McMaster University | HEALTH FORUM

COVID-END COVID-19 Evidence Network to support Decision-making ... in Canada

COVID-19 Living Evidence Profile #1

(Version 7: 28 May 2021)

Question

What is known about anticipated COVID-19 vaccine roll-out elements?

Background to the question

The roll-out of the COVID-19 vaccine is arguably one of the largest health-system initiatives ever conducted. As such, there are many activities that vaccine roll-out plans will need to consider, which we summarize in the framework below. We use this framework to organize key findings from evidence documents and experiences from other countries and from Canadian provinces and territories in this fourth version of our living evidence profile (LEP).

It is important to note that this living evidence profile does not include evidence about the efficacy or effectiveness of COVID-19 vaccines. Four evidence-synthesis teams (COVID-NMA, McMaster/BMJ, Copenhagen Trials Unit, and PAHO/L*VE) are already addressing the question of vaccine efficacy in their respective living evidence syntheses, and they are each planning to address or are considering also addressing vaccine effectiveness by including 'real-world' observational studies, at least in some form. As well, a team led by Alfonso Iorio (McMaster University) and Julian Little (University of Ottawa) are maintaining, with support from COVID-END, a living evidence synthesis about vaccine effectiveness in general and for variants of concern, which will be updated every Wednesday for the foreseeable future.

Also, a team led by Justin Presseau and Jeremy Grimshaw (University of Ottawa) is maintaining, with support from COVID-

Box 1: Our approach

We identified new research evidence addressing the question by searching the COVID-END inventory of best evidence syntheses and the COVID-END guide to key COVID-19 evidence sources in the 19-21 May 2021 period. We updated jurisdictional experiences by searching jurisdiction-specific sources of evidence listed in the same COVID-END guide to key COVID-19 evidence sources, and by hand searching government and stakeholder websites. We selected eight countries (Australia, China, France, Germany, Israel, New Zealand, the U.K., and the U.S.) that are advanced in their thinking and/or experiences with the roll-out of the COVID-19 vaccine.

We searched for guidelines, full systematic reviews (or review-derived products such as overviews of systematic reviews), rapid reviews, protocols for systematic reviews, and titles/questions for systematic reviews or rapid reviews that have been identified as either being conducted or prioritized to be conducted. Single studies were only included if no relevant systematic reviews were identified.

We appraised the methodological quality of full systematic reviews and rapid reviews that were deemed to be highly relevant using AMSTAR. Note that quality appraisal scores for rapid reviews are often lower because of the methodological shortcuts that need to be taken to accommodate compressed timeframes. AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial or governance arrangements within health systems or to broader social systems. We appraised the quality of the highly relevant guidelines using three domains in AGREE II (stakeholder involvement, rigour of development, and editorial independence) and classified guidelines as high quality if they were scored as 60% or higher on each domain.

This update of the living evidence profile was prepared in the equivalent of two days of a 'full-court press' by all involved staff, and will be updated once every six weeks to provide evidence updates that can support COVID-19 vaccine roll-out.

END, a living behavioural-sciences document about supporting vaccine confidence and uptake among healthcare workers and (separately) among citizens, which will each be updated monthly for the foreseeable future (with the one focused on healthcare workers updated mid-month and the one focused on citizens updated at the end of the month).

Organizing framework

- **Securing and distributing a reliable supply of vaccines and ancillary supplies** (e.g., needles, diluents)
  - National purchasing
  - Delivery to country
  - Inventory management within country
  - Ordering within country
  - Distribution within country and to administration sites (including whether direct from centralized distributor to administering location and whether redistribution is allowed)
  - Storage and handling within country (e.g., cold-chain requirements and related supplies such as liquid nitrogen)
- **Allocating vaccines and ancillary supplies equitably**
  - Approaches to developing and adjusting allocation rules (e.g., citizen- and stakeholder-engagement processes)
  - Allocation rules (to priority populations, including those listed below, as well as to 'lower levels' in a federation and/or to providers who can reach priority populations)
    - Front-line healthcare workers
    - Residents in long-term care homes and other congregate-care settings
    - People at increased risk of severe COVID-19 (e.g., older and/or frail adults, those with chronic health conditions)
    - Essential workers (beyond front-line healthcare workers) and/or those in work environments that put them at elevated risk (e.g., food processing and transit)
    - Children (school aged)
    - Migrant workers
    - People in social environments that put them at elevated risk for COVID-19 (e.g., Black, Indigenous and other people of colour; those with low socio-economic status and/or living in crowded and poorly ventilated housing; and those living in communities with outbreaks)
    - People who have already had confirmed COVID-19
    - Mass public
    - People for whom vaccine safety and effectiveness has not yet been established (e.g., children under the age of 12 or 15, women who are pregnant or breastfeeding, immunocompromised, those with autoimmune conditions, those experiencing long episodes of COVID-19)
    - People at significant risk for severe allergic reaction
  - Dosing rules (number, timing of second dose, and potential for second dose to be a different vaccine)
  - Ensuring equity (including whether and how access through private means can be achieved by those not initially prioritized)
- **Communicating vaccine-allocation plans and the safety and effectiveness of vaccines**
  - Target of intervention
    - General public
    - High-risk groups (see above list)

        - Individuals who are hesitant about or opposed to vaccination
    - Delivery of the intervention
        - By whom (e.g., health worker, research expert, teacher, business leader, government leader, community leader, citizen champion, media)
        - Frequency (e.g., daily, weekly)
        - Duration (i.e., how much or for how long)
        - Modality of delivery (e.g., social media, text, email, telephone, radio, television, face-to-face by video, face-to-face in person)
    - Content of messaging
        - Data and evidence about safety and about effectiveness in terms of both protection against COVID-19 (including duration of protection) and protection against transmission (and other factors that may contribute to vaccine acceptance and hesitancy)
        - Information about novel vaccine platforms (e.g., mRNA), current vaccine options (e.g., number of vaccines available in a country, number of doses required of any given vaccine), prioritized populations, and behaviours after vaccination
        - Information (for health workers) about vaccine-administration protocols
        - Myths and misinformation about vaccines
        - Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)
        - Anticipated timing of when all those who want a vaccine will have been vaccinated
- **Administering vaccines in ways that optimize timely uptake**
    - With what explicit effort to leverage existing health-system arrangements (e.g., vaccination systems and primary-care practices/community health centres)
    - Where
        - Community-based health settings (e.g., mobile clinics and pharmacies)
        - Other community settings (e.g., schools, workplaces, shelters, community centres, Indigenous community hubs, and unconventional spaces like drive-through lots and arenas or tents)
        - Primary-care settings (e.g., family doctor offices, nursing stations, community health centres)
        - Acute care (e.g., hospitals)
        - Long-term care homes
        - Public-health offices/centres
        - Other (e.g., private clinics, prisons)
    - With what appointment/scheduling and screening support, changes to physical spaces and patient flows through these spaces, and changes to hours of operation
    - With what post-vaccination observation period and what physical distancing, personal protective equipment, sanitation and other public-health measures
    - By whom (e.g., nurses, public-health workers, retired health workers) and with what changes to remuneration (e.g., increased vaccine-administration fee code)
    - With what partnerships to reach early populations of focus (e.g., among Black, Indigenous and people of color (BIPOC), and Indigenous leaders)
    - With what broader, complementary health interventions (e.g., flu vaccination and routine immunization, ongoing public-health measures)
    - With what second-dose provisions (e.g., from same manufacturer and from same or later supply than original dose)
    - With what second-dose reminders

- With what reporting requirements (e.g., vaccine supply, expiration dates, temperature excursion, and uptake) and supporting immunization information systems (e.g., vaccine registries and COVID-19 apps) and broader healthcare information systems (e.g., EHRs)
- With what safety monitoring requirements (e.g., adverse events)
- With what injury-compensation program (for vaccine recipients) and liability immunity (for vaccine distributors, planners and administering staff)

- **Surveillance, monitoring and evaluation, and reporting**
  - Documenting vaccine-related opinions (e.g., vaccine acceptance and hesitancy)
  - Documenting vaccine status (e.g., for number of doses received and for use in cross-border travel and work-related migration)
  - Documenting adverse events and follow-up
  - Identifying sources of vaccine hesitancy
  - Monitoring supply safety (e.g., expiration dates, temperature excursion)
  - Identifying and measuring performance indicators (particularly those adjusted from standard vaccine programs)
  - Infrastructure to enable surveillance, monitoring and evaluation (e.g., patient-held records, electronic health records or reporting systems, online vaccination registries, COVID-19 apps)

What we found

We identified 133 new evidence documents since the last update of this LEP, of which we deemed 35 to be highly relevant. The newly added highly relevant evidence documents include:

- 10 new guidelines that meet our minimum requirements for a guideline (includes explicit recommendations and an explicit process for developing them);
- one new systematic review;
- 11 new rapid reviews;
- eight new protocols for reviews that are underway; and
- five new single studies that provide additional insight.

This LEP also includes evidence documents from the previous version that we deemed to still be highly relevant, for a total of 157 highly relevant documents.

Note that guidelines that do not meet minimum requirements for a guideline are assessed in terms of whether they include an evidence synthesis that we can then consider as a systematic or rapid review, and whether they describe jurisdictional experiences that we can then consider as a document included in our jurisdictional scan. We list documents that do not meet our requirements for a guideline, evidence synthesis or jurisdictional-experiences document in Appendix 5.

We outline insights from the most salient information from the newly identified highly relevant evidence documents and from the jurisdictional scans in narrative form below. This is accompanied by Table 1, which provides more details about key findings from each of the newly identified evidence documents and new insights from the jurisdictional scans. In Table 2, we provide findings from still-relevant evidence documents and jurisdictional scans from the previous version of our LEP. We also outline the type and number of all documents that were identified in Table 3.

For those who want to know more about our approach, we provide a detailed summary of our methods in Appendix 1. In addition, we provide: all highly relevant evidence documents identified from the updated searches in this LEP version in Appendix 2a; all highly relevant documents that were identified in previous versions in Appendix 2b (including their relevance to the categories in the organizing framework, key findings, and when they were conducted or published); medium- and

low-relevance documents identified from the updated searches in this LEP version in Appendix 2c; and detailed summaries of COVID-19 vaccine roll-out plans from other countries in Appendix 3 and from Canadian provinces and territories in Appendix 4. Documents excluded at the final stages of reviewing are provided in Appendix 5.

Key findings from highly relevant evidence documents

The highly relevant evidence documents included in this LEP address one or more of the following four key areas of current focus in the vaccine roll-out (which often cut across multiple domains of the organizing framework):

- adjusting plans for allocating vaccines equitably (e.g., focusing on 'hotspots', marginalized communities, and medical risk);
- supporting community and primary-care settings to communicate about and administer vaccines in ways that optimize timely and equitable uptake (e.g., vaccination information, engagement of the community, and mobile clinics for hard-to-reach people);
- adjusting public-health guidance for people who are fully vaccinated; and
- monitoring the COVID-19 vaccine roll-out (including documentation of vaccination, adverse events, hesitancy/intention).

First, we found five highly relevant guidelines (of which one is high quality) and one low-quality rapid review that provide recommendations on COVID-19 vaccine provision and considerations for different population groups that have increased risk of severe illness and/or death from COVID-19, including:

- people with autoimmune rheumatic diseases (Canadian Rheumatology Association – high-quality AGREE II rating; published 15 May 2021);
- women aged 50 years or younger and pregnant or lactating people (American College of Obstetricians and Gynecologists – low-quality AGREE II rating; last updated 28 April 2021);
- people with hemophilia (Hemophilia Board of the German, Austrian, Swiss Society on Thrombosis Hemostasis Research – low-quality AGREE II rating; published 15 April 2021)
- healthcare providers who are pregnant or breastfeeding (International Federation of Otorhinolaryngological Societies research group and Confederation of European Otorhinolaryngology Head and Neck Surgery board – low-quality AGREE II rating; published 15 April 2021);
- people with cryoglobulinaemic vasculitis (Italian Group for the Study of Cryoglobulaemias – low-quality AGREE II rating; published 12 April 2021); and
- people with disabilities and accessibility challenges (rapid review – AMSTAR rating: 0/9; published 26 April 2021).

Additionally, we found a medium-quality rapid review that examined the magnitude of risk factors and severe outcomes of COVID-19 to help inform vaccination prioritization guidance by Canada's National Advisory Committee on Immunization (7/10 AMSTAR rating; pre-print last edited 22 May 2021). The review reported that increased risk of mortality from COVID-19 is associated with people aged 60 to 69 years, with two or more chronic conditions, Down syndrome, Type 1 and 2 diabetes, end-stage kidney disease, epilepsy, motor neuron disease, multiple sclerosis, myasthenia gravis, and/or Huntingdon's disease.

Second, for supporting community and primary-care settings to communicate about and administer vaccines in ways that optimize timely and equitable uptake, we found a low-quality guideline, two low-quality rapid reviews, and a single study:

- WHO and UNICEF guidelines on how to engage community health workers in COVID-19 vaccination programs given that they have the potential to identify and connect with marginalized populations to help address accessibility and knowledge barriers (low-quality AGREE II rating; published 26 April 2021);
- a low-quality rapid review that identified three models of mass-vaccination clinics (i.e., drive-through, walk-through, and mobile clinics), which found that effective practices involved the maintenance of public-health measures (e.g., physical distancing, reducing participant length of time, providing multiple locations within a region) (3/9 AMSTAR; literature last searched 20 June 2020);
- a low-quality rapid review that recommended the development of supportive and safe environments where information about vaccine safety and efficacy could be discussed between employers and healthcare personnel (2/9 AMSTAR rating; published 20 April 2021); and
- a single randomized controlled trial study that assessed the effectiveness of different types of written COVID-19 vaccination information, which found that emphasizing personal benefits instead of collective benefits or a combination of both was more effective in individuals who are strongly hesitant about vaccination (published 12 May 2021).

Third, with respect to adjusting public-health guidance for people who are fully vaccinated, the European Centre for Disease Prevention and Control developed interim guidance (low-quality AGREE II rating; published 21 April 2021) recommended:

- relaxing physical distancing and face-mask requirements if fully vaccinated people meet with other fully vaccinated individuals;
- relaxing physical-distancing and face-mask requirements if there are no risk factors for severe disease in interactions between vaccinated and unvaccinated individuals;
- considering fully vaccinated individuals who may have been exposed as a low-risk contact during contact tracing;
- modifying or waiving testing and quarantine for fully vaccinated individuals in settings with low community transmission; and
- maintaining current public-health measures in public spaces, large gatherings, and during travel.

Lastly, guidance and evidence continue to emerge for monitoring and evaluating the COVID-19 vaccine roll-out, including documentation of vaccination, adverse events, and hesitancy/intention. We found:

- guidance from the U.S. Advisory Committee on Immunization Practices on thrombosis thrombocytopenia syndrome (TTS), which reported that the Janssen COVID-19 vaccine is highly effective and that limiting its usage to specific populations may reduce TTS cases (low-quality AGREE II rating; published 30 April 2021);
- a medium-quality review that attributed the roll-out of mass-vaccination programs to a reduction of COVID-19 cases, hospitalizations, and deaths in addition to low rates of vaccine-related serious adverse events across jurisdictions with good vaccination coverage, with accessibility to vaccination programs and sites identified as a challenge (5/9 AMSTAR rating; literature last searched 1 March 2021);
- a medium-quality rapid review that summarized 109 studies on vaccination uptake and attitudes in Canada and globally, which found that the intent to vaccinate among the general population in Canada ranges between 66-88% (with people living in British Columbia, Quebec, and Atlantic

provinces having the highest intention to vaccinate) (4/9 AMSTAR rating; last updated 23 April 2021);

- a medium-quality rapid review that summarized sources of vaccine hesitancy among Indigenous groups, Black, African and Caribbean communities, and individuals experiencing homelessness, which found primary concerns were related to vaccine safety, trade-off between perceived risk of COVID-19 and risk of adverse effects of the vaccine, and ease of accessibility to vaccination programs and sites (6/9 AMSTAR rating; last updated 30 April 2021);
- two medium-quality rapid reviews reporting that lower vaccination acceptance and/or uptake among the general public and healthcare workers were associated with concerns and misinformed beliefs about efficacy, safety and necessity, mistrust of government and public-health agencies, and whether they belonged to a marginalized group (e.g., Black, Latinx, Asian) (4/9 AMSTAR rating; literature last searched 20 April 2021; 5/9 AMSTAR rating; literature last searched 20 April 2021); and
- a low-quality rapid review that summarizes recommendations from different professional societies about diagnostic pathways and treatment for patients with possible thrombotic adverse events following COVID-19 vaccination (0/9 AMSTAR rating; last updated 13 May 2021).

Key findings from the jurisdictional scan

We identified several new insights across each of the five domains of the organizing framework based on the experiences with the roll-out of the COVID-19 vaccine in eight countries (Australia, China, France, Germany, Israel, New Zealand, the U.K., and the U.S.), as well as all provinces and territories in Canada. We summarize these insights according to each domain of the framework below.

In terms of securing and distributing a reliable supply of vaccines and ancillary supplies, we found that:

- countries are entering into more purchasing agreements with mRNA vaccine manufacturers with:
  - Australia having secured new agreements with both Pfizer-BioNTech and Moderna to purchase millions of their vaccines to be delivered in 2021, and
  - Canada having purchased more Pfizer-BioNTech vaccines to be delivered between May and July 2021, and having also secured Pfizer-BioNTech vaccines for 2022 and 2023, with the flexibility to extend to 2024;
- China's Sinopharm vaccine was given emergency use authorization approval by the World Health Organization on 7 May 2021, and China has continued to support its vaccine producers in exporting vaccines to other countries;
- efforts are being made by some countries to secure domestic manufacturing of mRNA vaccines, with:
  - Germany now manufacturing and distributing Pfizer-BioNTech vaccines at its new production plant,
  - Australia having discussions with Moderna to set up a manufacturing plant in-country, and
  - Canada investing in establishing an mRNA vaccine production plant in Mississauga, Ontario;
- Canada has not yet distributed the Johnson & Johnson vaccines it has received to provinces after learning that the doses were processed in a U.S. plant where quality-control problems were reported; and
- more efforts to ensure the safe and efficient storage and handling of Pfizer-BioNTech vaccines have been made in Australia (where the government is preparing to secure cold-chain storage, staff training, and regular management of equipment and monitoring systems) and the U.S.

(where the Food and Drug Administration has authorized a longer time for refrigerator storage of thawed Pfizer-BioNTech COVID-19 vaccine prior to dilution).

In terms of adjusting plans for allocating vaccines and ancillary supplies equitably, we found that:

- all included countries except Australia, Germany, New Zealand and some parts of the U.K. are currently allowing all adults 18 years and older to book appointments for a COVID-19 vaccine;
- several countries have made changes to their recommendations for the use of the Oxford-AstraZeneca and the Johnson & Johnson vaccines in recent weeks, with:
  - Germany and the U.S. having lifted all restrictions on the use of the Johnson & Johnson vaccine, allowing all adults to get the vaccine,
  - Germany also lifting restrictions on the use of the Oxford-AstraZeneca vaccine,
  - the U.K. and Canada issuing advice for adults under 55 years old to be given the Oxford-AstraZeneca and Johnson & Johnson vaccines only if the individual does not wish to wait for an mRNA vaccine and the benefits outweigh the risks, and
  - most Canadian provinces having chosen to suspend issuing first doses of the Oxford-AstraZeneca vaccine and instead focusing on administering existing and incoming doses to individuals who have already received their first dose;
- given recent authorizations of the Pfizer-BioNTech vaccine for emergency use in youth 12 to 15 years old in Australia, Israel, the U.S. and Canada, these countries are now prioritizing individuals in this age group in their vaccine roll-out plans;
- as of 24 April 2021, China began vaccinating foreigners in some provinces;
- human rights and health organizations have identified inequities related to the vaccine roll-out and allocation for Palestinians, and in response, efforts have been made to ensure access to vaccines for Palestinians with relatives who live in Jerusalem, Palestinian prisoners, and Palestinian residents;
- most countries reviewed have vaccinated between 40% and 65% of their populations with at least one dose of a COVID-19 vaccine;
- the province of Alberta has entered into an agreement with the U.S. state of Montana to allow approximately 2,000 Alberta truck drivers who transport goods into the U.S. to receive the Johnson & Johnson vaccine at a rest stop in Montana at no cost; and
- for two weeks in May 2021, the province of Ontario allocated about 50% of all doses to 'hotspot' communities in 13 public-health units in the province that had elevated rates of virus transmission, hospitalizations and deaths.

