age were demonstrably the best way to achieve this aim, we should still be interested in ensuring that our approach is equitable and fair, which may work to constrain or modify this approach.

SUPPLY AS A KEY VARIABLE IN VACCINE PRIORITISATION

In contexts where vaccine supply is sufficient to vaccinate the entire population in short order, there is generally no need for priority setting. Limited vaccine supply, on the other hand, requires that we think carefully about where these scarce resources should be allocated, lest they be used inefficiently, inequitably or unfairly.[26] Without setting priorities for limited COVID-19 vaccine doses, people who are at greatest risk of becoming infected, becoming severely ill, or dying from COVID-19 would have the same chance of receiving a vaccine as those who are at very low risk. This would result in inefficiencies, as the vaccines would not be used in a manner that would maximise their benefits. Inefficiencies are bad because they constitute an opportunity cost.[27] It would also result in inequities, as this approach would be indifferent to variation in people's unique needs/risks. Finally, it would result in unfairness, as there is good reason to believe that, in the absence of earmarked allocations for at-risk populations, those who experience less disadvantage would have better access to vaccines.

That setting priorities is important in the context of limited supply is obvious. Yet, what many fail to fully appreciate is that varying degrees of scarcity should be matched by varying degrees of precision or granularity in priority setting. As mentioned, sufficient supply does not generally require that we set priorities. With abundant but relatively constrained supply, even modest criteria for prioritisation, such as 'high-risk' populations first, followed by 'low-risk' populations, would work to ensure that vaccines are being used in a more efficient, equitable and fair manner. It would likely be inefficient and unnecessary in this context to establish additional criteria for prioritisation, even if it is possible to distinguish greater and lesser risk within 'high-risk' and 'low-risk' categories, as there is sufficient supply to quickly administer vaccinations to all who are eligible within these categories. This is one reason why vaccine prioritisation schemes tend to use 5 or 10-year age bands (eg, 70–79 or 75–79) rather than 1-year age bands (eg, 78–79).

Part of finding the right balance between supply and prioritisation requires an appreciation that supply affects the timing of when some segments of the population will be vaccinated. If the difference in timing for vaccine roll-out between individuals aged 70–79 and individuals aged 16–69 with high-risk health conditions was a matter of days or a few short weeks given an abundance of vaccine supply, then a simple, age-based approach could conceivably be justified, as those not falling within priority age ranges would be vaccinated soon after. The added burden and confusion that may be associated with more complicated prioritisation schemes would ostensibly not be worth it. However, if the interval between vaccinating these two groups was a matter of several months due to low vaccine supply, then one ought to think much more carefully about the relative risks between populations in order to eliminate significant differences in the timing of vaccination between populations experiencing similar risks.

The upshot of this discussion about supply is that countries like Israel, who has to date received enough vaccine to vaccinate the majority of its population,[28] has been in the more fortunate position to not have to be as exacting when setting priorities. It also shows why other countries who have received far fewer doses per capita should not necessarily look to Israel as a model for setting priorities, despite Israel's successes. If other countries with much more constrained vaccine supply were to follow the lead of countries with significantly greater vaccine supply and thereby adopt 'simpler' prioritisation schemes, there is a greater likelihood this would create or exacerbate inequities.

THE EXPRESSIVE FUNCTION OF PRIORITISATION

Finally, one should consider the expressive function that accompanies the inclusion of populations as vaccine priority groups. Identifying a population group as a priority for vaccination represents a recognition that they have an enhanced claim to be vaccinated earlier than others (even if it is simply earlier than healthy young adults). Failing to acknowledge via prioritisation the risks of exposure, infection, illness, hospitalisation or death that may exist for certain populations (eg, grocery store workers, teachers, 20-year-olds with cancer) who would not be captured earlier in age-based approaches may suggest to these populations that their heightened risks and burdens are being ignored, or worse, that they are at lesser risk and therefore less in need to be vaccinated as compared with those who have been prioritised.

