McMaster University | HEALTH FORUM

RISE Rapid-Improvement Support and Exchange

COVID-19 Rapid Evidence Profile #24 (17 November 2020)

Question

What is known about strategies for encouraging vaccine acceptance and addressing vaccine hesitancy (including efforts to combat misinformation that may lead to vaccine hesitancy) or uptake (when interpreted, at least in part, through the perspective of vaccine acceptance or hesitancy)?

What we found

We included documents that describe best practices for encouraging vaccine acceptance and addressing vaccine hesitancy. We have excluded documents that focus solely on the determinants of vaccine hesitancy (e.g., analyses of vaccine hesitancy according to demographic variables), unless these documents included findings related to specific factors that can enhance acceptance or reduce hesitancy (e.g., sources of messages about the importance of vaccines or the types of information that enhance acceptance or reduce hesitancy among specific groups).

We organized our findings using the framework below, which is grounded in frameworks from the implementation-science field that are focused on supporting behaviour change (in this case changes to encourage vaccine acceptance and reduce vaccine hesitancy):

- **Target of intervention**
  - General public
  - High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
  - Individuals who are hesitant about or opposed to vaccination
- **Level of intervention (i.e., who is intervening)**
  - Government
  - Business and education leaders and staff

Box 1: Our approach

We identified 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 on 12, 13, 16 and 17 November 2020. We also searched Health Evidence (www.healthevidence.org), which focused on evidence about public-health programs and products (such as vaccines), and Health Systems Evidence (www.healthsystemsevidence.org), which focuses on getting the right programs and products to those who need them. We identified experiences by searching jurisdiction-specific sources of evidence using the same COVID-END guide. Jurisdictions were chosen based on experience with intervention efforts surrounding vaccine hesitancy and/or because they are a common comparator to Canada.

We searched for guidelines that were developed using a robust process (e.g., GRADE), 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 they provided insights about encouraging vaccine acceptance and addressing vaccine hesitancy specifically in relation to a future COVID-19 vaccine.

We appraised the methodological quality of full systematic reviews and rapid reviews 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.

This rapid evidence response was prepared in four business days to inform next steps in evidence synthesis, guideline development and/or decision-making related to the question that was posed.

    - Healthcare professionals
    - Community champions
    - Citizens
- **Types of interventions**
    - Information or education provision
    - Behaviour-change support
    - Skills and competencies development
    - Personal support
    - Communication and decision-making facilitation
    - System participation
- **Delivery of the intervention**
    - By whom
        - Nurse
        - Doctor
        - Pharmacist
        - Educators (teachers or administrators)
        - Researchers and experts
        - Community leaders
        - Government elites
        - Media
    - Frequency (e.g., daily, weekly)
    - Duration (i.e., how much or for how long)
    - Modality of delivery
        - Postal
        - Radio
        - Telephone
        - Television
        - Email alerts and reminders
        - Mobile-phone alerts/text messages
        - Social media (including web-based advertising)
        - Face-to-face (in-person)
        - Face-to-face (video-enabled virtual meeting)
    - Location of delivery
        - Community centres
        - School
        - Workplace
        - Healthcare settings (e.g., hospital or a clinician's office)
        - Public-health offices
        - Pharmacy
- **Content of messaging**
    - Data and evidence about risks and benefits
    - Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)
    - Myths or mis-information about vaccines
- **Outcomes of the intervention**
    - Vaccine acceptance or hesitancy
    - Vaccine uptake (when interpreted, at least in part, through the perspective of vaccine acceptance or hesitancy)

We included a total of 89 evidence documents, of which we deemed only 14 as providing highly relevant evidence in relation to the question. Many of the included documents that were not deemed to be highly relevant included strategies that reported on vaccine uptake, but without an explicit link to encouraging vaccine acceptance and addressing vaccine hesitancy. The highly relevant evidence documents include:

- two guidelines developed using a robust process (e.g., GRADE);
- nine full systematic reviews;
- two rapid reviews; and
- one guideline developed using some type of evidence synthesis and/or expert opinion.

None of the above evidence documents address a COVID-19 vaccine specifically, except for the guideline developed using some type of evidence synthesis and/or expert opinion. However, we also identified three single studies that provide specific insights into strategies for encouraging acceptance and addressing hesitancy for a COVID-19 vaccine specifically.

We outline in narrative form below our key findings related to the question from highly relevant evidence documents and based on experiences from other countries and from Canadian provinces and territories. This is complemented by key findings from the of the highly relevant evidence documents, which are organized by target groups in Table 1. In addition, we provide additional details in Table 2 (the type and number of all documents that were identified), Table 3 (for experiences from other countries), and Table 4 (for experiences from Canadian provinces and territories). In addition, we provide a detailed summary of our methods in Appendix 1, the full list of included evidence documents (including those deemed of medium and low relevance) in Appendix 2, abstracts for highly relevant documents in Appendix 3, and hyperlinks for documents excluded at the final stage of reviewing in Appendix 4.

Key findings from highly relevant evidence sources

Most of the evidence documents we identified as highly relevant focused on several components of the organizing framework. Given this, we provide findings below about strategies for encouraging vaccine acceptance and addressing vaccine hesitancy according to the target groups for such strategies (i.e., general public, high-risk groups, and individuals who are hesitant about or opposed to vaccination).

An overarching finding from the documents presented below are that vaccine acceptance is encouraged and hesitancy reduced through: 1) multi-component community-based strategies that typically include information and education and reminder and recall interventions; and 2) provide vaccines through familiar and accessible locations, including pharmacies which have been found to improve acceptance given enhanced convenience and access in communities. Only two of the highly relevant documents (a guideline developed using a robust process and a rapid review) included information about addressing misinformation about vaccines, which are included under the section abut approaches that target more than one of the groups.

Key findings related to approaches targeting the general public

We identified seven highly relevant full systematic reviews and three single studies focused on approaches targeting the general public to encourage vaccine acceptance or reduce vaccine hesitancy.

Three of these systematic reviews evaluated multi-component strategies that were often labelled as 'community-based interventions' and included an informational or educational component. A high-quality reviews found that vaccine attitude and parents' attitude towards vaccines substantially improved in eight of 15 studies after receiving educational resources and information, such as brochures, pamphlets, or posters. A medium-quality review outlined that increased vaccine acceptance and uptake was found following community-based interventions (most of which were targeted at parents or caregivers of children and using home visits and/or information campaigns through community health workers and medical interns); monetary incentives (which had a moderate impact on alleviating financial burden in low-income settings); and technology-based health literacy. Lastly, a low-quality review found strong evidence for the use of community-based interventions (implemented in combinations) to support appropriate vaccination, but many interventions are resource-intensive (e.g., community-based interventions using manual outreach, tracking or home visits were more costly than interventions without these components). Given this, the review suggested that: 1) resource-intensive interventions may be necessary strategies to increase vaccination rates amongst populations who typically have low rates of vaccination; and 2) costs could be reduced if interventions are implemented in a stepped approach, starting with less resource-intensive interventions (e.g., reminder and recall systems) and progressing to other interventions in a strategic manner if needed.

A high-quality review of the effects of different types of patient reminder and recall interventions found that reminding people (e.g. by telephone and automatic calls, sending a letter or postcard, or sending a text message) to get a vaccination likely increases the number of people who receive vaccination rates by an average of 8%, and that reminding people over the telephone is more effective than other types of reminders.

Two systematic reviews focused on strategies that use pharmacists or pharmacies to enhance vaccine acceptance or reduce vaccine hesitancy. A high-quality review found an increase in vaccine coverage was when pharmacists were involved in the immunization process, regardless of role (e.g., educator, facilitator, administrator) or vaccine administered (e.g., influenza, pneumococcal), when compared to vaccine provision by traditional providers without pharmacist involvement. The review highlighted that convenience and accessibility are importance facilitators of immunization acceptance. Given this, the extended hours of pharmacies and availability of walk-in appointment contribute to increased vaccine acceptance and uptake found in the review. Complementing this, a medium-quality review assessed the feasibility, acceptability, and effectiveness of community pharmacies as sites for adult vaccination and found that: pharmacy-based immunization services are widely accepted by both patients and pharmacy staff; pharmacies may improve access and increase vaccination rates; and political and organizational barriers may limit the feasibility and effectiveness of pharmacies for sites of adult vaccination.

The last review, provided a synthesis of qualitative evidence related to the reasons why many children do not receive recommended vaccines, including lack of trust in vaccines or the healthcare workers who provide them. The synthesis found that parents:

- want balanced information about vaccination benefits and harms that is presented clearly and simply and tailored to their situation and that that they want vaccination information to be available at a wide variety of locations (not just in health settings) and with access to information provided well in advance of a vaccination appointment;
- view health workers as an important source of information, but that poor communication and negative relationships with health workers can impact vaccination decisions;

- find it difficult to know which vaccination information sources to trust and challenging to find unbiased and balanced information (and parents who are vaccine hesitant want more information); and
- most of the included interventions addressed at least one or two key aspects of communication, including the provision of information prior to a vaccination appointment and tailoring information to parents' needs, but none of the interventions responded to negative media stories or addressed parental perceptions of health worker motives.

Lastly, we identified three single studies that provided insight about acceptance or hesitance specifically for a future COVID-19 vaccine. A global survey of 13,426 people in 19 countries published in October 2020 found that respondents reported higher levels of trust in information from government sources were more likely to accept a vaccine and take their employer's vaccine advice. The other two studies report on surveys conducted in the U.S. The first is a survey that randomly assigned 7,064 U.S. respondents to read pro-vaccine communication materials with information emphasizing personal health risks, economic costs or collective public-health consequences of not vaccinating (and with the message source – ordinary people or medical experts – also randomly assigned). The survey found that: 1) messages that emphasize personal-health risks and collective health consequences of not vaccinating significantly increased intentions to vaccinate; 2) the effects were similar regardless of the message source and efforts to pre-emptively de-bunk concerns about the safety of expedited clinical trials; and 3) 'economic cost' related framing had no discernible effect on vaccine intentions. The second survey that public opinion toward COVID-19 vaccinations may be responsive to political motivation and support, with findings highlighting that positive statements by President Trump and Dr. Fauci had a significant positive effect on public reactions towards a COVID-19 vaccine.

Key findings related to approaches targeting high-risk groups

We found one high-quality systematic review conducted in 2017, which indicated that several interventions were found to be effective for increasing demand for vaccination among community dwelling older adults, including reminder/recalls by letters and leaflets, pharmacist-provided education, nurse-provided vaccinations, personalized phone calls, home visits, client group clinic visits, and free vaccination programs.

Key findings related to approaches targeting individuals who are hesitant about or opposed to vaccination

One systematic review and one rapid review provide insights on approaches targeted to those who are vaccine hesitant or against vaccination. A systematic review with high methodological quality found that the attitude of parents who are hesitant about vaccines substantially improved after receiving educational resources and information (such as brochures, pamphlets, or posters). Additionally, a rapid review with low methodological quality reported that vaccine uptake may be improved by setting up vaccination clinics in familiar and accessible locations and leveraging community partners to reach individuals who are hesitant about or opposed to vaccination

Key findings related to approaches target more than one of the groups

We identified two guidelines developed using a robust process, one rapid review, and one guideline developed using some type of evidence synthesis and/or expert opinion that targeted more than one of the target groups outlined above.

The two guidelines from the WHO provided general insights about vaccine delivery, but also described specific steps for ministries of health to encourage vaccine acceptance and address vaccine hesitancy. The first guideline focuses on actions for ministries of health, while the second guideline describes the Vaccine Introduction Readiness Assessment Tool, which includes information on establishing data systems to collect social-media misinformation and behavioural data.

One rapid review from the U.K.'s national academy of sciences, the Royal Society, published five key recommendations to address vaccine hesitancy and improve vaccine uptake, and highlighted the need for:

- public dialogue about vaccine concerns and misinformation;
- convenient locations for vaccination and that build on existing vaccination programs;
- decentralized local vaccination programs with visually appealing, multi-language toolkits for local jurisdictions and partners;
- ethical allocation of vaccines by prioritizing age and comorbidity-based groups; and
- accountability from media and responsibility from citizens to report misinformation and remove harmful information.

Similar guidelines were published based on the expert opinion of a 23-member Working Group of Readying Populations for COVID-19, with recommendations include that governments should:

- value social science (generate research on social, behavioural, and communication science, and develop active partnerships);
- inform public expectations about COVID-19 vaccination benefits, risks, and supply (e.g., temper expectations, provide transparency on vaccine-safety systems, and seek input from marginalized populations);
- communicate in meaningful ways (e.g., centre public well-being, reject political tensions, conduct qualitative studies to understand local and community needs, attitudes and beliefs, and engage networks of trusted champions and spokespeople to deliver a unified message);
- earn public trust and confidence in allocation and distribution (e.g., by developing strategies that take marginalized populations into consideration, and implementing guidelines that are consistent across providers and locations); and
- make vaccination available in safe, familiar places (e.g., in schools, pharmacies, places of worship, workplaces, grocery stores, health departments, senior centers, home visits, prepare educational materials, train providers and other allied professionals, develop hesitancy campaign plans, and foster intersectoral partnerships with government, health departments and media); and
- establish an independent body to instil public ownership (e.g., by establishing public committees to report on measures such as public understanding, access, and acceptance).

Key findings from the jurisdictional scan

We examined experiences with efforts to encourage vaccine acceptance and to address vaccine hesitancy in five comparator countries (Australia, China, New Zealand, U.K., and U.S.), as well as all provinces and territories in Canada. Experiences from these countries and provinces and territories are presented below.

Findings from other countries

Generally, all of the countries reported efforts to encourage vaccine acceptance and address vaccine hesitancy through existing population-based interventions, which include:

- launching vaccination campaigns with an emphasis on the importance of vaccination;
- providing tailored information to describe evidence on the risks and benefits of vaccines through common modalities (e.g., radio/podcasts, television, email alerts and reminders, text messages, face-to-face (in-person), social media (including web-based advertising) and through less frequently mentioned modalities (e.g., financial incentives, reminder-recall notifications);
- engaging healthcare providers to provide information and address concerns from vaccine-hesitant individuals during clinic visits; and
- combating myths and misinformation about vaccines through community engagement and transparency of the vaccine development process.

Specific to COVID-19, The U.S. Department of Health and Human Services' National Vaccine Advisory Committee released five recommendations to build confidence on the vaccine, which outline the need to:

- deliver effective COVID-19 vaccines to the public through the Food and Drug Administration's Biologics License Application process;
- rapidly deploy and coordinate vaccine safety monitoring through the federal-level immunization task force;
- create proactive and highly impactful communication for the general public on the development, safety, approval, and recommendation criteria;
- establish an independent group of vaccine and public health experts to conduct rapid reviews of available vaccine safety monitoring data; and
- conduct community-based studies and engagement to increase the likelihood of vaccine uptake in communities and marginalized populations.

Findings from Canadian provinces and territories

In Canada, there are existing guidance to encourage vaccine acceptance and help address vaccine hesitancy for the general public, such as strategies outlined by the Public Health Agency of Canada, Canvax, and the Canadian Pediatric Society.

For example, a 2016 Public Health Agency of Canada report described strategies for engaging vaccine acceptors, as well as those who are vaccine hesitant and who refuse vaccines. For vaccine acceptors, strategies include encouraging resiliency, describing common side effects and rare adverse events, and using verbal and numeric descriptions of disease risks. For those who are vaccine hesitant, key strategies include building rapport and accepting questions and concerns, establishing honest dialogue with information about risk and benefits of the disease and vaccine, utilizing decision aids and other information tools, and providing the opportunity to book additional appointments with healthcare providers for further discussion. Lastly, for those who refuse vaccines, strategies include avoiding debates about vaccination, providing opportunities for brief open-ended discussions, providing information about the risks of non-vaccination, and offering access to clinical care during adverse events.

All of the provinces and territories reported strategies to encourage immunization among the general population, which were often cited within flu-vaccination campaigns. The most-reported strategy included information or education campaigns on social media (including web-based advertising to address hesitancy, fact sheets about the risks and benefits, and information on immunization schedules, and where to get their vaccine). Yukon's 2020 influenza vaccine campaign featured public

education and engagement through YouTube, and explained key vaccination dates, provided information on COVID-19, and addressed vaccine hesitancy.

A presentation from the Vaccine Evaluation Centre at the University of British Columbia provided recommendations for healthcare providers to improve vaccine hesitancy, which includes maintaining trust, reinforcing the role of community immunity, emphasizing pro-social reasons for vaccination, and acknowledging diversity by working with culturally specific health promotion groups and patient/parent communities.

