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Rapid Review Update 1: What are best practices for risk communication and strategies to mitigate risk behaviours?

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Please Note: An update of this review may be available. Access the most current version of this review by visiting the National Collaborating Centre for Methods and Tools COVID-19 Rapid Evidence Service at the above link.

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Executive Summary

Background

As jurisdictions continue to respond to coronavirus disease 2019 (COVID-19), including recent variants of concern, adherence to recommended public health measures such as physical distancing, hand hygiene and mask wearing will be critical to reduce the burden of COVID-19 and prevent spread to the most vulnerable. Of growing concern is the relaxing of individuals' adherence to these measures, which may be partly attributed to confusion and lack of clarity around changing recommendations as various measures are lifted and reinstated. Effective communication by government officials, physicians, local public health organizations and other community leaders is necessary to help control spread.

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

This rapid review is based on the most recent research evidence available at the time of release. A previous version was completed on October 8, 2020. This updated version includes evidence available up to February 12, 2021 to answer the question: **What are best practices for risk communication and strategies to mitigate risk behaviours?**

What Has Changed in This Version?

- Four new syntheses have been added, from topic areas other than COVID-19. The relevance of these findings to COVID-19 context is unknown.
- More evidence specific to COVID-19 has emerged in this update in six new single studies. These studies provide increased specificity on characteristics of effective spokespeople, including physicians for some populations.
- Key points remain consistent.

Key Points

- The risk communication literature from a variety of topic areas emphasizes the importance of clear, repeated, action-oriented messaging by a trusted leader (e.g., physician, community leader, trusted public health professional, etc.). The certainty of the evidence is moderate (GRADE).
- Trust in both the message and the person delivering the message can be built by addressing uncertainty and acknowledging changing recommendations and information or previous errors. The certainty of the evidence is low (GRADE) and may change as more evidence becomes available.
- Communications should be tailored to target audiences by both message and medium; stakeholder engagement is important to identify the most appropriate message framing and medium of the message. The certainty of evidence is moderate (GRADE).

- Mainstream media consumption was shown to lead to better retention of messages and expressing more positive opinions of government crisis response. Peer health communication and intensive multimedia interventions show effectiveness for influencing risk behaviour change related to viruses. Positively framed messages emphasizing a collective or social responsibility message, versus an individual approach, may be more effective, although one synthesis and one study showed no effect of message framing related to vaccination attitudes and intention. The certainty of the evidence is low (GRADE) and may change as more evidence becomes available.
- Evidence is lacking for the experiences of many populations who live with social and structural inequities, such as Indigenous or racialized communities. Further research is required to ensure representation of these populations for decision making.
- When expressing risk using statistics, frequencies are better understood than percentages, and relative risk is more persuasive than absolute risk or number needed to treat. The certainty of the evidence is moderate (GRADE).

Overview of Evidence and Knowledge Gaps

- Physicians have been found to be effective spokespeople to improve COVID-19-related knowledge for some population groups, including Japanese and Black audiences, and race/ethnicity-concordant physicians are particularly effective for improving knowledge among Black audiences. Other tailoring efforts (e.g., acknowledging injustice and economic hardship, addressing fear of stigma and racism when wearing a mask) did not have a significant effect on knowledge or preventive behaviours.
- Evidence is lacking related to the delivery of messaging to change behaviour and increase compliance with infection control practices. Other characteristics of a trusted leader, and an understanding of who is the best person to deliver communications to specific target audiences, are questions that require more research.
- Participatory approaches to risk communication in low- and middle-income countries are most effective.
- Effective communication about vaccines depends on several factors, including perceived risk, but the study findings are inconsistent, according to one synthesis.
- The majority of the evidence comes from studies conducted in other topical areas (e.g., past epidemics, childhood vaccinations, smoking behaviours). Given the unprecedented scale of the COVID-19 pandemic and current influence of social media, previous findings may not apply directly.
- There is limited evidence on effective social marketing campaign designs that demonstrate an increase in testing outcomes. Many of the single studies exploring the impact of COVID-19-specific risk communication are limited to assessing the spread of information via social media; continued evaluation of current COVID-19-specific communication campaigns on knowledge, attitude and behaviour change will help inform pandemic response.

Methods

Research Question

What are best practices for risk communication and strategies to mitigate risk behaviours?

Search

On February 12, 2021, the following databases were searched using key terms “risk communication”, “behavioural science”, “behavioral science”, "social marketing", "social behaviour", "social behavior", "persuasive communication", "health communication". This search builds upon the previous search conducted in the first version of this rapid review.

