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Rapid Review: What is known about reasons for vaccine confidence and uptake in populations experiencing inequities?

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Executive Summary

Background

As vaccines continue to become available, the public health sector is tasked with ensuring vaccination coverage is not only sufficient to promote herd immunity, but more importantly equitable across communities. Literature from previous vaccination campaigns has shown that some populations may be less likely to be vaccinated. An in-depth understanding of reasons that either contribute to or decrease both vaccine confidence (a desire to be vaccinated or decision to receive a vaccination) and vaccine uptake (receiving a vaccination) is critically important in designing effective and equitable vaccine rollout strategies at the local level.

This rapid review was produced to support public health decision makers' response to the coronavirus disease 2019 (COVID-19) pandemic. This review seeks to identify, appraise, and summarize emerging research evidence to support evidence-informed decision making.

This rapid review includes evidence available up to April 14, 2021 to answer the question: **What is known about reasons for vaccine confidence and uptake in populations experiencing inequities?**

Key Points

Rights holders, including First Nations, Inuit and Métis peoples in Canada and Indigenous Peoples globally

- Across studies exploring perceptions of different vaccines, safety was a primary concern both as a motivator for seeking vaccination (i.e., to protect oneself and others from illness) and as a reason to not seek vaccination (i.e., potential side effects). The confidence in this finding is low (GRADE-CERQual) however, it is possible that this finding is a reasonable representation of the phenomenon of interest.
- Consistent across populations and vaccines were themes reflecting a desire for knowledge and understanding about risks and benefits to enhance confidence in vaccination decisions, with a preference for information from trusted sources given experiences of stigmatization, discrimination, and racism. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- Approaches to encourage vaccine uptake include collaboration with trusted leaders and community groups, providing vaccination at convenient and trusted locations, and ensuring ease of access. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.

Black, African, Caribbean communities in North America and Europe

- Across studies, the tradeoff between the perceived risk of contracting the relevant illness and/or perceived severity of the illness and the risk of adverse effects of the vaccine played an important role in vaccine uptake. The confidence in this finding is low (GRADE-CERQual) however, it is possible that this finding is a reasonable representation of the phenomenon of interest.

- Mistrust, due to both historical injustices and the current socio-political climate, was a consistent contributor to lower vaccine confidence and uptake. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- Effective risk-benefit communication from a trusted messenger, which aimed to combat misinformation and address fear, was found to be important. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- Ease of access was highlighted as essential to support uptake; vaccines should be provided in trusted and accessible locations, and rollout should build in strategies to increase access for all (e.g., allow for paper-based appointment booking vs. online only bookings). The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.

Individuals experiencing homelessness or who are precariously housed

- Across studies, ease of accessibility of vaccination programs was the primary driver of vaccine uptake across both adults and youth. This includes cost, location of vaccination clinics, awareness of times and locations of clinics, and ability to drop-in. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- While some concerns about vaccine effectiveness or necessity were reported, across studies participants generally were willing to follow healthcare provider recommendations, particularly if the provider was a known and trusted source. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- A barrier to vaccine uptake across studies was uncertainty about vaccination status for specific vaccines; lack of an easily accessible tracking system or vaccination records prevented healthcare providers from recommending vaccination. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.

Overview of Evidence and Knowledge Gaps

- Most evidence to date comes from studies that are focused on vaccines other than COVID-19. Given the unprecedented nature of the COVID-19 pandemic, it is not known how applicable these findings are to the current context.
- Concerns about vaccine safety may be more important in the context of COVID-19 given the recency and speed of vaccine development; however, the perceived risk of contracting COVID-19 and its associated harms may also be much higher, particularly in the communities that are included in this review.
- Trusted messengers to deliver information about vaccinations and encourage access to vaccination was highlighted across all three populations; however, the characteristics of a trusted messenger were not often described and is likely variable across communities.
- The evidence is clear that a one-size fits all approach is not likely to be effective, and that close collaboration and partnerships with community leaders and community members at the local level is critical to not only promote vaccine confidence, but to ensure vaccines are accessible to those who wish to receive them.

Methods

Research Question

What is known about reasons for vaccine confidence and uptake in populations experiencing inequities?

Search

Between March 15 and April 14, 2021, the following databases were searched using key terms:

- MEDLINE database
- EMBASE database
- Sociological Abstracts
- CINAHL
- Trip Medical Database
- World Health Organization's Global literature on coronavirus disease
- COVID-19 Evidence Alerts from McMaster PLUS™
- COVID-19 Living Overview of the Evidence (L·OVE)
- McMaster Health Forum
- Cochrane Rapid Reviews
- Prospero Registry of Systematic Reviews
- MedRxiv preprint server
- NCCMT COVID-19 Rapid Evidence Reviews
- NCCDH
- NCCEH
- NCCID
- NCCIH
- NCCHPP
- Institute national d'excellence en santé et en services sociaux (INESSS)
- BC Centre for Disease Control (BCCDC)
- Public Health England
- Various Canadian advocacy groups

A copy of the full search strategy is available at this link.