In terms of communicating vaccine-allocation plans and the safety and effectiveness of vaccines, we found that:

- New Zealand launched a public-information campaign consisting of fact-based information and encouragement for people about the benefits of vaccination;
- to increase vaccine uptake in recent weeks, leading businesses, employers and industry bodies in the U.K. have encouraged staff to be vaccinated when eligible;
- most Canadian provinces have a dedicated webpage on their websites that they regularly update with information about the progress of the vaccine roll-out, eligibility, and how to book vaccine appointments;
- resources are being provided for Indigenous communities in British Columbia with an aim of addressing vaccine anxiety and hesitancy;
- Alberta provides information on the efficacy of the Oxford-AstraZeneca vaccine after the first dose and the second dose when administered at different intervals;

- Newfoundland and Labrador, P.E.I. and the Northwest Territories have YouTube and Facebook channels to deliver information about how to book a vaccination appointment; and
- Newfoundland and Labrador is providing youth the opportunity to submit anonymous vaccine questions to be answered by the province's Chief Medical Office of Health between 19 May and 22 May 2021.

In terms of vaccine administration, we found that:

- in New Zealand, a national vaccination booking system in its trial phase will be scaled up to the broader population in the second half of the year, and it was announced that 5,358 vaccinators have completed the country's vaccinator-training program;
- as New Zealand's influenza season has begun, New Zealand's Ministry of Health has recommended a two-week gap between the influenza vaccine and the COVID-19 vaccine, and if an individual has a vaccination appointment booked for COVID-19, they should get the COVID-19 vaccine first, but if not, they should get the influenza vaccine first;
- vaccinations continue to occur in countries and Canadian provinces at a variety of locations, including 'supersites,' malls, drive-through clinics, doctor's offices, and pharmacies;
- five Indigenous-led COVID-19 immunization clinics have been established in Manitoba and several employer-led workplace vaccination clinics have been completed, are being started, or are being planned in Ontario and in Quebec;
- Nova Scotia has partnered with the Rural Transportation Association to offer low-cost transportation for individuals unable to get to a vaccination appointment; and
- vaccination clinics will be held in schools for students aged 12 to 17 years in Prince Edward Island, Yukon and the Northwest Territories.

In terms of adjusting public-health guidance for people who are fully vaccinated, we found that:

- in Israel, occupancy restrictions have been removed for places under the 'green pass' and it is mandatory for non-essential businesses to require people to hold a green pass to enter (the green pass system will end on 1 June 2021, which means that a proof of vaccination will no longer be required to enter businesses, and all remaining COVID-19 public-health restrictions on gatherings in Israel will also be lifted as of 1 June 2021;
- as of 1 May 2021, all managed isolation and quarantine and government border workers in New Zealand must show proof of vaccination to enter their workplace, and new workers will need to have received their first vaccine dose before starting work, and then have 35 days from starting work to receive their second dose;
- in the U.S., the CDC has stated that fully vaccinated people no longer need to wear a mask or physically distance in any setting, except where required by laws, rules and regulations, including local businesses and workplace guidance, and fully vaccinated people can also refrain from testing following a known exposure unless they are residents or employees of a correctional or detention facility or a homeless shelter; and
- according to modelling data of the Public Health Agency of Canada from 23 April 2021, by maintaining public-health measures until at least 75% of the Canadian population has received their first dose of COVID-19 vaccine and 20% of the population has received their second dose, infection rates of COVID-19 would be driven low enough to lift restrictions without overwhelming the health system (following this modelling and increasing vaccination rates, several Canadian provinces, including Alberta, Saskatchewan and Ontario, have released reopening plans based on vaccination thresholds and vaccine availability).

Lastly, in terms of surveillance and monitoring, we found that:

- the latest online survey commissioned by the New Zealand government on the attitudes and sentiments of New Zealanders towards COVID-19 vaccines indicated that potential uptake overall has increased in April from 69% to 77% since March 2021 and that:
  - those unlikely to take a vaccine if offered has dropped from 20% to 12% since March, and
  - the two most common reasons for hesitancy are the quick turnaround time for development of the vaccine and the lack of information about any long-term effects of the vaccine;
- adverse reactions to vaccines in New Zealand are reported to the Centre for Adverse Reactions Monitoring (CARM), which has an independent safety monitoring board that reviews all reports of concern in country as well as from overseas reporting;
- a survey released on 26 May 2021 revealed that most Canadians showed strong support for vaccine passports use in international travel, with 79% of respondents supporting mandatory vaccine passports for international travel outside of the U.S., while 76% supported such a requirement for travel to the U.S. (but 41% of respondents did not support the idea of using vaccination proof domestically, such as when entering restaurants, malls and movie theatres);
- reports of rare blood clotting following administration of the Oxford-AstraZeneca vaccine have been made in a few Canadian provinces, including Alberta, Saskatchewan and Quebec; and
- the Quebec government is beginning to make digital proof of vaccination available through the clicsante.ca portal.

Table 1: Highlights from new highly relevant evidence documents and experiences

COVID-19 vaccine roll-out activities	New evidence	New experiences
General/cross-cutting insights	• A medium-quality systematic review reported that reduction of SARS-CoV-2 cases, hospitalizations, and deaths in addition to low rates of vaccine-related serious adverse events were attributed to the roll-out of mass-vaccination programs in jurisdictions with good vaccination coverage (5/9 AMSTAR rating; literature last searched 1 March 2021) o Most mass-vaccination programs involved the following elements: prioritization of vulnerable population groups, large vaccination hubs, use of solely or combination of Pfizer-BioNTech, Moderna, and Oxford-AstraZeneca vaccines, and guidelines for staffing, training and recruitment requirements o The review described potential challenges to vaccine roll-outs such as shortages, vaccine-access inequities across vulnerable populations (e.g., refugees, migrants, minority groups, individuals living in conflict areas), cost of procurement and delivery, and vaccine hesitancy (e.g., especially among younger adults, individuals who identify as female, and black populations) • WHO released updated recommendations for the use of Oxford-AstraZeneca including: intended use, administration, booster doses, interchangeability with other COVID-19 vaccines, co-administration with other vaccines, contraindications, precautions, vaccination of specific population groups, and other considerations (e.g., communication strategies and vaccination logistics) (high-quality AGREE II rating; last updated 21 April 2021)	• More adjustments have been made to vaccine roll-out plans in countries and Canadian provinces after reviews of reports on thrombosis with thrombocytopenia syndrome (blood clots) from Oxford-AstraZeneca and Johnson & Johnson vaccines were completed • The Pfizer-BioNTech vaccine has been approved for emergency use in youth 12 to 15 years old in Australia, Israel, the U.S., and Canada o Both Australia and Canada have purchased millions more doses of Pfizer-BioNTech vaccine in April o Countries and Canadian provinces are or will be vaccinating youth in this age group in the coming days and weeks • Countries are continuing to invest in domestic manufacturing of vaccines to better ensure future vaccine supply • As vaccination rates have increased significantly over the last few weeks, the U.S. CDC has updated its guidelines with more allowances for fully vaccinated individuals, and Israel and some Canadian provinces have released reopening plans based on vaccination rate thresholds in their populations
Securing and distributing a reliable supply of vaccines and ancillary supplies	None identified	*National purchasing* • Australia purchased 20 million additional doses of Pfizer-BioNTech vaccine during the month of April and secured an agreement for 25 million doses of the Moderna vaccine in May

(e.g., needles, diluents)		• Following the approval of China's Sinopharm COVID-19 vaccine for emergency use by the World Health Organization on 7 May 2021, China continues to support its vaccine companies in exporting its vaccines to countries around the world, and is also collaborating with over 10 countries in vaccine research and development production
		• On 16 April 2021, it was announced that Canada has signed a new agreement with Pfizer-BioNTech for eight million more doses of their vaccine
		  ○ Four million of these doses will be delivered in May 2021 (for a total of 8 million doses) and two million doses will be delivered in both June and July
		  ○ With this new agreement, Canada is now on track to receive a total of 24 million doses of Pfizer-BioNTech vaccine between April and June
		• On 23 April 2021, the Government of Canada announced that Canada has secured COVID-19 vaccines from Pfizer-BioNTech for 2022 and 2023 with flexibility to extend into 2024
		  ○ This agreement includes access to a guaranteed 35 million doses in 2022 and 30 million in 2023, with options for 30 million more doses in each year
		
		Delivery to country
		• As of 23 May 2021, Germany has received 50,910,572 vaccine doses through partnerships with Pfizer-BioNTech, Oxford-AstraZeneca, and Moderna
		• Germany expects to receive 119 million doses of Pfizer-BioNTech vaccine, 78 million doses of Moderna vaccine, 56.3 million doses of Oxford-AstraZeneca vaccine, and 36.7 million doses of Johnson & Johnson vaccine by the end of 2021
		• New Zealand's Director-General of Health said that Johnson & Johnson plans to deliver the two million doses of their Janseen vaccine in the third quarter of 2021, giving the country time to decide if and when those vaccines will be used
		• Canada received 300,000 doses of the Johnson & Johnson vaccine on 28 April 2021 and 665,000 doses of the Oxford-AstraZeneca vaccine procured from the COVAX facility on 13 May 2021

		• Canada also expects to receive 9 million doses of Pfizer-BioNTech vaccine in July alone
		Inventory management within country
		• Health Canada announced that as a result of reported cases of rare thrombosis in combination with thrombocytopenia (blood clotting) in the U.S., the labels on Johnson & Johnson vaccine vials have been updated with information about the possible side effects of the vaccine
		
		Ordering within country
		• The Australian Government is in discussions with Moderna to establish a manufacturing facility in Australia
		• On 15 May 2021, China approved one more inactivated COVID-19 vaccine for emergency use, giving China a total of six COVID-19 vaccines authorized for use in the country
		• Distribution of the first batch of Pfizer-BioNTech vaccines manufactured at the new production plant in Germany was scheduled to begin in April 2021
		• On 26 April 2021, Moderna announced an agreement with Sanofi for fill and finish manufacturing of the Moderna COVID-19 vaccine in the U.S.
		• The Prime Minister of Canada announced on 18 May 2021 that Canada will be investing nearly $200 million towards a facility based in Mississauga, Ontario to produce millions of mRNA vaccines each year
		
		Distribution within country and to administration sites
		• On 15 April 2021, New Zealand's Director-General of Health said that when vaccines are delivered, they arrive at a distribution centre in Auckland and then are distributed by a third-party company called "PACE" to the different health regions
		• As of 25 May 2021, the U.S. CDC reported that more than 359 million doses of COVID-19 vaccinations have been distributed
		• As of 25 May 2021, Health Canada has confirmed distribution of 25,541,882 COVID-19 vaccines to the provinces and territories
		  ○ 17,095,242 doses of Pfizer-BioNTech vaccine
		  ○ 5,593,760 doses of Moderna vaccine

		○ 2,852,880 doses of Oxford-AstraZeneca vaccine • Health Canada has held off on distributing the shipment of Johnson & Johnson vaccines to provinces after learning that the doses were processed in a U.S. plant where quality control problems were reported *Storage and handling within country* • To safely store and handle the Pfizer-BioNTech vaccine, the Government of Australia is preparing to secure cold-chain storage, staff training, and regular management of equipment and monitoring systems • On 19 May 2021, the Food and Drug Administration authorized longer time for refrigerator storage of thawed Pfizer-BioNTech COVID-19 vaccine prior to dilution to make the vaccine more widely available • Ontario has published vaccine storage and handling guidance for vaccines including information regarding freezer setup, inspections, monitoring of storage equipment, vaccine transport, temperature excursion, preparation for immunization clinics, what to do when product is damaged, storage requirements for vaccines, recommendations for onward transport of vaccine beyond the initial point of delivery, guidance about insulated containers, and guidance on extracting additional doses from vaccine vials
Allocating vaccines and ancillary supplies equitably	*Allocation rules* • The Canadian Rheumatology Association (CRA) conditionally recommends COVID-19 vaccines for individuals with autoimmune rheumatic diseases (ARDs) based on low certainty of current evidence on the effect of certain vaccines (i.e., Pfizer-BioNTech, Moderna, Johnson and Johnson) and very low certainty of AstraZeneca in people with ARDs (high-quality AGREE II rating; published 15 May 2021) • The American College of Obstetricians and Gynecologists recommend FDA-authorized COVID-19 vaccines for women under age 50 (including pregnant individuals) and to ensure that individuals are consulted on the rare risk of thrombosis and thrombocytopenia syndrome (low-quality AGREE II rating; last updated 28 April 2021)	*Allocation rules* • Australia began phase 2A of its vaccine roll-out on 3 May 2021 with people aged 50 years and over • On 24 May 2021, France started vaccinating priority professionals aged 18 years and older, but given the significant vaccination coverage for this group, France will open vaccination to all individuals 18 years and older as of 31 May 2021 ○ Professionals concerned will be able to be vaccinated on presentation of proof of eligibility, such as professional card, pay slip for employees, declaration on honour for others • On 7 June 2021, Germany will lift its vaccination prioritization plan and allow anyone over the age of 16 to make a vaccination appointment

	• The Hemophilia Board of the German, Austrian, Swiss Society on Thrombosis Hemostasis Research recommend intramuscular COVID-19 vaccines for individuals with hemophilia, but with some considerations (low-quality AGREE II rating; published 15 April 2021)
	• The International Federation of Otorhinolaryngological Societies research group and Confederation of European Otorhinolaryngology – Head and Neck Surgery board recommend COVID-19 vaccines for otolaryngologists and head and neck surgeons who are considering pregnancy, who are childbearing, and/or breastfeeding (low-quality AGREE II rating; published 15 April 2021)
	• The Italian Group for the Study of Cryoglobulaemias recommend COVID-19 vaccines for individuals with cryoglobulinaemic vasculitis, and they should be considered a priority group during vaccine allocation (low-quality AGREE II rating; published 12 April 2021)
	• A medium-quality rapid review examined Canada's vaccine prioritization guidance based on the PROGRESS model and the magnitude of risk factors and severe outcomes of COVID-19 (7/10 AMSTAR rating; pre-print last edited 22 May 2021)
	  ○ Increased risk of mortality from COVID-19 are associated with people aged 60 to 69 years, with two or more chronic conditions, have Down syndrome, 1ype 1 and 2 diabetes, end-stage kidney disease, epilepsy, motor neuron disease, multiple sclerosis, myasthenia gravis, or Huntingdon's disease
	  ○ Higher increased risk of mortality from COVID-19 are associated with people with Down syndrome, aged 60 to 69 years, and diabetes
	  ○ There is little to no increase of severe outcomes for people with cardiovascular and respiratory conditions or for adult males compared to females
	• A low-quality rapid review from the WHO and UNICEF developed COVID-19 vaccination recommendations and equity considerations for people with disabilities and their social supports, governments, healthcare providers,
		• As of 30 April 2021, 95% of MIQ workers included in the first group of New Zealand's vaccine roll-out have been vaccinated
		• In the U.K., while Northern Ireland has opened vaccine eligibility to individuals 18 years and older as of 5 May 2021, England has only allowed individuals aged 30 years and older to be vaccinated as of 26 May 2021
		• Alberta's Premier announced on 7 May 2021 that the province had reached an agreement with the U.S. state of Montana to allow about 2,000 Alberta truck drivers who transport goods into the U.S. to receive the Johnson & Johnson vaccine at a rest stop in Montana at no cost
		• Canadian provinces have made significant progress in their vaccine roll-outs and made adjustments to prioritize certain populations
		  ○ As of 12 May 2021, B.C. passed the 50% threshold of eligible adults receiving a first vaccination dose, and as of 22 May 2021, all residents aged 18 to 59 may call and book a vaccine appointment in five-year increments between May and June 2021
		  ▪ Health officials have reported that all eligible adults should receive at least their first dose by the middle of June 2021
		  ○ In Alberta, vaccines were offered to more than 15,000 workers at 136 federal and provincial meat-packing plants starting 27 April 2021, and vaccine eligibility for groups under Phase 2C of the roll-out plan was expanded on 4 May 2021, to include teachers, early childhood educators and support staff provincewide to help protect schools
		  ▪ Bookings for this group operate on an honour system and no proof of employment is required to attend a vaccination appointment
		  ○ Alberta began Phase 3 of its vaccine roll-out on 6 May 2021, opening vaccine appointment bookings to the general public, and the province aims to offer all adult residents a vaccine before 30 June 2021
		  ○ Individuals 16 years and older in Saskatchewan became eligible to book a vaccination appointment on 18 May 2021
		  ▪ The province aims to have all Saskatchewan residents fully vaccinated with two doses by 31 July 2021

	community organizations, residential institutions and long-term facilities, and communities (0/9 AMSTAR rating; published 26 April 2021) • A single study analyzed vaccine allocation plans across U.S. states and found that a majority of the plans ensured equitable distribution of vaccines and included indicators to measure progress (published 18 May 2021) *Dosing rules* • A modelling study examined the impact of extending the dosing intervals of mRNA vaccine (12 or 24 weeks) under the scenario of limited vaccine supply and a third wave in Canada, and found that this extension could lead to accelerated vaccine coverage and fewer cases of symptomatic disease, hospitalizations, and deaths compared to a six-week dosing interval (published 10 April 2021) ○ Increased death rates were attributed to parameters where the first dose only provided three-month protection and the first dose was only 65% or less effective against death	○ In Manitoba, adults aged 18 years and older are now eligible to book appointments to receive their first dose of COVID-19 vaccine ○ Phase II vaccinations began in Ontario with older adults, people who live and work in high-risk congregate settings, caregivers in select congregate-care settings, individuals with health conditions and essential caregivers, and people who cannot work from home ○ On 6 April 2021, Ontario announced it would be increasing vaccine allocations to hotspot communities via all the established delivery channels in 13 public-health units in the province that had elevated rates of virus transmission, hospitalizations and deaths ▪ A news release from 29 April 2021 shows that during the weeks of 3 May 2021 and 10 May 2021 the province was planning to allocate 50% of all doses to hotspots, and then return to allocating vaccine doses on a per capita basis as of the week of 17 May (based on the remaining eligible population) ○ As of 18 May 2021, all adults 18 and older in Ontario became eligible to book an appointment for a first dose ○ In Quebec, all adults 18 years and older, pregnant women, and individuals 16 and 17 years old who are essential workers and/or have a chronic disease or health problem that increases the risk of complications of COVID-19 became eligible for vaccination as of 25 May 2021 ○ As of 18 May 2021, individuals aged 18 years and older in New Brunswick are now eligible to receive their first dose from either a pharmacy or vaccination clinic ○ New Brunswick is continuing to work with long-term care facilities to improve their vaccination rates ▪ As of 20 May 2021, 67.2% of long-term healthcare staff have received at least one dose ○ All adults in Nova Scotia are eligible to book a vaccination appointment ○ An update to Phase 2 of Prince Edward Island's vaccine roll-out plan shows that by 10 May 2021, all individuals 16 years and older will be eligible to be vaccinated

		▪ Phase 3 of Prince Edward Island's roll-out will take place from summer to September 2021 and will offer second doses to individuals vaccinated in Phase 2, and youth younger than 12 years of age will be eligible for a vaccine during this phase if one is approved for this age category o Newfoundland and Labrador has updated Phase 3 of its vaccine roll-out plan allowing individuals 12 years of age and older to book a vaccination appointment o As of 19 May 2021, all individuals in Yukon above 18 years of age are able to receive their first and second vaccine doses at a Whitehorse-based clinic • Several countries have made changes to their recommendations for the use of the Oxford-AstraZeneca and the Johnson & Johnson vaccines in recent weeks o In France, use of the Johnson & Johnson vaccine is only recommended for individuals over the age of 55 years in eligible population groups o As of 6 May 2021, Germany lifted restrictions banning those under 60 from getting the Oxford-AstraZeneca vaccine, and as of 10 May 2021, Germany lifted prioritization of the Johnson & Johnson vaccination, now allowing all adults to receive both vaccines ▪ Germany recommends that second doses of the Oxford-AstraZeneca and the Johnson & Johnson vaccines be administered four weeks after receiving the first dose o In the U.K., individuals aged 30 years or younger without underlying health conditions that put them at higher risk of severe COVID-19 disease are advised to choose an alternative to the Oxford-AstraZeneca vaccine, if available o On 23 April 2021, the FDA and the U.S. CDC lifted the recommended pause on use of the Johnson & Johnson COVID-19 vaccine following a thorough safety review o In Canada, the National Advisory Committee on Immunization (NACI) changed its recommendation on the use of the Oxford-AstraZeneca vaccine on 23 April 2021 and its recommendation on the use of the Johnson & Johnson vaccine on 3 May 2021 to lower the recommended age for use of both vaccines to adults aged 30 and above