- Pubmed’s curated COVID-19 literature hub: LitCovid
- Trip Medical Database
- World Health Organization’s Global literature on coronavirus disease
- COVID-19 Evidence Alerts from McMaster PLUS™
- Public Health +
- COVID-19 Living Overview of the Evidence (L·OVE)
- McMaster Health Forum
- Prospero Registry of Systematic Reviews
- MedRxiv preprint server
- PsyArXiv preprint server
- MEDLINE database
- EMBASE database
- NCCMT COVID-19 Rapid Evidence Reviews
- NCCDH Equity-informed Responses to COVID-19
- NCCEH Environmental Health Resources for the COVID-19 Pandemic
- NCCHPP Public Health Ethics and COVID-19
- NCCID Disease Debrief
- NCCIH Updates on COVID-19
- Institute national d’excellence en santé et en services sociaux (INESSS)
- BC Centre for Disease Control (BCCDC)
- PsycINFO
- ERIC
- Public Health Ontario
- Cochrane Library
- Public Health England COVID-19 Rapid Reviews
- Oxford COVID-19 Evidence Service
- COVID-19 Evidence Prime

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

Study Selection Criteria

English- and French-language, peer-reviewed sources and sources published ahead-of-print before peer review were included. 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.

Due to the large body of literature on risk communication in contexts other than COVID-19, only syntheses of this literature were included. Single studies related to COVID-19 were included if no syntheses were available, or if single studies were published after the search was conducted in the included syntheses. Guidance documents specific to risk communication during COVID-19 from reputable organizations were included as relevant. Surveillance sources were excluded.

	Inclusion Criteria	Exclusion Criteria
Population	General population	
Intervention	Risk communication, in public health and other contexts	Clinical decision making, clinical decision aids
Comparisons	-	
Outcomes	Change in knowledge, attitudes and behaviour	

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
Cross-sectional	Joanna Briggs Institute (JBI) Checklist for Analytical Cross-Sectional Studies
Qualitative	Joanna Briggs Institute (JBI) Checklist for Qualitative Research
Quasi-experimental	Joanna Briggs Institute (JBI) Checklist for Quasi-Experimental Studies
Randomized controlled trial	Joanna Briggs Institute (JBI) Checklist for Randomized Controlled Trials

Completed quality assessments for each included study are available on request.
The Grading of Recommendations, Assessment, Development and Evaluations (GRADE) (Schünemann *et al.*, 2013) approach was used to assess the certainty in the findings based on eight key domains.

In the GRADE approach to quality of evidence, **observational studies,** as included in this review, provide **low quality** evidence, and this assessment can be further reduced based on other domains:

- High risk of bias
- Inconsistency in effects
- Indirectness of interventions/outcomes
- Imprecision in effect estimate
- Publication bias

and can be upgraded based on:

- Large effect
- Dose-response relationship
- Accounting for confounding.

The overall certainty in the evidence for each outcome was determined taking into account the characteristics of the available evidence (observational studies, some not peer-reviewed, unaccounted-for potential confounding factors, different tests and testing protocols, lack of valid comparison groups). A judgement of 'overall certainty is very low' means that the findings are very likely to change as more evidence accumulates.

Findings

Summary of Evidence Quality

In this update, four new syntheses, six new single studies and one new in-progress synthesis were identified, for a total of 28 publications included in this review. The quality of the evidence included in this review is as follows:

Research Question	Evidence found		Overall certainty in evidence
What are best practices for risk communication and strategies to mitigate risk behaviours?	Completed syntheses Single studies In progress syntheses In progress single studies Guidance documents	13 9 1 2 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: Syntheses

Reference	Date Released	Description of Included Studies	Summary of Findings	Quality Rating: Synthesis	Quality Rating: Included Studies
New evidence from other topical areas reported on March 12, 2021					
Winograd, D. M., Fresquez, C. L., Egli, M., Peterson, E. K., Lombardi, A. R., Megale, A., … McAndrew, L. M. (2021). Rapid Review of Virus Risk Communication Interventions: Directions for COVID-19. *Patient Education and Counseling*. Epub ahead of print.	Jan 20, 2021 (search date not specified)	This rapid review included 31 single studies (14 randomized controlled trials) evaluating interventions for reducing the spread of viruses (HIV, Hepatitis B, influenza, H1N1, MERS, Zika) by changing individual cognitions or behaviours.	There was no clear best intervention among peer health communication, intensive multimedia communication, and audio/visual interventions. Peer health communication, in which peers share knowledge and behaviour change approaches, showed the most consistent positive findings for changing cognitive risk perception related to viruses and behaviour change outcomes. Intensive multimedia communication showed somewhat positive findings for behaviour change outcomes. Audio/visual communication showed somewhat positive findings for improving cognitive risk perception, cognitions about behaviours, and behavioural intention outcomes, with mixed results for behaviour change outcomes. Tailored interventions were more consistently related to behavioural changes (vs. non-tailored interventions). Interventions to reduce risk from HIV/AIDS consistently improved cognitive risk perceptions, cognitions about behaviours, behavioural intentions and behaviours to reduce risk; influenza interventions only showed improved cognitions about behaviours. Findings related to other viruses are few in number and hard to interpret.	Moderate	Very low-Low

