WHO SAGE Update of Prioritization Roadmap

World Health Organization

SAGE Meeting

June 29, 2021

Background

- WHO SAGE Prioritization Roadmap published in October 2020 in anticipation of vaccine availability.
- Update needed to reflect new evidence (clinical trial and observational studies), emerging issues and early learnings from programme implementation.

Purpose of this presentation

- Provide SAGE with an update on substantive changes made to Roadmap.

Rationale:

World Health Organization

November 2020

Given the urgency and wide-ranging effects of the COVID-19 pandemic, SAGE has developed an approach to help inform deliberation around the range of recommendations that may be appropriate under different epidemiologic and vaccine supply conditions. The SAGE consensus is that currently available evidence is too limited to allow any recommendations for use of any specific vaccine against COVID-19 at this time (7 October 2020). This document should be regarded as a Roadmap for planning purposes only.

Update:

Given the urgency and wide-ranging effects of the COVID-19 pandemic, SAGE has developed an approach to help inform national policy deliberations on the range of recommendations that may be appropriate under different epidemiologic and vaccine supply conditions. Despite the support of COVAX and other donor and bilateral procurement mechanisms that have resulted in unprecedented implementation of COVID-19 vaccination programmes, most middle- and lower-income countries still face limited and often unreliable vaccine supply. Hence, there remains a need to prioritize vaccination in a pragmatic and ethical manner. While all currently recommended COVID-19 vaccines have similar and broad indications for use, countries may decide to consider specific product attributes when prioritizing vaccine use in certain populations.

Rationale:

World Health Organization

November 2020

Not applicable

Update:

The Roadmap is not proposing coverage targets to be achieved. In 2020, the Roadmap worked with assumptions of initial very limited supply in stages from 0-10%, 11-20%, and 21-50% of population, based on the expected supply of vaccines. More ambitious coverage targets have since been called for, and some countries have indeed reached higher coverage levels. WHO is currently developing a Global Vaccination Strategy that will provide considerations to countries on goals and ambitions for COVID-19 vaccination (including coverage targets) and the necessary resource requirements. The Roadmap is intended to aid prioritizing use-cases for within country-set coverage goals and supply. The Roadmap currently provides guidance up to a population coverage level of 50%.

Process of Roadmap development:

World Health Organization

November 2020

Not applicable

Update:

An update was initiated in June 2021 to incorporate new evidence and the evolving landscape of the pandemic. Using methods similar to those used to develop the original Roadmap, data on vaccine efficacy, effectiveness, immunogenicity, safety, as well as new areas, such as SARS-CoV-2 virus variants of concern (VoC), have been added to this update. The updated Roadmap was reviewed by the SAGE COVID-19 working group and RITAG chairs, and endorsed by SAGE.

Key Assumptions:

November 2020

The current degree of uncertainty regarding age-independent vaccine efficacy of any specific vaccine was considered (for example, a scenario in which the vaccine is assumed to have the same efficacy at all ages, and another scenario in which the vaccine is assumed to have much lower efficacy in older adults). However, the Roadmap relies on the underpinning assumption, supported by current modelling results, that, given the many-fold higher mortality rate among older individuals (4, 5), even a vaccine with relatively low efficacy in older adults would not significantly change the recommendations for priority use cases in older populations (6–8). If however it were determined that vaccine efficacy in older adults relative to other age groups were so low that individual protection and public health impact became significantly suboptimal, the individuals in older age groups in each scenario would likely be moved to a lower priority use case.

Update:

No longer applicable, therefore removed.

Key Assumptions:

November 2020	Update:
Similarly, it was assumed that there would not be substantive differences in vaccine efficacy in subgroups (for example, people with comorbidities that increase the risk of severe COVID-19 such as HIV-positive status).	No longer applicable, therefore removed.
The Roadmap assumes that non-pharmaceutical interventions are in place to varying degrees as vaccines are introduced and coverage expands. The Roadmap further assumes that vaccine efficacy will not deteriorate if use of non-pharmaceutical interventions is relaxed.	The Roadmap assumes that non-pharmaceutical interventions remain in place to varying degrees as vaccines are introduced and coverage expands.

Key Assumptions:

November 2020

Although a vaccine's effect on reducing transmission is an important consideration in the recommendations for use, direct evidence of impact on transmission will likely not be available when the first vaccines are authorized for use. The Roadmap assumes that at some point demonstrated evidence of vaccine effectiveness in reducing transmission will be available, sufficient to justify prioritizing vaccination of some groups on the basis of their role in transmission.

Update:

Current emerging evidence suggests that at least some vaccines reduce SARS-CoV-2 transmission. Therefore, vaccination of some groups has been prioritized based on those groups' contribution to transmission

Key Assumptions:

November 2020

Prioritization exercises undertaken for development of this Roadmap did not directly take account of severe disease, as the risk of this will be closely correlated with the risk of death. Similarly, long-term sequalae from SARS-CoV-2 infection have not been taken into account as evidence on chronic morbidity is still emerging.

Update:

Prioritization considerations for development of this Roadmap considered the risk of severe disease to be closely correlated with the risk of death. Similarly, because evidence on chronic morbidity (Post-COVID-19 condition) is still emerging, the impact of vaccines on long-term sequelae from SARS-CoV-2 infection have not been included in this update.

Key Assumptions:

November 2020

Not applicable.

Update:

Data on vaccine efficacy and effectiveness against VOCs continues to evolve. To date, most vaccines continue to exhibit reasonable effectiveness against VOCs, especially after two doses. For some VOCs effectiveness appears to be lower for symptomatic illness not associated with hospitalization and for asymptomatic infection, but is maintained at relatively high levels against severe disease (hospitalization), ICU admissions, and death.