Table 1: Key findings from highly relevant evidence documents for encouraging vaccine acceptance and addressing vaccine hesitancy among different target groups

Target group	Key findings from highly relevant evidence documents
General public only	*Key findings from full systematic reviews* • A review of the effects of different types of patient reminder and recall interventions to improve vaccination rates found that reminding people to get a vaccination likely increases the number of people who receive vaccination rates by an average of 8%; and reminding people by telephone and automatic calls, sending a letter or postcard, or sending a text message each increase vaccination rates, but reminding people over the telephone is more effective than other types of reminders (Source; AMSTAR rating 9/11; literature last search 2017) • An increase in vaccine coverage was found when pharmacists were involved in the immunization process, regardless of role (e.g., educator, facilitator, administrator) or vaccine administered (e.g., influenza, pneumococcal), when compared to vaccine provision by traditional providers without pharmacist involvement (Source; AMSTAR rating 10/11; literature last searched 2015) • Vaccine attitude, parents' attitude towards vaccines substantially improved in eight of 15 studies after receiving educational resources and information, such as brochures, pamphlets, or posters (Source; AMSTAR rating 8/10; literature last searched September 2012) • Increased vaccine acceptance and uptake was found following community-based interventions (most of which were targeted at parents or caregivers of children and using home visits and/or information campaigns through community health works and medical interns); monetary incentives (which had a moderate impact on alleviating financial burden in low-income settings); and technology-based health literacy (Source; AMSTAR rating 5/9; literature last searched August 2019 – pre-print) • A review of the feasibility, acceptability, and effectiveness of community pharmacies as sites for adult vaccination found that: pharmacy-based immunization services are widely accepted by both patients and pharmacy staff; pharmacies may improve access and increase vaccination rates; and political and organizational barriers may limit the feasibility and effectiveness of pharmacies for sites of adult vaccination (Source; AMSTAR rating 7/9; literature last searched 2016) • A synthesis of qualitative studies found that parents: o Expressed wanting balanced information about vaccination benefits and harms that is presented clearly and simply and tailored to their situation and that that they want vaccination information to be available at a wide variety of locations (not just in health settings) and with access to information provided well in advance before the time of a vaccination appointment o View health workers as an important source of information, but that poor communication and negative relationships with health workers can impact vaccination decisions o Find it difficult to know which vaccination information sources to trust and challenging to find unbiased and balanced information, and that parents who are vaccine hesitant want more information o Most of the included interventions addressed at least one or two key aspects of communication, including the provision of information prior to a vaccination appointment and tailoring information to parents' needs, but none of the

	interventions responded to negative media stories or address parental perceptions of health worker motives (Source; AMSTAR rating 7/9; literature last searched August 2013) • There is strong evidence for the use of community-based interventions (implemented in combinations) to increase vaccination rates, but many interventions (e.g., community-based interventions using manual outreach, tracking or home visits were more costly than interventions without these components) are resource-intensive, and the review suggested that: 1) resource-intensive interventions may be necessary strategies to increase vaccination rates amongst populations who typically have low rates of vaccination; and 2) costs could be reduced interventions are implemented in a stepped approach, starting with less resource-intensive interventions (e.g., reminder and recall systems) and progressing to other interventions in a strategic manner if needed (Source; AMSTAR rating 3/10; literature last searched May 2012) *Key findings from single studies* • An analysis of how timing and elite endorsement affects public opinion about COVID-19 vaccines in the United States found that public opinion toward COVID-19 vaccinations may be responsive to political motivation and support, with findings highlighting that positive statements by President Trump and Dr. Fauci had a significant positive effect on public reactions towards COVID-19 vaccine (Source; pre-print - last edited 28 October 2020) • A global survey (13,426 people in 19 countries) found that respondents reporting higher levels of trust in information from government sources were more likely to accept a vaccine and take their employer's vaccine advice (Source; published 20 October 2020) • A survey that randomly assigned 7,064 respondents in the United States to read pro-vaccine communication materials with information emphasizing personal health risks, economic costs or collective public-health consequences of not vaccinating that had the message source (ordinary people or medical experts) also randomly assigned found that: 1) messages that emphasize personal-health risks and collective health consequences of not vaccinating were found significantly increase intentions to vaccinate; 2) the effects were similar regardless of the message source and efforts to pre-emptively de-bunk concerns about safety of expedited clinical trials; and 3) economic cost frames were found to have no discernible effect on vaccine intentions (Source; last updated 8 September 2020 - pre-print)
High-risk groups only (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)	*Key findings from full systematic reviews* • Several interventions were found to be effective increasing demand for vaccination among community dwelling older adults, including reminder/recalls by letters and leaflets, pharmacist-provided education, nurse-provided vaccinations, personalized phone calls, home visits, client group clinic visits, and free vaccination programs (Source; AMSTAR rating 9/11; literature last searched 7 December 2017)
Individuals who are hesitant about or opposed to vaccination	*Key findings from full systematic reviews* • Attitude of parents who are hesitant towards vaccines substantially improved after receiving educational resources and information, such as brochures, pamphlets, or posters (Source; AMSTAR rating 8/10; last literature searched September 2012) *Key findings from rapid reviews*

	• Vaccine uptake among hard-to-reach groups may be improved by setting up vaccination sites in familiar and accessible locations, and leveraging community partnerships (Source; AMSTAR rating 3/9; date of literature search not reported – published 27 August 2020)
More than one of the above target groups	*Key findings from guidelines developed using a robust process* • WHO produced guidance and steps to develop a plan to generate COVID-19 vaccine confidence, acceptance and demand (WHO technical guidance; last update 21 September 2020) • WHO developed a COVID-19 Vaccine Introduction Readiness Assessment Tool (VIRAT), which includes information on establishing data collection systems for social media misinformation and behavioural data (WHO technical guidance; last update 21 September 2020) *Key findings from rapid reviews* • The Royal Society, U.K.'s national academy of sciences, published five key recommendations to address vaccine hesitancy and improve vaccine uptake (Source; AMSTAR rating 2/9; data of literature search October 2020) *Key findings from guidelines developed using some type of evidence synthesis and/or expert opinion* • The U.S. Working Group on Readying Populations for COVID-19 vaccine released a set of recommendations to improve vaccine acceptance and address hesitancy, which includes valuing social science, informing public expectations about COVID-19 vaccination risks, benefits, and supply, communicating in meaningful ways, earning public trust and confidence, making vaccination available in safe, familiar places, and establishing independent body to instil public ownership and monitoring (Johns Hopkins Center for Health Security and Texas State University Department of Anthropology; published 20 October 2020)

Table 2: Overview of type and number of documents that were identified about encouraging vaccine acceptance and addressing vaccine hesitancy

Type of document	Total	Target of intervention				Level of intervention (i.e., who is intervening)	Types of interventions	Delivery of the intervention	Content of messaging	Outcomes of the intervention
		General public	High-risk groups	Vaccine hesitant or against vaccination	Multiple groups					
Guidelines developed using a robust process (e.g., GRADE)	3	-	-	-	3	3	3	1	1	3
Full systematic reviews	53	29	8	2	14	18	49	38	19	49
Rapid reviews	9	4	1	2	2				7	4
Guidelines developed using some type of evidence synthesis and/or expert opinion	2	-	-	1	1	2	2	2	1	1
Protocols for reviews that are underway	6	4	1	1	-	-	-	-	3	6
Titles/questions for reviews that are being planned	0	-	-	-	-	-	-	-	-	-
Single studies in areas where no reviews were identified	16	11	1	-	4	2	6	5	9	16

Table 3: Experiences in other countries with encouraging vaccine acceptance and addressing vaccine hesitancy

Country	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
Australia	• Get the Facts campaign, which launched in 2020, is the third phase of the Childhood Immunization Education Campaign to encourage families to get their children vaccinated on time • The Australian Government Department of Health website outlines the importance of vaccinating children on time and the rationale behind the vaccination schedule • Services Australia offers an online and mobile app called Medicare to check your child's immunization history • The Melbourne Vaccine Education Centre produces podcasts that address common questions about vaccines, as well as vaccine experts discussing the benefits of immunization for children and adults • The 2020 influenza prevention campaign raises awareness about the influenza vaccination, with the core objective being to increase influenza vaccination rates, raise awareness about the risks associated with contracting the virus as well as the potential risk of contracting influenza and COVID-19 at the same time • Promotional materials include television commercials that ask viewers to protect themselves and others by getting vaccinated
China (hyperlinks in Chinese)	• China has a planned prophylactic vaccination system, and implemented a vaccination certificate system for children, and children's vaccination certificates/cards need to be reviewed before admissions to school • The China National Immunization Programme is a government and academic organization, with the overall goal to control/eliminate/eradicate vaccine-preventable diseases in China by raising awareness about the benefits of immunization and promoting the understanding and use of vaccines • As a member of the WHO-led project Vaccine Safety Net (VSN), information targeting the public and health professionals is available to provide vaccination-related documents and promotional materials, such as fact sheets, multimedia (video, posters), training and educational materials, regulatory documents, frequently asked questions and answers • In 2016, China's government issued vaccination regulations and recommended providing vaccination information through multiple approaches (face-to-face, phone calls, text messages, emails, broadcast, posters and social media) • On 14 September of 2020, China's government recommended taking the following measures to improve vaccine uptake for the prevention and control of influenza: o Providing influenza vaccine reminders to raise public awareness o Increasing the number of vaccination sites and locations in primary care o Starting vaccination program early o Extending vaccination schedule o Increasing daily service time for vaccination o Encouraging centralized vaccination in schools, kindergartens, and nursing homes o Reducing influenza vaccine fees for high-risk groups (children, older adults, people with chronic conditions, and healthcare professionals)
New Zealand	• New Zealand's Immunization Handbook provides advice to healthcare providers on dealing with vaccine-hesitant individuals o Effective communication and active listening are highlighted as key components of the informed-consent process when working with this group

	○ Providers are advised to tailor the content of the conversation to the needs of the individual, use plain language rather than medical jargon, ensure respect and acknowledgement of individuals' concerns, and finish with an effective immunization recommendation • The New Zealand Covid-19 Vaccine Strategy has a focus on securing vaccines but does not address communication efforts to increase COVID-19 vaccine uptake
U.K.	• The European Centre for Disease Prevention and Control released a technical report on interventions to address vaccine hesitancy ○ The interventions responding to vaccine hesitancy were based on dialogue, communication, information tools for parents or healthcare workers, advocacy campaigns, and reminder-recall systems • The United Kingdom Department for International Development created a guidance document to address vaccine hesitancy ○ Interventions to reduce vaccine refusal and hesitancy included leader involvement, mass media and social-media campaigns, training for healthcare workers, financial incentives, and reminder-recall notification
U.S.	• On 16 September 2020, the Departments of Health and Human Services and Defense released the Operation Warp Speed COVID-19 Vaccine Distribution Strategy which included a primary task of engaging with partners, stakeholders, and the public to promote vaccine confidence and uptake • On 23 September 2020 the Department of Health & Human Services' National Vaccine Advisory Committee released a letter to the Assistant Secretary for Health with the following five recommendations for building confidence in a COVID-19 vaccine: ○ Deliver effective COVID-19 vaccines to the public through the Food and Drug Administration's Biologics License Application (BLA) process ○ Rapidly deploy and coordinate vaccine safety monitoring at the federal-level immunization task force ○ Create proactive and highly impactful communication on the development, safety, approval, and recommendation criteria geared towards the public ○ Establish an independent group of vaccine and public health experts to conduct rapid reviews of available monitoring data ○ Conduct community-based studies and engagement to increase the likelihood of vaccine uptake in communities and marginalized populations • The Department of Health & Human Services' National Vaccine Advisory Committee operates a Vaccine Confidence Subcommittee tasked with synthesizing evidence about vaccine confidence and making recommendations • The Department of Health & Human Services' Office of Infectious Disease and HIV/AIDS Policy vaccine confidence strategy includes three pillars for increasing vaccine confidence across the life course: ○ Collaboration and partnerships ○ Research and evaluation ○ Communication strategies and knowledge dissemination • The Centers for Disease Control and Prevention's Vaccinate with Confidence framework aims to strengthen vaccine confidence and prevent outbreaks of vaccine-preventable diseases by advancing three pillars: ○ Identifying and protecting communities at risk ○ Empowering families by strengthening parent-provider conversations about vaccines ○ Engaging with stakeholders to contain and responds to the spread of misinformation and myths about vaccines • The Centers for Disease Control and Prevention maintains a webpage dedicated to providing information about vaccine safety, common questions, and other resources for general and specific populations (specifically, ethnic and racial groups; immigrants and refugees; and Spanish-speaking individuals)

Table 4: Experiences in Canada with encouraging vaccine acceptance and addressing vaccine hesitancy

Province/territory	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
Pan-Canadian	• A 2016 Public Health Agency of Canada report described strategies for three different population groups (vaccine acceptors, vaccine hesitant, and vaccine refusers) o Strategies for vaccine acceptors include encouraging resiliency, describing common side effects and rare adverse events, and using verbal and numeric descriptions of disease risks o Strategies for individuals who are vaccine hesitant include building rapport and accepting questions and concerns, establishing honest dialogue with information about risk and benefits of the disease and vaccine, utilizing decision aids and other information tools, and booking appointments for additional discussions o Strategies for vaccine refusers include avoiding debates about vaccination, providing opportunities for brief open-ended discussions, informing risks about non-vaccination, and offering access to clinical care during adverse events • Canadian guidance on addressing vaccine hesitancy to help foster vaccine demand and acceptance, includes strategies to detect vaccine hesitancy, skills to recognize and diagnose underlying factors in refusal or delay in vaccine acceptance, a guide to tailoring immunization program, strategies to address hesitancy and help foster demand, and steps to monitor and evaluate programmes addressing vaccine hesitancy • The Canadian Paediatric Society created a guidance document for provincial/territorial immunization programs, clinics and office practices on how to address hesitancy and improve vaccine acceptance rates o Steps to addressing hesitancy included: 1) detecting under-immunized subgroups, 2) educating all healthcare workers involved with immunization best practices, 3) employing evidence-based strategies to increase uptake, 4) educating children, youth and adults on the importance of immunization, and 5) working collaboratively across provincial/territorial jurisdictions and with the governments, leaders and health services o Companion documents including Working with vaccine hesitant parents: An update and Canada's eight-component vaccine safety system: A primer for health care workers were also produced • A 2018 consultation study by the Canadian Immunization Research Network found that the diffusion of negative information online and lack of knowledge about vaccines were identified as the key causes of vaccine hesitancy amongst participants o Based on the study findings, the Canadian Immunization Research Network suggested that a common understanding of vaccine hesitancy among researchers, public-health experts, policymakers and healthcare providers will better guide interventions to address vaccine hesitancy in Canada • Data from Statistics Canada's Canadian Perspectives Survey found that over half (57.5%) of Canadians were very likely to get a COVID-19 vaccine when it becomes available, and 19.0% reported that they were somewhat likely to get vaccinated o Canadians were unlikely to get a COVID-19 vaccine due to a lack of confidence in the safety of the vaccine and concerns about its risk and side effects o Approximately one-third of Canadians who said they were unlikely to get vaccinated (34.8%) indicated that they would wait until it seems safe to get the vaccine, and 25.9% of Canadians did not consider the COVID-19 vaccine necessary
B.C.	• A presentation entitled, Vaccine Hesitancy: It doesn't matter if the vaccine works if nobody gets it by Dr. Julie Bettinger from the Vaccine Evaluation Centre at the University of British Columbia provided recommendations for healthcare providers to improve vaccine hesitancy,

Province/territory	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
	which included maintaining trust, reinforcing the role of community immunity, emphasizing pro-social reasons for vaccination and acknowledging diversity by working with culturally specific health promotion groups and patient/parent communities • A 2017 survey of 1,308 adults in British Columbia found that more than 80% of respondents held positive attitudes towards vaccination o The survey also found that policies such as mandatory documentation of vaccination at school entry were supported by more than 70% of respondents and that punitive policies such as denial of child tax benefits for non-vaccination were supported by less than 40% of respondents o Respondents that had positive attitudes toward vaccination were also more likely to support all potential vaccination policies o The findings of this survey point to a majority of adults in British Columbia being supportive of vaccination and of information and requirement policy options to increase vaccination uptake • A poll from Angus Reid Institute found that 30% of British Columbians would wait to see how the COVID-19 vaccine worked, or what the side effects were, before getting the vaccine
Alberta	• Alberta's 2020-2021 Influenza Immunization program is focused on increasing the immunization rates for high-risk populations o Although targets for immunization of specific high-risk populations are provided, there were no strategies or objectives provided for encouraging vaccine acceptance • Despite evidence of growing vaccine hesitancy in the province, promotion of vaccine acceptance by the government of Alberta was found to be minimal
Saskatchewan	• The Saskatchewan Health Authority (SHA) is encouraging influenza uptake for the 2020-2021 season by: o Implementing a system-wide response strategy to offer the flu vaccine at every patient/client/resident encounter within the SHA o Promoting flu vaccination through their social media with their Twitter and Facebook cover photos (as of Nov 13, 2020) having a "Fight the Flu" theme, and with a number of posts in recent weeks focusing on the importance of flu vaccination
Manitoba	• On 15 October 2020, the Premier and Chief Public Health Officer launched the 'Add a Layer This Fall' campaign to encourage Manitobans to get the influenza vaccine o The campaign includes an interactive map of locations with flu vaccines (including clinics, pharmacies, public health offices) with filters such as walk-in and age limitations o Efforts are targeted at high-risk populations and their caregivers
Ontario	• The Government of Ontario's Fall Preparedness Plan for Health, Long-Term Care and Education states that there are actions underway to engage with stakeholders to promote the flu vaccine and run a public-education and targeted flu campaign • Prior to the COVID-19 pandemic, the Ontario Medical Association launched the #AskOntarioDoctors social-media and public-information campaign to combat vaccine misinformation and hesitancy
Quebec	• The Ministry of Health in Quebec maintains a website dedicated to demystifying beliefs regarding the risks of vaccination • A provincial program (Programme d'entretien motivationnel en maternité pour l'immunisation des enfants (EMMIE)) uses motivational interviewing during mothers' post-partum stay in maternity wards to encourage positive attitudes towards vaccination
New Brunswick	• The New Brunswick Department of Health website features a page on the importance of getting immunized, which addresses topics including how to get immunized and where to find your immunization records • Fact sheets on the various immunizations as well as the influenza vaccine outline the benefits of each vaccine, how it is administered and who should receive it

Province/territory	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
	• An immunization schedule outlining the vaccination and age it is administered is featured on the New Brunswick Department of Health website
Nova Scotia	• The Nova Scotia Department of Health and Wellness website features a chart outlining the immunization schedule for children, youth and adults • Due to school closures, Nova Scotia Health offered summer clinics for grade 7 students to receive the HPV, Hepatitis B, Tdap and Meningococcal Quadrivalent vaccines • The Nova Scotia Department of Health and Wellness website features a page outlining the importance of protecting yourself from the flu, and a quick facts page outlines who should receive the flu shot, the symptoms of the flu and the number of doses the province has ordered this year • The Nova Scotia Department of Health and Wellness posted an image of Health and Wellness Minister Leo Glavine on their Facebook page receiving the flu shot with the hashtag #GetTheShotNS
Prince Edward Island	• The Prince Edward Island Department of Health and Wellness website features a page that outlines all childhood immunizations and adult vaccine schedules, as well as a link to download the CANImmunize app which allows people to manage their vaccination records • Flu shot clinics were opened earlier this year to encourage more islanders to get vaccinated • PEI Public Health Nursing is offering flu vaccination clinics at various locations across the province • A frequently asked questions page is featured on the Prince Edward Island Health and Wellness website answering questions regarding who should receive the flu vaccine and which vaccine is available this season
Newfoundland and Labrador	• The Newfoundland and Labrador Health and Community Services Department website features a page on immunizations outlining how children are immunized in the province as well as how to receive a copy of their immunization record, as well as fact sheets detailing information about each vaccine are available on this page and a chart outlining the vaccination schedule • A news release by Newfoundland and Labrador Health and Community Services outlines several initiatives to encourage people to get the flu shot o A new online booking tool called Health Myself was created to schedule a flu shot appointment o A grant is available to companies with over 100 employees to hire a qualified healthcare provider to offer a vaccination clinic within the workplace o School districts and private schools will be offering the flu vaccine for students in grades 4 to 12 with parental consent • The Government of Newfoundland and Labrador created a website called, Time For The Shot that outlines information about the flu shot as well as resources for employers and health care professionals
Yukon	• Yukon Health and Social Services created a website called Yukon Immunize, which contains: o Yukon children's immunization schedule and information on grade 6/9 school-based immunization o Immunization information sheets that describe any potential side effects associated with vaccines and how to relieve them o Answers to common questions, including questions relating to vaccine hesitancy (e.g. that immunizations are safe, do not weaken the immune system, do not cause chronic conditions)