Olawepo, J. O., Pharr, J. R., & Kachen, A. (2018). The Use of Social Marketing Campaigns to Increase HIV Testing Uptake: A Systematic Review. *AIDS Care, 31*(2), 153-162.	Oct 10, 2018 Articles were included up to Oct 18, 2017. (Search date not specified)	13 included studies: • 6 cross-sectional • 3 observational cohort • 2 laboratory/ surveillance • 1 randomized controlled trial • 1 quasi-experimental Studies assessed the effect of social marketing campaigns on HIV testing uptake.	Studies reported positive (38%), mixed (38%) and no effect (31%) of social marketing campaigns on HIV testing uptake. Neither campaign design, location, use of theory, population, duration, channels used, or sample size demonstrated an effect on testing outcomes. Limitations of this review include weak study designs of included studies and lack of meta-analysis of the included studies due to differences in reporting metrics. Standardized methodology for reporting exposure to and impact of social marketing campaigns is needed.	Low	Not reported
Schiavo R., May Leung M., & Brown M. (2014). Communicating Risk and Promoting Disease Mitigation Measures in Epidemics and Emerging Disease Settings. *Pathogens and Global Health*, 108(2), 76-94.	Mar 21, 2014 (search completed Jul 2013)	29 included studies; description of included studies not provided.	Specific to low and middle-income countries, interventions to communicate risk and promote disease control at the community, healthcare or multi-sectoral levels may be most effective when using community-based or participatory approaches. There is a gap in research related to how interventions influence policy adoption, social determinants of health, or cost-effectiveness.	Low	Moderate-Low to High
Akl, E. A., Oxman, A. D., Herrin, J., Vist, G. E., Terrenato, I., Sperati, F., … Schünemann, H. (2011). Using Alternative Statistical Formats for Presenting Risks and Risk Reductions. *Cochrane Database of Systematic Reviews*.	Mar 16, 2011 (search completed Oct 2007)	35 included controlled trials with 41 total comparisons: • 30 randomized • 4 not randomized • 7 unclear	When presenting statistics on risk, frequencies (e.g., 1 in 100) are better understood than percentages (e.g., 1%) (Standard Mean Difference (SMD)=0.69, 95% CI=0.45-0.93) by health professionals and consumers. For risk reductions, relative risk reduction was perceived as larger and was more likely to be persuasive than absolute risk reduction (SMD=0.66, 95% CI=0.51-0.81) and number needed to treat (SMD=0.65, 95% CI=0.51-0.80).	High	Moderate, by GRADE

Previously reported evidence specific to the COVID-19 pandemic					

Ghio, D., Lawes-Wickwar, S., Tang, M. Y., Epton, T., Howlett, N., Jenkinson, E., … Keyworth, C. (2020). What Influences People's Responses to Public Health Messages for Managing Risks and Preventing Disease During Public Health Crises? A Rapid Review of the Evidence and Recommendations. *Preprint*.	Jul 13, 2020 (Search completed May 20, 2020)	78 included studies:
		• 3 systematic reviews
		  ○ 2 mixed methods
		  ○ 1 quantitative
		• 61 single studies
		  ○ 1 randomized controlled trial
		  ○ 11 survey
		  ○ 23 qualitative
		  ○ 10 content analysis
		  ○ 7 commentary
		  ○ 8 experimental
		  ○ 1 rapid review
		• 14 preprint manuscripts
		  ○ 3 experimental
		  ○ 11 survey
		Studies were specific to
		• H1N1 (n=20)
		• COVID-19 (n=15)
		• Ebola (n=12)
		• Influenza (n=8)
		• SARS (n=6)
		• Zika (n=4)
		• Bird flu (n=3)
		• West Nile (n=1)
		• General pandemics (n=1)
			4 key recommendations identified:
			1. Engage with different communities to ensure relevance and relatability and build community resilience:
			• Target and tailor messages to specific populations
			• Translate to other languages, considering accuracy and cultural relevance
			• Use diverse media forms and consider barriers to access
			
			2. Address uncertainty to increase trust:
			• Acknowledge changing information and admit errors
			• Coordinate consistent messages across information sources
			• Use sources perceived as credible to target population
			• Focus on positive, solution-oriented messaging
			
