Preparing the public for COVID-19 vaccines

How can general practitioners build vaccine confidence and optimise uptake for themselves and their patients?

CPD

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Background
The availability of a COVID-19 vaccine is being heralded as the solution to control the current COVID-19 pandemic, reduce the number of infections and deaths and facilitate resumption of our previous way of life.

Objective
The aim of this article is to provide a framework for primary care of what will be needed to optimise COVID-19 vaccine confidence and uptake in Australia once the vaccine prioritisation schedule and key target groups are known.

Discussion
While a number of vaccines are currently under development, with at least seven undergoing phase III trials (28 August 2020), it is hoped that an effective COVID-19 vaccine will become available to the public in 2021. Ensuring public confidence in vaccine safety and effectiveness will be crucial to facilitate uptake. General practitioners are at the forefront of public health, and one of the most trusted sources for patients. In this article, the authors discuss the expedited vaccine development process for COVID-19 vaccines; the likely vaccine prioritisation schedule and anticipated key target groups; the behavioural and social drivers of vaccination acceptance, including the work required to facilitate this; and the implications for general practice.

THE NOVEL CORONAVIRUS SARS-COV-2 is responsible for the infectious respiratory disease COVID-19, which emerged in Wuhan, China, in December 2019 and was declared a pandemic by the World Health Organization (WHO) in March 2020. By August 2020, >24 million people had tested positive for SARS-CoV-2 and >820,000 people had died from COVID-19, with the Americas having the highest number of cases at >12.5 million (28 August 2020).[1] While Australia (with just over 25,000 cases and 572 deaths; 28 August 2020) has not experienced numbers to the extent observed in countries such as the USA, Italy and the UK, the 'second wave' experienced in Victoria throughout July and August 2020 demonstrates Australia's ongoing vulnerability to this pandemic. The long-term solution is a globally implemented, equitable and safe vaccination program to achieve sustained clinical and socioeconomic benefit, a key component of the Australian emergency response plan for COVID-19.[2]

There has been a global effort towards development of COVID-19 vaccines. With recent promising data from phase I and II trials,[3,4] it is now anticipated that widespread availability of a COVID-19 vaccine could occur in early 2021. However, as has been shown in previous mass vaccination programs, planning for vaccine program rollout and community engagement to optimise vaccine confidence and uptake in Australia needs to commence beforehand, not when the vaccines become available.[5] Consistent with its existing role in vaccination programs, primary care professional are anticipated to play a key part in educating patients and carers about the vaccine, administering the vaccine, recording uptake and reporting adverse events following immunisation. It is anticipated that general practitioners (GPs), practice nurses and administrative staff will be at the forefront of COVID-19 vaccine delivery in primary care, as well as potentially one of the initial target groups for COVID-19 vaccine receipt.

In this article, the authors discuss the key issues related to COVID-19 vaccine planning and rollout and the implications for general practice. Other areas outlined include the vaccine development process and the COVID-19 vaccines in the pipeline; the vaccine prioritisation process and identification of key target groups, including healthcare workers in primary care; and what is known about COVID-19 vaccine acceptance in other countries. Overall, the aim of this article is to examine how the Australian government, public health officials and the medical and scientific community can prepare the public for COVID-19 vaccines.

The vaccine development process and COVID-19 vaccines in the pipeline

There has been a substantial global investment and race to produce a safe and effective COVID-19 vaccine, with more

than 200 vaccines in development. There are currently 17 vaccines in phase I trials and 10 vaccines in phase II/III clinical trials (28 August 2020).[6] Traditional vaccine development is a lengthy process, usually taking 10–15 years or more, with a distinct, linear sequence of steps and high attrition rate.[7] The usual steps include pre-clinical development, safety testing (phase I), safety and immunogenicity testing (phase II) and then safety and efficacy testing (phase III), prior to licensure, production at scale and introduction into the population (Figure 1).