For example, despite the fact that individuals with more 'common' health conditions, like diabetes or hypertension, are at greater risk of severe outcomes from COVID-19,[29] one might be inclined to think that because these conditions are relatively common in the general population (relative to advanced renal disease, for example), it would be preferable to simply open vaccination to the general public rather than go through the logistical challenges associated with prioritising individuals with

these conditions before doing so (even though there are ways to prioritise such groups in a manner that need not be logistically complex, like using the honour system to 'validate' individuals in this priority group). Yet, such populations are no doubt aware that they are at greater risk of severe outcomes due to COVID-19 relative to the general population. Consequently, failing to be prioritised at all may be perceived by such groups as an inequity and a failure to recognise their increased risk or burden. Worse still, such population groups may interpret not being prioritised as suggesting that they are at no greater risk than others, which may lead to them thinking it is less imperative that they be vaccinated.

CONCLUSION

Allocating COVID-19 vaccines on the basis of age alone represents the path of least resistance to vaccine prioritisation. While there is clearly value in maximising efficiency and administering vaccinations as rapidly as possible so as to avert as much mortality and morbidity as quickly as possible, this does not obviate the responsibility to attend to issues of equity or population needs that are more difficult to address. Attending to the needs of the underserved, marginalised, and least advantaged is often more resource intensive. Yes, it can be more challenging. Yes, it can take more planning and will be messier than simply standing up mass vaccination clinics and inviting everyone in certain age bands to get vaccinated. But while older age should play a central role in COVID-19 vaccine prioritisation given its association with severe COVID-19 outcomes, this is not sufficient warrant to neglect populations who are at similar or greater risk, and particularly those who have historically experienced discrimination, neglect or other forms of disadvantage.[30] Equity need not be the enemy of speed and simplicity, and it should militate against the adoption of the path of least resistance.

Contributors MJS was solely responsible for the conception, writing, editing and approval of this manuscript.

Funding This study was funded by WHO (grant number: 202598724).

Disclaimer The views expressed in this manuscript are my own and do not necessarily represent those of Ontario's COVID-19 Vaccine Distribution Task Force, its members, or Government of Ontario.

Competing interests MJS is currently remunerated as an appointed member to the province of Ontario's COVID-19 Vaccine Distribution Task Force, which provides advice to the provincial government regarding COVID-19 vaccine distribution, which is the subject matter of this article.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement There are no data in this work.