Vaccine supply scenarios:

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November 2020

Not included

Update:

In addition, the Roadmap is not proposing coverage targets to be achieved. In 2020, the Roadmap worked with assumptions of initial very limited supply in stages from 0-10%, 11-20%, and 21-50% of population, based on the expected supply of vaccines. More ambitious coverage targets have since been called for, and some countries have indeed reached higher coverage levels. WHO is currently developing a *Global Vaccination Strategy* that will provide considerations to countries on goals and ambitions for COVID-19 vaccination (including coverage targets) and the necessary resource requirements. The Roadmap is intended to aid prioritizing use-cases for within country-set coverage goals and supply. The Roadmap currently provides guidance up to a population coverage level of 50%. Both the Prioritization Roadmap and the Global Vaccination Strategy emphasize the importance of prioritizing initial limited supply of vaccine to optimize impacts across health, socioeconomic, and equity dimensions. Opening vaccine eligibility to all without first achieving higher coverage among age and other highest priority-use groups compromises the impact that initial limited vaccine supply could otherwise secure.

Pregnant women:

World Health Organization

November 2020

Pregnant women warrant particular consideration, as this group has been disadvantaged with respect to the development and deployment of vaccines in previous pandemics. Also, specific to COVID-19, evidence is emerging that pregnant women are at elevated risk of serious disease, further increased if they have pre-existing comorbidities, and may be at elevated risk of adverse pregnancy and birth outcomes as well

Update:

Pregnant women warrant particular consideration, because the potential benefits and risks of vaccination apply not only to the health of the women themselves, but also to the health of their offspring. This group has been historically neglected in the testing and deployment of epidemic vaccines including during the current pandemic. Evidence suggests that pregnant women with COVID-19 are at higher risk of developing severe disease compared to non-pregnant women of reproductive age, with increased likelihood of intensive care unit admission and invasive ventilation. Pregnant women who are older (age 35 years and above), have a high body mass index, or have an existing comorbidity such as diabetes or hypertension, are at particular risk of serious outcomes from COVID-19. In addition, COVID-19 in pregnancy is associated with adverse outcomes affecting neonates. Pregnant women with COVID-19 have an increased risk of preterm birth and of giving birth to neonates requiring neonatal intensive care, compared to pregnant women without COVID-19.

Pregnant women:

World Health Organization

November 2020

The Roadmap currently prioritizes pregnant women as specific groups in Stage III of two epidemiologic scenarios. By that time, there should be sufficient evidence to assess whether the net benefit of COVID-19 vaccination for pregnant women (with at least some vaccine candidates) outweighs the risks of community-acquired infection and subsequent severe COVID-19. It is possible that as evidence accumulates the risks to pregnant women and to their children will be judged to be great enough to warrant offering vaccine even in the absence of pregnancy-specific evidence about vaccine risk, in which case pregnant women may be added as a priority group to Stage II. Similarly, if the pregnancy-specific risks of vaccines (which may vary with vaccine product) are determined to be higher than the risks from infection and disease, these groups will need to be prioritized for non-vaccine preventive interventions

Update:

In line with the equal respect principle in the Values Framework, pregnant women are positioned in Stage II of all epidemiological scenarios of the Roadmap, to be included as part of the “Groups with comorbidities or health states determined to be at significantly higher risk of severe disease or death”. In many contexts, especially in epidemiologic scenarios a and b, these risks are likely to be greater than any theoretical risks posed by vaccination (the available evidence does not suggest any additional vaccine risks to date). WHO recommends that countries consult the section on pregnant women in the interim guidance document for specific vaccine products when considering use of a specific vaccine during pregnancy.

Lactating women:

World Health Organization

November 2020

Currently there are no data on any risks to the infant from immunization of their lactating mothers. As data become available, recommendations on lactating women may be provided for vaccinespecific recommendations. At least one manufacturer is enrolling lactating women. As with pregnant women, it is imperative that evidence on the safety of vaccination in lactating women be quickly gathered.

Update:

Limited data for certain products are now available that suggest no risks to the infant from immunization of their lactating mothers, although evidence on the safety of vaccination in lactating women continues to be gathered. Data from small studies have demonstrated vaccine-elicited antibodies in breast milk, raising the prospect of some, short term, neonatal protection. WHO does not recommend discontinuing breastfeeding because of vaccination.

Children:

World Health Organization

November 2020

Children also warrant specific consideration for at least two reasons. Children are dependent on adults and the wider society for their well-being, and setbacks in well-being during childhood can have severe negative and sometimes permanent effects that can last a lifetime.

Update:

Children warrant special consideration for at least three reasons. Children are dependent on adults and the wider society for their well-being, severe COVID-19 although rare in children is occasionally observed, and setbacks in well-being during childhood can have severe negative effects that can be lifelong.

Children:

World Health Organization

Update:

Several trials of COVID-19 vaccine candidates in children have been initiated, are ongoing or have been completed. Regulatory authorization for some vaccines has been granted, including with paediatric age-indications, and additional paediatric authorizations may follow. To date, evidence for vaccines for which there are data supports the conclusion that they are safe and efficacious in children.

Although children are less likely to suffer from the direct impact of COVID-19 morbidity and mortality when compared to other age groups, children do have a small risk of developing severe illness and complications from COVID-19. Children infected with SARS-CoV-2 are at low risk of developing Multisystem Inflammatory Syndrome in Children (MIS-C), a severe, potentially fatal multi-organ inflammatory condition with persistent fever. The long-term effects of acute asymptomatic infections and mild disease in children are yet to be determined (post COVID-19 condition), and need to be studied to more fully evaluate the benefit of vaccinating children. Preliminary evidence suggests that the COVID-19 case fatality ratios (CFR) in children may be higher in low- and middle-income countries compared to high-income countries.