			3. Unify messaging to ensure accurate understanding and heighten risk perception:
			• Keep core message consistent
			• Increase awareness
			• Clear instructions are more memorable
			
			4. Message framing to increase understanding and knowledge of threat:
			• Positively frame messages in the context of social responsibility and norms
			• Language to explain severity
			• Emphasize sense of personal control
				Low	Moderate-High

Lunn, P. D., Belton, C. A., Lavin, C., McGowan, F. P., Timmons, S., & Robertson, D. A. (2020). Using Behavioral Science to Help Fight the Coronavirus. *Journal of Behavioral Public Administration, 3*(1).	Mar 29, 2020 (Search date not reported)	Over 100 studies were reviewed; a description of included studies not provided	Systematic reviews find that multiple behavioural levers (education plus reminders, availability, social influences, and cues to capture attention) increase handwashing in healthcare settings. Clear and repeated messaging delivered by trusted leaders to establish social norms is necessary. Messaging around what is "best for all" is more effective than persuasion to undertake a certain behaviour. Cooperation is more likely when behaviours are publicly visible and there is social disapproval. Crisis communication requires tailoring for targeted audiences. Messages communicating 'threat' are more effective when self-efficacy is high. Also important in messaging is to be solution-focused or action-oriented. Invoking empathy in messaging has a positive influence on behaviour change. Communicating risk honestly (neither exaggerating or downplaying) builds trust and sets an example for others who play a role in risk perception (e.g., businesses and media). In communicating threats, there should also be clear messaging about extent of uncertainty, which can also build credibility.	Low	Not reported

Previously reported evidence from other topical areas					
Aya Pastrana, N., Lazo-Porras, M., Miranda, J. J., Beran, D., & Suggs, L. S. (2020). Social Marketing Interventions for the Prevention and Control of Neglected Tropical Diseases: A Systematic Review. *PLoS Neglected Tropical Diseases, 14*(6), e0008360.	Jun 17, 2020 (Search date not reported)	This systematic review included 47 articles describing 20 interventions to prevent neglected tropical diseases in 13 countries.	Interventions used a broad range of social marketing concepts and techniques. It is important for the intervention audiences and context to be understood when developing a social marketing intervention. Relationship building is critical – stakeholders should be involved from an early stage and can be involved in co-creation of intervention elements. Intervention strategies should be integrated and complementary to each other. Consider barriers to adoption of the desired behaviour. Effective interventions generally tended to incorporate health education and capacity building and were culturally appropriate.	Moderate	Moderate
McParland, J. L., Williams, L., Gozdzielewska, L., Young, M., Smith, F., MacDonald, J., ... Flowers, P. (2018). What Are the 'Active Ingredients' of Interventions Targeting the Public's Engagement With Antimicrobial Resistance and How Might They Work? *British Journal of Health Psychology, 23*(4), 804-819.	May 27, 2018 (Search date not reported)	20 studies included that examined active components and mechanisms of action of interventions that aimed to improve public awareness and behaviours regarding antimicrobial resistance.	The most common behaviour change techniques focused on education about consequences and instructions for performing antimicrobial resistance-related behaviours delivered by a credible source. Successful interventions included behaviour change techniques, including promoting beliefs regarding capability, behaviour reinforcement, encouraging commitment to behaviour change and imagining future outcomes if lack of behaviour change occurs, behavioural monitoring (+/- feedback), and provision of information on antecedents of behaviour.	High	Low

Carson, K. V., Ameer, F., Sayehmiri, K., Hnin, K., van Agteren, J. E., Sayehmiri, F., ... Smith, B. J. (2017). Mass Media Interventions for Preventing Smoking in Young People. *Cochrane Database of Systematic Reviews*.	Jun 2, 2017 (Search completed Jun 2016)	This systematic review included 8 studies (52,746 participants) that assessed the effects of mass media interventions on smoking behaviour among youth under 25 years of age. • 7 randomized controlled trials • 1 interrupted time-series Interventions included • Mass media alone (n=4) • Mass media plus school education (n=3) • Peer-led social media messaging (n=1)	Overall, certainty about the effects of mass media campaigns on smoking behaviours in youth is very low: • 3 studies found that mass media interventions reduced the smoking behaviours of young people • Five studies found no effect. Overall, effective campaigns tended to: • Use multiple channels for delivery (newspapers, television, radio, posters) • Last longer (minimum of 3 years) • Have more contact time for both school-based lessons and media spots • Build upon elements of existing effective campaigns • Carry out "developmental work" with representatives of the target audience • Use messages that were designed to reach the target audience (via media channels preferred by the target audience at the most appropriate times) • Combine campaigns with a structured support curriculum such as those available via school-based collaborations • Use social influence or social learning theory approach	High	Low