Study Selection Criteria

The search results were first screened for recent guidelines and syntheses. When available, findings from syntheses and clinical practice guidelines are presented first, as these take into account the available body of evidence and, therefore, can be applied broadly to populations and settings.

Single studies were included if no syntheses were available, or if single studies were published after the search was conducted in the included syntheses. English-language, peer-reviewed sources and sources published ahead-of-print before peer review were included. Guidance documents, jurisdictional policies, and expert opinion were included as relevant to the question. Surveillance sources were excluded.

	Inclusion Criteria	Exclusion Criteria
Population	a) Rights holders, including First Nations, Inuit and Métis peoples in Canada and Indigenous Peoples globally b) Black, African, Caribbean communities in North America c) Individuals experiencing homelessness or who are precariously housed	Studies that report data on "minority groups" combined, without exploring the specific perspectives of unique populations separately; Studies that report on barriers or strategies from the perspective of others (e.g., healthcare providers, administrators, etc.)
Interest	Studies that explore reasons for vaccine confidence and uptake from the first-person perspective of the specific population; could include descriptions of strategies that have been successful to build vaccine confidence; could include qualitative or mixed methods studies, quantitative observational studies, quasi-experimental studies or text and opinion from trusted sources	Studies describing non-modifiable 'risk factors', such as sociodemographic variables collected through administrative data or cross-sectional surveys. Studies describing generic strategies to increase vaccine access or uptake that did not address specific barriers that the target population report. Studies specific to HPV vaccinations were excluded given the unique application of these vaccines.

Data Extraction and Synthesis

Data relevant to the research question, such as study design, setting, location, population characteristics, interventions or exposure and outcomes were extracted when reported. We synthesized the results narratively due to the variation in methodology and outcomes for the included studies.

Appraisal of Evidence Quality

We evaluated the quality of included evidence using critical appraisal tools as indicated by the study design below. Quality assessment was completed by one reviewer and verified by a second reviewer. Conflicts were resolved through discussion. For some of the included evidence a suitable quality appraisal tool was not found, or the review team did not have the expertise to assess methodological quality. Studies for which quality appraisal has not been conducted are noted within the data tables.

Study Design	**Critical Appraisal Tool**
Synthesis	Assessing the Methodological Quality of Systematic Reviews (AMSTAR) AMSTAR 1 Tool
Case Report	Joanna Briggs Institute (JBI) Checklist for Case Reports
Expert Opinion	Joanna Briggs Institute (JBI) Checklist for Text and Opinion
Qualitative	Joanna Briggs Institute (JBI Checklist for Qualitative Research
Mixed Method	Mixed Methods Appraisal Tool (MMAT)

Completed quality assessments for each included study are available on request.

The Grading of Recommendations, Assessment, Development and Evaluations - Confidence in Evidence from Reviews of Qualitative research (GRADE CERQual) (Lewin *et al.*, 2015) approach was used to assess the confidence in the findings in qualitative research based on four key domains:

- Methodological limitations
- Relevance
- Coherence
- Adequacy

The overall confidence in the evidence (expressed as either high, moderate, low, or very low) for each outcome and in each population was determined considering the characteristics of the available evidence. A judgement of 'overall confidence is very low' means that the findings may or may not be representative of the phenomenon of interest.

Findings

Summary of Evidence Quality

This document includes one completed synthesis, one in-progress synthesis, 27 single studies and one in-progress single study, for a total of 30 publications included in this review. The quality of the evidence included in this review is as follows:

Population	Evidence included		Overall confidence in the findings based on completed evidence
First Nations, Inuit and Métis peoples in Canada and Indigenous Peoples globally	Single studies	10	Low-moderate
Black, African, Caribbean communities in North America	Single studies In progress syntheses In progress single studies	14 1 1	Low-moderate
Individuals experiencing homelessness or who are precariously housed	Syntheses Single Studies	1 3	Moderate

Warning

Given the need to make emerging COVID-19 evidence quickly available, many emerging studies have not been peer reviewed. As such, we advise caution when using and interpreting the evidence included in this rapid review. We have provided a summary of overall certainty of the evidence to support the process of decision making. Where possible, make decisions using the highest quality evidence available.