Using a pandemic paradigm, many steps are conducted in parallel to shorten the timelines, with increased attrition and financial risk.[8] Although the Coalition for Epidemic Preparedness Innovations (CEPI) and other funders have estimated that developing up to three vaccines in the next 12–18 months will require an investment of at least US$2 billion, global manufacturing and implementation of the COVID-19 vaccines will require an extraordinary additional global investment on a scale never seen before.[9] This may reduce the timeline for the development and implementation of COVID-19 vaccines into clinical practice to 12–18 months (Figure 1). At present, the Oxford vaccine (ChAdOx1 nCoV-19) is one of the leading candidates, with an acceptable safety profile and promising humoral and cellular immune responses, supporting large-scale evaluation in a phase III clinical trial.[4] However, the Oxford vaccine was noted to be more reactogenic than other vaccines given to adults, such as influenza vaccine. When compared with the meningococcal ACWY vaccine administered in the control group, local reactions such as pain at the vaccine site (67%, compared with 38% in the control group) and systemic reactions such as fatigue (70%, compared with 48% in the control group) and headache (68%, compared with 41% in the control group) were the most commonly observed adverse events. Some of the other vaccine candidates in development, such as the Moderna mRNA-1273 vaccine, are showing similar reactogenicity profiles when compared with the Oxford vaccine.[3] The public will need to be reassured that these reactions can be easily managed with simple analgesics, such as paracetamol or ibuprofen, and that they do not mean the vaccines are unsafe. Comprehensive post-marketing surveillance to track vaccine safety for these expected adverse events, as well as to detect postulated rarer adverse events such as antibody-enhanced disease, will also be essential to maintain vaccine confidence and achieve high vaccine acceptance and uptake.

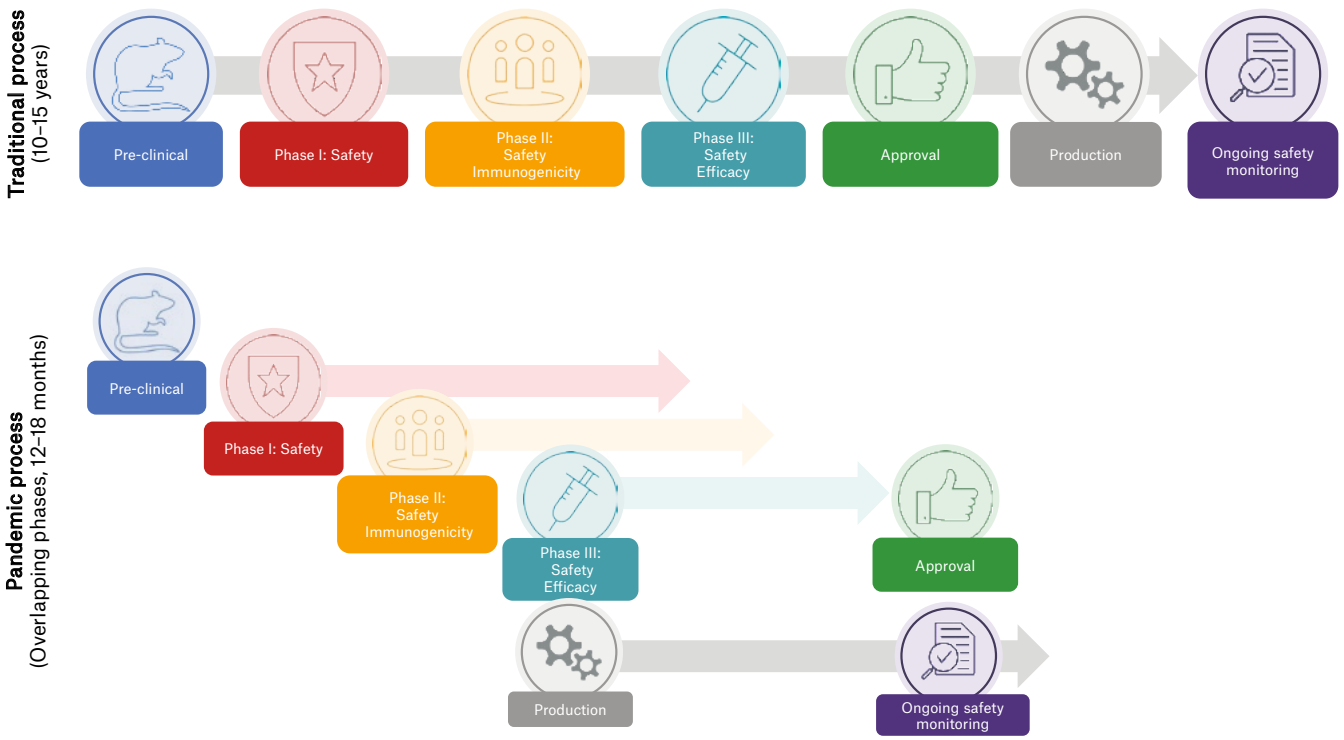

Figure 1. Initial timelines for the traditional versus pandemic vaccine development process