ORCID iD

Maxwell J Smith http://orcid.org/0000-0001-5230-0548

REFERENCES

1 United States Centre for Disease Control and Prevention. Older adults at greater risk of requiring hospitalization or dying if diagnosed with COVID-19. Available: https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/older-adults.html [Accessed 25 Mar 2021].
2 Williamson EJ, Walker AJ, Bhaskaran K, *et al*. Factors associated with COVID-19-related death using OpenSAFELY. *Nature* 2020;584(7821):430–6.
3 Government of Canada. Coronavirus disease 2019 (COVID-19): epidemiology update, 2021. Available: https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html [Accessed 25 Mar 2021].
4 CBC News. Dr. Strang 'very comfortable' age-based vaccination remains best approach, 2021. Available: https://www.cbc.ca/news/canada/nova-scotia/strang-herd-immunity-covid-vaccines-1.5956828 [Accessed 25 Mar 2021].
5 NBC News. Some states offering Covid vaccines by age. It's simpler, but is it fair? 2021. Available: https://www.nbcnews.com/health/health-news/some-states-offering-covid-vaccines-age-it-s-simpler-it-n1259014 [Accessed 25 Mar 2021].
6 Israel Ministry of Health. The first ones to have the COVID-19 vaccine within the "Ten Katef" vaccine campaign, 2020. Available: https://www.gov.il/en/departments/news/16122020-01 [Accessed 25 Mar 2021].
7 United Kingdom Department of Health and Social Care. Joint Committee on vaccination and immunisation: advice on priority groups for COVID-19 vaccination. Available: https://www.gov.uk/government/publications/priority-groups-for-coronavirus-covid-19-vaccination-advice-from-the-jcvi-30-december-2020/joint-committee-on-vaccination-and-immunisation-advice-on-priority-groups-for-covid-19-vaccination-30-december-2020#fn:1 [Accessed 25 Mar 2021].
8 United Kingdom Department of Health and Social Care. Guidance on shielding and protecting people who are clinically extremely vulnerable from COVID-19. Available: https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19 [Accessed 25 Mar 2021].
9 Government of Ontario. Ontario's COVID-19 vaccination plan, 2021. Available: https://covid-19.ontario.ca/ontarios-covid-19-vaccination-plan [Accessed 25 Mar 2021].
10 Government of British Columbia. COVID-19 immunization plan, 2021. Available: https://www2.gov.bc.ca/gov/content/covid-19/vaccine/plan#clinically-vulnerable [Accessed 25 Mar 2021].
11 Government of Alberta. COVID-19 vaccine: phase 2B, 2021. Available: https://www.alberta.ca/assets/documents/covid19-vaccine-phase-2B-eligibility-fact-sheet.pdf [Accessed 25 Mar 2021].
12 Government of Manitoba. COVID-19 vaccine: current eligibility criteria, 2021. Available: https://www.gov.mb.ca/covid19/vaccine/eligibility-criteria.html [Accessed 25 Mar 2021].
13 Government of New York. Phased distribution of the vaccine. Available: https://covid19vaccine.health.ny.gov/phased-distribution-vaccine [Accessed 25 Mar 2021].
14 Government of California. Vaccines, 2021. Available: https://covid19.ca.gov/vaccines/#California's-vaccination-plan [Accessed 25 Mar 2021].
15 Brown KA, Stall NM, Joh E. On behalf of the Ontario COVID-19 science Advisory table. A strategy for the mass distribution of COVID-19 vaccines in Ontario based on age and neighbourhood, 2021. Available: https://covid19-sciencetable.ca/sciencebrief/covid-19-vaccination-strategy-for-ontario-using-age-and-neighbourhood-based-prioritization/ [Accessed 25 Mar 2021].
16 Wrigley-Field E, Kiang MV, Riley AR. Geographically-targeted COVID-19 vaccination is more equitable than age-based thresholds alone. medRxiv 2021.
17 Stern RJ, Rafferty HF, Robert AC. Concentrating vaccines in neighborhoods with high covid-19 burden. NEJM catalyst innovations in care delivery 2021.
18 Ontario COVID-19 science Advisory table. vaccine rollout by age and neighborhood 2021.
19 Government of Ontario. Ethical framework for COVID-19 vaccine distribution, 2020. Available: https://www.ontario.ca/page/ethical-framework-covid-19-vaccine-distribution
20 Dawson A, Emanuel EJ, Parker M, *et al*. Key ethical concepts and their application to COVID-19 research. *Public Health Ethics* 2020;13(2):127–32.
21 Smith MJ. Social Justice and Health Equity: Core Ethical Values in the Health Sciences. In: *Encyclopedia of life sciences, 2*. Wiley-Blackwell, 2021.
22 Smith MJ. What constitutes success in the roll-out of COVID-19 vaccines? *The Lancet* 2021.
23 Parker WF, Persad G, Peek ME. Fair allocation at COVID-19 mass vaccination sites. *JAMA Health Forum* 2021;2(4):e210464.
24 Daniels N. Reconciling two ethics goals of public health: Reducing health disparities and improving population health. In: Mastroianni AC, Kahn JP, Kass NE, eds. *The Oxford Handbook of public health ethics*. New York: Oxford University Press, 2019.
25 Emanuel EJ, Persad G, Kern A, *et al*. An ethical framework for global vaccine allocation. *Science* 2020;369(6509):1309–12.
26 Emanuel EJ, Persad G, Upshur R, *et al*. Fair allocation of scarce medical resources in the time of Covid-19. *N Engl J Med Overseas Ed* 2020;382(21):2049–55.
27 Brighouse H. *School choice and social justice*. New York: Oxford University Press, 2000.
28 Our World in Data. Coronavirus (COVID-19) vaccinations, 2021. Available: https://ourworldindata.org/covid-vaccinations [Accessed 25 Mar 2021].
29 Government of Canada. People who are at risk of more severe disease or outcomes from COVID-19, 2020. Available: https://www.canada.ca/en/public-health/services/publications/diseases-conditions/people-high-risk-for-severe-illness-covid-19.html [Accessed 25 Mar 2021].
30 Sekalala S, Perehudoff K, Parker M, *et al*. An intersectional human rights approach to prioritising access to COVID-19 vaccines. *BMJ Glob Health* 2021;6(2):e004462.