Table 1: First Nations, Métis and Inuit communities in Canada and Indigenous Peoples globally: Single studies

Reference	Date Released	Study Design	Population	Summary of findings	Quality Rating:
COVID-19 Vaccine					
Mosby, I., & Swidrovich, J. (2021). Medical experimentation and the roots of COVID-19 vaccine hesitancy among Indigenous peoples in Canada. *Canadian Medical Association Journal*, *193*(11), E381-E383.	Mar 15, 2021	Text and opinion	First Nations, Métis, and Inuit communities in Canada	While some community leaders have expressed strong support for vaccination, the authors note concerns and fears by community members which need to be taken seriously and considered separately from the "anti-vax" movement. The authors cite well-documented examples of Indigenous Peoples being subject to medical experimentation and government mishandling of H1N1 (sending body bags to Manitoba First Nations communities instead of protective supplies) as contributing to hesitancy and mistrust of government and the healthcare system. The authors call for: • Community-focused and community-driven education • Doctors and health professionals who are administering vaccine to self-educate on racially segregated healthcare and medical experimentation to understand the true nature of vaccine hesitancy • Public health messages that: ○ Speak to Indigenous Peoples' historical and contemporary experiences ○ Are delivered by Indigenous Elders, leaders and health practitioners who have credibility in communities, ○ Focus on health and wellness of families, communities, land, and future generations	Moderate

Influenza Vaccines					
O'Grady, K.-A. F., Dunbar, M., Medlin, L. G., Hall, K. K., Toombs, M., Meiklejohn, J., … Andrews, R. M. (2015). Uptake of influenza vaccination in pregnancy amongst Australian Aboriginal and Torres Strait Islander women: A mixed-methods pilot study. *BMC Research Notes, 8*, 169.	Apr 29, 2015	Mixed methods	n=53 Aboriginal and Torres Strait Islander women from 28 weeks gestation to 16 weeks post-birth, attending two primary healthcare services, Australia	This mixed-methods study included a cross-sectional survey (n=53) and yarning circles focus groups (n=7). From the survey, 43% reported they had been offered the vaccine in pregnancy and 17% had received it. 43% reported they would get a vaccine if they became pregnant again. Qualitative data suggests that perceived benefits to themselves and infants were important in the decision to be vaccinated. Questions about vaccine safety, particularly for the fetus, were raised. The need to take a prescription to a pharmacy, collect the vaccine, and return to a clinic for a second time to be vaccinated was a stated deterrent. Most participants were not aware that influenza vaccination was recommended and available free for pregnant women, and noted discussions were not had with their healthcare provider.	High
Thomsen, R., Smyth, W., Gardner, A., & Ketchell, J. (2012). Centrelink: An innovative urban intervention for improving adult Aboriginal and Torres Strait Islander access to vaccination. *Healthcare infection, 17*(4), 136-141.	Dec 1, 2012	Case report	Aboriginal and Torres Strait Islander communities, Australia	Centrelink is a government statutory agency, responsible for delivering payment and human services during times of hardship, unemployment, and disability. To extend vaccination access to Aboriginal and Torres Strait Islanders, clinics were launched at non-traditional, opportunistic locations (e.g., food shelters, shopping centers, mobile clinics). Aboriginal and Torres Strait Islander Health Workers provided client assessments and post-vaccination services. Attendance at Centrelink vaccine clinics increased from 159 in 2004 to 441 in 2009; the number of vaccines administered increased from 204 to 667 (compared with decreasing average attendance at all other opportunistic sites). By 2009, Centrelink clinic vaccinations delivered 79% of total vaccinations to this population.	Moderate