Vaccine prioritisation process and identification of key target groups for COVID-19 vaccines

Given the global demand for a COVID-19 vaccine, it is anticipated that there will initially be a limited supply available in Australia. The WHO[10] and the US Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunisation Practice (ACIP)[11] are currently advising a risk- and aged-based approach for prioritisation of COVID-19 vaccine target groups. They have identified the top tier as high-risk healthcare workers; the second tier as individuals at highest medical risk, such as those with chronic medical comorbidities; and the next tiers to potentially include critical risk workers in industries essential to the functioning of society, such as teachers and school staff, and people at risk due to socioeconomic vulnerability and/or specific communication requirements such as people with physical or mental disabilities, or those in homeless shelters, prisons, jails or detention centres (Figure 2).

In Australia, other key groups at greatest occupational, medical and/or socioeconomic risk may include Aboriginal and Torres Strait Islander people and people from culturally and linguistically diverse (CALD) communities, refugees and asylum seekers[12] as well as groups such as abattoir or meat workers. Unlike previous mass vaccination programs, such as the 2009/A/H1N1 vaccination campaign, children are not an initial priority for COVID-19 vaccination because of decreased disease severity when compared with older people. However, younger infants and children with medical comorbidities may be at higher risk.[13] Younger adults, children and pregnant women are not currently specified as initial targets for vaccination; however, by the time the vaccines are available, these recommendations may change.

The WHO intends to finalise the vaccine prioritisation plan by late 2020 as more burden of disease data becomes available. As in other countries, Australia will prioritise groups and plan implementation and rollout on the basis of the country's needs and vaccine availability. Citizen juries or other deliberative methods may play an important part in informing vaccine prioritisation through asking what an informed citizenry believes should be the priority groups, as has been done with pandemic influenza vaccination.[14]

Public acceptance of COVID-19 vaccines

The threshold for COVID-19 herd immunity is estimated to be between 55% and 82% of the population, and this could be significantly affected by a vaccine refusal rate of more than 10–15%, as has been shown in Australia.[15,16] Vaccine hesitancy and refusal can be major barriers to vaccine uptake, particularly for new pandemic vaccines.[17,18]

A number of studies have begun to explore public acceptance of a hypothetical COVID-19 vaccine. These studies have been based on a product that has not yet been fully developed; however, they do raise concerns about potential acceptance levels. Early data from a survey of Australians estimated that approximately 4.9% would refuse and 9.4% are indifferent about receiving a COVID-19 vaccine (14.3% refusing or undecided).[16] Inadequate health literacy and lower education level were associated with vaccine reluctance. A study from the USA in May 2020 estimated 20% of people would not accept a COVID-19 vaccine, with vaccine safety (70%) the top concern.[19] Other reasons for potential refusal included concern about vaccine effectiveness (30%), concern about developing COVID-19 from the vaccine (42%) and not being concerned about getting sick from COVID-19 (31%). Similarly, in a French survey in March 2020, 26% of people said they would not accept a COVID-19 vaccine, particularly people with lower incomes (37%), who are potentially more prone to infectious diseases; women aged <35 years (36%), who play an important part in childhood vaccination; and people aged >75 years (22%), who are at higher risk of disease from COVID-19.[20] In France, the issue of vaccine hesitancy and refusal appears to be amplified by politicisation, as was seen with the low uptake of the H1N1 vaccine in 2009, because politicians, rather than scientific experts, are the public face of crisis management.