Children:

World Health Organization

Update:

In addition, infected children of all ages are capable of transmitting SARS-CoV-2 regardless of symptom status. The contribution of children under 10 to transmission is uncertain evidence is still evolving and may be context-specific.

Current evidence suggests that children with certain underlying medical conditions and infants (age <1 year) are at increased risk for severe illness from SARS-CoV-2 infection. In line with the equal respect principle in the Values Framework, children and adolescents with severe chronic comorbidities that place them at significantly higher risk of severe disease are included for vaccine prioritization in Stage II in both the Community Transmission and Sporadic Cases/Clusters of Cases epidemiologic scenarios. This subset of children and adolescents joins the use case for adult groups with significant comorbidities younger than older adults identified for priority use in Stage I (age cut-off determined at the country level). Where there is evidence that the adults in these groups are at higher risk than those 12-18 years-old, adults should be vaccinated first. Whether children and adolescents with severe chronic comorbidities will be eligible for vaccination will depend on the local availability of vaccines that have been issued an indication for use in paediatric populations by regulatory authorities.

Children:

World Health Organization

November 2020:

Although children are less subject to direct morbidity and mortality impacts of infection from SARS-CoV-2 when compared to other age groups, they have suffered significantly in other ways during the COVID-19 pandemic (27, 28). Physical distancing measures designed to decrease or prevent community transmission of SARS-CoV-2 have included withdrawing children from inperson learning at schools or closing schools altogether. The extent of learning loss and its impact on life prospects is expected to be far greater for children living in poverty or in otherwise disadvantaged groups. Beyond poor learning and constraints of life prospects from disruption in school provision, students have lost social and developmental benefits afforded by in-person learning. Schools often also provide a number of additional functions important for child health and well-being such as social interactions, meal provision and health services including immunizations and shelter from unstable or unsafe home living environments. These additional functions are especially important for children living in disadvantaged circumstances. Taken together, while all children are being harmed by educational disruptions, these effects are hitting the most disadvantaged children hardest, who also have less access to distance learning options, widening further existing inequities in child well-being (29). The health of all children, and especially low-income children, is also being threatened by COVID19-related disruptions to routine immunization and other child health programmes (30–32)

Update:

The negative impacts experienced by children during this pandemic go well beyond their personal direct risk of COVID-19 and burden of SARS-CoV-2 infection. Physical distancing measures designed to decrease or prevent community transmission of SARS-CoV-2 have included withdrawing children from in-person learning at schools or closing schools altogether. The extent of learning loss and its impact on lifetime prospects is expected to be far greater for children living in poverty or in otherwise disadvantaged groups. Beyond poor learning and constrained life prospects from disruption in school provision, students have lost social and developmental benefits afforded by in-person learning. Schools often also provide many additional functions important for child health and well-being such as social interactions, meal provisions, health services including immunizations, and shelter from unstable or unsafe home living environments. These additional benefits are especially important for children living in disadvantaged circumstances. Taken together, while all children are harmed by educational disruptions, these effects hit hardest the most disadvantaged children, who also have less access to distance learning options, widening further existing inequities in child well-being . The health of all children, and especially in low-income settings, is also threatened by COVID-19-related disruptions to routine immunization and other child health programmes.

Children:

November 2020

Although the pandemic has greatly impacted child well-being, children themselves are not directly prioritized as a population group in Table 1 for two reasons. First, trials of COVID-19 vaccine candidates in children have not yet been initiated and thus data on safety and efficacy in this age group are not expected for some time. Second, as already noted, the low risk of severe COVID-19 and death in children does not make them a high priority for direct immunization. However, child well-being is addressed within this Roadmap through the prioritization of other groups that directly contribute to child well-being. Within the Community Transmission epidemiologic scenario, health workers engaged in immunization delivery are prioritized to ensure that routine childhood immunization delivery will be safely maintained. Teachers and other adult staff employed in school settings are prioritized within this epidemiologic scenario as well to facilitate the full reopening of in-school education.

Update:

Child well-being continues to be addressed in the Roadmap through the prioritized vaccine use by other groups that directly contribute to child welfare. Within the Community Transmission epidemiologic scenario, vaccination of health workers engaged in immunization delivery is prioritized in Stage II (limited vaccine availability) to ensure that delivery of routine childhood vaccines is safely maintained. To facilitate the full reopening of in-school education, vaccination of some teachers and other adult staff employed in school settings is also prioritized in Stage II, and as are remaining school staff in Stage III (moderate vaccine availability). However, there is substantial evidence that schools can reopen safely without vaccinating children, particularly in the presence of other risk mitigation strategies.

WHO Roadmap for vaccine prioritisation in settings without community transmission (epidemiological scenarios b & c)

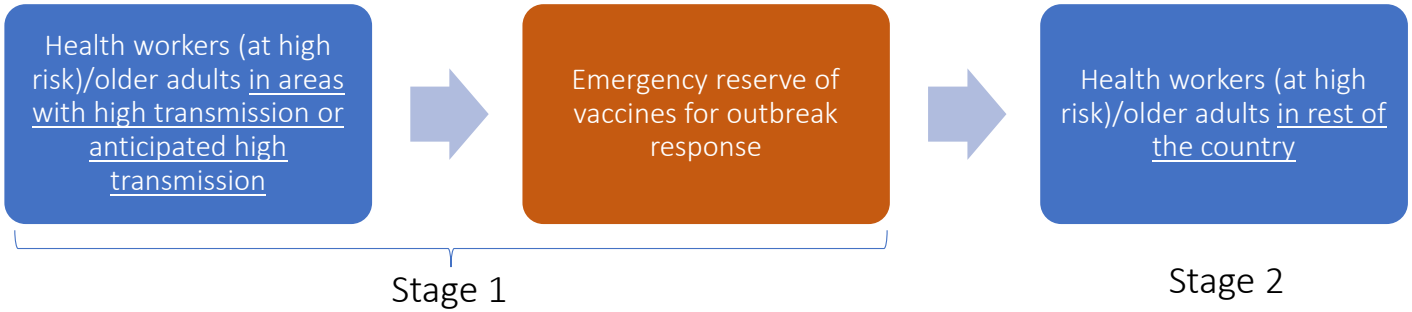
i. transmission prevention
ii. vaccine reserve for outbreak response