H1N1 Vaccines					
Driedger, S. M., Maier, R., Furgal, C., & Jardine, C. (2015). Factors influencing H1N1 vaccine behavior among Manitoba Métis in Canada: A qualitative study. *BMC Public Health, 15*, 128.	Feb 12, 2015	Qualitative	n=128, Métis from urban, rural, and remote locations in Manitoba, Canada	From 2010-2013, participants from 17 focus groups in 4 communities were asked about their decision-making related to the H1N1 vaccine; 56% had received the vaccine (64% in rural or remote communities vs. 46% in urban communities). Concerns about vaccine safety and lack of knowledge about the vaccine and the pandemic, in general, had the most negative influences on decision making. Perceived risk of contracting H1N1 positively influenced uptake, overriding concerns in many cases. Media reporting, the influence of peer groups, and government prioritization of Métis to receive the vaccine had dual influences (i.e., positively and negatively influenced different people).	Moderate
Driedger, S. M., Cooper, E., Jardine, C., Furgal, C., & Bartlett, J. (2013). Communicating risk to Aboriginal peoples: First Nations and Métis responses to H1N1 risk messages. *PLoS One, 8*(8), e71106.	Aug 7, 2013	Qualitative	n=193, First Nations, Métis, Manitoba, Canada n=23 key informant interviews (health decision makers)	From 2009-2010, participants from 23 focus groups were asked how they reacted to messaging about the H1N1 vaccine and the identification and establishment of First Nations and Métis people as high-risk priority groups. Participants reported a feeling of general stigmatization, discrimination, and vulnerability (resulting from government action, public health messaging), specifically around perceptions that: First Nations and Métis lives are less valued; being First Nations or Métis, in itself, is a risk factor; and a generalized First Nations and Métis identity perpetuates a racialized "other".	High
Landsburg, S. R., McQuade, E., Birney, P., Nicholas, L., Caplin, J., & Robichaud, N. (2010). 2009 pandemic H1N1 mass immunization in New Brunswick First Nation communities. *Canadian Journal of Infectious Diseases and Medical Microbiology, 21*(4), 229-230.	2010	Case-report	First Nations, New Brunswick, Canada	This report describes an H1N1 mass immunization program implemented in each First Nations community in the province. Provincial government and health authority leaders engaged First Nations leaders and community health teams in program planning, implementation, and evaluation. Successes noted by First Nations leaders and communities included: high coverage rates (82-100%); established partnerships and continual communication with health authorities; community members trusted local clinics; and high community involvement to incorporate cultural practices and tailor clinics to the community. Challenges included: records and data management (e.g., no access to immunization registry); and confusion related to eligibility, role, and navigating health authority staff networks.	Moderate

Childhood Vaccinations					
Burghouts, J., Del Nogal, B., Uriepero, A., Hermans, P. W., de Waard, J. H., & Verhagen, L. M. (2017). Childhood vaccine acceptance and refusal among Warao Amerindian caregivers in Venezuela; A qualitative approach. *PLoS One*, *12*(1), e0170227.	Jan 20, 2017	Qualitative	n=31 Warao Amerindians, Venezuela	Parents' attitudes were explored through in-depth interviews with 20 vaccine-accepting and 11 vaccine-declining caregivers. Although Warao caregivers were generally in favor of vaccination, fear of side effects and the idea that young and sick children are too vulnerable to be vaccinated negatively affected vaccine acceptance. The importance assigned to side effects was related to the perception that these resembled symptoms/diseases of illness and could harm the child. Religious beliefs or traditional healers did not influence the decision-making process.	High
Tarrant, M., & Gregory, D. (2003). Exploring childhood immunization uptake with First Nations mothers in north-western Ontario, Canada. *Journal of Advanced Nursing, 41*(1), 63-72. Tarrant, M., & Gregory, D. (2001). Mothers' perceptions of childhood immunizations in First Nations communities of the Sioux lookout zone. *Canadian Journal of Public Health*, *92*(1), 42-45.	Jan 2003	Qualitative	n=28 mothers, 2 First Nations communities in the Sioux Lookout Zone, north-western Ontario, Canada	Qualitative interviews were conducted with mothers to explore beliefs and perceptions of childhood immunizations and vaccine-preventable diseases. Participants were motivated to seek immunizations for their children by a fear of vaccine preventable diseases. A small proportion of mothers questioned the effectiveness of vaccines in preventing disease. Traumatic immunization experiences, vaccine side-effects and sequelae, negative interactions with health professionals, knowledge gaps related to vaccine effectiveness, the influence of others who are against vaccines, and barriers such as time constraints and not being able to vaccinate during a clinic visit when the child was ill all served as deterrents to immunization.	High
General Vaccination					
Burnett, K., Sanders, C., Halperin, D., & Halperin, S. (2020). Indigenous Peoples, settler colonialism, and access to health care in rural and northern Ontario. *Health & Place, 66*, 102445.	Oct 5, 2020	Qualitative	n=72 Indigenous community members in 10 focus groups, 2 Northern Ontario urban centers, 4 road-access and 5 fly-in First Nation communities	10 focus groups were conducted with Indigenous community members using a two-eyed seeing approach. Factors that informed vaccine decisions were rural space/location, access to healthcare, relationships with healthcare providers and the state more generally (contemporary and historical). Suspicion and distrust of the state and, by extension, healthcare providers, a lack of choice in healthcare, and negative relationships with providers had bearing on vaccine confidence. The authors conclude that trust and rapport are vital considerations when developing vaccination policy, especially given Indigenous people's experiences with racism and colonialism.	High

Table 2: Black, African, Caribbean communities in North America and Europe: Single studies