Appropriate and effective communication strategies are critical as Australia prepares for COVID-19 vaccine rollout. It is important to understand what information the priority vaccine target groups need, how they access information and what factors influence their behaviours.[21] Studies from the H1N1 pandemic showed that GPs were highly influential in encouraging uptake and are likely to have a similar role with a COVID-19 vaccine.[18] However, GPs will need comprehensive, up-to-date information about the COVID-19 vaccines and to be engaged in pre-vaccination planning to equip them with the knowledge and skills to counteract antivaccination messages in the media and address any of their own doubts about mass vaccination policies.[18] Strong community engagement is also required, particularly with CALD

Figure 2. Initial target groups for COVID-19 vaccines suggested by the World Health Organization and Centers for Disease Control and Prevention

Note: Tiers are subject to change.

communities and Aboriginal and Torres Strait Islander peoples, to inform responsive and culturally appropriate communication strategies more broadly to optimise COVID-19 vaccine acceptance and uptake.

Research in the Australian setting is urgently needed to develop resources to optimise vaccine uptake

Surveys, qualitative interviews and focus groups can provide key information to help policymakers understand community perceptions, attitudes and concerns about the COVID-19 vaccines, along with their information needs. This may include exploring perceptions about vaccine safety and efficacy, disease severity, the potential number of doses required, costs incurred, potential for requirements in certain settings, and other barriers and facilitators to vaccine recommendation and uptake. Importantly, this can assist with gaining insight into how best to target misinformation and build trust with various at-risk groups. By obtaining these data now, before the COVID-19 vaccines are available, leaders and those involved in vaccination programs at all levels can engage with communities and healthcare professionals. Through a co-design process between public health officials, providers and patients, culturally appropriate and community-led communication strategies can be developed using both traditional and social media.

It may also be prudent to think about establishing pharmacovigilance frameworks in primary care, including pharmacies, through which it is possible to track vaccine sentiment, safety and uptake through periodic surveys. This would enable regular and transparent communication about vaccine concerns and safety that is responsive to the rapidly changing environment of the pandemic to build and sustain vaccine confidence and trust. GPs will also require regular updates and accurate information about the COVID-19 vaccines, as well the rationale behind any immunisation campaigns before they commence, to maintain trust and clear communication between primary care providers, their patients, public health authorities and government.[18]

Conclusion

Billions of dollars will be invested in the development of COVID-19 vaccines, yet the arrival of these anticipated vaccines will not assure vaccine acceptance. To build vaccine confidence in general practice, governments need to invest in understanding the factors that will influence COVID-19 vaccine acceptance and plan to co-design strategies with communities to optimise uptake when these vaccines become available. With escalating COVID-19 misinformation and conspiracy theories, it is vital to understand community views and set realistic expectations to avoid lack of confidence and erosion of trust. The government also needs to ensure the adequate supply and accessibility of the vaccines, especially for at-risk groups, and that GPs, nurses and Aboriginal and Torres Strait Islander health workers – who will be at the frontline of vaccine delivery – have the evidence and are confident that the COVID-19 vaccines are safe and effective. This will be crucial to allow them to alleviate vaccine fears and concerns, and to support vaccine acceptance for themselves and their patients.

Australia will need high levels of vaccine acceptance and uptake to reduce community transmission, cases and deaths, and to work towards resuming our previous way of life. Effective risk communication from vocal pro-vaccine advocates in general practice, in addition to strong endorsement from government and early and transparent communication on the measures taken to ensure vaccine safety and rigorous approval processes, will be crucial to achieve this. Lastly, it is crucial to avoid overt and harmful politicisation of the COVID-19 vaccination program in Australia that risks dividing people's views about the vaccines along party lines.