Scenario c (no cases): transmission prevention strategy

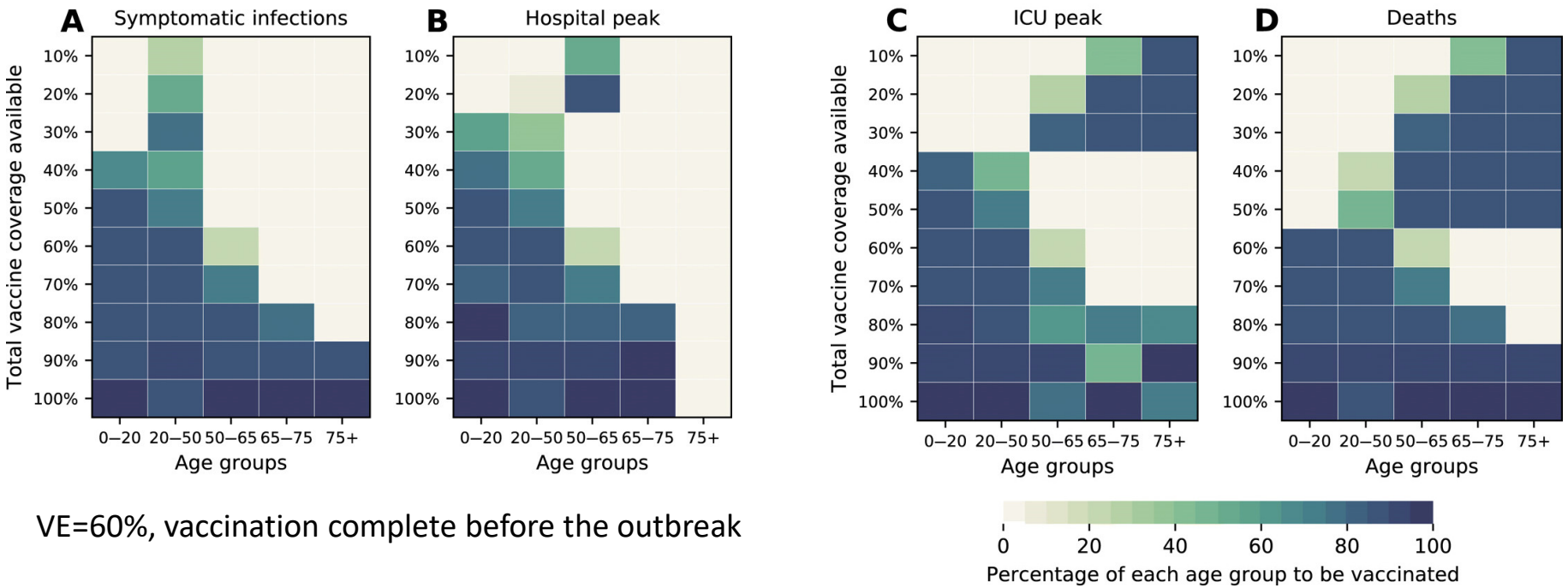
- **"Overall public health strategy for this epidemiologic setting:** Initial focus on prevention of community transmission; also, reciprocity."
- Stage 1 includes essential travellers, border protection staff, emergency reserve utilisation; stage 2 includes all travellers
- Older adults included in stage 3 (>20% supply)
- Not included: Groups with comorbidities or health states (pregnancy) determined to be at higher risk of severe disease or death
- Excluded: Social/employment groups at elevated risk of acquiring and transmitting infection (despite transmission prevention strategy)

Vaccine reserve for outbreak response (Scenarios b and c)

- Stage 1 of vaccine supply (1-10%):
  - **Scenario b (sporadic cases or clusters of cases)**: Emergency **reserve of vaccines** for utilization for outbreak response or mitigation (for example, severe localized outbreak)
  - **Scenario c (no cases)**: Emergency **reserve utilization** for focused outbreak response (for example, importation outbreaks).
- Stage 2 of vaccine supply (11-20%):
  - **Scenario c**: Emergency **reserve of vaccines** utilization for outbreak mitigation (for example, importation outbreaks).
- **Scenario b (sporadic cases or clusters of cases),** stage 1 and 2 of vaccine supply, prioritisation:



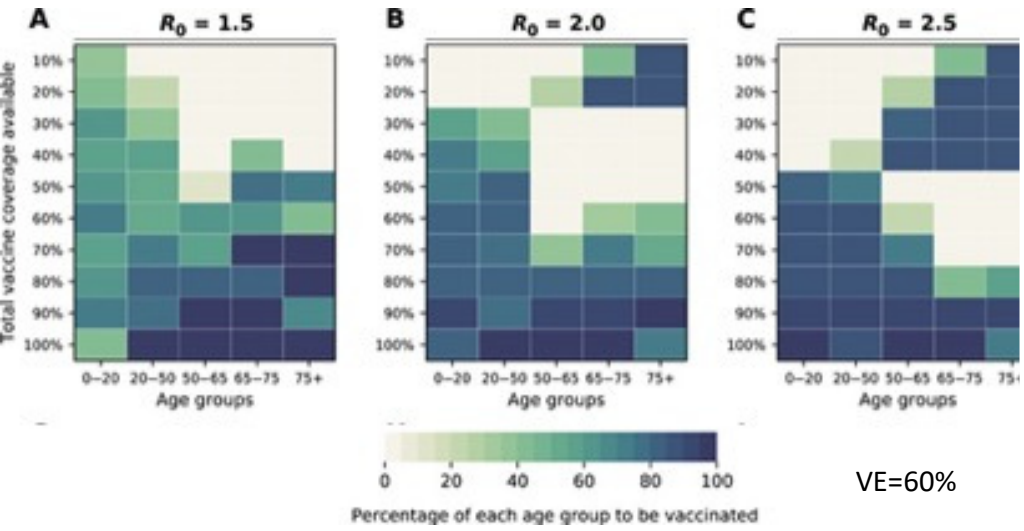
Modelling results on transmission reduction: optimal vaccination strategies (example)

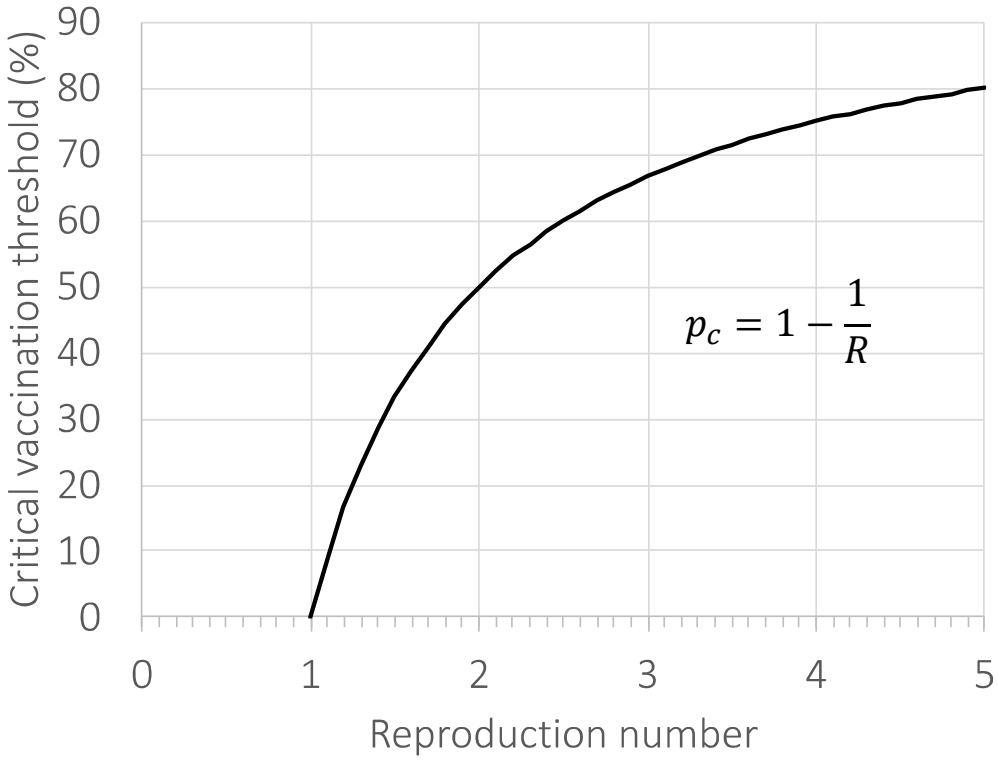


VE=60%, vaccination complete before the outbreak

Matrajt et al. 2021 https://advances.sciencemag.org/content/7/6/eabf1374

Transmission prevention strategies in case of limited supply may be optimal for reducing mortality when reproduction number is low (< ~1.3-1.5)





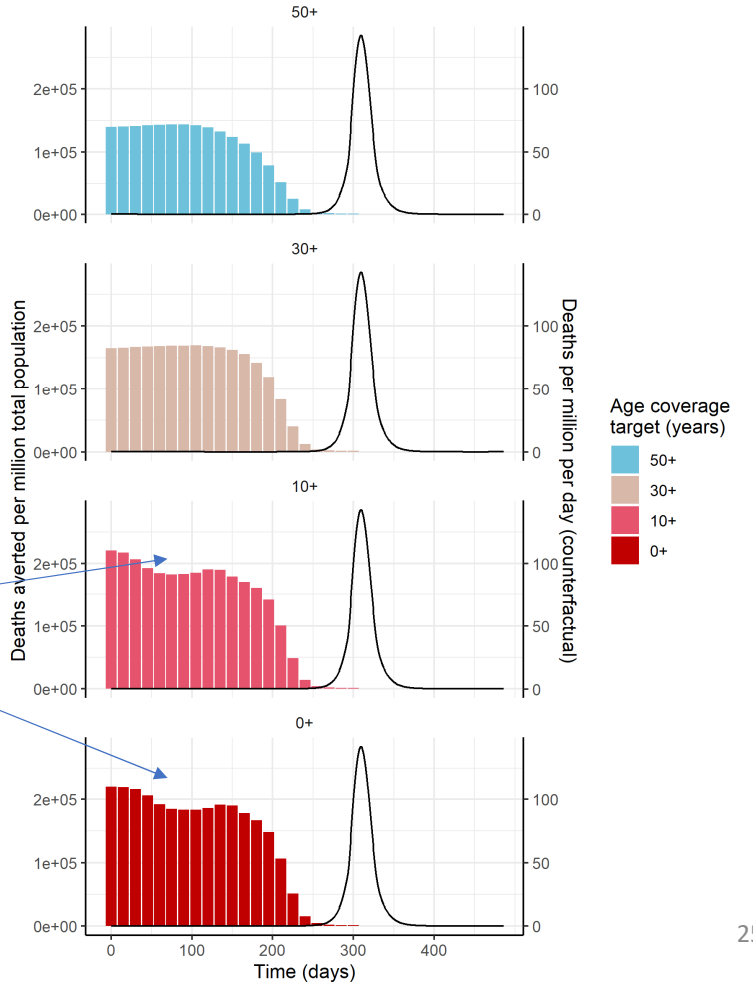
Matrajt et al. 2021
https://advances.sciencemag.org/content/7/6/eabf1374