Reference	Date Released	Study Design	Population, Setting	Summary of findings	Quality Rating:
COVID-19 Vaccine					
Ferdinand, K. C. (2021). Overcoming barriers to COVID-19 vaccination in African Americans: The need for cultural humility. *American Journal of Public Health, 111*(4), 586-588.	Apr 11, 2021	Text & Opinion	African Americans United States	The authors note mistrust in healthcare, stemming from multi-generational structural and historical racism, as a critical barrier to COVID-19 vaccine acceptance. Authors call for specific, targeted public health programs, in the spirit of "cultural humility" (e.g., self-reflection, respectful partnerships), to overcome vaccine hesitancy. Risk-benefit communication should be culturally sensitive, literacy-level appropriate, evaluated, and involve mass media, public health, policymakers, and "trusted messengers". For example, the Community Engagement Alliance Against COVID-19 Disparities and other state-level approaches aim to overcome misinformation and mistrust through community outreach, engagement, and culturally appropriate messaging.	Moderate
Abdul-Mutakabbir, J. C., Casey, S., Jews, V., King, A., Simmons, K., Hogue, M. D., … Veltman, J. (2021). A three-tiered approach to address barriers to covid-19 vaccine delivery in the Black community. *The Lancet Global Health*. Epub ahead of print.	Mar 10, 2021	Case report	Black community San Bernardino County, southern California, United States	Loma Linda University is the largest vaccination site in the county; however, over the first 30 days the Black community was underrepresented in dose recipients. A proactive, three-tiered approach was developed to more effectively reach the Black community, including: • Engagement of Black faith leaders; information sessions, pastors advertised mobile clinic, distributed registration paperwork, managed appointment lists • Delivery of COVID-19 vaccine education by Black pharmacists; provided webinars, managed transportation of vaccines to clinic and ensured vaccine was properly drawn • Establishment of a multidisciplinary mobile vaccination clinic in a church parking lot in a mostly Black community. Paper-based registration was used to eliminate need for internet/computer access 351/417 (84.2%) people vaccinated at the mobile clinic in 1 day were Black.	Moderate

Momplaisir, F., Haynes, N., Nkwihoreze, H., Nelson, M., Werner, R. M., & Jemmott, J. (2021). Understanding drivers of COVID-19 vaccine hesitancy among Blacks. *Clinical Infectious Diseases*. Epub ahead of print.	Feb 9, 2021	Qualitative	n=24 Black barbershop and salon owners, living in areas of elevated COVID-19 prevalence West Philadelphia, United States	From Jul-Aug 2020, four focus groups were conducted to understand COVID-19 vaccine attitudes, beliefs, and norms; results were analyzed using a modified grounded theory approach. COVID-19 vaccine confidence was decreased due to: mistrust in the medical establishment and vaccines, in general; skepticism of COVID-19 vaccines, specifically, due to perceptions of their rushed development and limited data on side effects; and historical racial injustice, further fostered by the current political environment. Participants feared becoming infected from the vaccine or suffering side effects due to co-morbid conditions; many thought COVID-19 prevention should focus instead on alternative therapies to improve baseline physical health. While most opposed vaccines, many would reconsider with more information (e.g., evidence showing vaccine safety and effectiveness) and if recommended by a trusted healthcare provider. Others had firm convictions (for or against); they would not be persuaded to change.	Moderate
Ferdinand, K. C., Nedunchezhian, S., & Reddy, T. K. (2020). The COVID-19 and influenza "twindemic": Barriers to influenza vaccination and potential acceptance of SARS-CoV2 vaccination in African Americans. *Journal of the National Medical Association, 112*(6), 681-687.	Dec 1, 2020	Text & Opinion	African Americans	Decreased vaccine acceptance, uptake, and adherence is thought to be a result of medical mistrust, vaccine safety and efficacy concerns, and environmental barriers to vaccine access. The authors recommend public health, scientific organizations, and government work with communities to gain their acceptance, specifically through: • Educational campaigns providing COVID-19 evidence (e.g., culturally appropriate, mass media and communication) • Vaccine policy initiatives that build trust (e.g., using trusted messengers and community leaders) • Equitable, barrier-free vaccine allocation (e.g., mobile clinics, partnerships with diverse healthcare providers).	Moderate