		○ NACI also announced a preferential recommendation for authorized mRNA vaccines (Pfizer-BioNTech and Moderna) for adults under 55 years old, and advised that the Oxford-AstraZeneca and Johnson & Johnson vaccines should only be used if the individual does not wish to wait for an mRNA vaccine and the benefits outweigh the risks • Canadian provinces are in the midst of deciding if and how to administer doses of the Oxford-AstraZeneca vaccine that arrived between 17-23 May 2021 from Health Canada after considering NACI's advice, reports and concerns of rare blood clotting from the vaccine, and the increased supply of alternative mRNA vaccines in recent weeks ○ As of 12 May 2021, provincial health officers in B.C. are allowing appointments for second doses of the Oxford-AstraZeneca vaccine to continue through pharmacies, but no new appointments may be made regardless of age group ○ On 19 April 2021, Alberta lowered the age eligibility for the Oxford-AstraZeneca vaccine to adults 40 years and older, but due to limited supply of the vaccine in May, existing doses in Alberta will be reserved for individuals who have a contraindication to an mRNA vaccine or are eligible to receive their second dose of the vaccine ○ Saskatchewan lowered the eligible age for use of the Oxford-AstraZeneca vaccine from 55 years to 40 years on 20 April 2021, but then stopped giving out first doses of vaccine on 12 May 2021 due to supply issues, and instead decided to reserve remaining and incoming shipments for second doses ○ On 19 April 2021, the decision was made in Manitoba to allow use of the Oxford-AstraZeneca vaccine for all individuals aged 40 and older, and on 30 April 2021, the age for eligibility was lowered to include people aged 30 to 39 with priority health conditions ○ On 21 May 2021, Ontario announced it will move forward with second doses of the Oxford-AstraZeneca vaccine, enabling eligible individuals to receive their second dose with a minimum of a 10-week interval between doses and informed consent

		▪ The province published an information sheet that outlines the options for second doses for individuals who have already received one dose of the Oxford-AstraZeneca vaccine ○ Quebec stopped administering the Oxford-AstraZeneca vaccine as a first dose vaccine on 13 May 2021, but still offers it as a second dose ▪ The suspension comes after the Quebec Immunization Committee released guidance and recommendations regarding the use of the Oxford-AstraZeneca vaccine in the context of signals of vaccine-induced immune thrombotic thrombocytopenia ○ New Brunswick has 3,500 doses of Oxford-AstraZeneca vaccine that will expire on 31 May 2021, and is urging individuals 55 years of age and older who received the first dose to register for their second dose before the end of the month • The Quebec Immunization Committee issued recommendations regarding the use of the Johnson & Johnson vaccine on 13 May 2021 ○ The committee recommended that the vaccine be offered to individuals aged 18 and older who present a contradiction for receiving an mRNA vaccine or if exceptional circumstances, such as when logistics prelude the use of an mRNA vaccine, arise ○ The committee notes that the vaccine may be considered for women aged 60 and older and men aged 30 and older who prefer a single dose vaccine or do not want to wait for an mRNA vaccine ○ The committee stresses the importance of making patients aware of the advantages and risks of the vaccine and ensuring providers are aware of the signs of vaccine-induced immune thrombotic thrombocytopenia • Prioritizing the vaccination of youth ages 12 to 17 years has had an impact on vaccine roll-out plans in Israel and in most Canadian provinces ○ The Ministry of Health in Israel is currently considering vaccination for children who are aged 12 to 15 given the current authorization to vaccinate children aged 12 years and older who belong to a high risk group

		○ As of 19 May 2021, provincial health officers in B.C. announced that residents aged 12 to 17 years old can register for vaccination through the provincial booking system ▪ Parental consent forms will not be required to receive a vaccination under the Infants Act ○ On 10 May 2021, every resident of Alberta age 12 and older became eligible to book a vaccination appointment ▪ Residents 12 to 15 years old are only eligible to receive the Pfizer-BioNTech vaccine as authorized by Health Canada ○ Saskatchewan has added youth aged 12 to 15 to their vaccine roll-out sequencing, and this group became eligible to book vaccination appointments on 20 May 2021 ▪ Written consent is required for all youth prior to vaccination ○ In Manitoba, youth 12 to 17 years of age are now eligible to book appointments to receive their first dose of COVID-19 vaccine ○ As of 23 May 2021, all youth aged 12 years and older in Ontario are eligible to book an appointment for a first dose ○ As of 25 May 2021, adolescents 12 to 17 years of age throughout Quebec are eligible for vaccination ○ Newfoundland and Labrador has updated Phase 3 of its vaccine roll-out plan allowing individuals 12 years of age and older to book a vaccination appointment ▪ Newfoundland and Labrador has a goal of getting all children between the ages of 12 and 15 fully vaccinated by early in the next school year ○ As of 31 May 2021, youth in rural areas in Yukon between 12 and 17 years of age are eligible to receive the Pfizer-BioNTech vaccine ▪ Youth in Whitehorse will be eligible to receive their first dose starting June 1 and their second dose starting June 23 ○ As of 24 May 2021, all youth in NWT aged 12 to 17 are eligible to receive the Pfizer-BioNTech vaccine ▪ The Pfizer vaccine is exclusively reserved for youth due to limited supply *Dosing rules*

		• As of 25 May 2021, a total of 3,690,622 COVID-19 vaccine doses have been administered to Australians
		  ○ 2,061,522 of these doses have been delivered through primary care
		• As of 25 May 2021, more than 546.71 million doses of COVID-19 vaccines have been administered across China
		  ○ As of 25 May 2021, over 2.2 million vaccine doses have been administered in Hong Kong, and 934,341 people have been fully vaccinated
		  ○ As of 26 May 2021, a total of 157,263 vaccine doses have been administered in Macao, with 58,837 people fully vaccinated
		• As of 26 May 2021, France has administered 34,200,676 vaccines doses
		  ○ 24,098,326 individuals have received their first dose (45.9% of the total population)
		  ○ 10,102,350 individuals have received their second dose and are fully vaccination (19.2% of the total population)
		• As of 24 May 2021, Germany has administered 45.4 million vaccine doses
		  ○ 40.4% of the population has received the first dose of the vaccine, and 14.3% of the German population has been fully vaccinated
		  ○ 669,641 doses are administered each day
		• As of 25 May 2021, 62.9% of the population in Israel have received at least one dose of COVID-19 vaccine and 59.1% of the population are fully vaccinated
		  ○ 92% of Israelis aged 50 and older are fully vaccinated
		• As of 25 May 2021, New Zealand has administered 562,149 doses of the Pfizer-BioNTech vaccine – 371,043 first doses and 191,106 second doses
		  ○ New Zealand has used 98% of its vaccine stock
		• As of 26 May 2021, the U.K. has administrated 61,996,062 vaccine doses
		  ○ 38,378,564 individuals have received their first dose
		  ○ 23,616,498 individuals have received their second dose and are fully vaccinated

		• In the U.K., those remaining people in the top nine priority groups who have yet to receive their second dose can do so earlier as the interval for second doses has been shortened from 12 to eight weeks
		  ○ This follows the latest recommendation from the Joint Committee on Vaccination and Immunization (JCVI) to reduce dosing interval to protect the most vulnerable from the B1.617.2 variant of concern identified in India
		• As of 25 May 2021, the U.S. CDC reported that more than 287 million doses of COVID-19 vaccines have been administered
		• As of 26 May 2021, 85.7% of doses delivered to Canada have been administered
		  ○ 20,052,430 first doses and 1,720,486 second doses of COVID-19 vaccine have been administered
		  ○ About 52.8% of the Canadian population have been vaccinated with at least one dose of COVID-19 vaccine
		• As of 25 May 2021, the number of vaccine doses administered in Canadian provinces ranges from 8,251,642 in Ontario to 761,132 in Manitoba to 5,051,681 doses in Quebec to 31,272 doses in Nunavut
		• The Saskatchewan government announced that as of 17 May 2021, second dose administration of COVID-19 vaccines would begin in adults 85 years and older and will continue in lowering age increments
		  ○ Priority for second doses will also be given to individuals diagnosed with or being treated for cancer, and individuals who have received solid organ transplants
		• Manitoba is modelling vaccine roll-out and distribution projections for second doses under high-supply and low-supply scenarios
		  ○ Under a low-supply scenario, 70% of Manitobans aged 12 and older are forecasted to have a second dose by 31 July 2021, while under a high-supply scenario, 70% of Manitobans aged 12 and older are forecasted to have a second dose by 29 July 2021
		• On 23 April 2021, the Quebec Immunization Committee issued the following recommendations regarding second doses for long-term care residents in the context of a third wave and suboptimal vaccine coverage in health workers:

		○ Immediately consider the administration of second doses to long-term care residents, respecting the minimum 28-days interval between doses ○ Improve vaccine coverage amongst health workers using effective and adaptable strategies ○ Monitor in quasi-real time the impacts of vaccination in Quebec and the international evidence to evaluate risks and benefits *Ensuring equity* • As of 25 April 2021, COVID-19 vaccination in China is available for foreigners in Shanghai, Beijing, Tianjin, Zhejiang province, Jiangsu province and Guangdong province • Human rights and health organizations have called out on inequities related to the vaccine roll-out and allocation for Palestinians ○ Efforts have been made to vaccinate Palestinians with relatives who live in Jerusalem and Palestinians prisoners ○ The vast majority of Palestinian citizens and residents of Israel have been vaccinated, but a majority of individuals living in the West Bank and the Gaza Strip remain unvaccinated (as of 20 May 2021, 5.5% of Palestinians have received at least one dose of COVID-19 vaccine) ○ Vaccine shipments from the COVAX facility arrived in Palestine as of 17 March 2021 • In Manitoba, all Indigenous people aged 12 years and older, as well as people with certain priority health conditions, are eligible to book an appointment for their second dose (if the minimum time interval between doses has been met) • As of 20 May 2021, 71,326 vaccine doses had been allocated to First Nations communities in Manitoba ○ Most of these doses (72.1%) have been administered on reserves • Individuals who are not permanent residents of Nova Scotia and do not have a Nova Scotia Health Card can book a vaccination appointment when their age group becomes eligible
Communicating vaccine-allocation plans and the safety and	*Target of intervention* • A low-quality rapid review found that COVID-19 vaccination should be strongly encouraged among healthcare personnel, and recommended a supportive environment where information and clear explanation of	*Target of intervention* • Leading businesses, employers and industry bodies, including IKEA, Asda, Metro Bank, and Proctor & Gamble U.K., have come together to support the COVID-19 vaccination program and encourage staff to receive their vaccine when eligible

effectiveness of vaccines	the benefit and value of the vaccine could be discussed between employers and healthcare personnel (2/9 AMSTAR rating; published 20 April 2021) *Content of messaging* • WHO released guidance for the use of COVID-19 BIBP vaccine and recommends effective and culturally and linguistically acceptable communication to the general population regarding vaccine efficacy and safety (high-quality AGREE II rating; published 7 May 2021) • Emphasizing personal benefits instead of collective benefits or a combination of both was more effective in individuals who are strongly hesitant about vaccination based on a single-blind parallel-group randomized controlled trial in the U.K. that assessed the effectiveness of different types of written COVID-19 vaccination information (published 12 May 2021)	• Resources for Indigenous communities in British Columbia aiming to address vaccine anxiety and hesitancy are provided • Between 19 May and 22 May 2021, youth in Newfoundland and Labrador have the opportunity to submit anonymous vaccine questions to be answered by the province's top doctor *Delivery of the intervention* • New Zealand's public-information campaign includes TV and radio ads, information booklets, videos of influential persons, and social media • Brochures have also been sent to all households in New Zealand to advise residents of which group they are in and how to book an appointment for a vaccination • The Newfoundland and Labrador Centre for Health Information posted on its YouTube channel a video explaining how to book a COVID-19 vaccination appointment online • A video titled, "Vaccine Clinic Walkthrough" was posted on the Government of Prince Edward Island's YouTube channel on 14 May 2021, outlining how to prepare for, and what to expect at your vaccination appointment • A public-service announcement titled, "When it's your turn, get vaccinated" was posted on the Government of Prince Edward Island's YouTube channel on 6 April 2021 to promote Islanders to get their vaccination once they become eligible • Weekly updates of the vaccine are provided on the Facebook page of the Government of Northwest Territories *Content of messaging* • New Zealand ramped up its public information campaign around vaccines during the week of 18 April 2021, consisting of fact-based information and encouragement for people about the benefits of vaccination • Information on the efficacy of the Oxford-AstraZeneca vaccine after the first dose and the second dose when administered at different intervals is provided on the Alberta government's website • Manitoba maintains a constantly updated webpage dedicated to outlining in detail the specific groups of people currently eligible to

		book an appointment to receive their first or second vaccination appointment • A chart listing all eligible individuals, as well as where they can get a COVID-19 vaccine, has been updated on the Government of New Brunswick website • A list of the communities hosting vaccination clinics has been updated on the Government of New Brunswick website • Links for booking appointments, as well as the locations of vaccination clinics, pharmacies and local schools offering the vaccine, are posted on the Government of Prince Edward Island website • Links to book a vaccination appointment at one of the regional health authorities and information about the COVID-19 variants can be found on the Government of Newfoundland and Labrador website
Administering vaccines in ways that optimize timely uptake	*Where* • A low-quality rapid review identified three models of mass-vaccination clinics (i.e., drive-through, walk-through, mobile clinics) and found that effective practices involved the maintenance of public health measures (e.g., physical distancing, reducing participant length of time, providing multiple locations within a region) (3/9 AMSTAR rating; literature last searched 20 June 2020) *With what partnerships* • WHO and UNICEF outline guidance to involve community health workers in COVID-19 vaccination programs given that they have the potential to identify and connect with marginalized populations to help address accessibility and knowledge barriers (low-quality AGREE II rating; published 26 April 2021) *With what broader, complementary health interventions* • The European Centre for Disease Prevention and Control developed interim guidance for fully vaccinated individuals (low-quality AGREE II rating; published 21 April 2021) o Physical distancing and face-mask requirements can be relaxed if fully vaccinated people meet with other fully vaccinated individuals	*With what explicit effort to leverage existing health-system arrangements* • As of 17 May 2021, the Government of Northwest Territories is offering funding to Indigenous and community governments to promote vaccines at the local and regional levels *Where* • In April 2021, medical practices in Germany began administering vaccinations • Vaccine administration is being managed differently by each district health board (DHB) in New Zealand, and will be made available at a range of locations, including pop-up clinics, general practitioners, Māori and Pacific healthcare providers, mobile clinics, and community clinics o Vaccinations for group 3 of the vaccine roll-out have begun in different regions at different times in May • According to the Minister for the COVID-19 Response, vaccinations are being offered to staff and residents of aged residential care facilities around New Zealand at community vaccination centres o Mobile clinics have also been deployed to some rest homes o Each vaccination site in New Zealand goes through an accreditation process to ensure that the site can administer

	○ Physical distancing and face-mask requirements can be relaxed if there are no risk factors for severe disease in interactions between vaccinated and unvaccinated individuals ○ Fully vaccinated individuals who may have been exposed could be considered a low-risk contact during contact tracing ○ Testing and quarantine can be waived or modified for fully vaccinated individuals in settings with low community transmission ○ Current public-health measures should remain in place during public spaces, large gatherings, and during travel	vaccines safely and in a measured way, according to the Director-General of Health, • British Columbia is now offering vaccinations at malls, and youth aged 12 to 17 will be vaccinated in community clinics • Through a partnership between the First Nations Health Authority and First Nations communities in B.C., community-based clinics are being operated for First Nations people living on reserve and those living nearby off-reserve to be vaccinated • Select pharmacies in Saskatchewan are part of a pilot program to offer COVID-19 vaccines where bookings for appointments began on 26 April 2021 ○ As of 3 May 2021, 102 pharmacies in 37 Saskatchewan communities are approved to receive vaccines as part of this program ○ Pharmacies were advised to offer vaccines to pharmacy and grocery staff working in facilities where vaccines are being offered • Saskatchewan announced on 12 April 2021 that its mobile vaccination units would target first responders once vaccinations in congregate-living settings were completed ○ First responders and front-line workers were also prioritized at mass-vaccination sites when Saskatchewan residents 40 years and older became eligible to receive the Oxford-AstraZeneca vaccine on 20 April 2021 ○ Proof of employment is required at the vaccination site • The Saskatchewan Health Authority will begin administering the Pfizer-BioNTech vaccine in elementary and high schools across the province in the month of June • Supersites in Manitoba are currently in operation in Winnipeg (where there are two supersites), Brandon, Thompson, Selkirk, Morden, Dauphin, and Steinbach, with plans to open a new site in Gimli on 29 May 2021 ○ At supersites and pop-up clinics, adults aged 18 years of age and older, as well as youth aged 12 to 17 years of age, are eligible to book appointments to receive their first dose • A distributed model of doctors' offices and pharmacists in Manitoba was expected to administer 25% of daily doses in the second quarter, subject to approval of suitable vaccines

		○ As of 18 May 2021, 10% of doses have been distributed through the distributed-channel model • Five Indigenous-led COVID-19 immunization clinics have been established in Winnipeg, Brandon, Portage la Prairie, and Thompson to increase vaccine accessibility and provide culturally safe spaces for First Nations (status and non-status), Metis and Inuit peoples in Manitoba • Ontario is anticipating that by the end of May 2021 more than 2,400 pharmacies across the province will be offering either the Pfizer or Moderna vaccines • As of 5 May 2021, several employer-led workplace vaccination clinics in Ontario have been completed, are being started, or are being planned • As of 3 May 2021, 23 company-led vaccination centres have been established in Quebec • Two drive-thru clinics in Nova Scotia have been set up to increase the number of vaccinations administered daily ○ The first drive-thru clinic opened on 10 May 2021, at the Dartmouth General Hospital for individuals 50 years of age and older • Students aged 12-15 in P.E.I. will have the option of receiving their vaccination either at school or at a vaccine clinic beginning the 4 June 2021 • As of 31 May 2021, clinics will be held in schools across every Yukon community, and clinics located in Whitehorse, will allow youth between 12 and 17 years old to receive their first and second Pfizer-BioNTech doses • As of 24 May 2021, Pfizer-BioNTech vaccines will be provided during school to youth in N.W.T. *With what appointment/scheduling and screening support* • In New Zealand, a national vaccination booking system is in its trial phase and will be scaled up to the broader population in the second half of the year ○ Individuals who have booked vaccinations but missed their appointments are allowed to "walk-up" to vaccination centres

		and get their vaccine, according to the Minister for the COVID-19 Response
		• Some pop-up clinics in Manitoba operate on a walk-in basis while others require patients to call a dedicated phone line to book an appointment
		• As of 19 May 2021, approximately 67% of vaccination appointments in Manitoba are being made through the online booking portal, with the remainder being made over the phone
		• Ontario is operating an online booking system and provincial customer service desk to support vaccination appointment bookings at mass-immunization sites across all local public-health units in the province
		  ○ Individuals booking through the provincial portal can book both their first and second dose appointments at the same time
		  ○ Pharmacies are responsible for establishing and operating their own systems for vaccination appointment booking and management
		• The province of Nova Scotia has partnered with the Rural Transportation Association to offer low-cost transportation for individuals unable to get to a vaccination appointment
		  ○ A link to find a provider to arrange transportation can be found on the Government of Nova Scotia website
		• Individuals in rural communities in Yukon who are 18 years or older can call local clinics to schedule a vaccine appointment or visit the Whitehorse clinic
		
		By whom and with what changes to remuneration
		• The government of New Zealand announced on 18 May 2021 that 5,358 vaccinators have completed the IMAC training program
		  ○ Initiatives are underway to further boost the pool of vaccinators in time for vaccination roll-out peaks later in the year, including possibly allowing people with health- and disability-sector experience across the country to work as supplementary vaccinators
		• As of 18 May 2021, there are 4,007 staff working in vaccination centres in Manitoba

		• Primary-care providers in six public-health units in Ontario have begun contacting eligible patients to book vaccination appointments; they are not taking appointments by request
		
		With what broader, complementary health interventions
		• Non-vaccinated people in Israel can now enter indoor attractions, and private gatherings have increased to up to 500 people outdoors and 50 people indoors
		• In Israel, occupancy restrictions have been removed for places under the green pass and it is mandatory for non-essential businesses to require people to hold a green pass to enter
		  ○ The Green Pass system will end on 1 June 2021, which means that a proof of vaccination is no longer required to enter businesses (e.g., venues, stores, restaurants)
		• All remaining COVID-19 public-health measure restrictions on gatherings in Israel will also be lifted as of 1 June 2021
		  ○ The requirement to wear masks indoors remains in place for the next two weeks
		• As of 1 May 2021, all MIQ and government border workers in New Zealand must show proof of vaccination in order to enter their workplace
		  ○ Initially, current workers who have received one dose of vaccine will be considered vaccinated
		  ○ By 5 June 2021, all current workers must have had two doses of vaccine to be considered vaccinated
		  ○ New workers will need to have had their first dose before starting work, and then have 35 days from starting work to receive their second dose
		• New Zealand's Ministry of Health recommends a two-week gap between the influenza vaccine and the COVID-19 vaccine
		  ○ It is recommended that if an individual has a vaccination appointment booked for COVID-19, they should get the COVID-19 vaccine first, but if not, they should get the influenza vaccine first
		  ○ New Zealand's 2021 influenza immunization program began on 14 April 2021 for people 65 years and older
		• The U.S. CDC updated its guidelines for fully vaccinated people on 13 May 2021 and made the following changes:

		○ Fully vaccinated people no longer need to wear a mask or physically distance in any setting, except where required by federal, state, local, tribal, or territorial laws, rules and regulations, including local business and workplace guidance ○ Fully vaccinated people can refrain from testing following a known exposure unless they are residents or employees of a correctional or detention facility or a homeless shelter • According to modelling of the Public Health Agency of Canada on 23 April 2021, by maintaining public health measures until at least 75% of the Canadian population has received their first dose of COVID-19 vaccine and 20% of the population has received their second dose, infection rates of COVID-19 would be driven low enough to lift restrictions without overwhelming the healthcare system • The Alberta government has announced a three-stage Reopening Plan for summer 2021 based partially on vaccination rates ○ Stage one of the plan is anticipated to begin on 2 June 2021 and requires two weeks to have passed after 50% of Albertans 12 years and older have received at least one dose of a COVID-19 vaccine ○ As of 25 May 2021, 49.7% of the population in Alberta have received their first dose • On 4 May 2021, the Government of Saskatchewan released a three-step Re-opening Plan for the province based on vaccination thresholds and vaccine availability ○ The first step of the plan is expected to commence once three weeks have passed since 70% of the population 40 years and older have received their first dose of COVID-19 vaccine and all adults over 18 years old are eligible ○ A target date was set by the Saskatchewan government to reach the threshold to enter step one of the plan on 30 May 2021 • The recently released reopening plan in Ontario also proposes a three-step plan that is based on vaccination rates ○ Step 1 (60% of adults with one dose): Outdoors first with limited, well-managed crowding and restricted retail ○ Step 2 (70% of adults with one dose and 20% fully vaccinated): Open indoors with small numbers and face coverings and expanded outdoor activities

		○ Step 3 (70-80% with one dose and 25% fully vaccinated): Expand indoors where face coverings can't always be worn • As of 25 May 2021, Yukoners who are fully vaccinated and can provide confirmation of their vaccine status, do not have to self-isolate when entering the territory from anywhere in Canada, and Yukon bars and restaurants will return to full capacity with no physical distancing given that nearly 75% of Yukoners have received their first vaccine dose • While proof of vaccination is not required for travel outside of the Northwest Territories, proof of vaccination can be provided to individuals who complete and submit a COVID-19 vaccine record form • As of 21 April 2021, all employees covered by the Employment Standards Code in Alberta are allowed three hours of paid, job-protected leave to get each dose of a COVID-19 vaccine *With what injury-compensation program* • As of 17 May 2021, Australia is not pursuing a no-fault COVID-19 vaccine-injury compensation as serious side effects are extremely rare
Surveillance, monitoring and evaluation, and reporting	*Documenting vaccine-related opinions* • A medium-quality rapid review summarized 109 studies that focused on vaccination uptake and attitudes in Canada and globally (4/9 AMSTAR rating; last updated 23 April 2021) ○ Vaccination uptake was positively associated with individuals who are males, older, higher socio-economic status, trust in experts and government, previous history of receiving an influenza vaccine, and heightened concern about COVID-19 ○ Marginalized populations (e.g., Black, Asian) have been reported with the lowest vaccination-uptake rate ○ Intent to vaccinate in the general population in Canada ranges between 66-88% (with British Columbia, Quebec, and Atlantic provinces with the highest intention to vaccinate) • A medium-quality rapid review summarized behavioural responses and attitudes towards receiving a COVID-19	*Documenting vaccine-related opinions* • Four distinct online surveys have been taken on the attitudes and sentiments of New Zealanders towards COVID-19 vaccines, and the latest survey indicated that potential uptake overall has increased in April to 77% from 69% in March 2021 ○ Those unlikely to take a vaccine if offered has dropped to 12% from 20% in March ○ The two most common reasons for hesitancy are the quick turnaround time for development of the vaccine and the unknown about the long-term effects of the vaccine • An Angus Reid survey released 26 May 2021 revealed that most Canadians showed strong support for vaccine passports use in international travel ○ 79% of respondents supported mandatory vaccine passports for international travel outside of the U.S. while 76% supported such a requirement for travel to the U.S.

	vaccine if it resulted in a certification to allow for extended activities and international travel and found that responses varied based on the type of activity (7/9 AMSTAR rating; literature last searched 28 December 2020)
	• A single study reported that individuals preferred single doses over multiple vaccine doses, reduced wait times, and vaccinations at a pharmacy or health facility instead of mass-vaccination sites
	  ○ The authors concluded that streamlined and simplified vaccination campaigns with autonomy over brand and location may promote ease of vaccination
	Documenting adverse events and follow-up
	• The U.S. Advisory Committee on Immunization Practices developed interim guidance based on thrombosis thrombocytopenia syndrome (TTS) identified in the Vaccine Adverse Event Reporting System (VAERS), and found that Janssen COVID-19 vaccine is highly effective, but limiting its usage to specific populations may reduce TTS cases (low-quality AGREE II rating; published 30 April 2021)
	• A low-quality rapid review summarizes recommendations from different professional societies about diagnostic pathways and treatment for patients with possible thrombotic adverse events following COVID-19 vaccination (0/9 AMSTAR rating; last updated 13 May 2021)
	
	Identifying sources of vaccine hesitancy
	• A medium-quality rapid review summarized sources of vaccine hesitancy among Indigenous groups, Black, African and Caribbean communities, and individuals experiencing homelessness (6/9 AMSTAR rating; last updated 30 April 2021)
	  ○ Indigenous groups were primarily concerned about vaccine safety and preferred communication from trusted sources to provide information about risks and benefits
		○ However, 41% of respondents did not support the idea of using vaccination proof domestically, such as when entering restaurants, malls and movie theatres
		
		Documenting vaccine status
		• According to the Director-General of Health of New Zealand, as of 27 April 2021, all employers of border workers are mandated to use the COVID-19 immunization register to upload information about their workers who require vaccination; the register is connected to New Zealand's NHI system
		• Public Health England released its updated COVID-19 vaccine surveillance report, current as of 20 May 2021
		  ○ Findings show that one in three adults in England are already fully vaccinated with both doses
		• The Quebec government is beginning to make digital proof of vaccination available through the clicsante.ca portal
		  ○ Individuals are required to input a valid email address or phone number as well as their health insurance number to receive proof of vaccination via email or text message
		
		Documenting adverse events and follow-up
		• Adverse reactions to vaccines are reported to the Centre for Adverse Reactions Monitoring (CARM), which has an independent safety monitoring board that reviews all reports of concern in country as well as from overseas reporting, according to New Zealand's COVID-19 Response Minister
		• Canada reported its first case of rare blood clotting after vaccination with the Oxford-AstraZeneca vaccine in Quebec on 13 April 2021
		  ○ The first death due to these blood clots was also reported in Quebec on 27 April 2021
		• Weekly reports on adverse events following vaccination are published on the B.C. Centre for Disease Control website
		• Alberta reported its first case of rare blood clotting following vaccination with the Oxford-AstraZeneca vaccine on 17 April 2021 and its first death due to the blood clotting on 5 May 2021

	○ Black, African, and Caribbean communities were primarily concerned about the trade-off between perceived risk of COVID-19 and risk of adverse effects of the vaccine, but also highlighted concerns around ease of access (e.g., trusted and accessible locations) ○ Individuals experiencing homelessness were primarily concerned about ease of accessibility to vaccination programs, but potential lack of vaccination records was a barrier for healthcare providers • A medium-quality living evidence review found that lower vaccination acceptance and/or uptake among the general public were associated with concerns and misinformed beliefs about efficacy, safety and necessity, mistrust of government and public-health agencies, and among marginalized groups (e.g., Black, Latinx, Asian); however, this may be counteracted with social and peer-to-peer influence (5/9 AMSTAR rating; literature last searched 20 April 2021) • A medium-quality rapid review found that lower vaccination acceptance and/or uptake among healthcare workers were associated with concerns and misinformed beliefs about efficacy, safety and necessity, mistrust of government and public-health agencies, and among marginalized groups (e.g., Black, Latinx, Asian) and non-physician healthcare workers (e.g., nurses) (4/9 AMSTAR rating; literature last searched 20 April 2021)	• Saskatchewan reported its first case of rare blood clotting after vaccination with the Oxford-AstraZeneca vaccine on 14 May 2021

Table 2: Key findings from highly relevant documents identified in previous versions related to one or more COVID-19 vaccine roll-out elements

COVID-19 vaccine roll-out activities	Evidence from previous versions	Experiences from previous versions
General/cross-cutting insights	• WHO developed guidelines and tools for vaccine roll-out organizing framework: ○ The Vaccine Introduction Readiness Assessment Tool is intended to be used by ministries of health as a roadmap for countries to plan for COVID-19 vaccine introduction ○ Another guideline is designed to help countries develop their national COVID-19 vaccine deployment and plans in many aspects ○ A WHO guideline provides interim recommendations for use of the Moderna mRNA-1273 vaccine against COVID-19 ○ A WHO guideline provides the COVID-19 vaccine introduction and deployment costing tool (CVIC tool) to help governments, partners, and other stakeholders estimate the introductory and deployment cost of COVID-19 vaccine procurement and service delivery, before detailed planning can take place ○ A WHO guideline outlines the step-by-step process for national deployment and vaccination plan for COVID-19 vaccines (NDVP) development, submission and review, which should be used in conjunction with the standard review form and considerations for forming a regional COVID-19 review committee ○ Interim guidance from WHO provides an overview of key activities and considerations to achieve high acceptance and uptake of COVID-19 vaccines and a communication-planning template ○ WHO provides recommendations about how to put community engagement at the centre of strategies for the COVID-19 vaccine roll-out, including tips and discussion topics about vaccine delivery and demand creation, as well as guiding steps to ensure a safe and community-centred	• The vaccine supply of countries is dependent on manufacturing capacity within countries and/or external manufacturers, timing of vaccine approvals by national vaccine regulators, and the quantity of appropriate storage equipment and supplies for vaccine distribution and administration • As vaccine manufacturing capacity for COVID-19 vaccines continues to expand around the globe, countries are currently ramping up or planning to ramp up their vaccination efforts by procuring large volumes of vaccines and ancillary supplies, adding vaccination locations to reach communities, increasing the vaccination workforce, and providing information to the public on the safety and efficacy of approved vaccines and processes for scheduling vaccination appointments • Vaccine roll-out plans have been developed in all countries that focus on vaccinating priority populations using a phased approach • The European Centre for Disease Prevention and Control updated its overview of national COVID-19 vaccination campaign challenges in the European Union with notable updates to vaccine uptake, priority groups, vaccination strategies and policies, changes to vaccine products (e.g., resumed use of Oxford-AstraZeneca vaccine) monitoring, and the use of vaccination certificates • While most countries are progressing through their vaccine roll-outs according to plan, several Canadian provinces have adjusted their age-based roll-outs to prioritize people living in regions with high rates of COVID-19 transmission • To facilitate mass vaccinations, countries are launching mobile and community-based clinics as well as upscaling their health workforce to ensure that all individuals in their populations will have access to a COVID-19 vaccine • Concerns of the Oxford-AstraZeneca vaccine, which has been authorized for use in most of the countries reviewed, causing

	approach when conducting community-engagement activities ○ The COVID-19 vaccine safety guidance manual from WHO provides countries with recommendations on preparedness plans for COVID-19 vaccine safety in their overall vaccine-introduction plans, including nine modules ○ Interim guidance from the WHO provides recommendations and considerations about monitoring COVID-19 vaccination and presents different tools and digital systems for collecting and analyzing COVID-19 vaccination data, such as home-based records (vaccination cards), facility-based records (immunization registers), health-management information systems (HMIS), electronic immunization registries (EIR), and logistics-management information systems (LMIS) ○ One WHO guideline provides the COVID-19 vaccine checklist to help front-line health workers prepare and complete a COVID-19 vaccination session at a fixed post or outreach session • A guideline from the American College of Obstetricians and Gynecologists (ACOG) recommends that: ○ Pregnant and breastfeeding women should be offered the COVID-19 vaccine; ○ A conversation between pregnant women and their clinical teams should include the potential efficacy of the vaccine, the safety of the vaccine for the pregnant patient and the fetus, and other prevention measures such as hand washing, physical distancing, and wearing a mask; and ○ Vaccination of pregnant women may occur in any clinical setting and non-clinical community-based vaccination sites such as schools and community centres • One single study identified and analyzed 12 specific factors contributing to the success of Israel's vaccine roll-out in its initial phase, which broadly relate to: ○ Long-standing characteristics of Israel which are extrinsic to healthcare, such as Israel's small size in terms of both area and population	thrombosis with thrombocytopenia syndrome (blood clots) in adults under 55 years has led to changes in vaccine allocations and distribution in all countries and provinces where the vaccine is approved for use • Chinese vaccines have been approved in over 60 countries and may be distributed in many more should the Sinopharm and CoronaVac (Sinovac) vaccines be approved in the coming weeks for emergency use by the World Health Organization, which partners with the COVAX facility • As countries continue to ramp up their administration of COVID-19 vaccines, thought is being given to life post-vaccination, with actions being taken by governments to develop guidelines (U.S.) and ease restrictions (Israel) for fully vaccinated individuals

	○ Long-standing health-system features, such as a tradition of effective cooperation (particularly during national emergencies) between government, health plans, hospitals, and emergency care providers • One guideline from the European Centre for Disease Prevention and Control provides an updated overview of national COVID-19 vaccination roll-out across the EU/EEA countries, including new insights into some of the critical aspects and challenges they are experiencing with the implementation of national deployment plans • One single study describes key characteristics of 26 candidate COVID-19 vaccines, including efficacy levels, dosing regimens, storage requirements, prices, production capacities in 2021, and stocks reserved for low-income and middle-income (LMIC) countries ○ The four dimensions of effective global immunization include development and production, affordability, allocation and deployment ○ The vaccines produced by Johnson & Johnson are likely easier to deploy in LMIC countries and resource-restrained settings given that it only needs to be refrigerated and is one-dose only ○ Diverse options of vaccines that can be administered are likely needed to control the pandemic • A low-quality rapid review summarizes available information on vaccines (and storage and administration requirements), priority groups, surveillance and adverse events, and key training recommendations when administering vaccines in the United Kingdom	
Securing and distributing a reliable supply of vaccines and ancillary supplies (e.g., needles, diluents)	*National purchasing* • A U.S. CDC guideline describes several considerations related to securing and distributing a reliable supply of vaccines • One single study reveals that international institutions, governments and vaccine manufacturers need to plan for sufficient vaccine production and negotiate affordable prices for low- and middle-income countries	*National purchasing* • All countries assessed have finalized advance purchasing agreements with vaccine developers to secure COVID-19 vaccine doses as they become available, and some have even secured additional procurement agreements (on many occasions with multiple companies that have developed or are currently developing COVID-19 vaccines) • Efforts by countries to procure vaccines include:

	• Another single study calls for equitable sharing globally by indicating that high-income countries have secured more than half of the vaccine doses *Delivery of vaccines at a country level* • One single study calls for strengthening national and international vaccine-supply chains to ensure the efficient distribution and administration for remote communities, and to avoid vaccine wastage *Vaccine distribution within country and to administration sites* • A WHO guideline provides a five-step decision-making framework for implementing mass-vaccination campaigns for the prevention of vaccine-preventable diseases and high-impact diseases • A European CDC guidelines reports that the COVID-19 vaccine will be provided free of charge in most countries • A guideline from the Health Information and Quality Authority guideline from Ireland stresses how vaccination-site location (and no or low vaccination costs) can contribute to equitable access • Interim guidance from WHO recommends that long-term care facilities and local health authorities should conduct timely communications and plans to determine the logistics of how the COVID-19 vaccines will be deployed in their jurisdictions	○ The Hong Kong Special Administrative Region (HKSAR) government has secured a total of 22.5 million doses of COVID-19 vaccines, enough to cover Hong Kong's 7.5-million population ○ The U.K. government has ordered more than 400 million doses of seven of the most promising vaccines and has announced a deal with an eighth biopharmaceutical company, CureVac, to purchase 50 million doses of its vaccine to be delivered later this year if required ○ The U.K. government also ordered 30 million doses of the Johnson & Johnson vaccine, despite Johnson & Johnson halting deployment of its vaccine across Europe and the U.K. not yet approving the vaccine ○ A domestic manufacturing deal was also signed by the U.K. government with GlaxoSmithKline for 60 million doses of Novavax COVID-19 vaccine ○ Pfizer-BioNTech announced that the U.S. government purchased an additional 100 million doses of the Pfizer-BioNTech COVID-19 Vaccine (bringing the total to 300 million) ○ Following the USDA's emergency use authorization for the Johnson & Johnson vaccine on 27 February 2021, reports surfaced that the Biden administration plans to buy an additional 100 million doses of the Johnson & Johnson COVID-19 vaccine • Given the advancement in its domestic vaccine roll-out, China is making efforts to assist developing countries in securing COVID-19 vaccines by offering its vaccines to countries directly or through the COVAX Facility • Ancillary supplies were mass ordered by France prior to the arrival of the COVID-19 vaccine • Over $66 million has been allocated by the New Zealand government to support the roll-out of COVID-19 vaccines, including purchasing supplies to vaccinate the population and providing support to the Pacific countries • New Zealand's Prime Minister announced on 8 March 2021 that the government has decided to make Pfizer-BioNTech the country's primary vaccine provider because of the high degree of

		efficacy of its vaccine, and the resulting simplification of the vaccine roll-out ○ An advance purchasing agreement has been signed with Pfizer-BioNTech for an additional 8.5 million vaccine doses to bring New Zealand's total order to 10 million doses, enough for the country's entire population to be fully vaccinated ○ The New Zealand government is still determining how to make use of other vaccines that it has already procured, and is considering delaying shipments to New Zealand until 2022 and donating surplus vaccines to other countries ○ The government may consider procuring a vaccine that is more easily transported as a "backup option" to make vaccines more accessible for rural communities • The Government of Canada established advance purchasing agreements with seven companies that have developed or are currently developing COVID-19 vaccines to secure enough doses for all Canadians who wish to be vaccinated • Health Canada authorized the use of Pfizer-BioNTech COVID-19 vaccine on 9 December 2020 and the Moderna COVID-19 vaccine on 23 December 2020 ○ Advance purchasing agreements were previously secured with manufacturers of both of these vaccines • On 26 February 2021, Canada approved the Oxford-AstraZeneca COVID-19 vaccine and has pre-ordered 22 million doses of the vaccine • On 5 March 2021, Canada approved the Johnson & Johnson COVID-19 vaccine and has pre-ordered 10 million doses of the vaccine • Following the approval of the Pfizer-BioNTech vaccine label change by Health Canada, the Government of Canada ordered 64 million special syringes to extract the additional dose of the Pfizer-BioNTech vaccine • A total of 75 million immunization supplies and 422 freezers have been purchased by the Government of Canada (e.g., syringes, needles, gauze, and sharps containers) to be distributed to provinces • Canada negotiated a procurement agreement with the U.S. to purchase 1.5 million doses of unused Oxford-AstraZeneca

		vaccine on loan with the understanding that they will pay the U.S. back with doses in the future ○ Health Canada had to approve the sites where the vaccines were made in the U.S. in order for the doses to be received in Canada • Recent procurement activities in Canadian provinces include: ○ The province of Manitoba directly signing a deal to procure up to two million doses of a vaccine (that is currently in the first phase of human trials) being developed by Providence Therapeutics ○ Manitoba also procuring 400 shipping containers for transporting vaccines, 200 specialized freezers and fridges, and more than 80,000 syringes to enable the extraction of six doses per vial of the Pfizer-BioNTech vaccine ○ Efforts being made to secure COVID-19 vaccine storage equipment (freezers, fridges, power generators) for Saskatchewan First Nations communities *Delivery to country* • In general, delivery of COVID-19 vaccines to countries is being facilitated by the vaccine manufacturers through the use of shipping carriers like DHL and FedEX • On 15 February 2021, both Australia, and New Zealand received their first shipments of the Pfizer-BioNTech vaccine • China continues to provide vaccine aid to 80 countries worldwide by delivering vaccines and supplies during the month of March ○ Three factors are considered in formulating an aid plan: the benefits of equitable and timely access to vaccines for developing countries, the severity of the epidemic and the specific vaccine aid needs of the countries concerned, and the capacity of the Chinese government to provide vaccines • As of 3 March 2021, over 10.3 million doses of Pfizer-BioNTech, Oxford-AstraZeneca, and Moderna vaccines have been delivered to Germany by manufacturers ○ Vaccination centres located in the federal states in Germany are scheduled to receive an estimated 2.25 million doses each week throughout April 2021