Responsive vaccination is not expected to be effective

Timing of window of vaccination relative to epidemic peak

- Coloured bars show the total deaths averted if vaccination **begins** at that time point
- Each coloured bar represents an increment of around a fortnight
- The black line shows the counterfactual epidemic
- LMIC setting shown here
- Note that only one epidemic wave shown – there would be additional impact on subsequent waves

Nonlinearity due to waning immunity following infection

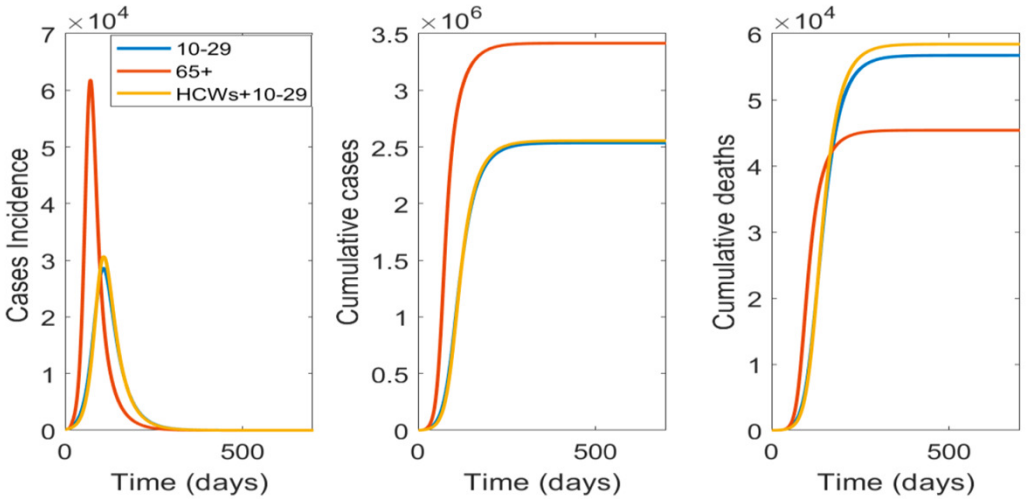


Hogan et al. 2021 presentation to WHO SAGE COVID-19 WG

Similar conclusions from other modelling work: Australia

'With a limited vaccine stockpile of 1 million doses in NSW, … [there is a] minimal impact on the epidemic, but vaccinating older people prevents more deaths.'

MacIntyre et al. https://www.medrxiv.org/content/10.1101/2020.12.15.20248278v2



Similar conclusions from other modelling work: Australia

Even with high vaccine coverage, potential for rapid epidemic growth that can rapidly overwhelm health system capacity [assuming R_0 =2.4, alpha VoC, etc.]

McVernon et al. presentation to WHO SAGE modelling subgroup 21 June 2021

Vaccination strategy:

Essential workers/ Adults >50 years

Entire eligible population

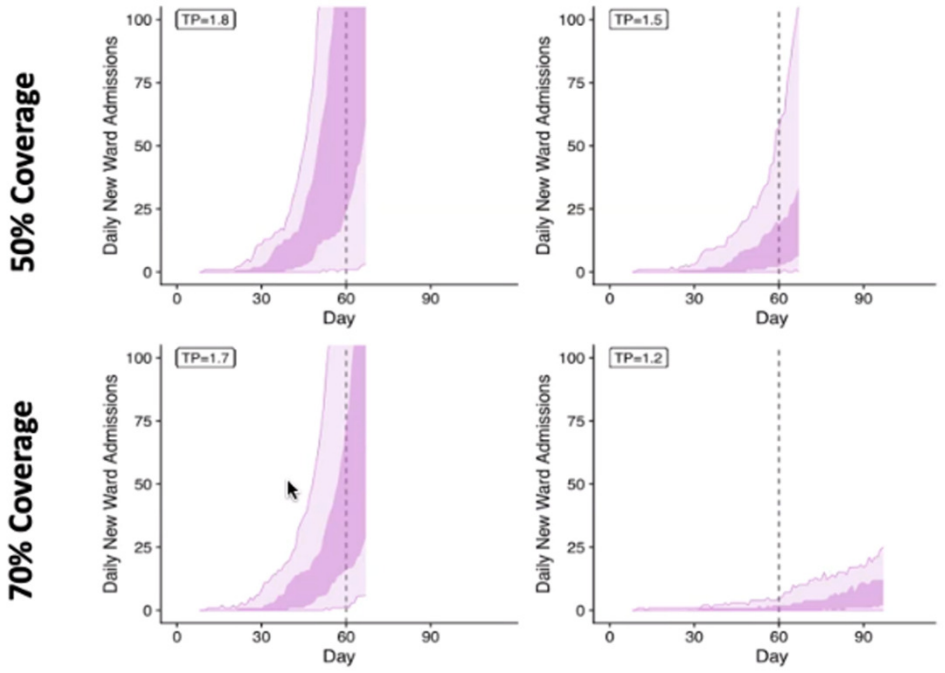


Table 1. Epidemiologic setting and vaccine supply scenarios and recommendations for priority use cases for vaccines against Covid-19 in the context of limited supply

World Health Organization

(a) Epidemiologic setting scenario: Community Transmission

Overall public health strategy for this epidemiologic setting:
Initial focus on direct reduction of morbidity and mortality and maintenance of most critical essential services; also, reciprocity. Expand for further reduction of mortality/morbidity and contribute to reduction in transmission to further reduce disruption of social and economic functions.