Province/territory	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
	• In April 2020, the Yukon Immunization Program (community health program) created a video about the importance of not delaying the childhood immunization schedule during COVID-19, including safety measures that are being taken to ensure that patients feel safe when attending their appointments • The Yukon Immunization Program Manual (Section 1- Introduction) discusses the role of healthcare providers in delivering education about vaccines and increasing their uptake o Section 3.0 (Immunization Competency) states that the Yukon Immunization program assists all healthcare professionals who provide immunizations to be knowledgeable vaccine providers, educators and advocates o Section 5.0 (Relative Risks of Diseases and Immunization) addresses the shift in public and mass-media concerns toward vaccine safety, and contains guidelines for providers for communicating effectively with parents and individuals regarding the risks and benefits of immunization o The Immunization Communication Tool for Immunizers is approved by the Yukon Immunization Program for use by providers to help in addressing parent concerns about immunizations • The Yukon Immunization Program Manual (Section 3- Immunization Schedule) recommends that healthcare providers use each client contact as an opportunity to review their immunization status and administer all vaccines that the client is eligible for (including available vaccines that are not currently publicly funded) • Yukon's 2020 influenza vaccine campaign features public education and engagement o Yukon Health and Social Services created a video that explains key dates, COVID-19-related changes and addresses vaccine hesitancy o The video also asks the public to think about why they get the flu shot, which led to a follow-up video featuring community members and a Facebook campaign to engage the public
Northwest Territories	• The Government of Northwest Territories Health and Social Services Department (DHSS) website has an immunization/vaccination page that provides public information, including: o A poster version of its immunization schedule o Vaccine information sheets, which contain information about the disease, who should get the vaccine and any potential risks/reactions • The DHSS promotes National Immunization Awareness Week and the CANImmunize app on their website • The DHSS has a station on SoundCloud called HSS Communications that plays music with interspersed public-health messages o In 2016, there was a message titled Get Vaccinated! that was played in English, Chipewyan, Gwich'in, North Slavey, South Slavey and Tłı̨chǫ o The message targeted parents and spoke about the importance and safety of vaccines • The NWT COVID-19 Pandemic Planning Guide contains a communication plan that involves the DHSS, HSS Authorities and the Government of Northwest Territories Territorial Planning Committee o Though not specific to communications relating to a vaccine, it states that the DHSS is the lead on all public communications and messaging about COVID-19 during the pandemic • In January 2020, the Canadian Pediatric Society hosted a workshop in Northwest Territories which trained front-line healthcare workers on how to manage parental hesitancy to vaccines
Nunavut	• The Nunavut Department of Health website features a page on Influenza, which contains information about the disease and vaccine, including:

Province/territory	Efforts to encourage vaccine acceptance and to address vaccine hesitancy
	○ A Flu Fact Sheet, which is offered in four languages, and encourages people to get the flu vaccine to prevent infection and spread ○ A Flu Myths and Facts Sheet, which addresses numerous vaccine-related hesitancies • The Nunavut Department of Health has used public-service announcements to encourage individuals to get the flu vaccine, and to inform the public of key dates relating to vaccine delivery • Advertisements for booking flu shots and clinic information can be found on the Government of Nunavut Facebook page • The Nunavut Department of Health website features a page on childhood immunization, which contains information on immunization programs and the immunization schedule ○ This page also links to the Public Health Agency of Canada document A Parent's Guide to Immunization, which addresses vaccine-related hesitancies • Section 8 (Setting up Clinics) of the Government of Nunavut Immunization Manual provides strategies for healthcare providers to keep children on the immunization schedule, including assessing immunization opportunities at every clinic visit, keeping track of children in the community and educating patients and guardians on the benefits of immunization and the risks of contracting vaccine-preventable diseases • Section 8 (Setting up Clinics) of the Government of Nunavut Immunization Manual provides guidance for setting up a community immunization clinic, which are most commonly used in Nunavut for the seasonal influenza program and in pandemic situations ○ To increase use of the centres, the manual suggests that it is important to inform key community stakeholders of the clinic and its purpose ○ It is also suggested to have language specific signs, pamphlets and media coverage to provide accurate information on the location and purpose of the clinic

Gauvin FP, Lavis JN. COVID-19 rapid evidence profile #24: What is known about strategies for encouraging vaccine acceptance and addressing vaccine hesitancy (including efforts to combat misinformation that may lead to vaccine hesitancy) or uptake (when interpreted, at least in part, through the perspective of vaccine acceptance or hesitancy)? Hamilton: McMaster Health Forum, 17 November 2020.

The McMaster Health Forum is one of the three co-leads of RISE, which is supported by a grant from the Ontario Ministry of Health to the McMaster Health Forum. To help Ontario Health Team partners and other health- and social-system leaders as they respond to unprecedented challenges related to the COVID-19 pandemic, the Forum is preparing rapid evidence responses like this one. The opinions, results, and conclusions are those of the McMaster Health Forum and are independent of the ministry. No endorsement by the ministry is intended or should be inferred.

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Appendix 1: Methodological details

We use a standard protocol for preparing each rapid evidence profile (REP) to ensure that our approach to identifying research evidence as well as experiences from other countries and from Canadian provinces and territories are as systematic and transparent as possible in the time we were given to prepare the profile.

Identifying research evidence

For each REP, we search our continually updated inventory of best evidence syntheses and guide to key COVID-19 evidence sources for:

1) guidelines developed using a robust process (e.g., GRADE);
2) full systematic reviews;
3) rapid reviews;
4) guidelines developed using some type of evidence synthesis and/or expert opinion;
5) protocols for reviews or rapid reviews that are underway
6) titles/questions for reviews that are being planned; and
7) single studies (when no guidelines, systematic reviews or rapid reviews are identified)

For this rapid evidence profile, we also searched: 1) Health Evidence (www.healthevidence.org), which focuses on evidence about public-health programs and products (such as vaccines) and which we searched using hesitan* OR acceptance and using the immunization topic filter under intervention strategy; and 2_ Health Systems Evidence (www.healthsystemsevidence.org), which focuses on getting the right programs and products to those who need them and which we searched using 'vaccine' and the filter for 'public health' (under health-system sectors).

Each source for these documents is assigned to one team member who conducts hand searches (when a source contains a smaller number of documents) or keyword searches to identify potentially relevant documents. A final inclusion assessment is performed both by the person who did the initial screening and the lead author of the rapid evidence profile, with disagreements resolved by consensus or with the input of a third reviewer on the team. The team uses a dedicated virtual channel to discuss and iteratively refine inclusion/exclusion criteria throughout the process, which provides a running list of considerations that all members can consult during the first stages of assessment.

During this process we include published, pre-print and grey literature. We do not exclude documents based on the language of a document. However, we are not able to extract key findings from documents that are written in languages other than Chinese, English, French and Spanish. We provide any documents that do not have content available in these languages in an appendix containing documents excluded at the final stages of reviewing.

Identifying experiences from other countries and from Canadian provinces and territories

For each rapid evidence profile we collectively decide on what countries to examine based on the question posed. For other countries we search relevant sources included in our continually updated guide to key COVID-19 evidence sources. These sources include government-response trackers that document national responses to the pandemic. In addition, we conduct searches of relevant government and ministry websites. In Canada, we search websites from relevant federal and provincial governments, ministries and agencies (e.g., Public Health Agency of Canada).

While we do not exclude countries based on language, where information is not available through the government-response trackers, we are unable to extract information about countries that do not use English, Chinese, French or Spanish as an official language.

Assessing relevance and quality of evidence

We assess the relevance of each included evidence document as being of high, moderate or low relevance to the question and to COVID-19. We then use a colour gradient to reflect high (darkest blue) to low (lightest blue) relevance.

Two reviewers independently appraise the methodological quality of systematic reviews and rapid reviews that are deemed to be highly relevant. Disagreements are resolved by consensus with a third reviewer if needed. AMSTAR rates overall methodological quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. High-quality reviews are those with scores of eight or higher out of a possible 11, medium-quality reviews are those with scores between four and seven, and low-quality reviews are those with scores less than four. 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 health-system arrangements or to economic and social responses to COVID-19. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered 'high scores.' A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8.

Preparing the profile

Each included document is hyperlinked to its original source to facilitate easy retrieval. For all included guidelines, systematic reviews, rapid reviews and single studies (when included), we prepare declarative headings that provide a brief summary of the key findings and act as the text in the hyperlink. Protocols and titles/questions have their titles hyperlinked given that findings are not yet available. We then draft a brief summary that highlights the total number of different types of highly relevant documents identified (organized by document), as well as their key findings, date of last search (or date last updated or published), and methodological quality.

Appendix 2: Key findings from evidence documents that address the question, organized by document type and sorted by relevance to the question and COVID-19

Type of document	Relevance to question	Key findings	Recency or status
Guidelines developed using a robust process (e.g., GRADE)	• Target of intervention o General public o Individuals who are hesitant about or opposed to vaccination • Level of intervention (i.e., who is intervening) o Government • Types of interventions o Information or education provision o Behaviour-change support o System participation • Outcomes of the intervention o Vaccine acceptance or hesitancy o Vaccine uptake	• This guideline highlights how countries can begin pre-planning for the introduction of COVID-19 vaccines by conducting a series of activities, including activities that focus on demand generation and communication. o Design a demand plan (includes advocacy, communications, social mobilization, risk and safety communications, community engagement, and training) to generate confidence, acceptance and demand for COVID-19 vaccines. o The plan must include a crisis communications preparedness planning. Source	Last update 21 September 2020
	• Target of intervention o General public o Individuals who are hesitant about or opposed to vaccination • Level of intervention (i.e., who is intervening) o Government • Types of interventions o Information or education provision o Behaviour-change support o System participation • Outcomes of the intervention o Vaccine acceptance or hesitancy o Vaccine uptake	• COVID-19 Vaccine Introduction Readiness Assessment Tool proposes additional activities that focus on demand generation and communication. o Design a demand plan (includes advocacy, communications, social mobilization, risk and safety communications, community engagement, and training) to generate confidence, acceptance and demand for COVID-19 vaccines. The plan must include a crisis communications preparedness planning. o Establish data collection systems, including; 1) social media listening and rumor management, and 2) assessing behavioral and social data. o Develop key messages and materials for public communications and advocacy, that are aligned with the demand plan. Source	Last update 21 September 2020

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o General public
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	  o Individuals who are hesitant about or opposed to vaccination
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	• Delivery of the intervention
	  o By whom
	  ▪ Nurse
	  ▪ Doctor
	  ▪ Pharmacist
	• Content of messaging
	  o Data and evidence about risks and benefits
	• Outcomes of the intervention
	  o Vaccine uptake
		• This guideline indicates that people in eligible groups who understand why flu vaccination is particularly important for them are more likely to be vaccinated.
		  o Thus, professionals need to explain the benefits of vaccination and address people's misconceptions about it.
		• The guideline proposes a multicomponent approach to develop and deliver programmes to increase flu vaccination uptake, including raising awareness among health and social care staff, and among eligible groups.
		Source
			Last update 22 August 2018

Full systematic reviews	• Target of intervention
	  o General public
	• Types of interventions
	  o Information or education provision
	  o Communication and decision-making facilitation
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)
	  o Myths or misinformation about vaccines
	• Outcomes of the intervention
		• The review examined 33 studies and reported increased vaccine acceptance and uptake following community-based interventions, monetary incentives, and technology-based health literacy
		• For community-based interventions, most of them were targeted at parents or caregivers of children, with home visits and information campaigns conducted community health workers and medical interns as the most common modality
			Pre-print (Literature last searched 2019)

Type of document	Relevance to question	Key findings	Recency or status
	○ Vaccine acceptance, confidence, or hesitancy ○ Vaccine uptake	• For incentive-based interventions, alleviating financial burden had a moderate impact in low-income settings • Technology-based health literacy interventions (videos, posters, lectures) were conducted in urban primary care practices and medical organizations, and reported improved vaccine acceptance among the general public Source (AMSTAR rating 5/9)	
	• Target of intervention ○ High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Level of intervention (i.e., who is intervening) ○ Healthcare professionals ○ Community leaders • Types of interventions ○ Communication and decision-making facilitation ○ Modality of delivery ▪ Postal ▪ Telephone ▪ Face-to-face (in-person) • Outcomes of the intervention ○ Vaccine uptake	• The use of reminder/recalls by letters and leaflets, pharmacists educating or nurses vaccinating patients were positively associated with an increased demand of vaccination among community-dwelling older adults (aged 60 years or older) • Effective studies (that were not part of the meta-analysis) included outreach by retired teachers, receptionists, nurses, and medical students • Personalised phone calls and home visits are effective in increasing vaccination uptake; however, it is more resource-intensive • Home visits, client group clinic visits, and free vaccination programs were associated with improved vaccination access Source (AMSTAR rating 9/11)	Literature last searched 7 December 2017
	• Target of intervention ○ General public • Types of interventions ○ Communication and decision-making facilitation • Delivery of the intervention ○ Modality of delivery ▪ Postal	• This review examined the effectiveness of various types of patient reminder and recall interventions to improve vaccination rates • Findings revealed that: ○ Reminding people to get a vaccination likely increases the number of people who receive vaccination rates (an average of 8 percentage points)	Literature last searched 2017

Type of document	Relevance to question	Key findings	Recency or status
	▪ Mobile-phone alerts/text messages • Outcomes of the intervention o Vaccine uptake	o Reminding people by telephone and automatic calls, sending a letter or postcard, or sending a text message increased vaccination rates (as well as a combination of reminders) o Reminding people over the telephone was more effective than other types of reminders Source (AMSTAR rating 9/11)	
	• Target of intervention o General public • Types of interventions o System participation • Delivery of the intervention o By whom ▪ Pharmacist o Location of delivery ▪ Pharmacy	• This review examined the feasibility, acceptability, and effectiveness of community pharmacies as sites for adult vaccination • Findings revealed that: o Pharmacy-based immunization services are widely accepted by both patients and pharmacy staff o Pharmacies may improve access and increase vaccination rates o Political and organizational barriers may limit the feasibility and effectiveness of pharmacies for sites of adult vaccination Source (AMSTAR rating 7/9)	Literature last searched 2016
	• Delivery of the intervention o By whom ▪ Pharmacist • Outcomes of the intervention o Vaccine uptake	• Research evidence found an increase in vaccine coverage when pharmacists were involved in the immunization process, regardless of role (e.g., educator, facilitator, administrator) or vaccine administered (e.g., influenza, pneumococcal), when compared to vaccine provision by traditional providers without pharmacist involvement Source (AMSTAR rating 10/11)	Literature last searched 2015
	• Target of intervention o General public • Level of intervention o Healthcare professionals • Types of interventions o Information or education provision o Behavior-change support	• The review focused on parents' and informal caregivers' views and experiences of communication about routine childhood vaccination and found, in general, parents desired more information than they were receiving and that a lack of information led to worry and regret about vaccination decisions among some parents	Literature last searched August 2013

Type of document	Relevance to question	Key findings	Recency or status

	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Delivery of intervention
	  o Modality of delivery
	  ▪ Face-to-face (in person)
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Risk-mitigation efforts
	• Outcomes of the intervention
	  o Vaccine uptake
	  o Vaccine acceptance, confidence, or hesitancy
		• The synthesis of included qualitative studies found that parents:
		  o Expressed wanting balanced information about vaccination benefits and harms that is presented clearly and simply and tailored to their situation and that that they want vaccination information to be available at a wide variety of locations (not just in health settings) and with access to information provided well in advance before the time of a vaccination appointment
		  o View health workers as an important source of information, but that poor communication and negative relationships with health workers can impact vaccination decisions
		  o Find it difficult to know which vaccination information sources to trust and challenging to find unbiased and balanced information, and that parents who are vaccine hesitant want more information
		• Most of the included interventions addressed at least one or two key aspects of communication, including the provision of information prior to a vaccination appointment and tailoring information to parents' needs, but none of the interventions responded to negative media stories or address parental perceptions of health worker motives
		Source (AMSTAR rating 7/9)	

	• Target of intervention
	  o High-risk groups
	  o Individuals who are hesitant about or opposed to vaccination
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	• Delivery of the intervention
		• There is strong evidence on the effectiveness of home visits to increase vaccination rates
		• Home visits can be resource-intensive and costly
		• Home visits include discussions of current vaccination status, on-site vaccinations, and referrals to other immunizations for populations who are unresponsive to previous vaccine reminder interventions
			Literature last searched 2012

Type of document	Relevance to question	Key findings	Recency or status
	○ By whom ▪ Nurse ▪ Doctor ▪ Pharmacist ○ Modality of delivery ▪ Face-to-face (in-person) ○ Location of delivery • Content of messaging ○ Data and evidence about risks and benefits • Outcomes of the intervention • Vaccine uptake	• Home visits are conducted by health providers, such as nurses, or other allied professionals such as social workers Source (AMSTAR rating 3/10)	
	• Target of intervention ○ General public • Types of interventions ○ Personal support • Delivery of the intervention ○ Location of delivery ▪ Public-health offices • Outcomes of the intervention • Vaccine uptake	• This systematic review included seven studies, each of which aimed to examine the use of incentive rewards in vaccination programs • The review suggested that financial incentives are effective intervention strategies to improve immunization rates; their effectiveness can be enhanced when integrated within health plans • The findings of the review noted that immunization rates were found to be raised by a median of approximately eight percentage points; when incentive reward programs were used alone, similar increases of 8.5 and nine percentage points were observed Source (AMSTAR rating 3/10)	Literature last searched 2012
	• Target of intervention ○ Individuals who are hesitant about or opposed to vaccination • Level of intervention (i.e., who is intervening) ○ Government ○ Healthcare professionals • Types of interventions ○ Information or education provision ○ Communication and decision-making facilitation	• This systematic review aimed to examine interventions that may be effective in improving vaccine hesitancy and acceptance among parents • Within the included studies in the review, educational resources and information were the most commonly examined intervention • In eight of the 15 studies assessing vaccine attitude, parents' attitude towards vaccines substantially improved after receiving educational	Literature last searched September 2012

Type of document	Relevance to question	Key findings	Recency or status
	• Outcomes of the intervention o Vaccine acceptance or hesitancy	resources and information, such as brochures, pamphlets, or posters Source (AMSTAR rating 8/10)	