		○ Germany is expected to receive 70 million vaccine doses in the second quarter of 2021 • On 29 March 2021, Moderna provided a vaccine-supply update for the U.S., stating that it met its goal to deliver 100 million doses by March 2021 ○ Moderna is on track to deliver an additional 100 million doses of its vaccine by the end of May and the third instalment of 100 million doses by the end of July • Shipments of the Oxford-AstraZeneca vaccine increased during the first quarter of 2021: ○ On 28 February 2021, 300,000 doses of the vaccine arrived in Australia ○ France will be receiving a shipment of 280,000 doses of the vaccine during the week of 15 March 2021 ○ 5.6 million doses of the vaccine are scheduled to be delivered to Germany by April 2021 ○ Canada received 500,000 doses of the vaccine from the Serum Institute of India on 3 March 2021 • For France, the Pfizer-BioNTech vaccine is moved from the production plant to one of 11 private platforms capable of storing the vaccine at -80°C • Canada's vaccine program slowed between 18 January 2021 and 14 February 2021 when production issues limited shipments to fewer than 350,000 doses • As of 10 March 2021, Canada has received 3,182,510 vaccines from Pfizer-BioNTech, Moderna and Oxford-AstraZeneca manufacturers ○ The Public Health Agency of Canada said it is not expecting any new deliveries of the Oxford-AstraZeneca vaccine or the Johnson & Johnson vaccine until April 2021 ○ Shipments of the Pfizer-BioNTech and Moderna vaccines will continue to be delivered to Canada in the coming weeks • In early April, Canada received the 1.5 million doses of the Oxford-AstraZeneca vaccine it procured on loan from the U.S. as well as a shipment of approximately 317,000 doses of Oxford-AstraZeneca vaccines procured from the COVAX facility

		• Canada has experienced delays in expected shipments of Moderna vaccine during the month of April, which has led to cancelled vaccination appointments in some provinces
		• Canada expects to receive more than one million doses of COVID-19 vaccines each week in April and May of 2021 and approximately 44 million doses of vaccines by the end of June 2021
		  ○ Canada expects to receive two million more doses of Oxford-AstraZeneca vaccines from the Serum Institute of India and a total of 1.9 million doses of the vaccine from the COVAX facility
		  ○ On 9 April 2021, Canada's Minister of Public Services and Procurement confirmed that Johnson & Johnson vaccines are on schedule to be delivered at the end of April but could not confirm how many doses will be arriving
		• The National Operations Centre has 14 vaccine delivery sites across Canada and is being assisted by FedEx Express Canada and Innomar Strategies with distribution
		• As a result of Health Canada's approval of the Pfizer-BioNTech vaccine label change from five doses to six doses, shipments of the Pfizer-BioNTech vaccine doses may change going forward
		
		Inventory management within country
		• Israel received permission from the Pfizer-BioNTech to repackage doses of its vaccine into tens or hundreds per shipment (instead of 1,000 per shipment) to avoid waste and create safer mobilization of doses to remote areas
		• China has established and implemented whole-process traceability systems for COVID-19 vaccines
		• The Government of Canada established an immunization National Operations Centre within the Public Health Agency of Canada to manage COVID-19 vaccine delivery and collaboration with provinces and territories
		• Manitoba maintains a complex data set to link vaccine deliveries with inventory levels and known appointments
		
		Ordering within country

		• Some countries that manufacture vaccines in country (Germany, the U.K., the U.S., and China) have re-purposed existing capacity and invested in new vaccine manufacturing capacity to help expedite the production of vaccine
		• The manufacturing of the Pfizer-BioNTech COVID-19 vaccine at a production facility in Marburg, Germany was approved on 26 March 2021 by the European Medicines Agency
		• As of 3 March 2021, China has put the Sinopharm inactivated COVID-19 vaccines into mass production and the output is expected to surpass one billion doses in 2021
		• As of 3 March 2021, China has granted conditional market approval to four self-developed COVID-19 vaccines and 17 Chinese vaccines have entered clinical trials
		• China's annual vaccine production as of 21 March 2021 can fully meet the whole country's needs, as judged by the existing production arrangements
		• On 16 March 2021, the Canadian government announced that it is investing millions of dollars in domestic biomanufacturing companies to boost future vaccine and medicine development capacity
		
		Distribution within country and to administration sites
		• All countries assessed have developed strategies and systems for managing distribution of vaccines as they are approved and become available, including for cold-chain requirements
		• The Civil Aviation Administration of China (CAAC) updated the guidebook for COVID-19 vaccine transport in February 2021 and established a special team to support and coordinate vaccine transportation
		• The vehicles transporting COVID-19 vaccines in China will be exempted from tolls until 31 December 2021
		• COVID-19 vaccine distribution in Germany to medical practices is conducted with the following sequence:
		  ○ Delivery from the federal government to wholesalers
		  ○ Delivery from wholesalers to pharmacies
		  ○ Delivery from pharmacies to physician clinics

		• In Germany, distribution of the Pfizer-BioNTech vaccine to federal states is based on the proportion of the population that reside in those regions
		• Once Pfizer-BioNTech vaccines arrive in France, they are then transported to pharmacies and institutional care facilities (e.g., long-term care) for use or delivered directly to one of 100 hospitals in the country that can safely store and administer them
		• Vaccines are transported from the U.S. to Israel (and monitored under electronic surveillance to ensure proper shipping storage) and then transferred to the logistics department of a pharmaceutical company "Teva", which distributes them to the Health Plans
		  ○ Vaccines are then repackaged and sent to national centres and subsequently repackaged in small boxes to ship three times a week to communities
		• On 1 April 2021, the FDA in the U.S. made two revisions to Moderna COVID-19 Vaccine Emergency Use Authorization to help increase the number of vaccine doses available that: 1) clarified the number of doses per in the vials currently available (10-11 doses); and 2) authorized the availability of an additional multi-dose vial in which each vial contains 13-15 doses
		• Protocols have been established in Ontario to move the Pfizer-BioNTech vaccine so it can be used in long-term care and high-risk retirement home
		• In a recent interview, an executive director in Alberta Health Services' (AHS) central zone described how COVID-19 vaccines are moved in the province from the airport to vaccination clinics:
		  ○ All of Alberta's vaccine supply is flown into Calgary International Airport and AHS staff check the shipments to make sure that the cold-chain temperature did not get disrupted during transport
		  ○ Contracted courier companies transport the vaccines from the airport to 36 vaccine storage sites set up around the province that are capable of administering vaccines
		  ○ In the case where vaccines need to be transported from storage sites to other sites, like pharmacies, the vaccines are thawed and transported within a limited six-hour window

		○ Thawed Pfizer-BioNTech vaccine can be stored in refrigerators at administration sites for up to five days and thawed Moderna vaccine for up to 30 days ○ Additional complications that must be managed include that both the Pfizer-BioNTech and the Moderna vaccines must be used within six hours of the vaccine vials being punctured, and the Pfizer-BioNTech vaccine must be diluted with sodium chloride prior to administration • Vaccine distribution in Nova Scotia is based on census data and population estimates • In Newfoundland and Labrador, once a vaccine shipment arrives it is immediately distributed to regional health authority depots and then to communities where public-health nurses deliver the inoculations settings • Vaccines will be distributed to the Yukon and across Canada by the Immunization National Operation Centre for COVID-19 *Storage and handling within country* • To facilitate easier handling and distribution of the Pfizer-BioNTech vaccine, Health Canada authorized on 3 March 2021 that the vaccine can be stored and shipped at "standard freezer temperatures" of -25C and -15C for up to 14 days • The National Operations Centre within the Public Health Agency of Canada (PHAC) has developed vaccine storage and distribution capacity in the form of equipment, supplies and logistical coordination • Both Alberta and Ontario have published guidelines describing the requirements for storing and handling the Pfizer-BioNTech and Moderna vaccines • Nova Scotia now has 10 cold-storage sites from which eight clinics across the province receive the vaccines on a rotational basis
Allocating vaccines and ancillary supplies equitably	*Approaches to developing and adjusting allocation rules* • A U.S. guideline provides a recommended approach for national, state, tribal, local and territorial levels that is guided by four ethical principles (maximize benefits and minimize harms; promote justice; mitigate health inequities; and	*Approaches to developing and adjusting allocation rules* • The New Zealand Ministry of Health is working in partnership with the Māori and Pacific neighbours to plan for their roll-out programs

	promote transparency) which should be accompanied by additional considerations based on science (e.g., safety and efficacy) and feasibility of implementation (e.g., storage and handling) • One single study identified public perceptions in relation to allocation priorities for the COVID-19 vaccine and found that in addition to prioritizing health workers and those at risk for contracting COVID-19 or developing severe symptoms, participants emphasized the need to prioritize a broad range of other essential workers and to those of low socio-economic status *Allocation rules* • A U.S. CDC guideline updated the interim vaccine-allocation recommendations for COVID-19 vaccination program planning and implementation in federal, state and local jurisdictions • A medium-quality rapid review emphasized that COVID-19 vaccines must be administered in accordance with the priority groups that have been established to uphold the ethical integrity of the process • A low-quality rapid review indicated that most U.S. medical centres will offer COVID-19 vaccination to pregnant or breastfeeding women based on the shared decision-making principle, but organizations in the U.K. consider pregnancy and breastfeeding to be contraindications for the vaccine • A guideline (from the European Academy of Allergy and Clinical Immunology) recommends that COVID-19 vaccines should be administered to patients with allergies who do not have a history of allergic reactions to vaccine components • However, one single study from the U.K. revealed that 32.6% of respondents were concerned that the government's priority list made no reference to Black, Asian and minority ethnic groups • A medium-quality rapid review assessed how U.S. state and federal vaccine-allocation plans differed and found general agreement related to prioritizing front-line workers and long-term care facilities, and distinguishing between medical and	• The Government of British Columbia has reportedly been working closely with the Provincial Health Services Authority, First Nations Health Authority, Health Emergency Management BC, Canadian Red Cross and Canadian Armed Forces to prepare a system that is ready to distribute all vaccine types as they become available • The Government of Yukon is working closely with First Nation governments, NGOs, closely with First Nation governments, NGOs, community leaders, and community health centres to reach all Yukoners • The New Zealand government is negotiating with its Pacific neighbours to determine their specific preferences for vaccines *Allocation rules* • Aside from minor differences in policies, most countries, including Canada, prioritize healthcare workers and long-term care residents, along with some other at-risk populations (e.g., older adults, individuals with chronic conditions, at-risk adults in Indigenous communities), and in some cases others such as immunocompromised individuals and select caregivers • Other prioritized groups for vaccination in some countries include border workers (New Zealand), those who plan to work or study in countries with medium or high risk of COVID-19 infection (China and Israel), other congregate facility residents and staff (Canada), and those who work in ship piloting, aviation, public transport, fresh markets, and healthcare settings (China)) • Australia is scheduled to begin vaccinating adults aged 70 years and over, healthcare workers, adults with pre-existing conditions, front-line workers, and Aboriginal and Torres Strait Islander people on 22 March 2021 ○ Household members of quarantine and border workers, residents living with a disability, and caregivers were added to the list of priority groups for COVID-19 vaccination, and those younger than 16 years of age will be eligible to be vaccinated for the Pfizer-BioNTech vaccine only in Phase 3 • Australia allows unvaccinated individuals who were eligible to be vaccinated in a previous phase of their roll-out to remain eligible in subsequent phases

	non-medical first responders, but differed on how essential workers, older adults, and underlying medical conditions were defined and prioritized (with fewer states including people living or working in congregate settings and developmental disabilities in priority groups)
	• A low-quality rapid review identified key considerations when designating certain populations as a potential vaccination group (e.g., accurate identification, vaccine roll-out logistics and operationalization, impact of variant transmission, transmission from certain groups and impact of the wider community)
	• A low-quality rapid review summarized existing evidence on the effects of SARS-CoV-2 and current vaccines for people with neurodegenerative diseases, and found sufficient immunogenicity across the different vaccines, but requires further consultation with their provider and additional clinical research
	• A low-quality rapid review, two high-quality guidelines (one from the American College of Rheumatology and the other published in Clinical Rheumatology) and a low-quality guideline from the Korean College of Rheumatology described available vaccination guidance for people with autoimmune/autoinflammatory rheumatic diseases and recommended that this group should receive a COVID-19 vaccine, however the review described only when the disease is under control and there are no risks of concurrent infections
	• A low-quality rapid review summarized available vaccination guidance for immunosuppressed cancer patients and found that inactivated, nucleic acid, protein subunit, and virus-like protein vaccines are safe, but may have reduced protection
	• Two low-quality guidelines published by the American College of Obstetrics and Gynecology and the Japan Society of Obstetrics and Gynecology updated their guidelines and recommend the COVID-19 vaccine to people considering future pregnancy, currently pregnant, or lactating given that symptomatic pregnant people with COVID-19 have
		• China is aiming to vaccinate the eligible population as widely as possible and gradually build an immune barrier within the whole population to control the epidemic
		  ○ COVID-19 vaccinations for people aged 60 years and older in China began on 21 March 2021 COVID-19
		  ○ Hong Kong expanded its priority groups on 8 March 2021 to include workers in the catering industry, tourism, public transportation, property management, construction sites, and schools
		• China is willing to cooperate with the International Olympic Committee to provide vaccines to Olympians
		• As of 24 February 2021, elementary school, childcare, and day care staff were added to group 2 of Germany phased roll-out
		• France expanded its priority groups as of 2 March 2021 to residents aged 60 years and older in migrant worker homes, individuals between the ages of 50 and 74 who are living with comorbidities, individuals who have previously contracted COVID-19, and pregnant or breastfeeding women
		  ○ As of 12 April 2021, all residents aged 55 and older in France became eligible to receive a COVID-19 vaccine
		  ○ The Ministry for Solidarity and Health in France recommends that individuals who have previously contracted COVID-19 wait at least three months, and preferably six months, prior to receiving a single dose of the COVID-19 vaccine
		• The New Zealand government released its official COVID-19 vaccine roll-out plan on 10 March 2021
		• Vaccination of border and MIQ workers in New Zealand is nearly complete as about 91% of these workers had begun receiving their second dose of COVID-19 vaccine by 17 March 2021
		  ○ New Zealand's Prime Minister stated on 12 April 2021 that border workers must be vaccinated by the end of the month or risk being moved out of their role after an unvaccinated border worker tested positive and transmitted the virus to two other people
		• The New Zealand government announced on 24 March 2021 that early vaccinations will be made available for people who need to leave New Zealand before 31 August 2021 on compassionate grounds or for reasons of national significance

	increased risk of severe illness; however, consultation with the patient and provider are important
	• A pre-print single study found that obesity, diabetes and hypertension were associated with increased rates of severe illness and should be prioritized for vaccination
	
	Ensuring equity
	• A WHO guidance document proposed a values framework for COVID-19 vaccine allocation and prioritization, which consists of six core principles: 1) human well-being; 2) equal respect; 3) global equity; 4) national equity; 5) reciprocity; and 6) legitimacy
	• Two single studies provided additional insights about the disparities in the availability and distribution of COVID-19 vaccines due to limited vaccine production, supply capacity, and market forces in developing countries and low- and middle-income countries
	• Interim WHO guidance recommends that long-term care facilities (LTCFs) should be a high priority for COVID-19 vaccine deployment, and the initial high-priority targets for immunization should be health workers (including those working in LTCFs and the private sector), older people and those with underlying health conditions
	• One guideline consolidates guidance issued by the U.S. Centers for Disease Control and Prevention, the American College of Obstetricians and Gynecologists, and the Society for Maternal-Fetal Medicine on COVID-19 vaccine provision to the pregnant population
	• A single study reported through the U.S. CDC'S MMWR reported that U.S. states with high equity of vaccination had prioritized people in racial/minority groups during the early vaccination phases, actively monitored and addressed barriers to vaccination in marginalized communities, directed vaccines to these communities, offered free transportation, and collaborated with community partners
	• A mathematical modelling study using Ontario-based parameters concluded that interrupting transmission might reduce mortality more effectively than targeting vulnerable
		• As of 3 February 2021, all residents in Israel aged 16 years and older became eligible for the COVID-19 vaccine
		  ○ Health authorities in Israel decided that when there was a decline in vaccination rates among priority groups, they would move on to the next priority group instead of waiting for everyone in the current priority group to be vaccinated in order to avoid wastage
		• After meeting its target for vaccinating phase 1 priority groups (cohort 1 to 9), the U.K. government has moved into phase 2 of their vaccine roll-out and will follow the Joint Committee on Vaccination and Immunization (JCVI)'s released advice to follow an age-based strategy, starting with older adults aged 40 to 49 years
		• Allocation rules around the administration of the Oxford-AstraZeneca vaccine have changed in several countries as a result of recent evidence of thrombosis with thrombocytopenia syndrome (blood clots) caused by the vaccine in adults under 55 years
		  ○ In Australia, the Australian Technical Advisory Group on Immunisation recommended on 8 April 2021 that adults under the age of 50 be prioritized for the Pfizer-BioNTech vaccine rather than the Oxford-AstraZeneca vaccine, and that residents who have already been vaccinated with the first dose of the Oxford-AstraZeneca vaccine, without any prior side effects, will still be able to receive their second dose
		  ○ Under specific situations, when the benefits outweigh the risks, residents in Australia under the age of 50 years can consent to receive the Oxford-AstraZeneca vaccine
		  ○ Administration of the Oxford-AstraZeneca vaccine in France is only recommended in eligible population groups over the age of 55 years, while the Pfizer-BioNTech and Moderna vaccines can be administered to all eligible groups regardless of age
		  ○ Administration of the Oxford-AstraZeneca vaccine in Germany is now being prioritized for residents aged 60 years and older, and residents under the age of 60 years who previously received their initial dose of the vaccine will be able to choose whether to delay their second dose

	groups within populations with high seropositivity and later vaccination start date *Dosing rules* • One single study found that a three-month dose interval may be advantageous compared to a program with a short dose interval to protect a larger number of individuals as soon as possible when vaccine supplies are limited • A pre-print modelling study found that vaccines offering high protection from a single dose favours vaccination strategies that prioritize providing a single dose to more people than heterogenous strategies (e.g., allocating a percentage of vaccines for first dose and the remainder for second doses)	○ After a series of changing advice, Canada's National Advisory Committee on Immunization (NACI) recommended on 29 March 2021 that Canadian provinces pause the use of the Oxford-AstraZeneca vaccine on people under the age of 55; Canadian provinces have adopted this recommendation, including B.C., Alberta, Manitoba, Ontario, Quebec, Prince Edward Island, and Newfoundland and Labrador • On 13 April 2021, the CDC and FDA made a joint statement to pause the use of the Johnson & Johnson COVID-19 vaccine to review cases of blood clots that occurred in six cases out of the more than 6.8 million doses that were administered • Aside from minor differences in policies (e.g., Saskatchewan prioritizing long-term care residents over 50 years of age living in remote areas in addition to residents over 70), all provinces in Canada generally follow the National Advisory Committee on Immunization (NACI) recommendations for the first phases of their roll-out plans • In British Columbia, people born in or before 1931 and Indigenous peoples born in or before 1956 were able to book a vaccine appointment as of 8 March 2021, and people born in or before 1936 and in or before 1941 were able to book appointments within the next two weeks ○ Vaccination registration expanded in B.C. on 12 April 2021 to people 45 years and older, Indigenous peoples 18 years and older, and people aged 16 to 74 who are considered clinically vulnerable can now register for vaccination ○ Health officials in B.C. reported that all eligible adults should receive at least their first vaccine by the end of June 2021 • Phase 2 vaccinations began in Alberta on 15 March 2021 to anyone aged 65 to 74, First Nations and Métis people aged 50 and older, staff of licensed supportive-living facilities not included in Phase 1, anyone aged 16 to 64 with high-risk underlying conditions, residents and staff in congregate-living settings, healthcare workers who have a high potential for spread, and caregivers who are most at risk of severe outcomes are eligible for vaccination • In Saskatchewan, additional healthcare workers were added to the priority list in Phase 1, including individuals who will be directly

		involved in delivering COVID-19 vaccinations in Phase 2 of the roll-out • Saskatchewan began phase 2 of its vaccine roll-out on 18 March 2021 and individuals 52 years and older province-wide, pregnant women, young adults ages 16 and 17 who are clinically extremely vulnerable, and individuals over the age of 40 in the far north are currently eligible to book a vaccination o Once an individual becomes eligible for vaccination in Saskatchewan, they will continue to be eligible even if the province has moved on to a different phase of the roll-out o In response to increasing COVID-19 transmission risk in the Regina region of Saskatchewan, eligibility for vaccination was expanded on 13 April 2021 at the Regina drive-thru vaccination clinic to residents ages 49 to 54 only, Regina police officers were prioritized for vaccination, and the Saskatchewan government announced that in the coming weeks first responders will be targeted by mobile vaccination units, and pharmacies will be offering vaccines to all pharmacy and grocery store staff working in the facilities where vaccines are offered • In Manitoba, all adults aged 60 and older, First Nations people aged 40 and older, and a range of individuals aged 18 and older working in high-risk health and social-care settings are currently eligible to book a vaccination at supersites and pop-up clinics o The roll-out of vaccines in First Nations communities in Manitoba is expected to begin in mid-March and will prioritize communities at high-risk of floods, fires and other evacuation risks o Manitoba is modelling vaccine roll-out and distribution projections under high-supply and low-supply scenarios • On 5 March 2021, additional details on Phase II groups in Ontario were released, which focus on prioritizing primarily age and risk (based on hotspots, specific health conditions, congregate care setting, essential caregivers, and those who cannot work from home) • Ontario is currently in phase 2 of its vaccine roll-out and intends for primary priority groups in the phase to be vaccinated first