Vaccine supply scenario	Priority-use groups
Stage I (very limited vaccine availability, for 1–10% nat. pop.)	Stage Ia (initial launch): • Health workers at high to very high risk of acquiring and transmitting infection as defined in Annex 2. (A1) (A3) (D1) Stage Ib: • Older adults defined by age-based risk specific to country/region; specific age cut-off to be decided at the country level. (A1) (C1)
Stage II (limited vaccine availability, for 11–20% nat. pop.)	• Older adults not covered in Stage I. (A1) (C1) • Health workers at low to moderate risk of acquiring and transmitting infection as defined in Annex 2. (A1) (A3) (D1) • Groups with comorbidities or health states (such as pregnancy) determined to be at significantly higher risk of severe disease or death. Efforts should be made to ensure that disadvantaged groups where there is underdiagnosis of comorbidities are equitably included in this category. (A1) (C1) (C2) • Sociodemographic groups at significantly higher risk of severe disease or death (depending on country context, examples may include: disadvantaged or persecuted ethnic, racial, gender, and religious groups and sexual minorities; people living with disabilities; people living in extreme poverty, homeless and those living in informal settlements or urban slums; low-income migrant workers; refugees, internally displaced persons, asylum seekers, populations in conflict settings or those affected by humanitarian emergencies, vulnerable migrants in irregular situations; nomadic populations; and hard-to-reach population groups such as those in rural and remote areas). (A1) (B1) (B2) (C1) (C2) • Health workers engaged in immunization delivery (routine programmes and COVID-19 vaccination). (A1) (A2) (B2) (C1) (C2) (D1) • High-priority teachers and school staff (depending on country context, examples may include: preschool and primary school teachers because of the critical developmental stage of the children they teach, teachers of children where distance learning is very difficult or impossible). (A2) (A3) (B1) (C1) (C2) • Seafarers and air crews with special attention to seafarers who are stranded at sea and prevented from crossing international borders for crew change due to travel restrictions (55). (A2) (A3) (B1) (C1) (D1)
Stage III (moderate vaccine availability, for 21–50% nat. pop.)	• Remaining teachers and school staff. (A2) (A3) (B1) (C1) (C2) • Other essential workers outside health and education sectors (examples: police officers, municipal services, child-care providers, agriculture and food workers, transportation workers, government workers essential to critical functioning of the state not covered by other categories). (A2) (A3) (D1) • Personnel needed for vaccine production and other high-risk laboratory staff. (A1) (A2) (A3) (D1) • Social/employment groups at elevated risk of acquiring and transmitting infection because they are unable to effectively physically distance (depending on country context, examples may include: people living or working in detention facilities, incarcerated people, dormitories, informal settlements or urban slums; low-income people in dense urban neighbourhoods; homeless people; military personnel living in tight quarters; and people working in certain occupations such as mining and meat processing). (A1) (B1) (B2) (C1) (C2)

Table 1. Epidemiologic setting and vaccine supply scenarios and recommendations for priority use cases for vaccines against Covid-19 in the context of limited supply

World Health Organization

(b) Epidemiologic setting scenario: Sporadic Cases or Clusters of Cases

Overall public health strategy for this epidemiologic setting:

Initial focus on direct reduction of morbidity and mortality and maintenance of most critical essential services; also, reciprocity. Expand to contribute to control transmission and minimize disruption of social and economic functions.

Vaccine supply scenario	Priority-use groups
Stage I (very limited vaccine availability, for 1–10% nat. pop.)	• Health workers at high to very high risk of acquiring and transmitting infection as defined in Annex 2 ~~in areas with high transmission or anticipated high transmission~~. , (A1) (A3) (D1) • Older adults defined by age-based risk specific to country/region – specific age cut-off to be decided at the country level ~~in areas with high transmission or anticipated high transmission~~. (A1) (C1) • ~~Emergency reserve of vaccines for utilization for outbreak response or mitigation (for example, severe localized outbreak). (A1) (A2)~~
Stage II (limited vaccine availability, for 11–20% nat. pop.)	• Older adults not covered in Stage I. (A1) (C1) • Health workers at low to moderate risk of acquiring and transmitting infection as defined in Annex 2. (A1) (A3) (D1) • Groups with comorbidities or health states (such as pregnancy) determined to be at significantly higher risk of severe disease or death ~~in areas with high transmission or anticipated high transmission~~.. Efforts should be made to ensure that disadvantaged groups where there is underdiagnosis of comorbidities are equitably included in this category. (A1) (C1) (C2) • Sociodemographic groups at significantly higher risk of severe disease or death ~~in areas with high transmission or anticipated high transmission~~. (depending on country context, examples may include: disadvantaged or persecuted ethnic, racial, gender, and religious groups and sexual minorities; people living with disabilities; people living in extreme poverty, homeless and those living in informal settlements or urban slums; low-income migrant workers; refugees, internally displaced persons, asylum seekers, populations in conflict settings or those affected by humanitarian emergencies, vulnerable migrants in irregular situations; nomadic populations; and hard-to-reach population groups such as those in rural and remote areas). (A1) (B1) (B2) (C1) (C2) • Seafarers and air crews with special attention to seafarers who are stranded at sea and prevented from crossing international borders for crew change due to travel restrictions (55). (A2) (A3) (B1) (C1) (D1)
Stage III (moderate vaccine availability, for 21–50% nat. pop.)	• Primary and secondary teachers and school staff ~~in areas with high transmission or anticipated high transmission~~.. (A2) (A3) (B1) (C1) (C2) • Other essential workers outside health and education sectors (examples: police officers, municipal services, childcare providers, agriculture and food workers, transportation workers, government workers essential to critical functioning of the state not covered by other categories) ~~in areas with high transmission or anticipated high transmission~~.. (A2) (A3) (D1) • Social/employment groups at elevated risk of acquiring and transmitting infection because they are unable to effectively physically distance ~~in areas with high transmission or anticipated high transmission~~. (depending on country context, examples may include: people living or working in detention facilities, incarcerated people, dormitories, informal settlements or urban slums, low income people in dense urban neighbourhoods, homeless people, military personnel living in tight quarters, and people working in certain occupations for example, mining, meat processing). (A1) (B1) (B2) (C1) (C2) • Health workers engaged in immunization delivery (routine programmes and COVID-19 vaccination). (A1) (A2) (B2) (C1) (C2) (D1) • Age groups at high risk of transmitting infection by age-based risk specific to country/region; specific age cut-off to be decided at the country level. (A1) (A2) • Personnel needed for vaccine production and other high-risk laboratory staff. (A1) (A2) (A3) (D1)