	• Target of intervention
	  o General public
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	  o Personal support
	  o Communication and decision-making facilitation
	• Delivery of the intervention
	  o Location of delivery
	  ▪ Community centres
	• Outcomes of the intervention
	  o Vaccine uptake
		• This review found that there is strong evidence for the use of community-based interventions, implemented in combinations, to increase vaccination rates
		• The review found a median increase in vaccination rates of 14 percentage points
		• The 18 studies evaluated various interventions in different combinations
		  o Client reminder and recall systems were used in most of the evaluated vaccination programs
		  o These systems were commonly implemented by vaccination providers or generated from a regional immunization information system
		• The review found that many of the interventions were resource-intensive, and that community-based interventions using manual outreach, tracking or home visits were more costly than interventions without these components.
		  o It was suggested that resource-intensive interventions may be necessary strategies to increase vaccination rates amongst populations who typically have low rates of vaccination
		  o Community-based interventions may be less costly if they are implemented in a stepped approach, starting with less resource-intensive interventions such as client reminder and recall systems and progressing to other interventions in a strategic manner if needed
		Source(AMSTAR rating 3/10)
			Literature last searched May 2012

	• Target of intervention o General public • Level of intervention (i.e., who is intervening)	• The focus of this systematic review was to examine interventions targeting vaccine uptake in adolescents	Literature last searched May 2019

Type of document	Relevance to question	Key findings	Recency or status
	○ Government ○ Healthcare professionals • Types of interventions ○ Information or education provision ○ Communication and decision-making facilitation • Delivery of the intervention ○ By whom ▪ Nurse ▪ Doctor ○ Modality of delivery ▪ Email alerts and reminders ○ Location of delivery ▪ School ▪ Workplace ▪ Healthcare settings (e.g., hospital or a clinician's office) • Outcomes of the intervention ○ Vaccine acceptance or hesitancy ○ Vaccine uptake	• This review noted that health education has shown to improve HPV vaccine uptake; additional intervention strategies, which include financial incentives and mandatory vaccination delivery for permittance in schools may be effective interventions in increasing vaccine uptake among adolescents • Provider-oriented interventions, such as receiving individualized or performance feedback may be effective in increasing vaccine uptake Source (AMSTAR rating 11/11)	
	• Target of intervention ○ High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Level of intervention ○ Government • Types of interventions ○ System participation • Delivery of the intervention ○ Location of delivery ▪ School • Outcomes of the intervention ○ Vaccine uptake	• There is strong evidence on the effectiveness of vaccination requirements for childcare, school, and college attendance in increasing vaccination rates and decreasing rates of vaccine-preventable disease and associated morbidity and mortality • Vaccination requirements could be: ○ laws created by states, with the specific vaccines required established by the legislature and embodied in statutes or adopted as administrative rules by health or education departments ○ additional vaccination policies established by institutions (such as colleges and private schools) for attendance or residence ○ varied across jurisdictions Source (AMSTAR rating 3/10)	Literature last searched 2015

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o General public
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	• Delivery of the intervention
	  o Duration
	  o Modality of delivery
	  ▪ Postal
	  ▪ Telephone
	  ▪ Email alerts and reminders
	  ▪ Mobile-phone alerts/text messages
	  ▪ Social media (including web-based advertising)
	  ▪ Face-to-face (in-person)
	  o Location of delivery
	  ▪ Community centres
	  ▪ School
	  ▪ Healthcare settings
	• Outcomes of the intervention
	  o Vaccine uptake
		• Complex, locally designed interventions have the strongest evidence for increasing vaccine uptake, particularly in urban, ethnically diverse, low-income or deprived population
		  o Complex interventions comprise several interacting components, such as promotional materials, patient reminder/recall, outreach, healthcare workers training and prompts
		• There are some evidence that postal and telephone reminders are effective
		• Evidence remains mixed for text-message reminders
		• Computer-based interventions were not effective
		• Escalating intervention intensity appear effective
		Source (AMSTAR rating 3/9)
			Literature last searched November 2015

	• Target of intervention
	  o General public
	• Level of intervention
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	  o Behavior-change support
	• Delivery of intervention
		• Vaccine uptake and coverage can be improved by implementing interventions that apply new media such as text messaging, internet promotions, and computerized standing orders and reminders for healthcare providers
		• Computer-generated text messaging sent to parents of newborns and school-aged children
			Date of literature search not reported (published January 2015)

Type of document	Relevance to question	Key findings	Recency or status
	o Modality of delivery ▪ Email alerts and reminders ▪ Mobile-phone alerts/text messages ▪ Social media (web-based advertising) • Content of messaging o Data and evidence about risks and benefits o Risk-mitigation efforts • Outcomes of the intervention o Vaccine uptake	were effective at increasing vaccination in these groups • Immunization campaign websites and computerized reminders for patients have some influence on uptake of vaccine information and patient attitudes and behaviors about vaccination • There is uncertainty about how effective social media networks, email communications and smartphone applications are on influencing vaccine uptake • Vaccination rates are higher when computerized reminders to encourage providers to recommend vaccination and computer-based standing orders are in use Source (AMSTAR rating 7/10)	
	• Target of intervention o General public o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) o Individuals who are hesitant about or opposed to vaccination • Level of intervention (i.e., who is intervening) o Government o Healthcare professionals o Community champions • Types of interventions o Information or education provision o Behaviour-change support o Skills and competencies development o Personal support o Communication and decision-making facilitation o System participation	• Findings about the structure of interventions revealed that: o Engaging religious and other community leaders was a commonly used strategy to address contextual influences (e.g. religion, culture and gender) o Across all regions, most interventions were multi-component • Findings about the success (defined as either increase in vaccine uptake, or increase in knowledge and awareness) of interventions revealed that: o Few interventions were found to have been evaluated for their success in vaccine uptake or their influence in increasing knowledge and awareness o Interventions to increase uptake that that have multiple components and/or have a focus on dialogue-based approaches tend to be more effective	Literature last searched 2013

Type of document	Relevance to question	Key findings	Recency or status
	• Delivery of the intervention o By whom ▪ Community leaders o Modality of delivery ▪ Face-to-face (in-person) • Content of messaging o Data and evidence about risks and benefits o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination) o Myths or misinformation about vaccines • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	o Interventions that resulted in the largest increases in vaccine uptake were those which directly targeted unvaccinated or under-vaccinated populations, improved convenience and access to vaccination, aimed to increase vaccination knowledge and awareness, targeted specific populations (e.g. healthcare workers), mandated vaccinations and engaged religious or other influential leaders o Interventions that resulted in the greatest increases in knowledge and awareness were education initiatives, especially where new knowledge was embedded into routine processes Source (AMSTAR rating 7/10)	
	• Target of intervention o General public • Types of interventions • Information or education provision o Communication and decision-making facilitation • Delivery of the intervention o Modality of delivery ▪ Postal ▪ Telephone ▪ Mobile-phone alerts/text messages • Outcomes of the intervention o Vaccine uptake	• Vaccination rates increased by 11% after implementing client reminders and recall interventions (including telephone, letter, postcard, text messages) • Interventions only required a few economic resources Source (AMSTAR rating 3/10)	Literature last searched 2012
	• Target of intervention o General public o High-risk groups • Types of interventions o System participation • Delivery of the intervention o By whom	• The review reported strong evidence on the effectiveness of standing orders to increase vaccination rates: o among adults and children o across a range of settings (clinics, hospitals, pharmacies, long-term care facilities)	Literature last searched 2012

Type of document	Relevance to question	Key findings	Recency or status
	▪ Nurse ▪ Pharmacist o Location of delivery ▪ Healthcare settings ▪ Pharmacy • Outcomes of the intervention o Vaccine uptake	o when used alone or when combined with additional interventions • Standing orders authorize nurses, pharmacists, and other healthcare personnel to assess a client's immunization status and administer vaccinations according to an approved protocol Source (AMSTAR rating 3/10)	
	• Target of intervention o General public • Types of interventions o Behaviour-change support o Personal support • Delivery of the intervention o Location of intervention ▪ Community centres ▪ School • Outcomes of intervention o Vaccine uptake	• The Community Preventative Services Task Force recommended interventions to increase vaccination coverage based on findings from systematic reviews of evaluation literature • The review concluded that reminder systems for clients and providers were the lowest-cost strategies to implement and the most cost effective in terms of additional people vaccinated. It was also found that interventions involving home visits and combination strategies delivered in community setting were more costly and less cost effective • In summary, the interventions recommended by the Task Force varied in terms of reach, cost and cost effectiveness. The findings of this review can guide individuals and organizations implementing vaccination programs based on their needs, resources and budget Source (AMSTAR rating 3/10)	Literature last searched May 2012
	• Target of intervention o General public • Types of interventions o Information or education provision • Delivery of the intervention o Modality of delivery ▪ Radio ▪ Television ▪ Social media	• There is insufficient evidence on the effectiveness of community-wide education when implemented alone to increase vaccination rates or reduce rates of vaccine preventable illness • Community-wide education providing information on the risk and benefits of vaccination can reach most or all of the target population in a geographic area	Literature last searched 2009

Type of document	Relevance to question	Key findings	Recency or status
	▪ Face-to-face (in-person) • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine uptake	• Community-wide education can be delivered by person-to-person interactions, community mobilization, mass or small media Source (AMSTAR rating 3/10)	
	• Target of intervention o Individuals who are hesitant about or opposed to vaccination • Types of interventions o Information or education provision o Communication and decision-making facilitation • Delivery of the intervention o By whom ▪ Nurse ▪ Doctor o Modality of delivery ▪ Face-to-face (in-person) • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	• The primary aim of this systematic review aimed to investigate the impact of face to face interventions and their effect on increasing parental knowledge and early childhood vaccine uptake • This review identified seven studies; the primary intervention studied was educational sessions for parents and those expecting • The findings from the review noted that face to face interventions did not drastically increase vaccination rates or knowledge surrounding childhood vaccinates; though, it is worth noting that the authors found limited and low-quality evidence Source	Literature last searched September 2020
	• Target of intervention o General public • Level of intervention (i.e., who is intervening) o Government o Business and education leaders and staff o Healthcare professionals o Community champions • Types of interventions o Information or education provision • Delivery of the intervention o Modality of delivery ▪ Telephone ▪ Email alerts and reminders ▪ Mobile-phone alerts/text messages	• Interventions that were found to increase immunization rates in adult populations included using text and telephone calls to provide education and reminders for vaccination, providing low-cost or subsidized vaccines, providing easy access to immunization services, and understanding the cultural and social needs of different racial and ethnic populations • Significantly improving vaccination rates will likely require the use of an evidence-based multimodal approach using different categories of interventions Source	Date of literature search not reported (published November 2019)

Type of document	Relevance to question	Key findings	Recency or status
	• Outcomes of the intervention o Vaccine uptake		

	• Target of intervention
	  o General public
	  o Individuals who are hesitant about or opposed to vaccination
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	• Delivery of the intervention
	  o By whom
	  ▪ Nurse
	  ▪ Doctor
	• Outcomes of the intervention
	  o Vaccine uptake
		• Barriers identified for HPV vaccination included missed opportunities for vaccination as a result of providers not recommending it, not being aware of current guidelines and parental vaccine hesitancy
		• Strategies found to be effective for enhancing HPV vaccination uptake included the use of reminder systems and strong provider recommendations, with multi-method strategies that adopt strong provider recommendations demonstrating the highest rates of increases
		Source
			Date of literature search not reported (published February 2019)

	• Target of intervention
	  o General public
	• Types of interventions
	  o Behaviour-change support
	  o Communication and decision-making facilitation
	• Delivery of the intervention
	  o Modality of delivery
	  ▪ Mobile-phone alerts/text messages
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)
	• Outcomes of the intervention
	  o Vaccine acceptance or hesitancy
	  o Vaccine uptake
		• This systematic review aimed to investigate whether interventions that present risk messages are able to increase risk appraisal, vaccine intention, and vaccine uptake
		• The findings from this review indicate that interventions involving risk messages had no effect on the intention of participants to vaccinate, their behaviour towards vaccines, and their perception of the severity of the disease
		• This review identified very few behaviour change techniques, though the additional inclusion of studies focusing on efficacy appraisal may increase intervention effectiveness
		Source
			Literature last searched September 2017

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o General public
	  o Individuals who are hesitant about or opposed to vaccination
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	  o Communication and decision-making facilitation
	• Delivery of the intervention
	  o Modality of delivery
	  ▪ Face-to-face (in-person)
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
	  o Vaccine uptake
		• Low- to moderate-certainty evidence was found to suggest that face-to-face information or education may improve or slightly improve vaccination rates for children vaccination, as well parental knowledge about vaccinations and intention to vaccinate their children
		• The effects of face-to-face interventions were increased for populations where lack of awareness or understanding of vaccination is identified as a barrier, but effects are less clear in instances where there are parental concerns about vaccines or vaccine hesitancy
		Source
			Literature last searched August 2017

	• Target of intervention
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	• Delivery of the intervention
	  o By whom
	  ▪ Nurse
	  ▪ Doctor
	  ▪ Other – Midwives
	  o Location of delivery
	  ▪ Healthcare settings (e.g., hospital or a clinician's office)
		• The review evaluated strategies for increasing the uptake of vaccination for pertussis and influenza in pregnancy in high-income countries and found limited high-quality evidence, but some strategies were found to be effective, including reminders in antenatal care records about vaccination, midwives providing vaccination, and education and information provision for healthcare staff and patients
		Source
			Literature last searched August 2017

Type of document	Relevance to question	Key findings	Recency or status
	• Outcomes of the intervention o Vaccine uptake		
	• Target of intervention o General public o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	• This systematic review had two primary focuses: 1) to identify barriers that limit risk groups and the public from receiving their seasonal and pandemic influenza vaccinations; and 2) to better understand the knowledge gaps in influenza vaccine hesitancy • The findings from this review noted four barriers to vaccination uptake in risk groups: limited confidence in vaccines, inconvenience, calculation, and complacency • Confidence (i.e. concerns with the vaccine's safety and effectiveness) and complacency (i.e. low perceived risk of the influenza virus) are reported to be the primary causes for vaccine hesitancy Source	Literature last searched 12 February 2016
	• Target of intervention o General public o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Types of interventions o Information or education provision o Behaviour-change support • Delivery of the intervention o By whom ▪ Community leaders o Modality of delivery ▪ Postal ▪ Face-to-face (in-person) o Location of delivery ▪ Community centres	• Education on vaccination within the community and healthcare facilities substantially increased the uptake of childhood vaccinations in low-income counties • Interventions included information campaigns, audiotaped presentations, leaflet distributions, structured group discussions, and home-based information sessions Source	Literature last searched June 2016

Type of document	Relevance to question	Key findings	Recency or status
	▪ Healthcare settings (e.g., hospital or a clinician's office) • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine uptake		
	• Target of intervention o General public • Type of intervention o Information or education provision • Delivery of the intervention o Location of intervention ▪ Healthcare settings • Outcomes of the intervention o Vaccine uptake	• This review concluded that there was insufficient evidence to determine the effectiveness of clinic-based client education in increasing vaccination rates. • Two studies identified in the review implemented a potentially useful educational approach to improving vaccination rates, which was prompting discussions between clients and their vaccination providers. o In both of these studies, an educational brochure was provided to patients while they were in the waiting room. The brochure included a specific request for a discussion with their provider about vaccinations. o Both of these studies found that the use of a brochure increased vaccination rates by 16 percentage points in a client population which was identified to have low baseline rates of vaccination compared to the average population. • However, the findings of this review are small and inconsistent. Further research is required to investigate the applicability and generalizability of this educational approach. Source	Literature last searched May 2015
	• Types of interventions o Behaviour-change support • Outcomes of the intervention o Vaccine uptake	• A systematic review of 20 studies evaluated the impact of assessment and feedback for vaccination providers. o Sixteen studies provided common measurements of change in vaccination rates.	Literature last searched March 2015

Type of document	Relevance to question	Key findings	Recency or status
		The median increase of 9 percentage points was found with the implementation of assessment and feedback for vaccination providers. o The remaining studies provided insufficient information to calculate a change in vaccination rates. • This review also identified potential barriers to the use of assessment and feedback to improve vaccination rates. o These barriers included lack of an adequate information infrastructure, administrative burden on providers and systems and complex immunization schedules. • In summary, this review found that there was strong evidence of effectiveness for the use of assessment and feedback to improve vaccination rates. Source	
	• Target of intervention o General public • Types of interventions o Information or education provision o Communication and decision-making facilitation • Delivery of the intervention o By whom ▪ Doctor o Duration (i.e., how much or for how long) o Location of delivery ▪ Healthcare settings (e.g., hospital or a clinician's office) • Content of messaging o Myths or misinformation about vaccine	• This review examined the effectiveness of process interventions (e.g., education for clinicians, parent presence, education of parents [before and on day of vaccination], and education of patients on day of vaccination) on reducing vaccination pain, fear, and distress and increasing the use of interventions during vaccination • Findings reveal that: o Clinicians should be educated about vaccine-injection pain management o Parents should be present o Parents should be educated before the vaccination day o Parents should be educated on the vaccination day	Date of literature search not reported (published in 2015)

Type of document	Relevance to question	Key findings	Recency or status
		○ Individuals three years of age and above should be educated on the day-of-vaccination fear Source	
	• Target of intervention ○ High-risk groups • Types of interventions ○ Information or education provision • Delivery of the intervention ○ Modality of delivery ▪ Face-to-face (in-person) • Content of messaging ○ Data and evidence about risks and benefits • Outcomes of the intervention ○ Vaccine uptake	• There is a lack of effective interventions to increase the influenza vaccination rate in pregnant women • Based on the existing evidence, clinicians should provide influenza education pamphlets to pregnant women with a verbalized statement about the benefits of influenza vaccine to newborns Source	Literature last searched August 2014
	• Target of intervention ○ General public ○ High-risk groups • Types of interventions ○ Information or education provision ○ Behaviour-change support • Delivery of the intervention ○ Modality of delivery ▪ Telephone ▪ Email alerts and reminders ▪ Mobile-phone alerts/text messages ▪ Social media (including web-based advertising) ▪ Face-to-face (in-person) ○ Location of delivery ▪ School ▪ Healthcare settings • Outcomes of the intervention ○ Vaccine uptake	• Most practice- and community-level programs, including reminder/recall, physician-focused interventions, school-based programs, and social marketing efforts, significantly increased human papillomavirus vaccination rates among adolescents • Recall and reminder strategies included telephone calls, mailed letters, text messages, and/or outreach visits • Physician-focused interventions included education and training, audit and feedback, and/or electronic decision support or alerts Source	Literature last searched July 2014