Influenza Vaccine					
Henderson, V., Madrigal, J. M., & Handler, A. (2020). A mixed methods study: Midlife African American women's knowledge, beliefs, and barriers to well-woman visit, flu vaccine, and mammogram use. *Journal of Women & Aging, 32*(3), 292-313.	May 1, 2020	Mixed methods	African American women aged 40-64 years, n=124 online survey and n=19 in-depth interviews	This study examined relationships between knowledge of, beliefs about, and barriers to well-woman visits, flu vaccines, and mammograms. Beliefs or misperceptions about influenza vaccination (e.g., skeptical or distrustful of them, feelings that their immune systems were strong enough to fight off potential infections, beliefs that the flu shot caused illness rather than prevented it, or feelings they were not at high risk for illness) led to decisions not to be vaccinated. Women who did obtain annual flu shots did so to protect themselves from illness due to the nature of their work or because of current chronic medical conditions (e.g., asthma). Providers may be able to provide information and address incongruent beliefs through patient interaction.	High
Jamison, A. M., Quinn, S. C., & Freimuth, V. S. (2019). "You don't trust a government vaccine": Narratives of institutional trust and influenza vaccination among African American and white adults. *Social Science & Medicine, 221*, 87-94.	Jan 1, 2020	Mixed methods	n=119 White and African American adults, Maryland and Washington, DC; semi-structured interviews (n=12), 9 focus groups (n = 91), in-depth interviews (n=16)	This mixed-methods investigation of racial disparities in influenza vaccination was guided by grounded theory. Most participants distrusted government and pharmaceutical companies, which were viewed to be motivated by profit. Regardless of background knowledge, concerns about vaccines were related to trust in the sources of information and the healthcare system.	Moderate
Marsh, H. A., Malik, F., Shapiro, E., Omer, S. B., & Frew, P. M. (2014). Message framing strategies to increase influenza immunization uptake among pregnant African American women. *Maternal and Child Health Journal, 18*(7), 1639-1647.	Dec 12, 2013	Qualitative	n=21 pregnant African American women at urban OB/GYN clinics who had not received an influenza vaccine	Semi-structured interviews were conducted to explore attitudes, opinions, and concerns of African American women regarding influenza vaccination during pregnancy. Most women indicated that positively framed messages focusing on infant's health, such as protection against preterm birth and low birth weight outcomes, would encourage them to receive an influenza vaccine.	Low

				Messages via interpersonal networks and social media strongly influenced motivation to vaccinate.	
Cameron, K. A., Rintamaki, L. S., Kamanda-Kosseh, M., Noskin, G. A., Baker, D. W., & Makoul, G. (2009). Using theoretical constructs to identify key issues for targeted message design: African American seniors' perceptions about influenza and influenza vaccination. *Health Communication, 24*(4), 316-326.	Jun 3, 2009	Qualitative	n=48 African American seniors aged 65 and older	6 focus groups were conducted to identify perceptions about influenza and influenza vaccination. The extended parallel process model, which suggests that effective messaging needs to include elements of both threat (susceptibility and severity) and efficacy (self-efficacy and response efficacy), was used. Perceived susceptibility varied based on perceptions of individual health status, background knowledge, and age-related risk. Some saw influenza as a minor nuisance; others viewed it as threatening and potentially deadly. Self-efficacy was related to vaccine accessibility and affordability. Some participants had confidence in the vaccine, some questioned its preventive ability or believed that the vaccine caused influenza, and others noted expected side effects. Given the correct and incorrect beliefs held by participants, effective messages to promote vaccination must provide sufficient information to induce both high levels of threat and belief in efficacy.	Moderate
Wray, R. J., Jupka, K., Ross, W., Dotson, D., Whitworth, A. R., & Jacobsen, H. (2007). How can you improve vaccination rates among older African Americans? *The Journal of Family Practice, 56*(11), 925-929.	Nov 2007	Qualitative	Four focus groups (n=35) and 8 in-depth interviews with African Americans 50 years of age and older	Focus groups and interviews were used to explore older African Americans' concerns about the flu vaccine. Fear of getting the flu from vaccination was widespread, as were concerns about interactions with medications and allergic reactions. Participants doubted vaccine effectiveness and distrusted both the vaccine and the healthcare system. The authors recommend that healthcare providers address vaccine efficacy, safety, side effects, and drug interactions.	Low
Harris, L. M., Chin, N. P., Fiscella, K., & Humiston, S. (2006). Barrier to pneumococcal and influenza vaccinations in Black elderly communities: Mistrust. *Journal of the National Medical Association, 98*(10), 1678-1684.	Oct 2006	Qualitative	n=20 African Americans aged 65 years and older	Semi-structured interviews were conducted to explore perspectives on influenza vaccination among vaccinated and unvaccinated individuals. Most vaccinated participants viewed vaccines as a preventive measure, while the unvaccinated group viewed vaccines as irrelevant to their health and believed vaccines caused illness.	Moderate