Ames, H. M., Glenton, C., & Lewin, S. (2017). Parents' and Informal Caregivers' Views and Experiences of Communication About Routine Childhood Vaccination: A Synthesis of Qualitative Evidence. *Cochrane Database of Systematic Reviews*.	Feb 7, 2017 (Search completed Aug 30, 2016)	This systematic review included 38 studies examining parent/caregiver perceptions of vaccine communication and its influence on childhood vaccination decisions (for children up to 6 years of age).	Type, quantity, and availability of information: • Provide credible sources of information using a balanced approach with both risks and benefits. • Provide information to health service and community settings. • Tailor information to needs; vaccine-hesitant parents may need different types and amounts of information. • Use a variety of strategies to provide information such as text messaging. Sources of information: • Health workers are important and trusted sources of information. • Health workers should have open, respectful discussions in a caring, sensitive, and non-judgmental way and provide clear answers to their questions. • Provide a supportive environment for decision-making. Poor communication and negative relationships with health workers sometimes impacted vaccination decisions. Timing of information: • Provide information clearly and simply and in good time prior to each vaccination appointment, not while vaccinating the child.	Moderate	Moderate-High
Penta, M. A., & Baban, A. (2018). Message Framing in Vaccine Communication: A Systematic Review of Published Literature. *Health Communication 33*(3), 299-314.	Jan 6, 2017 (Search completed Jul 2016)	This systematic review identified 34 studies comparing gain-framed versus loss-framed messages for vaccine communication.	Most studies found that goal framing had no effect on vaccine attitudes, intentions or uptake. Across studies, some participant characteristics appear to be mediators or moderators of the effect (e.g., perceived risk, loss avoidance, etc.), but findings are inconsistent.	Low	Not reported

Infanti, J., Sixsmith, J., Barry, M.M., Núñez-Córdoba, J., Oroviogoicoechea-Ortega, C., & Guillén-Grima, F. (2013). A Literature Review on Effective Risk Communication for the Prevention and Control of Communicable Diseases in Europe. *European Centre for Disease Prevention and Control*.	Jan 2013 (Search date not reported)	A number of models, guidelines and reviews were included (number not reported).	Risk communication messages often fail to reach intended communities; needs assessment and public engagement is critical. Clear objectives, consistent messages, transparent and credible decision making. Messages must contain precise details about what, when, how and for how long. Effective risk communication must include acknowledgement and explanations of complexities and uncertainties.	Low	Not reported
Cugelman, B., Thelwall, M., & Dawes, P. (2011). Online Interventions for Social Marketing Health Behavior Change Campaigns: A Meta-Analysis of Psychological Architectures and Adherence Factors. *Journal of Medical Internet Research 13*(1), e17.	Feb 14, 2011 (Search completed Jan 16, 2009)	This systematic review assessed online intervention design features to inform the development of online health campaigns seeking voluntary health behaviour change. 31 papers met the inclusion criteria. 29 of these described 30 interventions and 2 qualified for adherence analysis.	The impact of online interventions was small but significant. Most interventions used feedback mechanisms, with 83% using tailoring, while 40% used personalization combined with tailoring. Shorter interventions achieved the largest impacts – as the length of an intervention increased, behavioural impacts and intervention adherence decreased. Goal-oriented interventions, using multiple behaviour change components, and providing normative pressure appeared to be most effective.	Moderate	Not reported

Table 2: Single Studies

Reference	Date Released	Study Design	Population	Setting	Summary of findings	Quality Rating:
New Evidence Reported March 12, 2021						
Chen, T., Dai, M., Xia, S., & Zhou, Y. (2021). Do Messages Matter? Investigating the Combined Effects of Framing, Outcome Uncertainty, and Number Format on COVID-19 Vaccination Attitudes and Intention. *Health Communication*. Epub ahead of print.	Jan 27, 2021	Randomized controlled trial	n=413 adults aged 18 to 60	China	Participants were randomly assigned to view 1 of 8 news articles related to COVID-19 vaccination, which varied based on framing of messages (gain vs. loss), outcome uncertainty (certain vs. uncertain), and number format (frequency vs. percentage). Vaccination attitudes and intentions were compared between groups. No differences were found between groups on attitudes or intentions.	Moderate
Heydari, S. T., Zarei, L., Sadati, A. K., Moradi, N., Akbari, M., Mehralian, G., & Lankarani, K. B. (2021). The Effect of Risk Communication on Preventive and Protective Behaviours During the COVID-19 Outbreak: Mediating Role of Risk Perception. *BMC Public Health 21*(54).	Jan 6, 2021	Cross-sectional	n=3213 adults aged 15 and older	Iran	The association between risk communication and risk perception and protective and preventive behaviours during the COVID-19 pandemic was assessed via an online survey. 73% of participants receive COVID-19 news via national media and social networks. Applying the survey data to a risk communication model showed that risk communication and risk perception were positively correlated, such that communication related to accurate understanding of risk can influence risk perception and mitigation behaviours.	Moderate