		during the months of April and May and secondary priority groups to be vaccinated starting in June ○ Primary priority groups include older adults aged 75 to 79 in decreasing 5-year age increments, individuals with high-risk health conditions, residents, caregivers and staff in high-risk congregate settings, and adults aged 50 and older in hotspot communities (defined as those with historic and ongoing high rates of virus transmission, severe illness, and death) ○ Secondary priority groups include remaining individuals with at-risk health conditions and essential workers who cannot work from home • On 6 April 2021, Ontario announced it would be increasing vaccine allocations to hotspot communities identified by postal codes in 13 public-health units in the province that have had elevated rates of virus transmission, hospitalizations and deaths ○ Individuals 18 to 49 years of age living in the identified postal codes will be eligible, and upcoming mobile and pop-up clinics will be promoted by public-health units and community partners ○ Low-barrier methods to verify age and residence in a hotspot community are to be used, and public-health units are to ensure that vaccination clinics in hotspot communities are readily accessible ○ Public-health units are to leverage community-based organizations and local healthcare organizations to reach residents, build vaccine confidence and address misinformation, and identify unique needs and barriers to accessing vaccination • As of 10 March 2021, the general population in Quebec aged 70 years of age or older is able to book an appointment for vaccination in all public-health units ○ As of 13 April 2021, individuals aged 60 and older in all regions, health and social workers with direct patient contact who are part of priority group two, residents in Montreal under 60 years of age with very high-risk health conditions, essential workers in Montreal working in environments deemed to be at high risk of outbreak, and people aged 55 to 79 who attend

		pharmacy-based walk-in vaccination clinics are currently eligible to be vaccinated ○ The Quebec Immunization Committee has recommended that vaccination for pregnant women should be offered • Priority for vaccinations in New Brunswick is currently being given to individuals 70 years of age and older, all First Nations 16 years of age and older, individuals who travel across the border, rotational workers, healthcare workers, health-system staff and individuals with complex medical conditions ○ Priority will be given next to individuals 40 years of age and older with three or more select chronic conditions, and individuals 60 to 69 years of age ○ New Brunswick anticipates that individuals between the ages of 16 and 59 will be eligible for vaccination in June • For P.E.I.'s vaccine roll-out phases, Phase 2 (April to June 2021) will include adults 18 years of age and older and Phase 3 (summer to September 2021) will include all individuals requiring a second dose and youth 15 years of age and older when an appropriate vaccine for this age category becomes available • Newfoundland and Labrador's Phase 2 (April to June 2021) will now include adults 60 years of age and older, adults who identify as First Nation, Inuit or Métis, adults in marginalized populations, first responders, front-line healthcare workers not immunized in phase 1, individuals 16-59 with medical conditions who could be at high risk if infected with COVID-19, individuals who travel in and out of the province for work, and front-line essential workers with direct contact with the public who cannot work from home ○ Phase 3 (July to September 2021) will include anyone in priority groups 1 and 2 who were not vaccinated and individuals 16-59 who have not been vaccinated • As of 19 February 2021, first doses of COVID-19 vaccines became available in the Northwest Territories to the majority of adults 18 years and older ○ Additional priority groups have been added for residents in Yellowknife, Hay River and Inuvik as of 5 March 2021 ○ All communities in Northwest Territories are now providing a second immunization for individuals who have received their

		first dose, and first doses for any resident older than 18 years of age • Canadian provinces have adjusted their roll-out plans to incorporate the arrival of the Oxford-AstraZeneca vaccine during the week of 8 March 2021 o Starting 10 March 2021, Albertans aged 50 to 64 and First Nations, Métis and Inuit individuals aged 35 to 49 will be eligible to receive the Oxford-AstraZeneca vaccine o Eligible groups in Saskatchewan who will be receiving the Oxford-AstraZeneca vaccine include individuals between the ages of 60 and 64 and priority healthcare workers o The Quebec Immunization Committee does not recommend systematically offering the Oxford-AstraZeneca vaccine to people in Quebec with a very high risk of sickness and complications (for example, residents of long-term care homes and immunocompromised people) o In Nova Scotia, the Oxford-AstraZeneca vaccine will be administered to individuals aged 63 and 64 starting 20 March 2021 o Starting 11 March 2021, individuals between the ages of 18 and 29 in P.E.I. who work in the food and beverage industry, including food delivery service, can register to receive the Oxford-AstraZeneca vaccine • Starting 1 March 2021, all residents of the Yukon became eligible to receive the COVID-19 vaccine including individuals who are no longer infectious if they had a previous COVID-19 infection, individuals who are currently breastfeeding, pregnant or planning to be pregnant, and anyone with immune-system problems or autoimmune conditions o Individuals in Yukon are advised not to receive the vaccine if they are 17 years of age or younger, have symptoms of a COVID-19 infection, are allergic to polyethylene glycol or had an allergic reaction without a known cause, had a serious allergic reaction with the previous dose of the COVID-19 vaccine, or have received another non-COVID-19 vaccine in the past 14 days

		○ Residents of British Columbia are eligible to receive vaccinations in Yukon if they typically receive healthcare in the territory • As of 10 March 2021, residents 18 years and older in Nunavut became eligible to schedule a vaccination ○ In Nunavut, if individuals miss their first-dose appointment and do not belong to the community scheduled to receive doses, they will be asked to wait until the next supply of vaccines is shipped to Nunavut *Dosing rules* • Millions of doses of COVID-19 vaccines have been administered in countries ○ As of 11 April 2021, over 167.34 million doses of COVID-19 vaccines have been administered across China ○ As of 13 April 2021, New Zealand has administered 135,585 doses of the Pfizer-BioNTech vaccine, Australia has administered 1,234,681 COVID-19 vaccine doses, France has administered 15,317,970 vaccine doses, Germany has administered over 18.6 million vaccine doses, the U.K. has administered more than 32 million first doses, and the U.S. has administered more than 192 million of the 245 million doses of the COVID-19 vaccines distributed ○ 61.5% of the population in Israel received at least one dose of COVID-19 vaccine as of 12 April 2021 and 57% of the population have been fully vaccinated ○ As of 13 April 2021, 16.9% of the total population in France and 16.3% of the German population have received their first dose of vaccine, and 5.9% of the French population and 6.2% of the German population have been fully vaccinated ○ Health Canada has confirmed distribution of 11,399,542 COVID-19 vaccines to the provinces and territories as of 12 April 2021 and 78.7% of the doses have been administered (7,703,437 first doses and 819,131 second doses) • As of 15 April 2021, about 22% of the Canadian population has been vaccinated with at least one dose of COVID-19 vaccine • As of 12 April 2021, the number of vaccine doses administered in Canadian provinces range from 2,005,106 doses in Quebec to

		1,025,019 doses in British Columbia to 290,921 doses in Saskatchewan and 23,569 vaccine doses in Nunavut • The Government of Nunavut will not be releasing specific details about the level of vaccination in communities to prevent stigma *Second dose intervals* • A Chinese guideline published on 29 March 2021 recommended to use the same vaccine product to complete immunization • China's recommendations on doses and vaccination intervals are as follows: o An interval of three to eight weeks for inactivated vaccines with two doses o For recombinant protein subunit vaccines with three doses, an interval of no less than four weeks between two shots, with the second dose being administered within eight weeks after the first shot and the third dose being administered within six months after the first shot o People who have not completed the vaccination within the schedule should resume the vaccination as soon as possible without needing to start over again, and a booster shot is not recommended • France maintains a second dose interval for the Pfizer-BioNTech vaccine of 21 days • According to Germany's Standing Committee on Vaccination (STIKO), the Oxford-AstraZeneca vaccine requires two doses in a 12-week interval • In response to the widespread transmission of the COVID-19 outbreak, the Joint Committee on Vaccination and Immunisation in England recommended that the time interval between the first and second dose of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines be extended to up to 12 weeks • On 3 March 2021, the National Advisory Committee on Immunization (NACI) issued new guidance for Canada advising that the time between shots for the Pfizer-BioNTech, Moderna, and Oxford-AstraZeneca vaccines be extended to four months in order to vaccinate, and hopefully protect, more people

		○ British Columbia, Ontario, Quebec, Manitoba, Alberta, Saskatchewan, New Brunswick, and Newfoundland and Labrador have extended their second dose intervals to align with NACI's recommendations • After concerns about certain populations not being fully vaccinated were highlighted in the media, the Advisory Committee of Canada's National Advisory Committee on Immunization (NACI) reconfirmed their recommendation to extend the dose interval between two-dose vaccines to four months in their updated guidance on 7 April 2021 • Ontario's Vaccine Clinical Advisory Group recommended on 26 March 2021 that the following populations be exempted from the extended second dose interval of four months: ○ Transplant recipients ○ Individuals with malignant hematologic disorders ○ Non-hematologic malignant solid tumours receiving active treatment (excluding individuals receiving solely hormonal therapy or radiation therapy) • Yukoners are encouraged to get their second vaccine 28 to 35 days after receiving their first dose and residents in Northwest Territories who have received their first dose are asked to wait at least four weeks before getting their second dose *Ensuring equity* • China will launch a "spring sprout" program to assist and secure vaccination for its citizens with Chinese or foreign vaccines ○ This program will include setting up vaccination stations in countries where conditions allow to administer Chinese vaccines to nationals living in surrounding countries • Vaccinations in China have been extended to foreign nationals in the city of Beijing, and on 16 March 2021, China's embassy in Egypt launched a COVID-19 vaccination drive for over 5,000 Chinese citizens • As of 8 March 2021, vaccination has begun for 100,000 Palestinians who work in Israel or are in Israeli settlements in the West bank, with efforts to vaccinate 1,000 people per day

		• Every person in New Zealand will be eligible for free vaccination regardless of their immigration status, and any information collected will not be used for immigration purposes
		• New Zealand is making a concerted effort to promote vaccinations within Māori communities
		• In its guidance for COVID-19 vaccinations in Canada, NACI recommended that at-risk adults in Indigenous populations be among the first priority groups to be vaccinated in provinces and territories
		  ○ As of 9 February 2021, 11,800 vaccine doses had been allocated to First Nations communities in Manitoba, and a time-limited clinic in Winnipeg was opened to provide vaccination for First Nations health-care workers, knowledge keepers and traditional healers
		  ○ Operation Remote Immunity was launched in Ontario to vaccinate adults in 31 fly-in First Nations communities and Moosonee in Northern Ontario
		  ○ Indigenous communities are being prioritized within the current phases of vaccine roll-outs in B.C., Alberta, Manitoba, and New Brunswick
		• In Quebec, one companion of a person 85 years of age or older will be able to be vaccinated at the same time if the companion is 70 years of age or older and provides care to their partner at least three days per week
		• An emergency order under the Emergency Measures Act enables Shared Health Manitoba to investigate and confirm the eligibility status of healthcare workers who have been vaccinated
		  ○ If people are found to have provided false information to get early vaccination, the order enables Shared Health to disclose this information to the individual's employer, professional regulatory body, or law enforcement

Communicating vaccine-allocation plans and the safety and effectiveness of vaccines	*Target of the intervention* • A WHO guideline provides behavioural insights related to drivers of vaccine acceptance and uptake with a focus on the drivers of vaccine uptake including: 1) an enabling environment; 2) social influences; and 3) motivation • Some of the evidence focused on communication interventions targeting the general public or community	*Target population* • Countries have used (or are recommending the use of) strategies to tailor information about COVID-19 and how to book vaccination appointments for culturally and linguistically diverse groups and at-risk populations (Australia, Germany, U.K., Israel), engaging the public and stakeholders through local partnerships

	opinion leaders to ensure evidence-based information is being relayed to the general public • It was also emphasized that communication interventions should be tailored to mitigate inequalities, particularly to Black, Asian and minority ethnic groups who have higher rates of infection, morbidity and mortality, as well as unvaccinated or under-vaccinated populations • Evidence was also found about the importance of targeting healthcare professionals (who should be educated about the vaccine prior to the initiation of any vaccination program) and ensuring that healthcare workers have the opportunity, skills and information to effectively communicate with patients and support vaccine-related decisions • A high-quality rapid review proposes that future vaccination-messaging campaigns for the public should ensure clear communication about vaccine eligibility and availability, and the engagement of target groups • A single study found the majority of participants used traditional media to obtain information on the COVID-19 vaccine, but that there is an opportunity for social-media platforms to reduce vaccine hesitancy • A guideline from WHO updated the risk communication and community-engagement strategy to cover anticipated COVID-19 related events, and proposes four objectives for people-centred and community-led approaches to improve trust and social cohesion, and reduce negative impacts of COVID-19 • Four single studies discussed COVID-19 vaccination intention and uptake among different populations, which found: ○ Low COVID-19 vaccine uptake among healthcare workers in Saudi Arabia and recommended to scale up targeted public-health communication efforts ○ News of a variant strain and case escalation could reduce COVID-19 vaccine hesitancy ○ Exposure to misinformation reduced the intent to accept a vaccine relative to exposure to factually correct information	(U.K., U.S.), and having medical experts assist with information dissemination to the public (Australia) • The Government of Australia will be promoting an educational campaign on its COVID-19 vaccination program ○ On 1 March 2021, the second phase of Australia's educational COVID-19 campaign was launched which included health professionals and researchers responding to public enquiries through a series of "Top 3 COVID-19 Vaccine Questions" • On 2 April 2021, China's NHC and CDC developed a series of COVID-19 vaccination training materials for vaccination providers and staff, including a guideline on the use of COVID-19 vaccines, adverse events following immunization (AEFI) management guideline, vaccination-administration guideline, and registration and reporting guideline • In France, a citizen panel consisting of 35 citizens was announced to collate the concerns and queries posed by the public and present them to the national government • A vaccine campaign was also launched in France via text and call on 31 March 2021 to reach out to residents older than 75 years of age who have yet to be vaccinated • To increase accessibility and persuade individuals who are hesitant or undecided about vaccination in Israel, mobile vaccination units have experts who travel with the units to answer questions, and also use free food or drink • The Associate Minister of Health (Māori Health) in New Zealand indicated that several initiatives had begun to promote vaccinations within Māori communities, including a roadshow, networking by Iwi leaders and communications networks, and the expansion of the engagement strategy to a number of social media platforms • On 17 March 2021, the COVID-19 Response Minister of New Zealand released a graph illustrating the country's vaccine roll-out plan, and later on in the month, the minister and his associate minister both received the first dose of Pfizer vaccine and publicly discussed their experience afterwards to demonstrate confidence in the vaccine

	○ Components of persuasive messaging had no significant effects on COVID-19 vaccination attitudes and intention • One single study found public trust through an integrated and familiar health system is one key factor for the successes of Israel's vaccination campaign *Delivery of the intervention* • A high-quality rapid review indicates that messages delivered in mixed-media campaigns in communities and hospitals could improve vaccine uptake • One WHO guideline provides health workers with a flow diagram for COVID-19 vaccination communication, which can be carried out during a COVID-19 vaccination session, or prior to the vaccination event, in-person or via a virtual platform, at a group educational session, community meeting, or one-on-one interaction • A medium-quality rapid review indicated that communication of reliable, frequent, and tailored information about vaccines should be shared with community members through multiple platforms, including social media, traditional media, and providers, and providers must be educated about vaccines and provided with appropriate training to increase provider vaccine recommendations to patients • However, a high-quality systematic review found that interventions involving risk messages were found to have no effect on the intention of participants to vaccinate, their behaviour towards vaccines, and their perception of the severity of the disease *Content of messaging* • One guideline emphasized that eligible groups who understand why vaccination is particularly important for them are more likely to be vaccinated, and that professionals should address any misconceptions about it • A high-quality rapid review indicates that messages that provide information about virus risks, vaccine benefits and	• An online tool was launched to help New Zealand residents determine which vaccination group they are in and when they can expect to get a COVID-19 vaccine • The Mosques and Imams National Advisory Board in the U.K. is leading a campaign to reassure its faithful that COVID-19 vaccinations are safe and compatible with Islamic practices • The Canadian government has a dedicated telephone line for providing COVID-19 information and also maintains a database of COVID-19 announcements (inclusive of updates on vaccine efficacy and procurement) on its website that can be filtered by announcement type (e.g., news releases), minister, and government institution • Indigenous Services Canada (ISC) is developing resources to guide vaccination delivery, messaging and education of indigenous populations • As of 10 February 2021, the province of Manitoba had 225 phone-line agents and plans to expand to 300 agents in March, as well as implement online self-service booking • The province of Manitoba has established a 'vaccine shot finder' webpage with a map to aid individuals in finding pharmacies and medical clinics participating in the vaccination campaign ○ The map distinguishes between sites that are and are not currently taking appointments • Ontario has published vaccine administration guidelines and information packets for healthcare providers regarding the Pfizer-BioNTech, Moderna, and Oxford-AstraZeneca vaccines • An updated chart outlining a timeline for when priority groups are eligible to receive their COVID-19 vaccine has been posted on the Government of Newfoundland and Labrador website • An information package is additionally available on the Government of Nunavut website describing what residents can expect when visiting vaccine clinics *Delivery of intervention* • Countries are using several modalities for communicating vaccine-allocation plans, including government websites, online FAQs and other online tools, social media and SMS messages on mobile

	safety, and address vaccine misunderstandings could improve vaccine uptake • A medium-quality rapid review shows that vaccine hesitancy is universal across countries and is typically manifested in the preference to wait to be vaccinated or to reject vaccination altogether, and the most cited reasons for vaccine hesitancy or refusal included fear of side effects, safety, and effectiveness, as well as the expedited development of the COVID-19 vaccines, perceived political interference, and misinformation • It is recommended that confidence in the COVID-19 vaccines can be improved by emphasizing transparency and compliance with scientific standards throughout the vaccine development and approval processes, and that communication strategies use positive cues to vaccinate through engagement with loved ones and family members, and trusted figures like doctors and religious leaders • One single study indicated that effective public-health communication strategies should be tailored to counter vaccine misinformation • A WHO guideline outlines key messages to communicate during a COVID-19 vaccination session, including benefits of vaccination, common potential side effects and how to handle them, myths and misinformation about vaccines, and complementary public-health and social measures • A high-quality guideline from the WHO on the use of Janssen (Johnson & Johnson) COVID-19-vaccine recommended it for individuals aged 18 years and older with caveats for specific population groups • One single study found that transparency regarding vaccine-safety information and culturally appropriate messages in digital and offline media could contribute to the successes of Israel's vaccination campaign	devices, press releases, radio, public Q&A sessions with experts, and engaging the public and stakeholders through local partnerships • The Ministry of Public Security of China has deployed a national campaign to combat vaccine-related crimes, including manufacture and sale of fake vaccines related fraud activities • On 8 March 2021, a COVID-19 vaccine eligibility tracker was launched in Australia to help provide residents with a projected vaccination timeline • The Australian government's Department of Health released educational material (e.g., videos) on COVID-19 vaccines in multiple languages (Arabic, Italian, Hindi, Korean, Russian and Spanish) with translated subtitles • The Government of Australia also launched a new website feature, "Is it true?", in an attempt to combat misinformation and reduce vaccine hesitancy among residents • Efforts have been made in Israel to increase vaccine uptake by publicizing vaccination endorsements from political and religious leaders • Current priority and eligible population groups in Israel receive text messages from their health maintenance organizations (HMO) about information on booking an appointment (either by phone or through the HMO online portal) • Preparation is underway in New Zealand for a public awareness and reassurance campaign centred around vaccine safety that will include paid advertising • In December 2020, the Public Health Agency of Canada required that federal, provincial and territorial governments provide ongoing access to comprehensive, clear and accurate information about COVID-19 vaccines and immunization plans through partnerships with First Nations, Inuit and Metis leaders, health professionals and other relevant stakeholders • Communication modalities used by provincial governments in Canada include FAQs (all provinces), news releases (Saskatchewan. Yukon), radio (Yukon), public Q&A sessions (Nunavut) and social media (Yukon and Nova Scotia)

		• Manitoba has released an interactive vaccine queue calculator for residents to understand their place in the vaccine priority line
		• On 12 April 2021, a video explaining how the COVID-19 vaccines are being distributed was posted on the government of Nova Scotia Twitter account
		• In the Northwest Territories, local health personnel will be made available to community residents to answer questions about the vaccine before mobile-vaccine clinics arrive
		• A public website discussing vaccine progress in the Yukon is now available to residents
		• Nunavut has created cash prize incentives for residents who choose to get vaccinated
		