				Willingness to be vaccinated was largely influenced by prior positive or negative experiences with healthcare systems.	
Sengupta, S., Corbie-Smith, G., Thrasher, A., & Strauss, R. P. (2004). African American elders' perceptions of the influenza vaccine in Durham, North Carolina. *North Carolina Medical Journal, 65*(4), 194-199.	Jul 2004	Qualitative	n=28 African Americans aged 65 years or older in North Carolina	In-person interviews were used to explore community vaccination perceptions amongst older African Americans. Physician reminders increased vaccine uptake, as did positive beliefs that the vaccine prevents influenza. Community influences to not get vaccinated and fear of getting the flu from the vaccination decreased confidence. Primary care settings are important, as they are the most likely settings for influenza vaccinations.	Moderate
Pneumococcal Vaccine					
Brown, T., Goldman, S. N., Acosta, F., Garrett, A. M., Lee, J. Y., Persell, S. D., & Cameron, K. A. (2017). Understanding Black patients' refusal of pneumococcal vaccination. *Journal of Racial and Ethnic Health Disparities, 4*(1), 1-8.	Dec 22, 2015	Mixed methods	n=40 African American primary care aged 65 years or over; 95 % female.	In this mixed-method study, older adults surveyed reported that while most participants recognized pneumonia could be deadly, they also reported low perception of personal susceptibility. Participants perceived childhood vaccines to be safer than adult vaccines. In follow-up qualitative interviews, reasons for not accepting vaccination included low perceptions of personal susceptibility, fear of side effects, and mistrust. Strategies to increase vaccination uptake may need to emphasize individual susceptibility. Further, given the discrepancies in perceptions toward childhood versus adult vaccinations, focusing on vaccination across the lifespan may be a promising vaccine promotion strategy.	High
Childhood Vaccines					
Shui, I., Kennedy, A., Wooten, K., Schwartz, B., & Gust, D. (2005). Factors influencing African-American mothers' concerns about immunization safety: A summary of focus group findings. *Journal of the National Medical Association, 97*(5), 657-666.	May 2005	Qualitative	n=53 African American mothers in 6 focus groups in Atlanta	Focus groups were conducted to examine vaccine safety concerns of African American mothers who, despite concerns, have had their children vaccinated. Lack of information and mistrust of the medical community and government were reasons for low vaccine confidence. Reasons for vaccine uptake despite low confidence included social norms and/or laws requiring vaccination, and fear of consequences of not vaccinating.	Moderate

				Suggestions given to improve vaccine confidence included improved provider communication and additional tailored information about the necessity and safety of vaccines.	
General Vaccination					
Privor-Dumm, L., & King, T. (2020). Community-based strategies to engage pastors can help address vaccine hesitancy and health disparities in Black communities. *Journal of Health Communication, 25*(10), 827-830.	Oct 2, 2020	Text & Opinion	African Americans	The authors propose a community engagement framework for building vaccine trust and acceptance – leveraging the role of faith leaders and customizing messages to the specific issues that communities face. This includes: • Understanding the history and current context • Listening and having empathy • Engaging faith leaders as trusted messengers • Creating partnerships with shared responsibility and power • Co-creating solutions with faith leaders, communities, governments, and institutions to create sustainable, long-term change. The authors believe faith leaders have an opportunity to facilitate discussion and information exchange, build trust, and develop measurable improvements.	High

Table 3: Black, African, Caribbean communities in North America and Europe: In-progress studies

Reference	Anticipated Completion	Study Design	Participants	Summary
COVID-19 Vaccine				
Basharat Hussain, Asam Latif, Stephen Timmons, Kennedy Nkhoma. (2021). *COVID-19 vaccine hesitancy in Black, Asian and minority ethnic groups in the UK: a rapid systematic review*. *PROSPERO 2021 CRD42021243083.*	Apr 15, 2021	Systematic review	Black, Asian, and minority ethnic groups, United Kingdom	This rapid review will synthesize evidence from primary studies related to COVID-19 vaccine hesitancy, including strategies and interventions to improve uptake.
Meharry Medical College. (2021). *COVID-19 vaccine hesitancy among African Americans*. *ClinicalTrials.gov, NCT04801030.*	2021	Quasi-experimental	African Americans, Nashville / Davidson County, Tennessee, United States	This study will test the feasibility and impact of a multi-layered, culturally appropriate, social marketing intervention to increase vaccine confidence, uptake, and completion of multi-dose vaccine series among COVID-19 vaccine-hesitant individuals.