Alsan, M., Stanford, F. C., Banerjee, A., Breza, E., Chandrasekhar, A. G., Eichmeyer, S., ... Duflo, E. (2020). Comparison of Knowledge and Information-Seeking Behavior After General COVID-19 Public Health Messages and Messages Tailored for Black and Latinx Communities: A Randomized Controlled Trial. *Annals of Internal Medicine*. Epub ahead of print.	Dec 21, 2020	Randomized controlled trial	n=7174 Black and 4520 Latinx adults	United States	Participants were randomized to receive one of 3 video messages from physicians that varied by physician race/ethnicity, acknowledgement of racism/inequality and community perceptions of mask wearing, or a control group. Seeing any video message reduced knowledge gaps (Incidence Rate Ratio (IRR)=0.737, 95% CI=0.643, 0.846) but did not change information-seeking. Messages from race/ethnic-concordant physicians increased information-seeking behaviour among Black participants (IRR=1.085, 95% CI=1.022, 1.153) but not for Latinx participants. Other tailoring efforts (e.g., acknowledging injustice and economic hardship, addressing fear of stigma and racism when wearing a mask) did not have a significant effect on information-seeking or knowledge. Intentions and behaviours were not explored.	High

Brewer, L. C., Asiedu, G. B., Jones, C., Richard, M., Erickson, J., Weis, J., ... Doubeni, C. A. (2020). Emergency Preparedness and Risk Communication Among African American Churches: Leveraging a Community-based Participatory Research Partnership COVID-19 Initiative. *Preventing Chronic Disease, 17*, E158.	Dec 10, 2020	Quasi-experimental	n=120 African American churches (number of congregation members not provided)	United States	This study describes the reach and engagement, feasibility, and acceptability of a COVID-19 emergency preparedness strategy using culturally relevant materials and community contacts within African American churches. Uptake of preventive measures was not studied. COVID-19 risks were communicated using message maps, containing 4 content areas: 1) inspirational messaging to promote spiritual, physical, and mental wellness; 2) COVID-19 health and preventive measures; 3) financial and community-based support resources; and 4) social support connections. Messages were disseminated via Zoom, Facebook Live, email, and social media channels. Results are described narratively: • Reach and engagement of Facebook posts increased over the course of the intervention. • The intervention was considered feasible. • Acceptability of the intervention overall was positive.	Moderate

Okuhara, T., Okada, H., & Kiuchi, T. (2020). Examining Persuasive Message Type to Encourage Staying at Home During the COVID-19 Pandemic and Social Lockdown: A Randomized Controlled Study in Japan. *Patient Education and Counseling*. Epub ahead of print.	Aug 21, 2020	Randomized controlled trial	n=1980 adults aged 18-69	Japan	Participants were randomized to receive persuasive messaging, from different narrators (e.g., local political leader, public health expert, physician, patient, resident or control). Intentions to stay home during lockdown, perceived severity, vulnerability, response efficacy, self-efficacy were measured. Messages delivered by a physician significantly increased intention to stay home in areas with high numbers of infections (mean change=0.34; 95% CI=0.26, 0.41), vs. political leader, mean change=0.17; 95% CI=0.11, 0.22); vs. expert, mean change=0.19; 95% CI=0.13, 0.25); vs. resident, mean change=0.17; 95% CI=0.12, 0.23). Messages delivered by a physician also increased perceived severity of the pandemic (mean change=0.23; 95% CI=0.14–0.32), vs. political leader, mean change=0.06; 95% CI=0, 0.12, response efficacy (mean change=0.37; 95% CI=0.29, 0.46) (vs. resident, mean change=0.19; C.I. 0.12, 0.26), and self-efficacy (mean change=0.33; 95% CI= 0.25, 0.41) vs. political leader, mean change=0.17; 95% CI=0.11, 0.23); vs. patient, mean change=0.16, 95% CI=0.09, 0.23).	High