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o High-risk groups
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	• Delivery of the intervention
	  o Modality of delivery
	  ▪ Telephone
	  ▪ Email alerts and reminders
	  ▪ Social media (including web-based advertising)
	  ▪ Face-to-face (in-person)
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Myths or misinformation about vaccines
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
	  o Vaccine uptake
		• Influenza vaccination uptake among pregnant women is suboptimal
		• Barriers to vaccination include inadequate knowledge of the risks of influenza, doubts about vaccine safety, efficacy and benefits, and fear of adverse reactions for both pregnant women and the unborn fetus
		• The following strategies would likely improve vaccination acceptance:
		  o education and communication-based interventions for health care providers and pregnant women
		  o positive vaccination recommendations from health care providers
		  o direct access to vaccination (e.g., non-site vaccination services)
		  o collaboration between public and private sectors (e.g., subsidized or free vaccination)
		  o effective use of media
		Source
			Literature last searched November 2013

	• Target of intervention
	  o General public
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	• Delivery of the intervention
	  o Modality of delivery
	  ▪ Radio
	  ▪ Email alerts and reminders
	  ▪ Social media (including web-based advertising)
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Myths or misinformation about vaccines
		• The review evaluated 33 studies of educational intervention to increase HPV vaccination acceptance, which included interventions with parents, adolescents or young adults, and that compared effects of different message frames in an educational intervention among adolescents, young adults or their parents
		• Most of the included studies involved populations with higher educational attainment and with interventions that required participants to be literate
		• Insufficient evidence was found to be able to recommend a specific educational intervention for wide-spread implementation
		Source
			Literature last searched August 2013

Type of document	Relevance to question	Key findings	Recency or status
	• Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake		
	• Target of intervention o General public • Types of interventions o Information or education provision • Delivery of the intervention o Location of delivery ▪ Healthcare settings (e.g., hospital or a clinician's office) • Outcomes of the intervention o Vaccine uptake	• This systematic review included six studies and aimed to investigate the use of provider education as an intervention to increase vaccine uptake • The findings from the review noted that this intervention strategy increased immunization rates by a median of four percentage points, though it is worth noting that there was heterogeneity across the included studies Source	Literature last searched 2012
	• Target of intervention o General public • Types of interventions o System participation • Delivery of the intervention o By whom ▪ Doctor o Location of delivery ▪ Healthcare settings • Outcomes of the intervention o Vaccine uptake	• Provider reminders (including alerts in client charts, electronic medical records, letters or email) is effective in increasing vaccination rates among the general public and a wide range of clinical settings • A subset of studies suggest that standing orders are more effective in improving vaccination rates among clinical settings (inpatient and outpatient) • Immunization information systems were less costly than manual processes Source	Literature last searched February 2012
	• Target of intervention o General public • Types of interventions o System participation • Outcomes of the intervention o Vaccine uptake	• There is strong evidence to suggest that reducing out-of-pocket costs can improve vaccination rates among the general public • Barriers to expand implementation include timeliness of reimbursement, cost of vaccines, storage, and administration Source	Literature last searched 2012
	• Target of intervention o General public • Types of interventions	• Vaccine education was delivered by face-to-face interactions public meetings and through posters and leaflets	Literature last searched July 2012

Type of document	Relevance to question	Key findings	Recency or status
	○ Information or education provision ○ Behaviour-change support • Delivery of the intervention ○ By whom ▪ Community leaders • Outcomes of the intervention ○ Vaccine acceptance, confidence, or hesitancy ○ Vaccine uptake	• Community-based education may improve knowledge and attitudes towards vaccines and increase the number of vaccinations within children • There was little to no impact on decision-making from mothers with vaccine uptake Source	
	• Target of intervention ○ High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) ○ Individuals who are hesitant about or opposed to vaccination • Level of intervention (i.e., who is intervening) ○ Healthcare professionals ○ Citizens • Types of interventions ○ Information or education provision ○ Behaviour-change support ○ Skills and competencies development ○ Personal support ○ Communication and decision-making facilitation ○ System participation • Outcomes of the intervention ○ Vaccine uptake	• Combinations of interventions should be used in efforts to increase vaccination rates in targeted populations • At least one of the interventions should be focused on increasing demand using approaches found to be most effective, including client reminder and recall systems, clinic-based client education, and manual outreach and tracking • One or more of the interventions should address either or both of the following: ○ enhancing access to vaccinations (e.g., through effective interventions such as expanded access in health care settings, reducing out-of-pocket costs, or home visits) ○ ensuring vaccination providers are reminded and supported to deliver vaccinations (e.g., through effective interventions such as reminders, standing orders and assessment and feedback) Source	Literature last searched February 2012
	• Target of intervention ○ General public • Types of interventions ○ System participation • Outcomes of the intervention ○ Vaccine uptake	• Use of an immunization information system (IIS) was an effective intervention to increase vaccination rates, and studies with benefit information focused on administrative efficiency of clinical vaccination activities and savings resulting from decreased over-vaccination	Literature last searched March 2012

Type of document	Relevance to question	Key findings	Recency or status
		Source	

	• Target of intervention
	  o General public
	• Delivery of intervention
	  o Location of delivery
	  ▪ Community centres
	  ▪ School
	• Outcomes of the intervention
	  o Vaccine uptake
		• School and child care centre-located vaccination programs are effective in increasing vaccination rates, and decreasing rates of vaccine-preventable morbidity and mortality
		• Key components of effective school and child care centre-located vaccination programs include:
		  o vaccinations provided on site;
		  o administration of programs by a wide range of providers including school health personnel, health department staff, and other vaccination providers
		  o delivery in a variety of different school and organized child care settings
		  o delivery of one or more of a range of vaccines recommended for children and adolescents
		  o inclusion of additional components such as education, reduced out-of-pocket costs, enhanced access to vaccination services
		• School and child care centre-located programs may be most useful for improving immunization rates among children and adolescents for new vaccines, where background rates are likely to be very low
		Source
			Literature last searched February 2012

	• Outcomes of the intervention
	  o Vaccine uptake
		• Immunization information systems are effective at increasing vaccination rates when used as a system-level intervention to support effective targeted interventions such as reminder and recall systems, provider assessment and feedback, and provider reminders
		• Immunization information systems are also effective for:
		  o supporting clinicians, health departments and schools in determining client vaccination status;
			Literature last searched April 2011

Type of document	Relevance to question	Key findings	Recency or status
		○ guiding public health responses to outbreaks of vaccine-preventable disease ○ informing assessments of vaccination coverage, missed vaccination opportunities, invalid dose administration, and disparities in coverage ○ facilitating vaccine management and accountability Source	
	• Target of intervention ○ General public ○ High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Level of intervention (i.e., who is intervening) ○ Healthcare professionals • Types of interventions ○ Information or education provision ○ Behaviour-change support • Delivery of the intervention ○ By whom ▪ Nurse ▪ Doctor ○ Location of delivery ▪ Healthcare settings (e.g., hospital or a clinician's office) • Outcomes of the intervention ○ Vaccine uptake	• This meta-analysis examines the impact of three types of intervention on influenza immunization uptake rates in at risk populations: ○ patient focused interventions (e.g., in-person, mail or telephone reminder); ○ provider focused interventions (e.g., office based reminder systems like chart checklists or nurse-initiated physician prompts); and ○ mixed interventions (e.g., provider incentive systems, small-group consensus programs, organizational changes like standing orders for nurses to vaccinate high-risk patients, walk-in flu clinics and free vaccinations) • Findings reveal that as vaccine uptake rates increase, single strategy patient-focused interventions are likely to become less effective. • Findings suggest that traditional provider reminder systems that have demonstrated effectiveness in low-coverage populations may need to be enhanced. • Mixed strategies combining changes in provider behaviours with organizational changes to increase the probability of patient-provider contacts during the flu season are likely to be more effective. Source	Literature last searched 1997

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o General public
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Level of intervention (i.e., who is intervening)
	  o Government
	  o Healthcare professionals
	• Types of interventions
	  o System participation
	• Delivery of the intervention
	  o By whom
	  ▪ Pharmacist
	  o Modality of delivery
	  ▪ Face-to-face (in-person)
	  o Location of delivery
	  ▪ Pharmacy
	• Outcomes of the intervention
	  o Vaccine uptake
		• This review aimed to estimate the effect of pharmacists' administering vaccinations for influenza on overall vaccination rates, and to assess whether there is a difference in effect for at-risk subgroups compared to the general population
		• Findings revealed that:
		  o There appeared to be a small positive effect associated with allowing pharmacists to administer influenza vaccinations
		  o The largest increase in overall population vaccination rates associated with pharmacists' vaccinating for influenza was 10%
		  o There was a graduated effect in that pharmacists with the most autonomy had the largest vaccination rate increases
		Source
			Literature last searched July 2019

	• Target of intervention
	  o High-risk group
	• Level of intervention
	  o Healthcare professionals
	• Types of interventions
	  o Information or education provision
	• Delivery of intervention
	  o By whom
	  ▪ Doctors
	  ▪ Midwives
	  o Modality of delivery
	  ▪ Email alerts and reminders
	  ▪ Face-to-face (in-person)
	  o Location of delivery
		• Uptake for maternal pertussis vaccination can be improved by increasing education of both pregnant women and healthcare providers
		• Significant vaccine uptake is seen following post-educational messaging of pregnant women using videos and iBooks
		• Inserting reminders about vaccination within electronic medical records and implementing education toolkits for providers in tertiary care centres can improve uptake as well
		• Bundled interventions that increase uptake include:
		  o Multi-component antenatal vaccine promotion programs in obstetric practices
			Date of literature search not reported (published 28 March 2019)

Type of document	Relevance to question	Key findings	Recency or status
	▪ Healthcare settings • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine uptake	o Mid-wife vaccine delivery programs at the place of antenatal service that include educating midwives and allowing them to administer vaccine • Educational materials for pregnant women on pertussis should be easily readable and accessible to women from diverse backgrounds Source	
	• Types of interventions o Communication and decision-making facilitation	• This review examined barriers that influence newcomers' decision-making with regards to vaccination • Findings revealed four types of barriers: o Cultural factors o Knowledge barriers o Insufficient access to healthcare o Vaccine hesitancy • More specifically, having insufficient knowledge about vaccination and having safety concerns were the most reported barriers Source	Literature last searched 2017
	• Target of intervention o General public • Delivery of the intervention o Location of delivery ▪ Healthcare settings • Outcomes of the intervention o Vaccine uptake	• A systematic review of eight studies examined the effectiveness of client-held paper immunization records in increasing vaccination rates or reducing rates of vaccine preventable disease • Client-held records used for vaccination increased clients' receipt of preventative services • Based on the limited available evidence, it was unclear whether client-held records utilized for vaccinations alone would produce the same results • In summary, this review found that there was insufficient evidence for the use of client-held paper immunization records in increasing vaccination rates or reducing rates of vaccine preventable disease Source	Literature last searched 2012

Type of document	Relevance to question	Key findings	Recency or status

	• Types of interventions
	  o Behaviour-change support
	• Outcomes of the intervention
	  o Vaccine uptake
		• A systematic review of two studies evaluated the effectiveness of monetary sanction policies to increase vaccination rates among children in families receiving government assistance
		• Barriers to implementing monetary sanctions may include organizations failing to adopt these policies due to concerns about harm to families or having caseworkers unwilling to apply sanctions to families
		• Due to the small number of included studies and inconsistent findings, this review found that there was insufficient evidence for the use of monetary sanction policies to increase vaccination rates among children in families receiving government assistance
		Source
			Literature last searched 2012

	• Target of intervention
	  o General public
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	  o Skills and competencies development
	  o Personal support
	  o Communication and decision-making facilitation
	  o System participation
	• Delivery of intervention
	  o Modality of delivery
	  ▪ Email alerts and reminders
	  ▪ Face-to-face (in-person)
	  o Location of delivery
		• There is insufficient evidence to determine whether actively promoted, off-site influenza vaccinations can help to promote increased vaccination coverage among workers in non-healthcare workers
		Source
			Literature last searched March 2008

Type of document	Relevance to question	Key findings	Recency or status
	▪ Community centres ▪ Healthcare settings (e.g., hospital or a clinician's office) ▪ Pharmacy ▪ Public-health offices • Outcomes of the intervention o Vaccine uptake		
	• Target of intervention o General public o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions) • Types of interventions o Information or education provision o Behaviour-change support o Skills and competencies development o Personal support o Communication and decision-making facilitation o System participation • Delivery of interventions o Modality of delivery ▪ Email alerts and reminders ▪ Face-to-face (in-person) o Location of delivery ▪ Community centres ▪ Healthcare settings (e.g., hospital or a clinician's office) ▪ Pharmacy ▪ Public-health offices • Outcomes of the intervention o Vaccine uptake	• On-site, reduced cost and actively promoted influenza vaccinations for non-healthcare workers are effective in increasing influenza vaccination coverage among workers in worksites • Key components of effective interventions include: o active promotion through worksite announcements (e.g., newsletters, email, paycheck inserts) o on-site access to vaccination o complementary components that support awareness and access (e.g., health information and education efforts, mobile carts) Source	Literature last searches March 2008

Type of document	Relevance to question	Key findings	Recency or status

	• Types of interventions
	  o Personal support
	  o By whom
	  ▪ Community leaders
	  o Modality of delivery
	  ▪ Telephone
	  ▪ Face-to-face (in-person)
		• Lay workers (community volunteers) providing immunization education may improve uptake of childhood vaccination
		• Interventions included home visits and telephone calls withing low-income communities
		Source
			Literature last searched 2002

	• Target of intervention
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Types of interventions
	  o Information or education provision
	• Delivery of intervention
	  o Modality of delivery
	  ▪ Postal
	• Outcomes of the intervention
	  o Vaccine uptake
		• The review found little to no evidence on the effectiveness of mass mailing to increase the uptake of vaccination among U.S. Medicare beneficiaries
		Source
			Literature last searched 2002

	• Target of intervention
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	• Level of intervention (i.e., who is intervening)
	  o Healthcare professionals
	  o Citizens
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	  o Skills and competencies development
	  o Personal support
		• There is strong evidence that interventions to enhance access, combined with provider- or system-based interventions (e.g., provider reminders, provider assessment and feedback, standing orders) and interventions to increase client demand (e.g., education and reminders) can improve influenza, pneumococcal polysaccharide, and hepatitis B vaccination coverage among high-risk adults
		• Provider reminders alone can improve vaccination coverage among adults in high-risk groups, and there is strong evidence of effectiveness for multi-component programs directed at clients and providers, when components include those meant
			Literature last searched August 2001

Type of document	Relevance to question	Key findings	Recency or status
	○ Communication and decision-making facilitation ○ System participation • Outcomes of the intervention ○ Vaccine uptake	to enhance access, combined with one or more provider- or system-based components • There is insufficient evidence to determine: ○ the effectiveness of interventions that aren't combined with one or more focused on enhancing access to vaccination services ○ the effectiveness of client incentives, community-wide education, or provider education as one component of combination interventions that include both provider- and system-based interventions Source	
Rapid reviews	• Target of intervention ○ General public ○ Individuals who are hesitant about or opposed to vaccination • Level of intervention ○ Government • Types of intervention ○ Information or education provision • Content of messaging ○ Data and evidence about risks and benefits ○ Risk-mitigation efforts (including complementary public-health measures used at time of vaccination) ○ Myths or misinformation about vaccines Risk-mitigation efforts • Outcomes of the intervention ○ Vaccine acceptance or hesitancy ○ Vaccine uptake	• The British Academy produced a rapid evidence review to assist in the understanding of COVID-19 and COVID-19 vaccines ○ The review found that behavioural factors underpinning vaccine uptake include: 1) complacency, 2) trust and confidence in efficacy and safety, 3) convenience, 4) sources of information and 5) socio-demographic variation ○ The review also found that COVID-19 vaccine deployment will encounter an infodemic with misinformation characterized by: 1) distrust of science and selective use of expert authority, 2) distrust in pharmaceutical companies and authorities, 3) straight forward explanations that are difficult to distinguish from facts, 4) use of emotion and divisive language to impact decision-making and 5) echo chambers that can exacerbate misunderstanding of facts • The review concluded with recommendations that may improve vaccine uptake and address hesitancy, including: ○ public dialogue about vaccine concerns and misinformation	Date of literature search October 2020

Type of document	Relevance to question	Key findings	Recency or status
		o convenient locations for vaccination (build on existing immunization programs) o decentralized local vaccination program with visually appealing, multi-language toolkits for local jurisdictions and partners o vaccine deployment with ethical allocation (age and comorbidity-based priority groups) o accountability from media and responsibility of citizens (report misinformation and remove harmful information) Source (AMSTAR rating 2/9)	
	• Target of intervention o Individuals who are hesitant about or opposed to vaccination • Delivery of the intervention o Location of delivery ▪ Community centres	• Hard-to-reach groups may be reached by vaccine-delivery programs by setting up vaccination sites in familiar and accessible population-specific spaces • Community-based teaching methods and community partnerships may be leveraged to enable greater vaccination uptake by hard-to-reach populations • Additional considerations must also be made to overcome language and cultural barriers Source (AMSTAR rating 3/9)	Date of literature search not reported (published 27 August 2020)
	• Target of intervention o General public • Level of intervention o Government • Types of intervention o Information or education provision o Skills and competencies development • Content of messaging o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)	• The Global Routine Immunization Strategic Plan (GRISP) is a useful framework for operationalizing programs to increase vaccine coverage in countries impacted by early COVID-19 mitigation measures • To maximize reach, services should be designed to reach all equitably, vaccinator capacity and training should be increased, and immunization services should be re-integrated as synergistically as possible • Efforts should be made to engage communities and create demand for immunization through culturally-specific education campaigns and	Literature last searched June 2020

Type of document	Relevance to question	Key findings	Recency or status
		engagement of stakeholders and community partners • Vaccination progress should be continuously monitored to ensure availability of vaccine stock and plan for catch-up vaccination Source	
	• Delivery of the intervention o Location of delivery ▪ Community centres ▪ Healthcare settings (e.g., hospital or a clinician's office)	• There are three models for vaccination delivery in non-healthcare settings, including: social-distancing immunization clinics, drive-through clinics, and small mobile-team clinics • Social-distancing clinics were found to be effective, although monitoring social distancing was challenging • Drive-through immunization clinics allowed for greater social distancing, but with less efficiency and with greater risk of use of an improper vaccine-administration technique • Mini-mobile teams increase ability to monitor social distancing and decrease the risk of exposure, but have significant logistical challenges • Strict protocols for vaccination sites to manage patient flow and duration of time at site must be established • Staff must be screened and appropriately trained to manage the vaccination site Source	Date of literature search not reported (published 27 August 2020)
	• Content of messaging o Data and evidence about risks and benefits o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination) o Myths or misinformation about vaccines	• Barriers to the uptake of vaccinations include: limited trust in vaccine effectiveness; limited knowledge; unhealthy lifestyle; low concern about disease; and safety concerns about immunizations • Reliable, frequent, and tailored information about vaccines must be shared with community members through multiple platforms, including social media, traditional media, and providers	Date of literature search not reported (published 27 August 2020)