Table 5: Individuals experiencing homelessness or who are precariously housed: Syntheses

Reference	Date Released	Participants, Setting	Summary of findings	Quality Rating:
General Vaccination				
Babando, J., Quesnel, D. A., Woodmass, K., Lomness, A., & Graham, J. R. (2021). Responding to pandemics and other disease outbreaks in homeless populations: A review of the literature and content analysis. *Health & Social Care in the Community*. Epub ahead of print.	Apr 6, 2021	Individuals experiencing homelessness	This review conducted content analysis on 223 studies examining pandemic or outbreak response and planning for rapid-spread illnesses with contact spread in homeless populations. 11 studies were specific to vaccination strategies/ The authors highlight the unique challenges for planning, implementing, and communicating pandemic-associated public health measures. The authors conclude that vaccines should be free; cost is one of the biggest barriers to uptake and may be facilitated by improved access to care, drop-in clinics in shelters, and good case management. Establishing incentives and education programs for service providers and recipients, strategies such as "blitzing" (e.g., offering influenza vaccines to a large cohort), and partnerships to administer vaccines (e.g., with faith-based organizations, local government, academic institutions) have also been shown to be successful.	Moderate

Table 6: Individuals experiencing homelessness or who are precariously housed: Single studies

Reference	Date Released	Study Design	Participants, Setting	Summary of findings	Quality Rating:
COVID-19 Vaccination					
Knight, K. R., Duke, M. R., Carey, C. A., Pruss, G., Garcia, C. M., Lightfoot, M., … Kushel, M. (2021). "This is about the coolest thing I've ever seen is that you just showed right up." COVID-19 testing and vaccine acceptability among homeless-experienced adults: Qualitative data from two samples. *Preprint*.	Mar 20, 2021	Qualitative	n=94 adults who were currently or recently experience homelessness Oakland and San Francisco, California, United States	From Jul-Oct 2020, interviews were conducted with participants from an ongoing cohort study (n=37) and a convenience sample from a mobile outreach COVID-19 testing event (n=57). The authors used participant observation to document interview interactions and content analysis to identify major themes. Many participants indicated a willingness to be vaccinated. They were motivated by wanting to reunite with family or return to everyday activities (such as work), and/or by a sense of civic responsibility. Low vaccine confidence was due to a lack of vaccine trial data, negative experiences with other vaccines (e.g., concerns that vaccines make people sick), wanting others (e.g., public figures, trusted community members) to be vaccinated first, and/or government mistrust (including experiences of racism).	Moderate ***PREPRINT***
Pneumococcal Vaccination					
Washington-Brown, L., & Cirilo, R. W. (2020). Advancing the health of homeless populations through vaccinations. *Journal of the American Association of Nurse Practitioners*. Epub ahead of print.	Oct 7, 2020	Case report	n=209 sheltered and unsheltered homeless adults, Miami-Dade County, United States	This case report describes the implementation of a successful five-step vaccination project delivered in shelters: 1. Train volunteer faculty/nurse practitioners, weekly 1-hour education sessions 2. Engage students to help with educational sessions 3. Enroll program into state health tracking system 4. Train nursing volunteers on vaccine storage, handling, and administration 5. Conduct post-vaccination survey to evaluate vaccine knowledge, adverse reactions >200 vaccines were administered in the first 3 months, and the project has since expanded to include influenza, tetanus, diphtheria and pertussis, and hepatitis A vaccinations.	High

General Vaccinations					
Doroshenko, A., Hatchette, J., Halperin, S. A., MacDonald, N. E., & Graham, J. E. (2012). Challenges to immunization: The experiences of homeless youth. *BMC Public Health, 12*, 338.	May 8, 2012	Qualitative	n=29 youth experiencing homelessness	This study explored knowledge, attitudes, beliefs, and experiences related to vaccination among youth experiencing homelessness. Youth acknowledged the protective mechanisms of vaccines. Most reported getting vaccinations despite being unsure as to their effectiveness. They often complied with health professional advice to be vaccinated. Immunizations are not a priority for youth because other personal challenges take precedence (e.g., food, finding a place to sleep). Barriers to vaccination uptake: • Lack of information from healthcare providers • Uncertainty among providers about youth qualifying for free vaccines • Cost • Lack of access to immunization services Strategies to improve immunization: • Outreach via media: better advertisement of time and location of free clinics via public/commercial locations (e.g., buses, grocery store pamphlets); ensure messaging is framed positively • Youth friendly healthcare systems: thinking outside the box to accommodate their unique needs • Improved access: using shelters as access point for vaccinations	Moderate

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Babando, J., Quesnel, D. A., Woodmass, K., Lomness, A., & Graham, J. R. (2021). Responding to pandemics and other disease outbreaks in homeless populations: A review of the literature and content analysis. *Health & Social Care in the Community*. Epub ahead of print.

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