Moreno, Á., Fuentes-Lara, C., & Navarro, C. (2020). COVID-19 Communication Management in Spain: Exploring the Effect of Information-Seeking Behavior and Message Reception in Public's Evaluation. *El profesional de la información*, *29*(4), e290402.	Jul 2, 2020	Cross-sectional	n=546	Spain	A survey was conducted from Mar 14-Apr 14, 2020 to assess how information forms and sources influence public information-seeking behaviours and perception of the government's crisis response strategies during the pandemic. Mainstream media use (television, newspapers and radio) was reported as high, with users of these platforms expressing more positive opinions of the government's crisis response. People who were mainly informed through Twitter (50.7%) and Facebook (49.5%) strongly believed that the government's communication confused the population, compared to those who used print newspapers (45.4%), online newspapers (46.7%), television (45.9%) and radio (43.8%). Results showed that people rely on different information channels during crisis situations with high simultaneous and multiplatform consumption of information. Television (86.2%), WhatsApp (77.6%), online newspapers (75%), and radio (42.6%) were the most frequently used information channels. Use of multiple and simultaneous platforms may contribute to over-information and contra-information. The inability of some users to discern unreliable messaging must be considered in planning. Factors related to media choice, including use of social media platforms, need to be understood for risk and crisis communication strategies and for further research.	Moderate

Previously Reported Evidence						
Sutton, J., Renshaw, S. L., & Butts, C. T. (2020). COVID-19: Retransmission of Official Communications in an Emerging Pandemic. *PLoS One, 15*(9), e0238491.	Sep 16, 2020	Cross-sectional	n=690 social media accounts	United States	This study explored spread of risk communication messages on social media through social media accounts of public health, emergency management, elected officials; 149,335 tweets analyzed. The following content increased odds of message spread: • Surveillance data (40%) • Technical information (30%) • Efficacy, how individual can protect themselves (28%) • Symptoms (27%) • Primary threat, using words to describe COVID-19 (21.5%) • Secondary threat, words describing threats resulting from COVID-19 (20%) • Official pandemic responses (19%) • Collective efficacy (12.5%) • Closures and openings (12%) Smallest positive effect on message retransmission was for content focused on resilience (6.8%) and susceptibility (4.6%). Factors that increase frequency of message retransmission include the use of: • Videos (63%) • Photos/images (27%) • Hashtags (12%) Factors that decreased message retransmission: • Use of quote tweets (7% decrease) • Mentioning another account (23% decrease) • Directly replying to a user (82% decrease) • Use of weblinks (30% decrease)	High

Purohit, N., & Mehta, S. (2020). Risk Communication Initiatives Amid COVID-19 in India: Analyzing Message Effectiveness of Videos on National Television. *Journal of Health Management, 22*(2), 262-280.	Aug 11, 2020	Cross-sectional	n=36 videos	India	A conceptual model of emergency risk communication was used as a tool to analyze the effectiveness of risk communication messages in 36 videos available in India from Mar-Apr 2020. The effectiveness of the videos at changing knowledge, attitudes or behaviours was not studied. Risk communication messages disseminated via videos demonstrated 9 key principles: • Scientifically accurate • Open and transparent messages • Clear messaging • Tailored messaging for target audiences • Consistency in messaging across different mediums • Repetition in messaging • Actionable messages, identify desirable behaviours • Timely dissemination of message • Messaging through multiple channels	Moderate
Liao, Q., Yuan, J., Dong, M., Yang, L., Fielding, R., & Lam, W. W. T. (2020). Public Engagement and Government Responsiveness in the Communications About COVID-19 During the Early Epidemic Stage in China: Infodemiology Study on Social Media Data. *Journal of Medical Internet Research 22*(5), e18796.	May 26, 2020	Cross-sectional	Weibo users	China	Engagement was compared between 644 Weibo posts from personal accounts and 273 posts from government agency accounts. Government posts focused mainly on pandemic updates, policies, guidelines and government response, and prevention messaging, using one-way communication. Government reassurance about risk was central to message content early on in the pandemic, which may have translated into low perception of risk. Personal posts more likely to show empathy to those affected, attribute blame to others/government, and express worry about pandemic; frequency in sharing of this content increased throughout the pandemic. There was lower public engagement with government agency posts with respect to likes, comments, and shares.	Moderate

Table 3: In-Progress Syntheses

Title	Anticipated Date of Completion	Setting	Description of Document
New evidence reported March 12, 2021			
Grimani, A., Bonell, C., Michie, S., Antonopoulou, V., Kelly, M., & Vlaev, I. (2020). *The Effect of Communication Strategies for Population Behaviour Change in Relation to Infectious Disease: A Systematic Review*. PROSPERO, CRD42020198874.	Apr 30, 2021	England	This systematic review will explore the effect of communication strategies with a focus on protecting others (mass media, social media, or small media [leaflets, posters] or health professional consultation) on population behaviour change in relation to infectious disease pandemics/ epidemics/ endemics.