Type of document	Relevance to question	Key findings	Recency or status
		• Providers must be educated about vaccines and provided with appropriate training to increase provider vaccine recommendations to patients Source	
	• Content of messaging o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination)	• A separate waiting area must be established to allow patients to be monitored post-vaccination for 15 minutes • Training staff to identify signs of adverse vaccine reactions, respond to adverse reactions, and enable quick access to emergency medical supplies are central to mitigating risks associated with vaccination • Ensuring patients are aware of how to get help in drive-through clinic models (i.e., through honking) and administering vaccines in-clinic for patients with a known history of adverse reactions is also critical to safety • For in-clinic vaccine administration, patient flow and clinic layout must be strictly monitored Source	Date of literature search not reported (published 27 August 2020)
	• Target of intervention o High-risk group • Level of intervention o Education leaders and staff o Healthcare professionals • Types of interventions o Information or education support o Skills and competencies development • Delivery of the intervention: o By whom: ▪ Educators ▪ Physicians ▪ School clinic staff o Modality of delivery ▪ Postal	• Human Papilloma Virus (HPV) vaccine coverage is improved when vaccination is required in schools and a national permissive recommendation is in place • Reminders about immunization improves vaccine coverage but has mixed effects on vaccine uptake. Interventions included: o Mailed letters o Telephone calls o Automated messages o Electronic messages o Recall systems • Healthcare provider training has no effect on overall HPV vaccine coverage but has mixed effects on vaccine uptake. Training involved:	Literature last searched December 2018

Type of document	Relevance to question	Key findings	Recency or status
	▪ Telephone ▪ Email alerts and reminders ▪ Mobile phone alerts ▪ Social media ▪ Face-to-face (in-person) o Location of delivery ▪ School • Content of messaging o Data and evidence about risks and benefits o Risk-mitigation efforts • Outcomes of the intervention o Vaccine uptake	o Instruction to encourage vaccination at every clinic visit o Learning strategies and tools to improve vaccine uptake • Vaccine uptake is higher when vaccination is offered at school-based immunization clinics. • Social marketing has mixed effects on vaccine uptake. Source	
	• Target of intervention o Individuals who are hesitant about or opposed to vaccination • Level of intervention o Healthcare professionals • Types of intervention o Information or education provision • Delivery of intervention o By whom ▪ Physicians o Modality of intervention ▪ Face-to-face (in-person) o Location of delivery ▪ Healthcare settings • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Vaccine uptake increases when parents making the decision to vaccinate their children are informed about vaccine safety/side effects, vaccine effectiveness, and the severity of vaccine-preventable diseases o Use a multi-component approach for information delivery (in-person meetings, support group question and answer discussions o A web-based decision tool may assist with conversations between healthcare providers and parents • Parents are less likely to feel informed about vaccination when there is inadequate depth and length of discussions with healthcare providers. • The effectiveness of vaccination media marketing on vaccine uptake was unclear. These included brochures, pamphlets, and posters Source	Literature last searched August 2013
	• Target of intervention o General public o High-risk groups • Level of intervention (i.e., who is intervening) o Healthcare professionals	• Parents need information about vaccine safety and side effects, vaccine effectiveness, and severity of vaccine-preventable diseases to make decisions about immunization • Vaccine uptake increased when:	Literature last searched August 2013

Type of document	Relevance to question	Key findings	Recency or status

	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
	  o Communication and decision-making facilitation
	• Delivery of the intervention
	  o By whom
	  ▪ Nurse
	  ▪ Doctor
	  o Modality of delivery
	  ▪ Radio
	  ▪ Face-to-face (in-person)
	  o Location of delivery
	  ▪ Healthcare settings (e.g., hospital or a clinician's office)
	• Content of messaging
	  o Data and evidence about risks and benefits
	• Outcomes of the intervention
	  o Vaccine acceptance or hesitancy
	  o Vaccine uptake
		o strategies were tailored to population subgroups and targeted to those at-risk for low immunization uptake
		o printed materials were combined with an opportunity to have questions answered
		• Vaccine uptake decreased when parent's immunization discussions with primary care providers were inadequate in depth and length; difficult and dismissive; and with the perception that health professionals do not agree with one's decision
		• Attitudes to immunization might improve when parents used a web-based decision tool
		• There is inconsistent evidence about effectiveness of brochures, face-to-face interventions, poster messaging, and a radio on vaccination communication
		Source	

Guidance developed using some type of evidence synthesis and/or expert opinion	• Target of intervention
	  o General public
	  o High-risk groups (e.g., those who are older, have chronic conditions, are immunocompromised, and have greater exposure due to living and/or working conditions)
	  o Individuals who are hesitant about or opposed to vaccination
	• Level of intervention (i.e., who is intervening)
	  o Government
	• Types of interventions
	  o Information or education provision
	  o Behaviour-change support
		• A 23-person *Working Group on Readying Populations for COVID-19 Vaccine* released a set of recommendations and best practices for improving COVID-19 vaccine acceptance and addressing hesitancy
		  o Value social science (involve research funding to include social, behavioural, and communication science, and develop active partnerships)
		  o Inform public expectations about COVID-19 vaccination benefits, risks, and supply (forecast range of scenarios, temper expectations, provide transparency of vaccine safety systems, seek input from marginalized populations)
		  o Communicate in meaningful ways (public well-being at the center of communication, reject
			Published 20 October 2020

Type of document	Relevance to question	Key findings	Recency or status
	○ Communication and decision-making facilitation • Delivery of the intervention ○ By whom ▪ Researchers and experts ▪ Community leaders ▪ Government elites ○ Modality of delivery ○ Location of delivery ▪ Community centres ▪ School ▪ Workplace ▪ Healthcare settings (e.g., hospital or a clinician's office) ▪ Public-health offices ▪ Pharmacy • Content of messaging ○ Data and evidence about risks and benefits ○ Risk-mitigation efforts (including complementary public-health measures used at time of vaccination) ○ Myths or misinformation about vaccines • Outcomes of the intervention ○ Vaccine acceptance, confidence, or hesitancy ○ Vaccine uptake	political tensions, conduct qualitative studies to understand local and community needs and concerns, conduct surveys on attitudes and beliefs across subgroups, engage network of trusted champions and spokespersons to deliver a unified message) ○ Earn public trust and confidence in allocation and distribution (develop strategies that take marginalized populations into consideration, implement guidelines that are consistent across providers and locations) ○ Make vaccination available in safe, familiar places (use schools, pharmacies, places of worship, workplaces, grocery stores, health departments, senior centers, home visits, prepare educational materials and train individuals tasked with vaccination, develop hesitancy campaign plans, foster partnerships with government, health departments, media) ○ Establish independent body to instil public ownership (establish public committees to review and report on public understanding, access, and acceptance) Source (Johns Hopkins Center for Health Security and Texas State University Department of Anthropology)	
	• Level of intervention (i.e., who is intervening) ○ Healthcare professionals • Types of interventions ○ Information or education provision ○ Behaviour-change support ○ Skills and competencies development • Delivery of the intervention ○ By whom ▪ Nurse	• The European Centre for Disease Prevention and Control developed a communication and behaviour-change guide for healthcare professionals for parents who are hesitant about vaccination for their child • There are four types of populations such as "the hesitant", "the unconcerned", "the poorly reached", and "the active resisters"	Published 2016

Type of document	Relevance to question	Key findings	Recency or status
	▪ Doctor o Modality of delivery ▪ Face-to-face (in-person) o Location of delivery ▪ Healthcare settings (e.g., hospital or a clinician's office)	• Recommendations for improving vaccine uptake include providing a two-way communication exchange, focus the discussions on the benefits of getting protected, and develop systems to access vaccinations easily • The guide provides specific recommendations for parents, health promoter, vaccination expert or provider, and 'hard-to-reach' populations	
Protocols for reviews that are underway	• Target of intervention o General public o Modality of delivery ▪ Face-to-face (in-person) • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Efficacy of motivational interviewing and knowledge-based interventions for vaccination Source	Anticipated completion date 1 August 2020
	• Target of intervention o General public • Content of messaging o Data and evidence about risks and benefits o Risk-mitigation efforts (including complementary public-health measures used at time of vaccination) o Myths or misinformation about vaccines • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Identifying determinants of COVID-19 vaccine acceptance Source	Anticipated completion date 1 June 2021
	• Target of intervention o High risk groups (e.g., older adults, people with chronic conditions, immunocompromised, increased exposure due to living and/or working conditions) • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Identifying factors contributing to vaccine hesitancy among patients with chronic conditions, families, and communities Source	Anticipated completion date 30 June 2020
	• Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Identifying interventions that address vaccine hesitancy for parents with children Source	Anticipated completion date 30 June 2020

Type of document	Relevance to question	Key findings	Recency or status
	• Target of intervention o General public • Content of messaging o Myths or misinformation about vaccines • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Evaluating the impact of social media exposure on vaccine hesitancy Source	Anticipated completion date 20 September 2020
	• Target of intervention o General public • Content of messaging o Myths or misinformation about vaccines • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• Evaluating the influence of social media on vaccine acceptance or hesitancy Source	Anticipated completion date 30 April 2020
Titles/questions for reviews that are being planned	None identified		
Single studies in areas where no reviews were identified	• Target of intervention o General public • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	• The study examined how timing and elite endorsement effect public opinion about COVID-19 vaccines in the United States • Approval before the election reduced willingness to vaccinate and confidence in COVID-19 vaccinations • A positive statement by President Trump and Dr. Fauci's had significant positive effects on public reactions towards COVID-19 vaccine o The effect was found to be four times larger amongst Democrats than Republicans o If President Trump endorsed the COVID-19 vaccine, confidence was raised about as much as Dr. Fauci's statement amongst Republicans but lowered confidence among Democrats • These studies demonstrated that the public opinion toward COVID-19 vaccinations may be responsive to political motivation and support • Further research should be directed towards developing strategies to accurately disseminate	Pre-print (last edited 28 October 2020)

Type of document	Relevance to question	Key findings	Recency or status
		information and gain public support within future COVID-19 vaccination campaigns Source	

	• Target of intervention
	  o General public
	• Level of intervention (i.e., who is intervening)
	  o Government
	  o Business and education leaders and staff
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
		• A global survey (13,426 people in 19 countries) showed respondents reporting higher levels of trust in information from government sources were more likely to accept a vaccine and take their employer's vaccine advice
		• Differences in COVID-19 vaccine acceptance rates ranged from almost 90% (in China) to less than 55% (in Russia)
		Source
			Published 20 October 2020

	• Target of intervention
	  o General public
	• Delivery of the intervention
	  o Modality of delivery
	  ▪ Mobile-phone alerts/text messages
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
	  o Vaccine uptake
		• The main objectives of this study were to examine the attitude of participants towards a COVID-19 vaccine and highlight any challenges that may pose as a barrier to vaccine uptake
		• The findings from this study reported that an estimated 68% of participants would be open to receiving a COVID-19 vaccine
		• The indicator that can best predict COVID-19 vaccine acceptance was found to be previous vaccine history; the authors note that interventions (e.g. messages) that relay information regarding the safety of vaccines should help to improve COVID-19 vaccine acceptance
		Source
			Published 3 October 2020

	• Target of intervention
	  o General public
	• Types of interventions
	  o Information or education provision
	• Content of messaging
	  o Data and evidence about risks and benefits
	  o Myths or misinformation about vaccines
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
		• A survey randomly assigned 7,064 respondents in the United States to read pro-vaccine communication materials with information emphasizing personal health risks, economic costs or collective public-health consequences of not vaccinating that had the message source (ordinary people or medical experts) also randomly assigned
		• Messages that emphasize personal-health risks and collective health consequences of not vaccinating
			Last updated 8 September 2020 (pre-print

Type of document	Relevance to question	Key findings	Recency or status
		were found significantly increase intentions to vaccinate and the effects were similar regardless of the message source and efforts to pre-emptively de-bunk concerns about safety of expedited clinical trials • Economic cost frames were found to have no discernible effect on vaccine intentions Source	
	• Target of intervention o General public • Types of interventions o Information or education provision • Outcomes of the intervention o Vaccine uptake	• Two online studies of 2,315 participants in the United Kingdom were conducted, in which knowledge about and beliefs in herd immunity as well as empathy for those most vulnerable to the COVID-19 virus were measured (study 1) or manipulated (study 2) • The studies resulted in four major findings: 1) increased knowledge about and belief in herd immunity increases individual's intention to receive the COVID-19 vaccine; 2) information about herd immunity can be used to increase vaccination intention; 3) empathy for those most vulnerable to COVID-19 represents an emotional basis regarding the intention to receive a COVID-19 vaccine; 4) empathy can be used to promote individual's intention to receive COVID-19 vaccinations • The findings of these two studies suggest that in order to achieve high levels of vaccination in the population, a combination of informational content and emotional content may be the most effective strategy to implement • Limitations of these studies include the small observable effect sizes found, and the use of COVID-19 vaccine intention as a surrogate outcome due to inability to measure real vaccine behaviour	Published 30 September 2020

Type of document	Relevance to question	Key findings	Recency or status
		• The findings of these studies emphasize the potential for using information about heard immunity and empathy as a strategy to encourage individuals to receive COVID-19 vaccination Source	
	• Target of intervention o General public o Individuals who are hesitant about or opposed to vaccination • Types of interventions o Information or education provision • Delivery of the intervention o By whom ▪ Doctor • Content of messaging o Myths or misinformation about vaccines • Outcomes of the intervention o Vaccine acceptance or hesitancy	• A survey of 845 U.S. adults showed that 33% of participants believed one or more conspiracies about COVID-19 • The intention to vaccinate among participants who believed conspiracies were 3.9 times lower than participants who disbelieved conspiracies • Doctors were the most trusted source of information about COVID-19 and might promote the uptake of COVID-19 vaccines when they become available Source	Published 10 September 2020
	• Target of intervention o High risk groups (e.g., older adults, people with chronic conditions, immunocompromised, increased exposure due to living and/or working conditions) • Types of interventions o Information or education provision o Behaviour-change support • Delivery of the intervention o Modality of delivery ▪ Radio ▪ Television • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• A survey of 311 older adults and 216 chronic respiratory patients in UK showed 86% are willing to receive a future vaccine for COVID-19 • The willingness to receive a COVID-19 vaccination was: o positively associated with the belief that the COVID-19 will persist over time o negatively associated with the perception that the media has over-exaggerated the risks of catching • Perceived facilitators to the COVID-19 vaccination uptake included perceptions of risk to personal health, severity of COVID-19, and health consequences to others COVID-19 • Concerns about vaccine safety acted as a barrier of COVID-19 vaccination uptake	Published 5 September 2020

Type of document	Relevance to question	Key findings	Recency or status
		• Content of mass media interventions to improve vaccine uptake should focus on the behaviour change techniques (BCTs) of information about health, emotional, social and environmental consequences, and salience of consequences Source	
	• Target of intervention o General public • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	• The primary aim of this study was to investigate the individual preferences that residents of China carry when it comes to COVID-19 vaccine acceptance • The findings from this study noted that vaccine effectiveness, adverse side-effects, and the proportion of other colleagues receiving vaccinations were primary factors in influencing one's decision to be vaccinated • The study reported that individuals who have more confidence in vaccines, a higher risk of infection, and lower education and income levels are reportedly more likely to receive a COVID-19 vaccine Source	Pre-print (last edited 27 August 2020)
	• Target of intervention o General public • Level of intervention (i.e., who is intervening) o Government • Outcomes of the intervention o Vaccine acceptance or hesitancy o Vaccine uptake	• This study conducted a global survey of 19 countries to: 1) investigate the influencing factors of vaccine acceptance; and 2) predict the rates of acceptance for a COVID-19 vaccine • The findings from the study found that 71.5% of participants would be open to receiving a COVID-19 vaccine; a total of 61.4% of participants would reportedly follow their employer's recommendation to get vaccinated • The study noted that individuals who placed more confidence in the information delivered via government sources (e.g., residents from China, Singapore, and South Korea) were correspondingly more likely to be receptive to a	Pre-print (last edited 25 August 2020)

Type of document	Relevance to question	Key findings	Recency or status
		vaccine and abide to their employer's vaccination requests Source	
	• Target of intervention o General public o Individuals who are hesitant about or opposed to vaccination • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy	• A survey of 5,009 American adults showed one-third would not intend to pursue a COVID-19 vaccine once it becomes available • The likelihood of refusal was higher for Blacks, women, and conservatives • Concerns about vaccine safety and effectiveness were associated with higher vaccine-refusal intention • Positive views of vaccination in general (vaccines are safe, effective, and important) and more concerns about COVID-19 were negatively associated with vaccine-refusal intention Source	Pre-print (last edited 12 August 2020)
	• Target of intervention o General public o Individuals who are hesitant about or opposed to vaccination • Content of messaging o Data and evidence about risks and benefits • Outcomes of the intervention o Vaccine acceptance, confidence, or hesitancy o Vaccine uptake	• A nationally representative sample of 3,133 adults in the U.S. evaluating intentions to vaccinate themselves and their children for COVID-19 found that 20% of people in the U.S. would decline a COVID-19 vaccine • Key deterrents to vaccination included general vaccine hesitancy (assessed by not having had a flu shot in the last two years), distrust of vaccine safety, and vaccine novelty • Findings also suggest that inconsistent risk messages from public-health experts and elected officials reduce vaccine uptake • Source	Last updated 2 July 2020
	• Target of intervention o General public • Types of interventions o Information or education provision • Delivery of the intervention o Duration (i.e., how much or for how long)	• The 100 widely viewed YouTube videos on COVID-19 vaccination culminates to 33 million views, which demonstrates that people are seeking related information on YouTube • Public-health officials should learn how to produce accurate and appealing videos about the	Published 23 July 2020

Type of document	Relevance to question	Key findings	Recency or status
	○ Modality of delivery ▪ Social media (including web-based advertising) • Content of messaging ○ Data and evidence about risks and benefits ○ Myths or misinformation about vaccines • Outcomes of the intervention ○ Vaccine acceptance, confidence, or hesitancy	safety and effectiveness of a COVID-19 vaccine to help people make informed decisions about vaccination Source	
	• Target of intervention ○ General public • Outcomes of the intervention ○ Vaccine acceptance, confidence, or hesitancy	• A survey of 1,971 US adults showed vaccine-related attributes (e.g., vaccine efficacy, adverse effects, and protection duration) and political factors (e.g., US Food and Drug Administration approval process, national origin of vaccine, and endorsements) were associated with self-reported preferences for choosing a hypothetical COVID-19 vaccine and self-reported willingness to receive vaccination • A higher probability of choosing a vaccine was associated with the following factors: ○ an increase in efficacy ○ an increase in protection duration ○ a decrease in the incidence of major adverse effects ○ full FDA approval ○ an endorsement from President Trump • A lower probability of choosing a vaccine was associated with the following factors: ○ an FDA emergency use authorization ○ a vaccine that originated from a non-US country ○ endorsements from the US Centers for Disease Control and Prevention and the World Health Organization Source	Published 20 October 2020

Type of document	Relevance to question	Key findings	Recency or status

	• Target of intervention
	  o General public
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
		• A survey of 2,058 Chinese adults showed a strong demand for and high acceptance of COVID-19 vaccination
		• A higher probability of accepting COVID-19 vaccination was associated with the following the following participants' characteristics:
		  o being male
		  o being married
		  o perceiving a high risk of infection
		  o with a history of influenza vaccination
		  o believing in the vaccine efficacy
		  o valuing doctor's recommendations
		• The following factors would hinder participants from immediate vaccination:
		  o having confirmed or suspected cases in local areas
		  o vaccination inconvenience
		  o vaccine price
		Source
			Published 27 August 2020

	• Target of intervention
	  o General public
	  o Individuals who are hesitant about or opposed to vaccination
	• Content of messaging
	  o Data and evidence about risks and benefits
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
		• A survey of 3,101 participants from Saudi Arabia showed 44.7% would like to accept COVID-19 vaccination if available, whereas 55.3% admitted hesitancy
		• Concerns about side effects were the key barrier for vaccine acceptance and most refusers would accept the vaccine if additional studies confirmed safety and effectiveness
		• A higher probability of accepting COVID-19 vaccination was associated with the following participants' characteristics:
		  o being younger
		  o being male
		  o with secondary education
		  o with a history of taking previous seasonal influenza vaccine
		  o with positive belief toward vaccination
			Pre-print (last edited 18 August 2020)

Type of document	Relevance to question	Key findings	Recency or status
		Source	

	• Target of intervention
	  o General public
	• Content of messaging
	  o Data and evidence about risks and benefits
	• Outcomes of the intervention
	  o Vaccine acceptance, confidence, or hesitancy
		• A survey of 352 health-care workers (HCWs) and 189 individuals in the general population in China showed 76.4% of HCWs (vs. 72.5% in the general) would like to receive vaccination
		• The willingness to receive the COVD-19 vaccination among HCWs was associated with risk evaluation of infection and confidence in the effectiveness and safety of vaccine
		• The willingness to receive the COVD-19 vaccination among general population was associated with vaccine safety and social contacts decisions
		• Providing COVID-19 vaccination education for HCWs would help improve the acceptance among the public
		Source
			Pre-print (last edited 14 April 2020)

Appendix 3: Abstracts for highly relevant documents

Note that the table below only includes the abstracts for the documents that we identified on page 1 as being highly relevant to the question.