		Content of messaging
		• China's NHC encouraged more people to get vaccinated against COVID-19 on a voluntary, informed basis instead of a compulsory one
		  ○ In addition to the above, China's CDC provides information on vaccine-administration protocols, contraindications, vaccine transportation and storage, monitoring and documentation, and risk-mitigation efforts
		• On 22 March 2021, HKSAR chief executive urged Hong Kong residents to actively receive COVID-19 vaccine and to refer to the official vaccine information and professional opinions of health experts, instead of rumours and disinformation
		• The Government of Germany has launched a COVID-19 vaccine information campaign, "Germany Pulls Up Its Sleeves", to help educate and inform the public
		  ○ The first phase of the campaign focuses on raising awareness regarding priority populations
		  ○ The campaign consists of educational videos, posters and advertisements
		• Media campaigns in Israel (including messages about social responsibility and use of celebrities) have launched to promote the "green pass"
		• The New Zealand Ministry of Health has published information on its website about the safety, effectiveness and side effects of

		the Pfizer-BioNTech vaccine, how to get a vaccine (for border and MIQ workers), and what to expect at your vaccination ○ The New Zealand Ministry of Health launched a dashboard on its website detailing key vaccination statistics, including the number of people vaccinated with first and second doses, the number of adverse reactions following vaccinations, and the forecasted and actual number of vaccinations administered each week ○ In addition to the above, New Zealand's COVID-19 Response Minister said on 17 March 2021 that the government introduced paid advertising with messaging about vaccines during the weekend and that the advertising campaign will ramp up throughout the year • On 22 March 2021, the New Zealand government released an online tool to help New Zealand residents determine which vaccination group they are in and when they can expect to get a COVID-19 vaccine ○ The government is in the process of having the tool translated into 24 languages • The U.S. FDA's Center for Biologics Evaluation and Research (CBER) and Office of Minority Health and Health Equity (OMHHE) collaborated to address vaccine confidence concerns in racial and ethnic minority communities through several initiatives: ○ Holding listening sessions with diverse health professional organizations and other stakeholders ○ Building awareness about clinical trial diversity ○ Providing weekly COVID-19 communications to stakeholders ○ Supporting development and translation of information for the COVID-19 Multilingual Resources webpage that features materials in more than 20 languages ○ Launching a COVID-19 Bilingual (English/Spanish) Social Media Toolkit to promote consistent messaging ○ Releasing English and Spanish videos about the importance of getting vaccinated ○ Hosting a webinar about the vaccine-approval process and key information for minority communities to be aware of

		• The Centre for Effective Practice in Ontario has put together resources for understanding vaccine hesitancy in Black and First Nations, Inuit and Métis communities • Common themes of the messaging on the websites of most countries and Canadian provinces include details on vaccine roll-out plans (including timelines for vaccinating priority groups), safety and efficacy of approved vaccines, vaccine options, possible adverse events following immunization, and updates on the number of vaccine doses received and administered o The government of Canada's website has a designated COVID-19 webpage with links to sources and information on vaccines that have been authorized, the vaccines that have been purchased in advance, and how to get vaccinated or register o Alberta Health Services has a COVID-19 immunization booking webpage that is regularly updated with information about how eligible residents can book a vaccine appointment o Quebec's Ministry of Health maintains a website dedicated to demystifying beliefs regarding the risks of vaccination o Details on who is eligible to book an appointment during each phase of the vaccine roll-out is available on the Government of Prince Edward Island website o Nova Scotia, Prince Edward Island and Newfoundland and Labrador have added information sheets about the Oxford-AstraZeneca vaccine on their government websites o A website is available to residents of Northwest Territories to access information about the Moderna vaccine, the vaccination schedule, and to book appointments online o The Government of Yukon's website provides an after care information package that discusses steps to take after receiving the vaccine, what side effects to expect after the immunization, when to return for the second dose, and things to remember when signing up for immunization • The Quebec government has released a document and video with guidance for the general public on how to register for vaccination through the online portal o The Ministry of Health and Social Services has produced and released several videos about COVID-19 vaccine safety and the

		provincial vaccination campaign for the general public (in English and French)
		• British Columbia's Centre for Disease Control and the Government of British Colombia have created designated public webpages that contain vaccine and eligibility FAQs, information sheets, a COVID-19 Digital Assistant Chat Box, and links to the online vaccine registration and booking system
		• The Saskatchewan Health Authority launched a website with information on COVID-19 vaccine drive-thru and walk-in sites as well as their wait times
		• Manitoba launched the #ProtectMB campaign to encourage vaccine uptake
		  ○ The campaign includes a dedicated website, an e-mail newsletter, and data-driven targeted advertising
		  ○ The program is based on research about the province's vaccine-intent profile that has identified groups that are keen to get vaccinated, those who are likely to get vaccinated but are not in a rush, and those who are ambivalent/concerned about vaccination
		  ○ To continually refine the campaign's strategy, the province is using EngageMB (the provincial public-engagement platform), monitoring trends in vaccine uptake, and continuing to conduct research
		  ○ A coordinating table has been established that includes Data Science, Public Health, Communications and Engagement, and Vaccine Task Force officials to guide the campaign and determine its informational needs
		• Both the Government of Yukon and the Government of Nunavut provide information packages about the Moderna vaccine that discusses COVID-19, the vaccine and its side effects, and who is eligible to receive the vaccine

Administering vaccines in ways that optimize timely uptake	*With what explicit effort to leverage existing health-system arrangements* • A European CDC guideline recommends using pre-existing vaccination structures and delivery services in the models for the roll-out of COVID-19 vaccines • A low-quality rapid review noted that leveraging community-based teaching methods and community partnerships for greater vaccination uptake by hard-to-reach populations	*With what explicit effort to leverage existing health system arrangements* • Most countries and Canadian provinces and territories are currently (or planning to) leverage existing health-system arrangements to administer COVID-19 vaccines in settings such as hospitals, general-practice clinics, pharmacies, and vaccination centres

	• Another low-quality rapid review provided a framework for operationalizing programs to increase vaccine coverage, including increasing vaccinator capacity and training, and synergistically re-integrating immunization services
	• A guideline (from the Johns Hopkins Center for Health Security and Texas State University Department of Anthropology) recommends enhancing vaccination by home visits, preparing educational materials, training vaccinators, and fostering partnerships with government, health departments, and the media
	• A WHO guideline indicates that there is no evidence for the need of a booster dose after the two-dose vaccine or about the interchangeability of Moderna mRNA-1273 vaccine with other mRNA vaccines
	• A low-quality rapid review describes some requirements for the integration of COVID-19 vaccination into the services delivered by the national primary-healthcare network in Lebanon, which include necessary physical environment and infrastructure, supplies, cold chain management, workforce requirements, training, policies and procedures, technology and record-keeping, waste disposal, financing, public information and communication, and community engagement
	
	Where
	• One medium-quality full systematic review found that school and childcare centre-located vaccination programs were beneficial for vaccination rates and outcomes, and a low-quality full systematic review highlighted the benefits of vaccination requirements for childcare, school, and college attendance
	• Another medium-quality full systematic review found that using an immunization information system was effective for increasing vaccination rates
	• A low-quality rapid review found three models for vaccination delivery in non-healthcare settings: social-distancing clinics, drive-through vaccination clinics, and mini-mobile teams
		• The New Zealand government has partnered with some Māori and Pacific NGOs to set up small community vaccination clinics in South Auckland to support the roll-out of vaccines to household contacts of border and MIQ workers
		• Over 4,500 accredited general practices will serve as administration sites during Australia's vaccine roll-out, and the Australian Defense Force will provide additional personnel to assist with the vaccine roll-out in residential aged care facilities
		• The Government of France has authorized both medical practices and pharmacies to assist in vaccine administration
		  ○ Medical practices in France will be distributing over 1.6 million doses of the Oxford-AstraZeneca vaccine by 12 March 2021, and pharmacies will be distributing an initial delivery of 67,000 doses of the Oxford-AstraZeneca vaccine
		• In April 2021, medical practices in Germany are scheduled to be delivery sites for vaccine administration
		• As of 21 February, university campuses and workplaces have launched as vaccination sites in Israel
		• Canadian provinces and territories have taken different approaches to leverage existing health arrangements in their vaccine roll-outs
		  ○ Phase II will see vaccine administration in Ontario occur at municipally run vaccination sites, hospitals, mobile vaccination sites, pharmacies, clinics, primary-care settings, and community locations
		  ○ In mid-March, Ontario is launching a pilot program for community pharmacy-based vaccine administration in three public-health units
		  ○ Saskatchewan has made an agreement with the Pharmacy Association of Saskatchewan for pharmacists to follow the influenza immunization model to administer COVID-19 vaccines
		  ○ Administration of the Oxford-AstraZeneca vaccine will commence at a drive-thru location in Regina according to a 9 March 2021 press release of the Saskatchewan government
		  ○ This agreement establishes the fee for pharmacist delivery of COVID-19 vaccines along with increases in dispensing fees for

	• One single study indicated a heavy-lift UAV quadcopter can expand COVID-19 vaccine delivery to Indigenous people living in villages impeded by rugged terrain • The same rapid review also describes how to integrate COVID-19 vaccination into the primary-healthcare network in Lebanon • A low-quality rapid review found that mandatory vaccinations (through law or conditional by employment) for specific populations such as healthcare workers could increase vaccination uptake but may reduce trust, and where infeasible, to use education and promotional strategies supplemented with incentives and on-site vaccination clinic *By whom* • A medium-quality full systematic review found that allowing pharmacists to administer influenza vaccinations had small positive effects on vaccination rates, which was increased with greater autonomy • A low-quality rapid review discussed the recruitment of individuals with or without medical backgrounds and training approaches *With what partnerships to reach early populations of focus* • One low-quality rapid review discussed setting up familiar and accessible vaccination sites, community-based teaching methods and community partnerships for hard-to-reach populations • Another rapid review also focused on efforts through culturally specific education campaigns and engagement of stakeholders and community partners • One medium-quality full systematic review discussed the education of clinicians and parents to reduce vaccination pain, fear and distress • A guideline from the allergy centres in Germany provides guidance on allergological risk assessment regarding COVID-19 vaccination *With what broader, complementary health interventions*	prescription drugs and influenza vaccines for the 2021 flu season ○ Within the month of March 2021, four more vaccine clinics will open in Nova Scotia, and 25 pharmacies and family physician clinics began offering the Oxford-AstraZeneca vaccine ○ During Phases 2 and 3 of P.E.I.'s vaccine roll-out, mobile clinics will launch in smaller communities and participating pharmacies in P.E.I. will be offering the Oxford-AstraZeneca vaccine in these provinces *Where* • New Zealand began vaccinating its border workers in Aotearoa on 20 February 2021 and in Wellington on 22 February 2021 • On 9 March 2021, New Zealand launched the first large-scale COVID-19 vaccination clinic and began vaccinating the household contacts of border workers • For large-scale vaccinations, some countries are using venues in the community such as football stadiums (the U.K.), pharmacies (France), and/or mobile clinics for rural and remote areas (Israel, the U.K.) • In Australia, the Pfizer-BioNTech vaccines will only be administered at Hospital/Pfizer Hubs and the Oxford-AstraZeneca vaccine will be administered at general practitioner-led respiratory clinics, select general practices, state-run vaccination clinics, and Aboriginal Controlled Community Health Centres ○ Vaccines will be administered to long-term care home residents in an estimated 240 aged-care facilities in over 190 regions ○ Vaccinations in Australia began at 1,000 general practitioner-led respiratory clinics on 22 March 2021 and this number will gradually increase to over 4,000 by the end of April 2021 ○ Community pharmacies are also eligible to serve as vaccine administration sites in Australia as part of Phase 2A of the roll-out plan • In China, vaccination sites are set up in the health service centres, township health centres or general hospitals in the jurisdictions

	• One guideline from the U.S. CDC provides updated healthcare infection prevention and control recommendations in response to the COVID-19 vaccination in healthcare settings
	• Another guideline from the U.S. CDC provides the first set of public-health recommendations for fully vaccinated people in non-healthcare settings
	• One scientific brief from the U.S. CDC provides the background rationale and evidence for public-health recommendations for fully vaccinated people
	• One low-quality rapid review found that the potential harms and costs of screen testing among vaccinated LTC home staff likely outweigh the benefits given the high rates of protection of COVID-19 vaccines against symptomatic and asymptomatic SARS-CoV-2 infection
	
	With what second-dose provisions
	• One guideline (from the U.S. CDC) developed using some type of evidence synthesis and/or expert opinion stating that adults should complete their second vaccination with the same vaccine product as the first dose
	
	With what safety monitoring requirements
	• One low-quality rapid review proposed several considerations for safety monitoring, including establishing a separate waiting area for post-vaccination monitoring, training staff, educating patients, administering to patients with a known history of adverse reactions, monitoring patient flow and clinic layout
		• To speed up the vaccination process, China deployed mobile vaccination vehicles offering a one-stop service for registration, disinfection and vaccination
		  ○ The vehicle is equipped with vaccination stations, medical refrigerators and first-aid equipment, and the refrigerators are able to store 1,200 vaccine doses
		• In France, 1,700 vaccination centres are fully operational and administering Pfizer-BioNTech and Moderna vaccines, and the government has authorized both medical practices and pharmacies to assist in the administration of the Oxford-AstraZeneca and Janssen vaccines
		• Vaccines are administered in Germany in vaccination centres and in care facilities by mobile teams during the centralized vaccination phases
		  ○ As of 5 April 2021, vaccine-administration sites in Germany have expanded to include 50,000 general practitioner clinics
		• Within less than a month, Israel's portable immunization sites shifted to a focus on primary-care clinics to increase uptake in remote areas
		• Israel is also vaccinating populations confined to their homes and remote places by either vaccinating at homes or carrying confined people to vaccination sites by ambulance
		• In the U.K., Moderna vaccine roll-out has begun in Wales, Scotland, and England and will be available at 21 sites
		• In Canada, several provinces are opening vaccination clinics in local communities to make vaccines more accessible to residents and Indigenous communities
		  ○ Individuals aged 55 to 64 can book appointments to receive the Oxford-AstraZeneca vaccine at participating pharmacies and medical clinics in B.C., Alberta, Ontario, Saskatchewan, and Manitoba
		  ○ In B.C., the first phase of COVID-19 vaccine administration, which is of the priority populations, is occurring at public-health clinics
		  ○ Focused Immunization Teams and Pop-up Clinics in Manitoba will each administer less than 5% of daily doses in the second quarter of 2021

		○ A pilot project at 'Vaxport' was opened in Thompson, Manitoba to provide immunization for residents of remote northern First Nations, and municipal and Indigenous and Northern Affairs communities ▪ The pilot project at the Vaxport has concluded and it now serves as a backup location for the Thompson supersite ○ There are fixed vaccination sites for staff working in personal-care homes and congregate-living settings in Manitoba ○ Starting 19 February 2021, Alberta Health Services (AHS) began vaccinating residents in retirement centres, lodges, supportive living, and other congregate-living facilities with people aged 75 and older ○ At a press conference on 12 April 2021, Alberta's prime minister announced that the province is administering vaccines in more than 1,300 pharmacies and 103 clinics ○ Vaccinations are taking place in Saskatchewan's long-term care homes, communities in the far north, and vaccination sites approved by the Saskatchewan Health Authority ○ Quebec has launched a program to engage private companies in establishing vaccination centres to complement public-sector vaccination efforts and to serve their employees, families and local communities ▪ The province called for companies to propose establishing vaccination sites, but also let companies indicate resources they would be willing to contribute towards vaccination efforts ▪ More than 450 companies responded with their interest in participating in this campaign and 13 companies have thus far been selected to participate as vaccination centres ▪ Enterprise vaccination centres are expected to become operational by May 2021 and run until August 2021 ○ Ontario plans to have 1,500 pharmacies in the province administering vaccinations by the end of April 2021 and is working with public-health units, business groups, and large employers to set up employer-operated vaccination clinics for hotspot communities at greatest risk

		▪ These clinics are meant to be set up, operated, and funded by employers and to vaccinate employees as well as members of local communities ▪ Employers operating these clinics must meet certain conditions and have the support of local public-health units and hospitals ▪ Public-health units and family health teams in Ontario are also developing strategies to reach homebound patients for vaccination ○ The first community-based clinic in Nova Scotia where individuals over the age of 80 not living in long-term care facilities will receive their vaccination ○ The first of thirteen vaccination clinics in Mi'kmaq communities across Nova Scotia will be starting the week of March 1st ○ During the week of 6 April 2021, the first African-community vaccination clinic opened at the Emmanuel Baptist Church in Nova Scotia ○ Vaccinations will be taking place in pharmacies and at regional health authorities in Nova Scotia ▪ Oxford-AstraZeneca vaccines will be available at both locations for people 55 years of age and older ○ Vaccinations are being administered in Inuit communities in Labrador to anyone 17 years of age and older with priority given to healthcare workers and seniors ○ Prince Edward Island is on track to have all individuals living and working in community care and long-term care facilities fully vaccinated by 16 February 2021 ○ Community health nurses in P.E.I. will begin running clinics at Lennox Island First Nation at the end of February and beginning of March ○ In Yukon, there are 14 mobile clinics scheduled to visit rural and remote communities across the Yukon for vaccine administration ▪ As of 7 April 2021, mobile clinics will continue visiting Yukon communities to vaccinate residents aged 18 and older • Mass-vaccination sites have opened in several Canadian provinces

		○ Online tools have been developed to help Canadians find COVID-19 vaccination sites and determine their eligibility ○ The third phase of B.C.'s COVID-19 roll-out plan is occurring at immunization clinics throughout the province, including school gymnasiums, arenas, convention halls, pharmacies, community halls and mobile clinics ▪ As of 10 April 2021, 170 mass-vaccination sites across the province are in operation ○ Saskatchewan opened its first drive-thru and walk-in immunization site in Regina on 3 April 2021, and several more sites opened during the week of 12 April 2021 ▪ Eligible residents for vaccination at the Regina drive-thru vaccination clinic are vaccinated on a first-come first-served basis ○ Manitoba vaccination supersites and pharmacies are currently in operation in major cities ○ Three more clinics have opened in Nova Scotia to vaccinate healthcare workers ○ As of 29 March 2021, six vaccination clinics running six days a week have opened in P.E.I. and are administering the Pfizer-BioNTech and Moderna vaccines ○ The Oxford-AstraZeneca vaccine is being administered to individuals in Newfoundland and Labrador between the ages of 55 and 64 years at vaccination clinics ○ In Nunavut, individuals must receive the second dose of the COVID-19 vaccine in the same location as where they received the first dose • In Ontario, Toronto Public Health launched a 'proof of concept' immunization clinic to test and adjust non-hospital vaccination plans ahead of mass vaccination *With what appointment/scheduling and screening support, changes to physical spaces and patient flows through these spaces, and changes to hours of operation* • France requires an appointment to be made for COVID-19 vaccination at a select vaccination centre • A few Canadian provinces have used telephone services to assist with booking vaccination appointments

		○ Eligible Manitobans can call a dedicated phone line to book vaccination appointments at pop-up sites and use the phone lines or the online booking portal ▪ As of 9 April 2021, 67% of appointment bookings in Manitoba were made over the phone with others being booked through the online appointment portal ○ Extremely vulnerable individuals in Saskatchewan who are now eligible to be vaccinated must book their appointments over the phone as the online booking system is aged-based and will not allow those under the eligible age range to book ○ Starting 4 February 2021, commercial truck drivers and rotational workers in P.E.I. will receive phone calls from Health PEI to set up appointments to be vaccinated • Nova Scotia issued letters by mail to residents with vaccination booking information • In some Canadian provinces, residents are required to book appointments directly through a local vaccination site ○ Ontario residents are required to contact pharmacies directly to book vaccination appointments ○ Vaccine appointments at pharmacies in New Brunswick are booked directly through a pharmacy and a list of participating pharmacies is provided on the Government of New Brunswick website ○ As of 13 April 2021, residents in Northwest Territories who are interested in being vaccinated are asked to contact their local health centre or public-health office ▪ A community visit may be organized if there is enough demand for vaccination in a particular community ○ Individuals in Nunavut must book an appointment with their local health centre in order to be vaccinated • Provincial vaccination scheduling systems has been implemented in several Canadian provinces ○ In Alberta, a tool has been provided to help eligible individuals find a pharmacy that is providing COVID-19 vaccinations in the province ▪ Alberta Health Services has an online booking tool for eligible healthcare workers to book immunization appointments

		○ In B.C., the "Get Vaccinated" online registration and vaccine booking system was opened for the general public on 6 April 2021, and vaccination appointments for front-line priority workers are organized by employers ○ A scheduling system is being developed in Saskatchewan for easy online access to vaccine appointments, and a toll-free telephone line will be operational in March 2021 to allow residents to book appointments ○ Scheduling a vaccine appointment with a Regional Health Authority is booked through the government of New Brunswick website ○ An update to the COVID-19 vaccine booking site in Nova Scotia includes a postal code look-up to help users find available appointment times and which vaccine is available at specific clinics in their area ▪ Appointment dates in Nova Scotia are only released once supply is confirmed ○ To assist with the timely booking of appointments, P.E.I. has outlined who is eligible to schedule an appointment each week during the month of April *With what post-vaccination observation period and what physical distancing, personal protective equipment, sanitation and other public-health measures* • In China, recipients of the vaccine should stay for 30 minutes, and if there is a suspected adverse reaction, immediately report to the vaccination institution and seek medical advice ○ Post-vaccination, mask-wearing is recommended along with other protective measures such as hand hygiene, ventilation, and social distancing need to be maintained • In Germany, an individual who suffers damage from the COVID-19 vaccine will receive care in accordance with the Federal Supply Act • In Israel, individuals are monitored for at least 15 minutes after vaccination or 30 minutes for individuals with history of anaphylaxis, and adverse-event reporting was conducted electronically