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References

1. World Health Organization. WHO coronavirus disease (COVID-19) Dashboard. Geneva, CH: WHO, 2020. Available at https://covid19.who.int/?gclid=EAIaIQobChMIiu-mxayw6wIVAqqWCh21WQV3EAAYASAAEgKJGfD_BwE [Accessed 23 August 2020].
2. Department of Health. Australian health sector emergency response plan for novel coronavirus (COVID-19). Canberra, ACT: DoH, 2020.
3. Jackson LA, Anderson EJ, Rouphael NG, et al. An mRNA vaccine against SARS-CoV-2 – Preliminary report. N Engl J Med 2020;NEJMoa2022483. doi: 10.1056/NEJMoa2022483. [Epub ahead of print]
4. Folegatti PM, Ewer KJ, Aley PK, et al. Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: A preliminary report of a phase 1/2, single-blind, randomised controlled trial. Lancet 2020;396(10249):467–78. doi: 10.1016/S0140-6736(20)31604-4.
5. Schaffer DeRoo S, Pudalov NJ, Fu LY. Planning for a COVID-19 vaccination program. JAMA 2020;323(24):2458–59. doi: 10.1001/jama.2020.8711.
6. World Health Organization. Draft landscape of COVID-19 candidate vaccines – 20 August 2020. Geneva, CH: WHO, 2020.
7. Lurie N, Saville M, Hatchett R, Halton J. Developing Covid-19 vaccines at pandemic speed. N Engl J Med 2020;382(21):1969–73. doi: 10.1056/NEJMp2005630.
8. Deming ME, Michael NL, Robb M, Cohen MS, Neuzil KM. Accelerating development of SARS-CoV-2 vaccines – The role for controlled human infection models. N Engl J Med 2020. doi: 10.1056/NEJMp2020076. [Epub ahead of print]
9. Yamey G, Schäferhoff M, Hatchett R, Pate M, Zhao F, McDade KK. Ensuring global access to COVID-19 vaccines. Lancet 2020;395(10234):1405–06.

10. World Health Organization. R&D blueprint and COVID-19. Geneva, CH: WHO, 2020. Available at www.who.int/teams/blueprint/covid-19 [Accessed 23 August 2020].
11. Mbaeyi S, Dooling K. COVID-19 vaccine prioritization considerations work group considerations and next steps. Meeting of the Advisory Committee on Immunization Practices (ACIP). Atlanta, GA: Centers for Disease Control and Prevention, 2020. Available at www.youtube.com/watch?v=0q3qXfnXbac&list=PLvrp9iOILTQb6D9e1YZWpbUvzfptNMKx2&index=2 [Accessed 31 August 2020].
12. Knight M, Bunch K, Vousden N, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: National population based cohort study. BMJ 2020;369:m2107. doi: 10.1136/bmj.m2107.
13. Grayson ML, Johnson PDR. Australia's influenza containment plan and the swine flu epidemic in Victoria. Med J Aust 2009;191(3):150. doi: 10.5694/j.1326-5377.2009.tb02724.x.
14. Australian Partnership for Preparedness Research on Infectious Disease Emergences (APPRISE). How should we distribute initially limited supplies of vaccines in the event of an influenza pandemic? Melbourne, Vic: APPRISE, 2020. Available at www.apprise.org.au/how-should-we-distribute-initially-limited-supplies-of-vaccines-in-the-event-of-an-influenza-pandemic [Accessed 23 August 2020].
15. Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. High contagiousness and rapid spread of severe acute respiratory syndrome coronavirus 2. Emerg Infect Dis 2020;26(7):1470–77. doi: 10.3201/eid2607.200282.
16. Dodd RH, Cvejic E, Bonner C, Pickles K, McCaffery KJ. Willingness to vaccinate against COVID-19 in Australia. Lancet Infect Dis 2020 doi: 10.1016/S1473-3099(20)30559-4. [Epub ahead of print]
17. Graham F. Daily briefing: WHO calls out 'vaccine hesitancy' as top 10 health threat. Nature. 16 January 2019. Available at www.nature.com/articles/d41586-019-00188-9 [Accessed 23 August 2020].
18. Kunin M, Engelhard D, Thomas S, Ashworth M, Piterman L. General practitioners' challenges during the 2009/A/H1N1 vaccination campaigns in Australia, Israel and England: A qualitative study. Aust Fam Physician 2013;42(11):811–15.
19. NORC at The University of Chicago. Expectations for a COVID-19 vaccine. Chicago, IL: The Associated Press and NORC, 2020. Available at https://apnorc.org/projects/expectations-for-a-covid-19-vaccine [Accessed 23 August 2020].
20. The COCONEL Group. A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicisation. Lancet Infect Dis 2020;20(7):769–70. doi: 10.1016/S1473-3099(20)30426-6.
21. World Health Organization. Immunization, vaccines and biologicals: Improving vaccination demand and addressing hesitancy. Geneva, CH: WHO, 2020. Available at www.who.int/immunization/programmes_systems/vaccine_hesitancy/en [Accessed 23 August 2020].

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