Type of document	Abstract and link to full text
Guidelines developed using a robust process (e.g., GRADE)	Preparing countries for COVID-19 vaccine introduction **Abstract** While there are still unknowns about the vaccine products, there are immediate actions that countries can take to prepare for COVID-19 vaccines. This document provides a brief summary of pre-planning actions that all countries can begin working on immediately. These actions are highlighted in the COVID-19 Vaccine Introduction Readiness Assessment Tool (VIRAT) and are listed below. Supporting countries to prepare for COVID-19 vaccine introduction: To prepare all countries for COVID-19 vaccine introduction, WHO, UNICEF, Gavi, and partners are working together at the global and regional levels to (1) develop and disseminate adaptable guidance, trainings, planning and monitoring tools, and advocacy materials and to (2) provide technical assistance and support to countries.
	COVID-19 vaccine introduction readiness assessment tool **Abstract** The COVID-19 Vaccine Introduction Readiness Assessment Tool (VIRAT) is intended to be used by ministries of health, with support from WHO and UNICEF Country Offices. It provides a roadmap for countries to plan for COVID-19 vaccine introduction and a structured framework for countries to self-monitor their readiness progress against key milestones. Countries can use the VIRAT to identify areas where support may be needed.
Full systematic reviews	Strategies to Overcome Vaccine Hesitancy: A Systematic Review*(pre-print)* Background: Vaccination, albeit a necessity in the prevention of infectious diseases, requires appropriate strategies for addressing vaccine hesitancy at an individual and community level. However, there remains a glaring scarcity of available literature in that regard. Therefore, this review aims to scrutinize globally tested interventions to increase the vaccination uptake by addressing vaccine hesitancy at various stages of these interventions across the globe and help policy makers in implementing appropriate strategies to address the issue. Methods: A systematic review of descriptive and analytic studies was conducted using specific keyword searches to identify literature containing information about interventions directed at vaccine hesitancy. The search was done using PubMed, Global Health, and Science Direct databases. Data extraction was based on study characteristics such as author details; study design; and type, duration, and outcome of an intervention. Results: A total of 105 studies were identified of which 33 studies were included in the final review. Community-based interventions, monetary incentives, and technology-based health literacy demonstrated significant improvement in the utilization of immunization services. On the other hand, media-based intervention studies did not bring about a desired change in overcoming vaccine hesitancy. Conclusion: This study indicates that the strategies should be based on the need

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	and reasons for vaccine hesitancy for the targeted population. A multidimensional approach involving community members, families, and individuals is required to address this challenging issue.
	Improving vaccination uptake among adolescents **Abstract** Objectives: To evaluate the effects of interventions to improve vaccine uptake among adolescents. Search methods: In October 2018, we searched the following databases: CENTRAL, MEDLINE Ovid, Embase Ovid, and eight other databases. In addition, we searched two clinical trials platforms, electronic databases of grey literature, and reference lists of relevant articles. For related systematic reviews, we searched four databases. Furthermore, in May 2019, we performed a citation search of five other websites. Main results: We included 16 studies (eight individually randomised trials, four cluster randomised trials, three non-randomised trials, and one controlled before-after study). Twelve studies were conducted in the USA, while there was one study each from: Australia, Sweden, Tanzania, and the UK. Ten studies had unclear or high risk of bias. We categorised interventions as recipient-oriented, provider-oriented, or health systems-oriented. Conclusion: Various strategies have been evaluated to improve adolescent vaccination including health education, financial incentives, mandatory vaccination, and class-based school vaccine delivery. However, most of the evidence is of low to moderate certainty. This implies that while this research provides some indication of the likely effect of these interventions, the likelihood that the effects will be substantially different is high. Therefore, additional research is needed to further enhance adolescent immunisation strategies, especially in low- and middle-income countries where there are limited adolescent vaccination programmes. In addition, it is critical to understand the factors that influence hesitancy, acceptance, and demand for adolescent vaccination in different settings. This is the topic of an ongoing Cochrane qualitative evidence synthesis, which may help to explain why and how some interventions were more effective than others in increasing adolescent HPV vaccination coverage.
	Interventions to increase influenza vaccination rates of those 60 years and older in the community **Abstract** To assess access, provider, system, and societal interventions to increase the uptake of influenza vaccination in people aged 60 years and older in the community. We included 3 new RCTs for this update (total 61 RCTs; 1,055,337 participants). Trials involved people aged 60 years and older living in the community in high-income countries. Heterogeneity limited some meta-analyses. We assessed studies as at low risk of bias for randomisation (38%), allocation concealment (11%), blinding (44%), and selective reporting (100%). Half (51%) had missing data. We assessed the evidence as low-quality. We identified three levels of intervention intensity: low (e.g. postcards), medium (e.g. personalised phone calls), and high (e.g. home visits, facilitators). We identified interventions that demonstrated significant positive effects of low (postcards), medium (personalised phone calls), and high (home visits, facilitators) intensity that increase community demand for vaccination, enhance access, and improve provider/system response. The overall GRADE assessment of the evidence was moderate quality. Conclusions are unchanged from the 2014 review.

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	Patient reminder and recall interventions to improve immunization rates To evaluate and compare the effectiveness of various types of patient reminder and recall interventions to improve receipt of immunizations. The 75 included studies involved child, adolescent, and adult participants in outpatient, community-based, primary care, and other settings in 10 countries.Patient reminder or recall interventions, including telephone and autodialer calls, letters, postcards, text messages, combination of mail or telephone, or a combination of patient reminder or recall with outreach, probably improve the proportion of participants who receive immunization (risk ratio (RR) of 1.28, 95% confidence interval (CI) 1.23 to 1.35; risk difference of 8%) based on moderate certainty evidence from 55 studies with 138,625 participants. Patient reminder and recall systems, in primary care settings, are likely to be effective at improving the proportion of the target population who receive immunizations.
	Community pharmacies as sites of adult vaccination: A systematic review **Abstract** Vaccine-preventable deaths among adults remain a major public health concern, despite continued efforts to increase vaccination rates in this population. Alternative approaches to immunization delivery may help address under-vaccination among adults. This systematic review assesses the feasibility, acceptability, and effectiveness of community pharmacies as sites for adult vaccination. We searched 5 electronic databases (PubMed, EMBASE, Scopus, Cochrane, LILACS) for studies published prior to June 2016 and identified 47 relevant articles. We found that pharmacy-based immunization services (PBIS) have been facilitated by state regulatory changes and training programs that allow pharmacists to directly provide vaccinations. These services are widely accepted by both patients and pharmacy staff, and are capable of improving access and increasing vaccination rates. However, political and organizational barriers limit the feasibility and effectiveness of vaccine delivery in pharmacies. These studies provide evidence to inform policy and organizational efforts that promote the efficacy and sustainability of PBIS.
	Impact of pharmacists as immunizers on vaccination rates: A systematic review and meta-analysis **Abstract** To complete a systematic review of the literature on the impact of pharmacists as educators, facilitators, and administrators of vaccines on immunization rates. We identified 2825 articles searching the following databases from inception until October 2015: PubMed, EMBASE, Cochrane Libraries, Cumulative Index to Nursing and Allied Health Literature, International Pharmaceutical Abstracts, Google Scholar. Grey literature was identified through use of the Canadian Agency for Drugs and Technology in Health "Grey Matters" search tool. Content from relevant journals and references of included studies were also searched. Inclusion criteria were clinical or epidemiologic studies in which pharmacists were involved in the immunization process. Studies were excluded if no comparator was reported. Two reviewers independently completed data extraction and bias assessments using standardized forms. Thirty-six studies were included in the review, 22 assessed the role of pharmacists as educators and/or facilitators and 14 assessed their role as administrators of vaccines. All studies reviewed found an increase in vaccine coverage when pharmacists were involved in the immunization process, regardless of

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	role (educator, facilitator, administrator) or vaccine administered (e.g., influenza, pneumococcal), when compared to vaccine provision by traditional providers without pharmacist involvement. Limitations of the results include the large number of non-randomized trials and the heterogeneity between study designs. Pharmacist involvement in immunization, whether as educators, facilitators, or administrators of vaccines, resulted in increased uptake of immunizations.
	Impact of pharmacists as immunizers on vaccination rates: A systematic review and meta-analysis **Abstract** BACKGROUND: Underutilization of vaccination programs remains a significant public health concern. Pharmacists serve as educators, facilitators, and in some jurisdictions, as administrators of vaccines. Though pharmacists have been involved with immunizations in various ways for many years, there has yet to be a systematic review assessing the impact of pharmacists as immunizers in these three roles. OBJECTIVE: To complete a systematic review of the literature on the impact of pharmacists as educators, facilitators, and administrators of vaccines on immunization rates. METHODS: We identified 2825 articles searching the following databases from inception until October 2015: PubMed, EMBASE, Cochrane Libraries, Cumulative Index to Nursing and Allied Health Literature, International Pharmaceutical Abstracts, Google Scholar. Grey literature was identified through use of the Canadian Agency for Drugs and Technology in Health 'Grey Matters' search tool. Content from relevant journals and references of included studies were also searched. Inclusion criteria were clinical or epidemiologic studies in which pharmacists were involved in the immunization process. Studies were excluded if no comparator was reported. Two reviewers independently completed data extraction and bias assessments using standardized forms. RESULTS: Thirty-six studies were included in the review, 22 assessed the role of pharmacists as educators and/or facilitators and 14 assessed their role as administrators of vaccines. All studies reviewed found an increase in vaccine coverage when pharmacists were involved in the immunization process, regardless of role (educator, facilitator, administrator) or vaccine administered (e.g., influenza, pneumococcal), when compared to vaccine provision by traditional providers without pharmacist involvement. Limitations of the results include the large number of non-randomized trials and the heterogeneity between study designs. CONCLUSIONS: Pharmacist involvement in immunization, whether as educators, facilitators, or administrators of vaccines, resulted in increased uptake of immunization.
	Vaccination Programs: Requirements for Child Care, School, and College Attendance **Abstract** The Community Preventive Services Task Force recommends vaccination requirements for child care, school, and college attendance based on strong evidence of effectiveness in increasing vaccination rates and in decreasing rates of vaccine preventable disease (VPD) and associated morbidity and mortality. These findings are based on studies demonstrating effectiveness of vaccination requirements for attendance in a variety of settings, for an array of recommended vaccines, and in populations ranging in age from early childhood to late adolescence.
	Interventions to reduce inequalities in vaccine uptake in children and adolescents aged <19 years: a systematic review

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	Abstract Background: In high-income countries, substantial differences exist in vaccine uptake relating to socioeconomic status, gender, ethnic group, geographic location and religious belief. This paper updates a 2009 systematic review on effective interventions to decrease vaccine uptake inequalities in light of new technologies applied to vaccination and new vaccine programmes (eg, human papillomavirus in adolescents). Methods: We searched MEDLINE, Embase, ASSIA, The Campbell Collaboration, CINAHL, The Cochrane Database of Systematic Reviews, Eppi Centre, Eric and PsychINFO for intervention, cohort or ecological studies conducted at primary/community care level in children and young people from birth to 19 years in OECD countries, with vaccine uptake or coverage as outcomes, published between 2008 and 2015. Results: The 41 included studies evaluated complex multicomponent interventions (n=16), reminder/recall systems (n=18), outreach programmes (n=3) or computer-based interventions (n=2). Complex, locally designed interventions demonstrated the best evidence for effectiveness in reducing inequalities in deprived, urban, ethnically diverse communities. There is some evidence that postal and telephone reminders are effective, however, evidence remains mixed for text-message reminders, although these may be more effective in adolescents. Interventions that escalated in intensity appeared particularly effective. Computer-based interventions were not effective. Few studies targeted an inequality specifically, although several reported differential effects by the ethnic group. Conclusions: Locally designed, multicomponent interventions should be used in urban, ethnically diverse, deprived populations. Some evidence is emerging for text-message reminders, particularly in adolescents. Further research should be conducted in the UK and Europe with a focus on reducing specific inequalities.
	Effectiveness of interventions that apply new media to improve vaccine uptake and vaccine coverage **Abstract** Vaccine-preventable diseases (VPD) are still a major cause of morbidity and mortality worldwide. In high and middle-income settings, immunization coverage is relatively high. However, in many countries coverage rates of routinely recommended vaccines are still below the targets established by international and national advisory committees. Progress in the field of communication technology might provide useful tools to enhance immunization strategies. Objective: To systematically collect and summarize the available evidence on the effectiveness of interventions that apply new media to promote vaccination uptake and increase vaccination coverage. Design: We conducted a systematic literature review. Studies published from January 1999 to September 2013 were identified by searching electronic resources (Pubmed, Embase), manual searches of references and expert consultation. Study setting: We focused on interventions that targeted recommended vaccinations for children, adolescents and adults and: (1) aimed at increasing community demand for immunizations, or (2) were provider-based interventions. We limited the study setting to countries that are members of the Organisation for Economic Co-operation and Development (OEC D). Main outcome measures: The primary outcome was a measure of vaccination (vaccine uptake or vaccine coverage). Considered secondary outcomes included willingness to receive immunization, attitudes and perceptions toward vaccination, and perceived helpfulness of the intervention. Results:

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	Nineteen studies were included in the systematic review. The majority of the studies were conducted in the US (74%, n = 14); 68% (n = 13) of the studies were experimental, the rest having an observational study design. Eleven (58%) reported results on the primary outcome. Retrieved studies explored the role of: text messaging (n.7, 37%), smartphone applications (n.1, 5%), Youtube videos (n.1, 5%), Facebook (n.1, 5%), targeted websites and portals (n.4, 21%), software for physicians and health professionals (n.4, 21%), and email communication (n.1, 5%). There is some evidence that text messaging, accessing immunization campaign websites, using patient-held web-based portals and computerized reminders increase immunization coverage rates. Insufficient evidence is available on the use of social networks, email communication and smartphone applications. Conclusion: Although there is great potential for improving vaccine uptake and vaccine coverage by implementing programs and interventions that apply new media, scant data are available and further rigorous research—including cost-effectiveness assessments—is needed.
	Parents' and informal caregivers' views and experiences of communication about routine childhood vaccination: a synthesis of qualitative evidence **Abstract** The specific objectives of the review were to identify, appraise and synthesise qualitative studies exploring: parents' and informal caregivers' views and experiences regarding communication about childhood vaccinations and the manner in which it is communicated; and the influence that vaccination communication has on parents' and informal caregivers' decisions regarding childhood vaccination. We searched MEDLINE (OvidSP), MEDLINE In-process and Other Non-Index Citations (Ovid SP), Embase (Ovid), CINAHL (EbscoHOST), and Anthropology Plus (EbscoHost) databases for eligible studies from inception to 30 August 2016. We developed search strategies for each database, using guidelines developed by the Cochrane Qualitative Research Methods Group for searching for qualitative evidence as well as modified versions of the search developed for three related reviews of effectiveness. There were no date or geographic restrictions for the search. We have high or moderate confidence in the evidence contributing to several review findings. Further research, especially in rural and low- to middle-income country settings, could strengthen evidence for the findings where we had low or very low confidence. Planners should consider the timing for making vaccination information available to parents, the settings where information is available, the provision of impartial and clear information tailored to parental needs, and parents' perceptions of health workers and the information provided.
	Strategies for addressing vaccine hesitancy – A systematic review **Abstract** The purpose of this systematic review is to identify, describe and assess the potential effectiveness of strategies to respond to issues of vaccine hesitancy that have been implemented and evaluated across diverse global contexts. Methods: A systematic review of peer reviewed (January 2007-October 2013) and grey literature (up to October 2013) was conducted using a broad search strategy, built to capture multiple dimensions of public trust, confidence and hesitancy concerning vaccines. This search strategy was applied and adapted across several databases and organizational websites. Descriptive analyses were undertaken for 166 (peer reviewed) and 15 (grey literature) evaluation studies. In addition, the quality of

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	evidence relating to a series of PICO (population, intervention, comparison/control, outcomes) questions defined by the SAGE Working Group on Vaccine Hesitancy (WG) was assessed using Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria; data were analyzed using Review Manager. Results: Across the literature, few strategies to address vaccine hesitancy were found to have been evaluated for impact on either vaccination uptake and/or changes in knowledge, awareness or attitude (only 14% of peer reviewed and 25% of grey literature). The majority of evaluation studies were based in the Americas and primarily focused on influenza, human papillomavirus (HPV) and childhood vaccines. In low- and middle-income regions, the focus was on diphtheria, tetanus and pertussis, and polio. Across all regions, most interventions were multi-component and the majority of strategies focused on raising knowledge and awareness. Thirteen relevant studies were used for the GRADE assessment that indicated evidence of moderate quality for the use of social mobilization, mass media, communication tool-based training for health-care workers, non-financial incentives and reminder/recall-based interventions. Overall, our results showed that multicomponent and dialogue-based interventions were most effective. However, given the complexity of vaccine hesitancy and the limited evidence available on how it can be addressed, identified strategies should be carefully tailored according to the target population, their reasons for hesitancy, and the specific context.
	Increasing Appropriate Vaccination: Client Reminder and Recall Systems **Abstract** The Community Preventive Services Task Force recommends client reminder and recall interventions based on strong evidence of effectiveness in improving vaccination rates: (1) in children, adolescents and adults; (2) in a range of settings and populations; (3) when applied at different levels of scale—from individual practice settings to entire communities; (4) across a range of intervention characteristics (e.g., reminder or recall, content, theoretical basis and method of delivery); and (5) whether used alone or with additional components.
	Increasing Appropriate Vaccination: Home Visits to Increase Vaccination Rates The Community Preventive Services Task Force recommends client or family incentive rewards, used alone or in combination with additional interventions, based on sufficient evidence of effectiveness in increasing vaccination rates in children and adults. The Community Preventive Services Task Force recommends home visits based on strong evidence of their effectiveness in increasing vaccination rates. The Task Force notes, however, the economic evidence showing that home visits can be resource-intensive and costly relative to other options for increasing vaccination rates. Evidence on effectiveness was considered strong based on a body of evidence that included studies of home visits delivered to all clients or to those unresponsive to other interventions, home visits focused on vaccination alone or in combination with other health concerns, and home visits that provided vaccinations on-site or referred clients to vaccination services outside the home.