Table 4: In-Progress Single Studies

Title	Anticipated Date of Completion	Setting	Description of Document
Previously Reported Evidence			
Dorison, C., Lerner, J. S., Heller, B. H., Rothman, A., Kawachi, I. I., Wang, K., … Coles, N. A. (2020). *A Global Test of Message Framing on Behavioural Intentions, Policy Support, Information Seeking, and Experienced Anxiety During the COVID-19 Pandemic*.	Not reported	Global	This research will experimentally test the effects of framing messages in terms of losses versus gains and examine effects on 3 primary outcomes: intentions to adhere to polices on COVID-19 prevention, opinions about these policies, and likelihood that participants seek additional policy information. Anxiety will be measured as a secondary outcome variable.
Betsch, C., Wieler, L., Bosnjak, M., Ramharter, M., Stollorz, V., Omer, S. B., … Schmid, P. (2020). *Germany COVID-19 Snapshot Monitoring (Cosmo Germany): Monitoring Knowledge, Risk Perceptions, Preventive Behaviours, and Public Trust in the Current Coronavirus Outbreak in Germany*.	Not reported	Germany	This serial cross-sectional study will collect data on public perceptions of COVID-19 risk, protective and preparedness behaviours weekly over a 10-week period (10 data collections) using an online platform. This will allow rapid and adaptive monitoring of these variables over time and assess the relations between risk perceptions, knowledge, and misinformation to preparedness and protective behaviour regarding COVID-19.

Table 5: Guidance Documents

Reference	Date Released	Summary of findings	Quality Rating:
Previously Reported Evidence			
The British Psychological Society. (2020, Apr 4). *Behavioural Science and Disease Prevention: Psychological Guidance*.	Apr 14, 2020	The British Psychological Society provides 9 recommendations to optimize communication during COVID-19: 1. Focus on collective vs. individual 2. Deliver messages from a source viewed as credible to the target audience 3. Create worry but not fear 4. Ensure policies, messages and interventions target behavioural influences including capabilities, opportunities and motivations 5. Clearly specify behaviours 6. Avoid unintended consequences and consider equity 7. Create clear channels across levels of health literacy 8. Engage with behavioural scientists and rely on psychological evidence 9. Use a multidisciplinary approach	Low ***NOT PEER REVIEWED***
World Health Organization. (2020, Mar 19). *Risk Communication and Community Engagement Readiness and Response to Coronavirus Disease (COVID-19): Interim Guidance, 19 March 2020*.	Mar 19, 2020	Action steps for risk communication and community engagement follows 6 main categories: risk communication systems, internal and partner coordination, public communication, community engagement, addressing uncertainty and perceptions and managing misinformation, and capacity building. Countries preparing for COVID-19 cases (no identified cases): • Communicate about preparedness activities and public health advice • Identify communication capacity and main stakeholders and form partnerships • Train risk communication and community engagement staff Countries where 1 or more identified COVID-19 cases: • Engage in two-way communication with public, address misinformation, misunderstandings, common questions • Encourage protective behaviours • Communicate uncertainties • Coordinate collaboration among response partners • Assess risk perception of public • Information delivery Countries with ongoing COVID-19 transmission: • Adapt and apply initial response steps • Modify risk communication plan based on risk perception and public questions • Focus on public resilience • Monitor processes for evaluation	Moderate ***NOT PEER REVIEWED***

World Health Organization. (2018, Jan 10). *Communicating Risk in Public Health Emergencies: A WHO Guideline for Emergency Risk Communication Policy and Practice*.	Jan 10, 2018	3 primary recommendations for risk communication in public health emergencies: 1. Building trust and engaging with affected populations: • Trust: consider accessibility, demonstrate transparency, timeliness, disseminate using multiple platforms, methods • Communicating uncertainty: acknowledge information that is known and unknown, provide explicit information about uncertainties related to risk, events, interventions • Community engagement: identify and involve key trusted community leaders 2. Integrate emergency risk communication (ERC) into health and emergency response systems: • Governance and leadership: Strategically integrate ERC role into responsibilities of global and national emergency preparedness and response leadership teams • Information systems and coordination: develop and maintain multi-disciplinary networks across geography • Tailor information and communication systems: involve stakeholders to ensure relevance of messaging and dissemination across sectors • Capacity building: regular training of ERC personnel with focus on stakeholder coordination • Finance: Allocate sustained funding to ERC as part of emergency preparedness and response 3. ERC practice: • Strategic communication planning: Overarching planning is required that includes process of needs assessment, objective setting, coordinated implementation of interventions, monitoring and evaluation of activities • Monitoring and evaluation tools: further research required • Social media: can be used for public engagement, increase awareness, monitor and manage misinformation, public concerns	High ***NOT PEER REVIEWED***

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