Table 1. Epidemiologic setting and vaccine supply scenarios and recommendations for priority use cases for vaccines against Covid-19 in the context of limited supply

World Health Organization

(c) Epidemiologic setting scenario: No Cases

Overall public health strategy for this epidemiologic setting:

Initial focus on risk mitigation to protect those most at risk of severe outcomes in the case of a COVID-19 outbreak alongside prevention of community transmission; also, reciprocity. Expand to preserve control of transmission and reduce reliance on most burdensome non-pharmaceutical interventions.

Vaccine supply scenario	Priority-use groups
Stage I (very limited vaccine availability, for 1–10% nat. pop.)	• Health workers at high to very high risk of acquiring and transmitting infection as defined in Annex 2. (A1) (A3) (D1) • Essential travellers at risk for acquiring infection outside the home country and reintroducing infection upon return to home country (for example, seafarers and air crews with special attention to seafarers who are stranded at sea and prevented from crossing international borders for crew change due to travel restrictions (55),students, business travellers, migrant workers, aid workers). Countries should define essential travellers in a way that constrains the ability of economically and politically powerful individuals to exploit this priority-use group to their advantage. (A1) (A2) (A3) (B1) (C1) (D1) • Border protection staff screening for imported cases and workers for outbreak management (for example, isolation and quarantine managers, immunization deployment staff). (A1) (A2) (D1) • Older adults defined by age-based risk specific to country/region; specific age cut-off to be decided at the country level. (A1) (C1) • ~~Emergency reserve of vaccines for utilization for outbreak response or mitigation (for example, severe localized outbreak). (A1) (A2)~~
Stage II (limited vaccine availability, for 11–20% nat. pop.)	• Older adults not covered in Stage I. (A1) (C1) • Health workers at low to moderate risk of acquiring and transmitting infection as defined in Annex 2. (A1) (A3) (D1) • All travellers at risk for acquiring infection outside the home country and reintroducing infection upon return to home country. (A1) (A2) • Groups with comorbidities or health states (such as pregnancy) determined to be at significantly higher risk of severe disease or death. Efforts should be made to ensure that disadvantaged groups where there is underdiagnosis of comorbidities are equitably included in this category. (A1) (C1) (C2) • Health workers engaged in immunization delivery (routine programmes and COVID-19 vaccination). (A1) (A2) (B2) (C1) (C2) (D1) • Sociodemographic groups at significantly higher risk of severe disease or death (depending on country context, examples may include: disadvantaged or persecuted ethnic, racial, gender, and religious groups and sexual minorities; people living with disabilities; people living in extreme poverty, homeless and those living in informal settlements or urban slums; low-income migrant workers; refugees, internally displaced persons, asylum seekers, populations in conflict settings or those affected by humanitarian emergencies, vulnerable migrants in irregular situations; nomadic populations; and hard-to-reach population groups such as those in rural and remote areas). (A1) (B1) (B2) (C1) (C2) • ~~Emergency reserve of vaccines for utilization for outbreak response or mitigation (for example, severe localized outbreak). (A1) (A2)~~
Stage III (moderate vaccine availability, for 21–50% nat. pop.)	• Social/employment groups at elevated risk of acquiring and transmitting infection because they are unable to effectively physically distance in areas with high transmission or anticipated high transmission (depending on country context, examples may include: people living or working in detention facilities, incarcerated people, dormitories, informal settlements or urban slums, low income people in dense urban neighbourhoods, homeless people, military personnel living in tight quarters, and people working in certain occupations for example, mining, meat processing). (A1) (B1) (B2) (C1) (C2) • Age groups at high risk of transmitting infection by age-based risk specific to country/region, specific age cut-off to be decided at the country level. (A1) (A2) • Primary and secondary school teachers and staff. (A2) (A3) (B1) (C1) (C2) • Other essential workers outside health and education sectors (examples: police officers, municipal services, child-care providers, agriculture and food workers, transportation workers, government workers essential to critical functioning of the state not covered by other categories). (A2) (A3) (D1) • Personnel needed for vaccine production and other high-risk laboratory staff. (A1) (A2) (A3) (D1)