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	Increasing Appropriate Vaccination: Standing Orders **Abstract** The Community Preventive Services Task Force recommends standing orders for vaccinations on the basis of strong evidence of effectiveness in increasing vaccination rates among adults and children; when used alone or with additional interventions; and across a range of settings and populations.
	Increasing Appropriate Vaccination: Client or Family Incentive Rewards **Abstract** The Community Preventive Services Task Force recommends client or family incentive rewards, used alone or in combination with additional interventions, based on sufficient evidence of effectiveness in increasing vaccination rates in children and adults.
	A systematic review of interventions for reducing parental vaccine refusal and vaccine hesitancy **Abstract** Unvaccinated individuals pose a public health threat to communities. Research has identified many factors associated with parental vaccine refusal and hesitancy toward childhood and adolescent immunizations. However, data on the effectiveness of interventions to address parental refusal are limited. We conducted a systematic review of four online databases to identify interventional studies. We used criteria recommended by the WHO's Strategic Advisory Group of Experts on immunization (SAGE) for the quality assessment of studies. Intervention categories and outcomes were evaluated for each body of evidence and confidence in overall estimates of effect was determined. There is limited evidence to guide implementation of effective strategies to deal with the emerging threat of parental vaccine refusal. There is a need for appropriately designed, executed and evaluated intervention studies to address this gap in knowledge.
	Increasing Coverage of Appropriate Vaccinations: A Community Guide Systematic Economic Review **Abstract** Context: Population-level coverage for immunization against many vaccine-preventable diseases remains below optimal rates in the U.S. The Community Preventive Services Task Force recently recommended several interventions to increase vaccination coverage based on systematic reviews of the evaluation literature. The present study provides the economic results from those reviews. Evidence acquisition: A systematic review was conducted (search period, January 1980 through February 2012) to identify economic evaluations of 12 interventions recommended by the Task Force. Evidence was drawn from included studies; estimates were constructed for the population reach of each strategy, cost of implementation, and cost per additional vaccinated person because of the intervention. Analyses were conducted in 2014. Evidence synthesis: Reminder systems, whether for clients or providers, were among the lowestcost strategies to implement and the most cost effective in terms of additional people vaccinated. Strategies involving home visits and combination strategies in

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	community settings were both costly and less cost effective. Strategies based in settings such as schools and MCOs that reached the target population achieved additional vaccinations in the middle range of cost effectiveness. Conclusions: The interventions recommended by the Task Force differed in reach, cost, and cost effectiveness. This systematic review presents the economic information for 12 effective strategies to increase vaccination coverage that can guide implementers in their choice of interventions to fit their local needs, available resources, and budget.
	Increasing Appropriate Vaccination: Community-Based Interventions Implemented in Combination **Abstract** The Community Preventive Services Task Force recommends community-based interventions implemented in combination to increase vaccinations in targeted populations, on the basis of strong evidence of effectiveness in increasing vaccination rates. The conclusion of strong evidence was based on findings from 18 studies that evaluated coordinated interventions to: increase community demand, enhance access to vaccination services, and, reduce missed opportunities by vaccination providers In 13 of the 18 studies, the community-based effort combined one or more interventions to increase community demand for vaccinations with one or more interventions to enhance access to vaccination services. The Task Force notes that implementing manual outreach and tracking or home visits can be resource-intensive and costly, relative to other options for increasing vaccination rates. Such interventions should be used only when there is demonstrated need, and resources are available.
Rapid reviews	COVID-19 vaccine deployment: Behaviour, ethics, misinformation, and policy strategies **Abstract** The rapid review focuses on behavioural aspects of deployment, suggesting government should begin to tackle these challenges immediately to ensure effective vaccine coverage. It makes the following policy recommendations: Start an open, transparent dialogue over vaccine deployment with the general public to address uncertainties about efficacy and safety and provide clarity on the longer timescale of vaccination roll-out to build support and understanding. Make vaccinations convenient and build on existing immunisation programmes, such as ensuring they are available at weekends and evenings at GP surgeries and other appropriate sites, where GPs could identify those with comorbidities, log vaccinations or issue reminders. Centralised mass sites and roving teams are likely to be less effective. Implement a decentralised local vaccination programme, with tool kits to support local authorities in community engagement including tailored, appealing, visual and multi-language messages to reach diverse populations and mobilise local communities. Phased and ethical vaccine deployment, adopting transparent principles of priority groups and ensure these are sufficiently debated with the public to build understanding – starting with age- and comorbidity-based priority groups, health and care workers but also look beyond those groups to high-risk occupations (e.g. teachers, bus drivers, retail workers) and vulnerable groups in crowded situations (e.g. homeless, prisons). Counter misinformation and fill real knowledge voids by empowering the public to spot and report misinformation, ensuring accountability for media companies to remove harmful information, and punish those who spread misinformation.

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	COVID-19: Accessibility of mass vaccination **Abstract** Abstract not provided
Guidance developed using some type of evidence synthesis and/or expert opinion	The public's role in COVID-19 vaccination: Human-centered recommendations to enhance pandemic vaccine awareness, access, and acceptance in the United States **Abstract** Given the social and economic upheavals caused by the COVID-19 pandemic, political leaders, health officials, and members of the public are eager for solutions. One of the most promising, if they can be successfully developed, is vaccines. While the technological development of such countermeasures is currently underway, a key social gap remains. Past experience in routine and crisis contexts demonstrates that uptake of vaccines is more complicated than simply making the technology available. Vaccine uptake, and especially the widespread acceptance of vaccines, is a social endeavor that requires consideration of human factors. To provide a starting place for this critical component of a future COVID-19 vaccination campaign in the United States, the 23-person *Working Group on Readying Populations for COVID-19 Vaccines* was formed. One outcome of this group is a synthesis of the major challenges and opportunities associated with a future COVID-19 vaccination campaign and empirically-informed recommendations to advance public understanding of, access to, and acceptance of vaccines that protect against SARS-CoV-2. While not inclusive of all possible steps than could or should be done to facilitate COVID-19 vaccination, the working group believes that the recommendations provided are essential for a successful vaccination program.
Protocols for reviews that are underway	Efficacy of motivational interviewing/communication and knowledge-based interventions for vaccination: a systematic review **Review questions** 1. Are educational and/or motivational interviewing/communication interventions efficacious in improving vaccination rates among adult patients or children? 2. Are educational and/or motivational interviewing/communication interventions efficacious in improving patients' vaccination hesitancy?
Single studies in areas where no reviews were identified	Timing of COVID-19 Vaccine Approval and Endorsement by Public Figures (Pre-print) **Abstract** The global spread of COVID-19 has created an urgent need for a safe and effective vaccine. However, even if a safe and medically effective vaccine is developed, hesitancy by citizens to receive it would undercut its effectiveness as a tool for limiting the spread of COVID-19.1,2,3 A potential driver of hesitancy in the United States is the politicization of a potential vaccine, including when one might be approved with respect to the presidential election and which public figures are

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	endorsing its safety and efficacy.4,5 Using a pair of randomized survey experiments, we show that announcing approval of a COVID-19 vaccine one week before the election compared to one week after considerably reduces both beliefs about its safety and efficacy and willingness to receive it. However, endorsement by Dr. Anthony Fauci increases reported beliefs about safety and willingness to receive a vaccine among all partisan subgroups. Further, an endorsement by Dr. Fauci increased uptake and confidence in safety even if a vaccine receives pre-election approval. The results here suggest that perceptions of political influence in COVID19 vaccine approval could significantly undermine the viability of a vaccine as a strategy to end the pandemic.
	A global survey of potential acceptance of a COVID-19 vaccine **Abstract** Several coronavirus disease 2019 (COVID-19) vaccines are currently in human trials. In June 2020, we surveyed 13,426 people in 19 countries to determine potential acceptance rates and factors influencing acceptance of a COVID-19 vaccine. Of these, 71.5% of participants reported that they would be very or somewhat likely to take a COVID-19 vaccine, and 61.4% reported that they would accept their employer's recommendation to do so. Differences in acceptance rates ranged from almost 90% (in China) to less than 55% (in Russia). Respondents reporting higher levels of trust in information from government sources were more likely to accept a vaccine and take their employer's advice to do so.
	Influences on Attitudes Regarding Potential COVID-19 Vaccination in the United States **Abstract** The COVID-19 pandemic continues to ravage the world, with the United States being highly affected. A vaccine provides the best hope for a permanent solution to controlling the pandemic. However, to be effective, a vaccine must be accepted and used by a large majority of the population. The aim of this study was to understand the attitudes towards and obstacles facing vaccination with a potential COVID-19 vaccine. To measure these attitudes a survey was administered to 316 respondents across the United States by a survey corporation. Structural equation modeling was used to analyze the relationships of several factors with attitudes toward potential COVID-19 vaccination. Prior vaccine usage and attitudes predicted attitudes towards COVID-19 vaccination. Assessment of the severity of COVID-19 for the United States was also predictive. Approximately 68% of all respondents were supportive of being vaccinated for COVID-19, but side effects, efficacy and length of testing remained concerns. Longer testing, increased efficacy and development in the United States were significantly associated with increased vaccine acceptance. Messages promoting COVID-19 vaccination should seek to alleviate the concerns of those who are already vaccine-hesitant. Messaging directed at the benefits of vaccination for the United States as a country would address the second predictive factor. Enough time should be taken to allay concerns about both short- and long-term side effects before a vaccine is released

Appendix 4: Documents excluded at the final stages of reviewing

Type of document	Hyperlinked title
Full systematic reviews	Immunization information systems to increase vaccination rates: cost analysis Assessing strategies for increasing urban routine immunization coverage of childhood vaccines in low and middle-income countries: A systematic review of peer-reviewed literature Increasing appropriate vaccination: Community-wide education when used alone (2010 archived review) Increasing appropriate vaccination: Home visits to increase vaccination rates (2009 archived review) Increasing appropriate vaccination: Standing orders (2009 archived review) Increasing appropriate vaccination: Vaccination requirements for child care, school, and college attendance (2009 archived review) Increasing appropriate vaccination: Client reminder and recall systems (2008 archived review) Increasing appropriate vaccination: Reducing client out-of-pocket costs for vaccinations (2008 archived review) Increasing appropriate vaccination: Provider reminders (2008 archived review) Increasing appropriate vaccination: Client or family incentive rewards (2011 archived review) Increasing appropriate vaccination: Provider education when used alone (2010 archived review) Systematic review of the incremental costs of interventions that increase immunization coverage Vaccine communication campaigns: A systematic review of the literature based on experimental methodology (2009-2019) *(unavailable)*
Rapid reviews	Encouraging travellers to take preventive measures against travel-related communicable diseases: A rapid review of the literature Why is cervical screening coverage falling in the UK and what has primary care done to increase uptake of cervical screening?

	What are the factors influencing health care workers' uptake of flu immunisation?
Guidance developed using some type of evidence synthesis and/or expert opinion	Designing and implementing an immunisation information system
Protocols for reviews that are underway	The use of supplementary immunisation activities to improve uptake of current and future vaccines in low-income and middle-income countries: A systematic review protocol Barriers, supports, and effective interventions for uptake of human papillomavirus and other vaccines within global and Canadian Indigenous peoples: A systematic review protocol *(from 2018)* Interventions targeted on healthcare workers to address vaccine hesitancy: Systematic review *(from 2019)* Seasonal and pandemic influenza vaccine hesitancy among health care professionals: An integrative review of the literature from 2009 - 2019
Single studies in areas where no reviews were identified	Contingent assessment of the COVID-19 vaccine The web and public confidence in MMR vaccination in Italy Impact of Australian mandatory 'no jab, no pay' and 'no jab, no pay' immunisation policies on immunisation services, parental attitudes to vaccination and vaccine uptake, in a tertiary paedatric hospital, the royal children's hospital, Melbourne Vaccine hesitancy and (fake) news: Quasi-experimental evidence from Italy Vanishing vaccinations: Why are so many Americans opting out of vaccinating their children? Addressing the vaccine confidence gap Caregiver and service provider vaccine confidence following the changchun changsheng vaccine incident in China: A cross-sectional mixed methods study Cost utility of public clinics to increase pneumococcal vaccines in the elderly COVID-19 vaccination intention in the UK: Results from the covid-19 vaccination acceptability study (covaccs), a nationally representative cross-sectional survey

	Demographic differences in us adult intentions to receive a potential coronavirus vaccine and implications for ongoing study Determinants of COVID-19 vaccine acceptance in the U.S. Effect of nursing intervention on mothers' knowledge of cervical cancer and acceptance of human papillomavirus vaccination for their adolescent daughters in Abuja – Nigeria General practice web-based decision aid improves MMR vaccination uptake Intention to have the seasonal influenza vaccination during the COVID-19 pandemic among eligible adults in the U.K Needed: Less influenza vaccine hesitancy and less presenteeism among health care workers in the COVID-19 era Parents' and guardians' views and experiences of accessing routine childhood vaccinations during the coronavirus (COVID-19) pandemic: A mixed methods study in England Simulated encounters with vaccine-hesitant parents: Arts-based video scenario and a writing exercise The impact of the covid-19 pandemic on uptake of influenza vaccine: A U.K-wide observational study Why is influenza vaccine uptake so low among Aboriginal adults? Web-based social media intervention to increase vaccine acceptance: A randomized controlled trial Willingness of Hong Kong healthcare workers to accept pre-pandemic influenza vaccination at different who alert levels: Two questionnaire surveys Pro-vaccine messages may be counterproductive among vaccine-hesitant parents Preparing for a COVID-19 vaccine: Identifying and psychologically profiling those who are vaccine hesitant or resistant in two general population samples *(withdrawn)* Impact of covid-19 and health system performance on vaccination hesitancy: Evidence from a two-leg representative survey in the UK Intention to vaccinate against the novel 2019 coronavirus disease: The role of health locus of control and religiosity

	Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic Interest in COVID-19 vaccine trials participation among young adults in China: Willingness, reasons for hesitancy, and demographic and psychosocial determinants Attitudes toward a potential SARS-CoV-2 vaccine: A survey of U.S. adults 'Vaccine hesitancy' among university students in Italy during the COVID-19 pandemic A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicisation Acceptability of a COVID-19 vaccine among adults in the United States: how many people would get vaccinated? Acceptance of a COVID-19 vaccine in southeast Asia: A cross-sectional study in Indonesia Caregiver willingness to vaccinate their children against COVID-19: Cross sectional survey Caregivers' willingness to accept expedited vaccine research during the COVID-19 pandemic: A cross-sectional survey Determinants of COVID-19 vaccine acceptance in the U.S. Facteurs associes a l'intention de se faire vacciner contre les infections a SARS-CoV-2 chez les professionnels de sante : et si la profession comptait Vaccine hesitancy: The next challenge in the fight against COVID-19 Mistrust in biomedical research and vaccine hesitancy: The forefront challenge in the battle against COVID-19 in Italy Are we ready when COVID-19 vaccine is available? Study on nurses' vaccine hesitancy in Hong Kong Acceptance and risk perception of COVID-19 vaccine in Uganda: A cross sectional study in western Uganda Acceptability of vaccination against COVID-19 among healthcare workers in the Democratic Republic of the Congo COVID-19 vaccine hesitancy is associated with beliefs on the origin of the novel coronavirus in the UK and Turkey Determinants of intent to uptake coronavirus vaccination among respondents in Saudi Arabia: A web-based national survey

	Divide in vaccine belief in COVID-19 Conversations: Implications for immunization plans Intention of nurses to accept coronavirus disease 2019 vaccination and change of intention to accept seasonal influenza vaccination during the coronavirus disease 2019 pandemic: A cross-sectional survey Measuring the impact of exposure to COVID-19 vaccine misinformation on vaccine intent in the UK and US Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England Public willingness to get vaccinated against COVID-19: How ai-developed vaccines can affect acceptance Public preference for COVID-19 vaccines in China: A discrete choice experiment Survey data for COVID-19 vaccine preference analysis in the United Arab Emirates Vaccine hesitancy among Maltese healthcare workers toward influenza and novel COVID-19 vaccination When it is available, will we take it? Public perception of hypothetical COVID-19 vaccine in Nigeria Willingness to pay for a potential vaccine against SARS-cov-2 / COVID-19 among adult persons Willingness to participate in a COVID-19 vaccine trial among young adults in China Willingness to receive a COVID-19 vaccine among adults at high-risk of COVID-19: A UK-wide survey *(pre-print)*