		• Vaccinated individuals in France are still required to respect and follow public-health measures (e.g., face mask and physical distancing)
		• Alberta's immunization record provides post-vaccination care instructions, including a list of potential side effects, contact information for Health Link, and a reference to the COVID-19 Self-Assessment for Albertans if unusual side effects persist
		• Electronic and paper copies of COVID-19 immunization records are made available for vaccinated individuals in Saskatchewan
		• The Quebec Immunization Committee is recommending that people in Quebec who have had severe reactions to other injections (that do not have common components with the COVID-19 vaccine) do not need specific pre-assessment, but should be monitored for 30 minutes following vaccination
		  ○ The normal observation period following vaccination is 15 minutes
		• Yukoners are asked to wait a minimum of 15 minutes at the vaccine clinic after receiving their immunization
		  ○ For individuals with a history or concern about vaccine allergy, a waiting period of 30 minutes is recommended
		  ○ Individuals are asked to inform a health provider if they feel unwell during the waiting period
		• In Nunavut, individuals are asked to wait 15-30 minutes after being vaccinated to monitor side effects or adverse reactions
		
		By whom and with what changes to remuneration
		• Resources provided for health professionals involved in vaccine roll-outs in the countries assessed range from accredited training modules (Australia) to 24/7 call centres to provide guidance and vaccine shipment information (Israel)
		• In France, the Pfizer-BioNTech vaccine is only to be administered by nurses and physicians
		• The Government of France is training 25,000 firefighters for vaccine administration at "mega-vaccination centres" that will be launched soon
		• Germany is deploying an additional 2,500 military personnel to vaccination centres in order to assist with the vaccine roll-out

		• Israel's Ministry of Health recruited community-based nurses, physicians, paramedics and EMTs and at least 7,000 reserve medics to administer vaccines at vaccination centres
		  ○ To increase the efficiency of the vaccination campaign, Israel has increased the hours of nurses and reduced their non-COVID-19 duties
		• Vaccinators in New Zealand will be sourced from non-practising nurses, doctors or pharmacists, final-year medical, nursing or pharmacy students, and other health professionals who have vaccinations within their scope
		  ○ The COVID-19 Response Minister of New Zealand said on 24 March 2021 that around 1,300 of the 2,000-3,000 additional full-time vaccinators needed to administer vaccines had been trained
		  ○ At a press conference on 7 April 2021, Dr Ashley Bloomfield, Director-General of Health, mentioned that an exemption was approved for non-regulated workforces to be able to be trained to be vaccinators in order to increase the vaccination workforce in Māori and other similar communities
		• Local vaccination service sites in the U.K. are being run by a mixture of primary-care networks and community pharmacies
		• Initiatives have been taken in a few Canadian provinces to recruit healthcare workers to administer vaccines
		  ○ Healthcare practitioners in B.C. can sign up as immunizers and join a registry maintained by the Ministry of Health to support the COVID-19 emergency response
		  ○ The province of Manitoba is actively recruiting healthcare and non-healthcare staff to work in immunization clinics, and a distributed model of doctors' offices and pharmacists is expected to administer 25% of daily doses in the second quarter of 2021
		  ○ Manitoba, Quebec, and New Brunswick have developed online training to expand the scope of practice for some healthcare professionals
		  ○ In Ontario, expanded healthcare professionals are able to register and apply to participate in vaccination efforts via Ontario's Matching Portal

		○ The Saskatchewan government intends for vaccines to be administered by physicians, nurse practitioners, and pharmacists in Phase 2 of its roll-out ○ Nova Scotia has called on retired health professionals to assist with administration • As of 6 April 2021, there are 3,312 full-time equivalent staff working in vaccination centres in Manitoba ○ Focused immunization teams have administered second doses to all personal-care home residents in Manitoba • Primary care providers in six public-health units in Ontario have begun contacting eligible patients to book vaccination appointments, and mobile teams and pop-up clinics are being deployed to vaccinate individuals in hotspot communities, beginning in Peel and Toronto ○ The mobile teams and pop-up clinics will (for now) not be using the provincial booking system ○ In Ontario, a "COVID-19 vaccine clinic operations planning checklist" was published to assist in local vaccination planning • To ensure a more timely approach to vaccinate a greater number of individuals in Phases 2 and 3, healthcare workers in Newfoundland and Labrador, including physicians and pharmacists, will assist with administering vaccines *With what broader, complementary health interventions* • On 8 March 2021, the Ministry of Foreign Affairs of China officially launched the international travel health certificate showing one's nucleic acid test and serum antibody results, vaccine inoculation and other information, which is available for Chinese citizens via a WeChat mini program • On 21 March 2021, the China's CDC recommended that people, vaccinated or not, still need to wear masks in indoor or closed sites where people gather, maintain personal hygiene, and comply with local COVID-19 prevention and control measures, until population-level immunity is achieved through vaccination in China ○ In Macao, a vaccination certificate and record card will be issued after completing two doses of vaccinations

		• China has eased visa application procedures for people inoculated with Chinese COVID-19 vaccines and will launch health certificates for international travellers that will declare a person's vaccination status or recent test results
		• As of 7 March 2021, fully vaccinated Israeli residents do not have to quarantine after entering the country, while unvaccinated individuals are required to isolate in designated hotels or in an alternate location using an electronic bracelet
		• Israel's Ministry of Health unveiled a "Green Pass" system that allows fully vaccinated (one week after last dose) or those recovered from COVID-19 to enter specific businesses with a "green pass/certificate" and photo ID
		  ○ Israeli residents with a "green pass/certificate" can attend cultural and sports events, gyms, exhibitions, hotels, tourist areas, and worship houses (with restrictions)
		  ○ Failure to comply will result in a fine
		  ○ Israeli residents with a "green pass" certificate can also volunteer in hospital wards
		• On 8 March 2021, the U.S. CDC released interim public-health recommendations for people in the U.S. who have been fully vaccinated for COVID-19:
		  ○ Fully vaccinated people may visit other fully vaccinated people as well as unvaccinated people at low-risk for severe COVID-19 from a single household without wearing masks or physical distancing
		  ○ Fully vaccinated people do not have to quarantine or be tested after known exposure if they are asymptomatic
		  ○ Otherwise, fully vaccinated people should continue to follow existing prevention measures, including wearing a mask and physical distancing
		• The CDC updated its guidelines for fully vaccinated people on 2 April 2021
		  ○ Fully vaccinated people can resume travel domestically and do not need to get tested or quarantine before or after travel
		  ○ Fully vaccinated people who are travelling internationally do not need to get tested prior to leaving the U.S. (unless required by the destination) and do not need to quarantine after arriving back in the U.S.

		• Vaccinated individuals are still required to follow all public-health measures in Canadian provinces and territories
		• The Public Health Ethics Committee in Quebec has published a bulletin on the topic of immunity passports
		  ○ The committee's analysis concludes that immunity passports are justifiable and can play a complementary and temporary role in deconfinement efforts
		  ○ The committee estimates that the benefits from immunity passports slightly outweigh the disadvantages
		  ○ The committee will not issue any formal recommendation until August 2021
		• As of 10 March 2021, the Government of Northwest Territories is exploring the possible implementation of vaccine passports to allow residents to travel easily
		• Public-health measures in Yukon, such as practising the Safe 6 Plus 1, getting tested if necessary, and following self-isolation requirements will be kept in place for all Yukoners, regardless of whether they have been vaccinated
		  ○ The Safe 6 Plus 1 includes physically distancing six feet, practising hand hygiene, staying at home when feeling sick, avoiding crowds, following guidelines when travelling to communities, self-isolating when necessary and staying connected with the outside world
		
		With what second dose provisions
		• In both New Zealand and France, the second dose of the Pfizer-BioNTech vaccine will be administered after 21 days
		• In response to the vaccine-supply shortage in Canada, provinces have chosen to either set aside second doses for eligible residents in order to maintain the recommended vaccination interval (New Brunswick, Ontario), or administer first doses to as many residents as possible while extending the second-dose vaccination interval (Quebec, Alberta, Saskatchewan)
		• The Quebec Immunization Committee is recommending using the same vaccine for patients' first and second doses
		  ○ If the same vaccine is not available (or known) a similar type of vaccine (e.g., mRNA or viral vector) should be given

		○ Regardless of what type of second dose is given, it will be considered valid, and a third dose is not indicated • The Quebec Immunization Committee has recommended that people with prior confirmed COVID-19 infection may only need one vaccine dose to develop sufficient immunity, but noted that immunocompromised people who have had a confirmed COVID-19 infection and all those whose COVID-19 infection occurred very close (temporally) with a first vaccine dose should receive two doses as a precaution *With what second-dose reminders* • The vaccination campaign in the U.K. to reach as many people as possible was boosted by a shift in policy in early January which prioritized the first dose of a vaccine, with a second dose up to 12 weeks later • Saskatchewan's immunization system, Panorama, will be updated to set reminders for second-dose follow-ups • Individuals in Alberta will receive a reminder from AHS or participating pharmacies to book a second-dose appointment at a later date • Yukoners are asked to bring their COVID-19 vaccine record cards, received during their first dose immunization, to their second immunization *With what safety monitoring requirements* • Israel conducts adverse-event reporting electronically *With what injury-compensation program and liability immunity* • As of 13 April 2020, Australia has not yet implemented a no-fault COVID-19 vaccine injury compensation program • People's Insurance Company of China (PICC) Life Insurance took the lead in launching medical accident insurance for COVID-19 and other vaccines, which covers compensation for abnormal reactions
Surveillance, monitoring and	*Documenting vaccine-related opinions* • A medium-quality rapid review identified and summarized 135 studies on COVID-19 vaccination knowledge, attitudes,	*Documenting vaccine status* • A mobile application "Health Kit" was developed in China for checking individuals' vaccination status

evaluation, and reporting	and behaviours of the Canadian and global population and found that intention to vaccinate varies between 54-75% in the Canadian context, and between 79-87% in the global context
	
	Documenting vaccine status
	• One WHO guideline focuses on the Vaccine Introduction Readiness Assessment Tool, which includes a framework and a set of recommended indicators for countries to self-monitor their readiness progress for COVID-19 vaccines
	
	Documenting adverse events and follow-up
	• A guideline states that the U.K. will identify 'safety signals' related to adverse events from COVID-19 vaccination, and has established a surveillance mechanism for vaccination in pregnancy
	• A guideline from the allergy centres in Germany states that reports of severe allergic reactions regarding COVID-19 vaccination can be made using an online questionnaire
	• One single study stated that two COVID-19 vaccines that received emergency use authorization (EUA) in the United States are undergoing safety monitoring during the initial implementation phases of the COVID-19 national vaccination program, using the vaccine adverse-event reporting system (VAERS) and v-safe
	• A medium-quality systematic review reported safety data from 11 clinical trials of COVID-19 vaccines and reported mild to moderate adverse events (e.g., pain and swelling at site of injection, fever, fatigue, myalgia, headache), with recommendations to monitor long term in some populations, especially marginalized and at-risk populations (e.g., elderly, people with comorbidities, pregnant people)
	• A low-quality guideline from the Canadian Society of Allergy and Clinical Immunology (CSACI) recommends that allergists and immunologists assess individuals who have a suspected allergy to the components of a COVID-19 vaccine prior to vaccination, but does not require assessments of
		• Vaccination coverage across Canada is monitored by the Government of Canada and reported on its website every Friday at 12 noon Eastern Standard Time
		• Most provinces in Canada continue to update information on the number of vaccine doses administered on government websites and platforms
		  ○ British Colombia's Centre for Disease Control has created a public dashboard displaying vaccination dosage rates in the province
		  ○ The Quebec Vaccination Registry is an electronic database that keeps track of all persons receiving vaccines in Quebec and all vaccines received by Quebec residents who may be out of the province
		  ○ Ontario has begun voluntarily collecting socio-demographic data from those being vaccinated
		  ▪ These data include race, household income, and linguistic profile
		  ○ Vaccinated individuals in New Brunswick receive a record of immunization
		
		Documenting adverse events and follow-up
		• In Australia, the reporting of adverse effects after COVID-19 vaccine administration can be directed to the TGA, healthcare providers, state health departments, and the NPS MedicineWise Adverse Medicine Events (AME) Line
		• On 2 April 2021, China's NHC and CDC developed guidelines on adverse events following immunization (AEFI) monitoring and management, and vaccination registration and reporting
		• The Public Health Agency of Canada will monitor adverse reactions through several pre-existing mechanisms
		  ○ Canada Vigilance Program
		  ○ Canadian Adverse Events Following Immunization Surveillance System
		  ○ Immunization Monitoring Program ACTive (IMPACT) network
		  ○ Canadian Immunization Research Network
		  ○ Canadian Vaccine Safety Network
		  ○ Special Immunization Clinics Network

	individuals with other types of allergies (e.g., food, drugs, insects, environmental allergens) • With respect to immunity and virus transmission from vaccinated individuals, a low-quality rapid review reported that the risk of COVID-19 infection in a residence decreases by 30% after having a household member vaccinated, with peak antibody titres occurring three to four weeks after vaccination *Identifying sources of vaccine hesitancy* • A low-quality rapid review (not yet publicly available) identified a series of associated factors that can influence the willingness to receive a COVID-19 vaccine • Two protocols for reviews that are underway aim to explore the hesitancy rate for COVID-19 vaccination and factors associated with COVID-19 vaccine uptake; and one protocol focuses on the barriers to vaccine acceptance in racial and ethnic minorities • A single study found that previous vaccine history could be an indicator to best predict COVID-19 vaccine acceptance • One WHO interim guidance document contains a set of tools (surveys, interview guides and related tools) to support the gathering and use of quality data on the drivers and barriers to COVID-19 vaccine uptake • One WHO interim guidance document provides four tools to understand intentions for receiving COVID-19 vaccines among prioritized populations, including three steps (plan, investigate, and act) • The same medium-quality rapid review identified that common factors positively associated with vaccination intention in Canada and globally include male gender, older age, higher education, adequate knowledge or health literacy, trust in experts and the government, and higher socio-economic status; factors associated with vaccine hesitancy or refusal include religious beliefs, vaccine safety and efficacy, and belief that the COVID-19 vaccine is unnecessary	• Alberta's Immunization Regulation requires health practitioners to report immunizations electronically to Alberta Health within a week • Health professionals in Ontario and Quebec are required to report adverse events to local public-health units who will investigate and provide support • Quebec has released guidance regarding the surveillance, management and reporting of vaccine-induced prothrombotic immune thrombocytopenia in vaccinated patients • Public Health Ontario has published a list of adverse events of special interest for COVID-19 vaccination surveillance • In Yukon, all serious side effects, such as hives, swelling or difficulty breathing, are asked to be reported to the Whitehorse Health Centre or to a local community health centre *Identifying and measuring performance indicators* • Through its surveillance efforts, Israel has seen a 41% drop in confirmed COVID-19 and 31% drop in hospitalizations from mid-January to early February in individuals aged 60 years and older • As of 17 January 2021, Israel's Ministry of Health and Pfizer signed an agreement to share anonymized medical-record data between hospitals or health plans and research entities in order to measure vaccine roll-out and immunity • Insights gleaned by the Economic, Social and Environmental Council in France found that the possibility of adverse side effects caused by the COVID-19 vaccine is the primary reason for hesitancy/rejection among participants *Infrastructure to enable surveillance, monitoring and evaluation* • Several countries are utilizing national immunization registers and electronic health records to enable surveillance, monitoring and evaluation of COVID-19 vaccinations (Australia, China, Israel, U.K., U.S. • Information from the Australian Immunisation Register is routinely uploaded to the Enterprise Data Warehouse (EDW)

	Infrastructure to enable surveillance, monitoring and evaluation • A guideline from the European CDC recommends using electronic immunization registries to help monitor vaccine safety, efficacy, coverage and acceptance • One guideline from the European Centre for Disease Prevention and Control provides an updated metrics for COVID-19 vaccine roll-out within EU/EEA countries as of 21 February 2021 • One guideline from the European Centre for Disease Prevention and Control states that EU/EEA countries described their deployment plans and cross-government arrangements, such as establishing a task force and electronic systems to support logistics management and vaccine registries, and they had the opportunity to compare their vaccination roll-out with an ideal vaccine deployment ('stress test') in order to identify gaps and the robustness of their current efforts • A guideline states that the U.K. will link the Second Generation Surveillance System and the National Immunisation Management System to monitor vaccine effectiveness • The same single study stated that the U.S. is implementing two safety monitoring systems for COVID-19 vaccination: VAERS is a passive surveillance system for adverse events that accepts input from healthcare providers, vaccine manufacturers and the public; and v-safe is an active surveillance system that was established by CDC and allows participants to voluntarily self-enroll and receive smartphone text messages providing hyperlinks to web surveys about local injection site and systemic reactions • A medium-quality scoping review (pre-print) identified eight COVID-19 vaccine certificate technologies that are currently in beta-testing trials, and highlighted that technology leaders (e.g., IBM, World Economic Forum, International Air Transport Association) are calling for standardization	○ De-identified data from the EDW will be transferred to the Vaccine Data Solution software that helps to monitor the coverage and logistics of the COVID-19 vaccine roll-out • The Government of Australia released a series of informative resources to aid residential aged care providers with the vaccine roll-out (e.g., monitoring and reporting) • A public form is available for health professionals and the general public in Australia to make enquiries related to COVID-19 vaccines • New or additional surveillance systems or indicators have been developed in some countries specific for COVID-19 to monitor vaccine roll-out program implementation ○ Australia developed a monitoring program for COVID-19 through a partnership with Accenture ○ In Germany, the Robert Koch Institute and Paul Ehrlich Institute will lead the surveillance and evaluation efforts for COVID-19 including app-based cohort studies and long-term hospital-based case-control studies ○ New Zealand is in the process of replacing their National Immunisation Register with the National Immunisation Solution to better support COVID-19 roll-out by allowing health workers to record vaccinations more efficiently ○ The CDC in the U.S. expanded safety monitoring systems that utilize a smartphone-based, post-vaccine health checker called V-safe which uses text messaging and web surveys from CDC to check in with vaccine recipients as well as provide second dose reminders if needed ○ Post-marketing surveillance of COVID-19 vaccine administration in Canada will be undertaken by the Public Health Agency and Health Canada through a number of surveillance programs • In addition to recording, storing and managing COVID-19 vaccination records, Saskatchewan and the Yukon both use an immunization administration system (Panorama), which also provides reminders for second-dose follow-ups ○ COVID-19 vaccination records are stored electronically on MySaskHealthRecord

		• Alberta Health Services provides a COVID-19 Client Immunization Record for individuals who have been administered a COVID-19 vaccine in Alberta • Manitobans who have been vaccinated can access their individual immunization record online with their health card number and email address, and family doctors also have access to immunization records • The Ministry of Health and Social Service in Quebec established a directive to introduce quality-assessment audits of vaccine management and handling at administration sites ○ These audits are to occur at least every three months • Yukoners can download the CanImmunize app to keep track of their COVID-19 vaccine and other vaccines

Table 3: Overview of type and number of documents related to one or more COVID-19 vaccine roll-out elements*

Type of document	Total (n=324)**	Securing and distributing a reliable supply of vaccines and ancillary supplies (n=10)	Allocating vaccines and ancillary supplies equitably (n=21)	Communicating vaccine-allocation plans and the safety and effectiveness of vaccines (n=46)	Administering vaccines in ways that optimize timely uptake (n=27)	Surveillance, monitoring and evaluation, and reporting (n=18)
Guidelines developed using a robust process (e.g., GRADE)	121	13	36	19	29	24
Full systematic reviews	15	0	1	5	5	4
Rapid reviews	34	1	13	7	10	3
Guidelines developed using some type of evidence synthesis and/or expert opinion	57	3	20	3	20	11
Protocols for reviews that are underway	26	0	2	3	0	21
Titles/questions for reviews that are being planned	-	-	-	-	-	-
Single studies that provide additional insight	128	8	18	29	9	64

*The table includes all newly identified evidence documents and all highly relevant evidence documents identified in previous versions of this LEP that continue to be deemed highly relevant.

**Some documents were tagged in more than one category so the column total does not match the total number of documents.

Bhuiya A, Bain T, Wang Q, Al-Khateeb S, DeMaio P, Ahmad A, Drakos A, Rintjema J, Sharma K, Matthews M, Gauvin FP, Lavis JN, Wilson MG. COVID-19 living evidence profile #1 (version 1.7): What is known about anticipated COVID-19 vaccine roll-out elements? Hamilton: McMaster Health Forum, 28 May 2021.

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