

# Optimizing Compliance with COVID-19 Public Health Interventions

## Disclaimer:

This *Quick Response Report* was published on October 14, 2020. Given the rapidly changing nature of the coronavirus pandemic, some of the references included in this report may quickly become out-of-date. We further caution readers that researchers at the Newfoundland & Labrador Centre for Applied Health Research are not experts on infectious diseases and are relaying work produced by others. This report has been produced quickly and it is not exhaustive, nor have the included studies been critically appraised.

Readers will note that some text below has been highlighted for emphasis.

## Original Request

**How can the health system optimize people's compliance with public health interventions?**

## Summary of Findings

- For the purposes of this report, we understood the context for the original request to be the COVID-19 pandemic and public health interventions intended to reduce transmission. We further understood that the request referred to ways in which public health interventions may be designed and/or delivered in order to maximize compliance.
- The available research evidence and expert opinion indicate that public health interventions that apply theories of behaviour change are more effective at increasing public health intervention uptake and maintenance than those that do not.
- Behavior change science is not yet well-represented in the public health research literature nor integrated in public health practice, leading to common errors, including the beliefs that public health interventions are just common sense, that knowledge and information drive behaviour, and that people act rationally (Kelly & Barker, 2016).
- However, since the COVID-19 crisis “requires large-scale behaviour change and places significant psychological burdens on individuals, insights from the social and behavioural sciences can be used to help align human behaviour with the recommendations of epidemiologists and public health experts” (Van Bavel et al., 2020).
- The available research-based evidence and expert opinion includes recommendations for the design, content, and delivery of public health communications, for actions to create supportive environmental conditions, and for the collaboration between public health and behavioral science experts and specialists in communication sciences.

## Guidance from Health Authorities

### Specific to the COVID-19 Pandemic

Alberta Health Services. [Attitudes and Adherence to COVID-19 Guidelines](#). September 17, 2020. [LINK](#)

- Provides an evidence summary of existing research in the field.
- Includes six recommendations for public health messaging, content, and delivery, government action to create favourable environmental conditions, and for public health officials to work with behavioral scientists and experts in communication sciences, including the Behavior Change Wheel (see Michie et al., 2011 below).

Health Canada. [Community-based measures to mitigate the spread of coronavirus disease \(COVID-19\) in Canada](#). May 30, 2020. [LINK](#)

- See [Appendix A: Communications and public education](#). Includes sections on: maintaining public trust, maintaining good relationships with stakeholders and media, messaging, stigma, misinformation, and community engagement.

Related:

- [COVID-19 pandemic guidance for the health care sector](#). April 22, 2020. [LINK](#)

Centres for Disease Control (CDC). [Public Health Communicators: Get Your Community Ready. Interim guidance for COVID-19](#). March 1, 2020. [LINK](#)

- “This guidance provides information about nonpharmaceutical interventions (NPIs) and their use during a COVID-19 outbreak.”

Related:

- NB: The following guidance documents are not COVID-19 specific, but are still considered directly relevant to the current pandemic.
- CDC. [Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome \(SARS\)](#). May 3, 2005. [LINK](#)
  - See [Supplement G: Communication and Education](#)
- CDC. [Interim Pre-pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States—Early, Targeted, Layered Use of Nonpharmaceutical Interventions](#). February, 2007. [LINK](#)
  - See Chapter 9: Assessment of the Public on Feasibility of Implementation and Adherence (p49)
- CDC. [CDC Field Epidemiology Manual](#). December 14, 2018. [LINK](#)
  - [Chapter 11: Developing Interventions](#). Broad overview of interventions, includes guiding principles
  - [Chapter 12: Communicating During an Outbreak or Public Health Investigation](#). Includes sections on: trust and credibility, effective messaging during an outbreak responses, working with news media.

### From Before the COVID-19 Pandemic

WHO. [WHO outbreak communication planning guide](#). 2008. [LINK](#)

- Extensive guidance on communication planning, including chapters on: assessment, coordination, transparency, listening during outbreaks, communication evaluation, emergency communication plans, and training.

## Systematic Reviews

### Specific to the COVID-19 Pandemic

Seale et al. [Improving the impact of non-pharmaceutical interventions during COVID-19: examining the factors that influence engagement and the impact on individuals](#). BMC Infectious Disease, August 17, 2020. [LINK](#)

- “The results revealed that there are a range of demographic, social and psychological factors underpinning engagement with quarantine, school closures, and personal protective behaviours. Aside from the factors impacting on acceptance and compliance, there are several key community concerns about their use that need to be addressed including the potential for economic consequences.”

### From Before the COVID-19 Pandemic

Lin et al. [What have we learned about communication inequalities during the H1N1 pandemic: a systematic review of the literature](#). BMC Public Health, May 21, 2014. [LINK](#)

- “Consistently across studies, a number of potential predictors of behavioral compliance to preventive recommendations during a pandemic were identified. Our findings show the need to include such evidence found in the development of future communication campaigns to ensure the highest rates of compliance with recommended protection measures and reduce communication inequalities during future emergencies”

Michie et al. [The behaviour change wheel: A new method for characterising and designing behaviour change interventions](#). Implementation Science, April 23, 2011. [LINK](#)

- “Nineteen frameworks were identified covering nine intervention functions and seven policy categories that could enable those interventions.”
- “At the centre of a proposed new framework is a 'behaviour system' involving three essential conditions: capability, opportunity, and motivation (what we term the 'COM-B system'). This forms the hub of a 'behaviour change wheel' (BCW) around which are positioned the nine intervention functions aimed at addressing deficits in one or more of these conditions; around this are placed seven categories of policy that could enable those interventions to occur.”

## Other Reviews

### Specific to the COVID-19 Pandemic

Weston et al. [Examining the application of behaviour change theories in the context of infectious disease outbreaks and emergency response: a review of reviews](#). BMC Public Health, October 1, 2020. [LINK](#)

- “The current paper presents a synthesis of review literature discussing the application of behaviour change theories within an infectious disease and emergency response context, with a view to informing infectious disease modelling, research and public health practice.”
- “The Discussion section details several key recommendations to help researchers, practitioners, and infectious disease modellers to incorporate these theories into their work.”
- “Overall, this review identifies a range of more commonly applied theories with broad support for their use within an infectious disease and emergency response context. The Discussion

section details several key recommendations to help researchers, practitioners, and infectious disease modellers to incorporate these theories into their work.”

West et al. [Applying principles of behaviour change to reduce SARS-CoV-2 transmission](#). Nature Human Behaviour, May 6, 2020. [LINK](#)

- “This paper focuses on adherence to behaviours required to reduce virus transmission. We argue that there is an urgent need to develop and evaluate interventions to promote effective enactment of these behaviours and provides a preliminary analysis to help guide this.”
- “Interventions to target individual behaviours such as these could potentially lead to substantial population-level effects, and behavioural science models and methods can be used to develop and evaluate such interventions. There is currently a dearth of evidence on interventions to achieve these behaviour changes and an urgent need to rectify this”

Webster et al. [How to improve adherence with quarantine: rapid review of the evidence](#). Public Health, May 2020. [LINK](#)

- “The main factors which influenced or were associated with adherence decisions were the knowledge people had about the disease and quarantine procedure, social norms, perceived benefits of quarantine and perceived risk of the disease, as well as practical issues such as running out of supplies or the financial consequences of being out of work.”

Van Bavel et al. [Using social and behavioural science to support COVID-19 pandemic response](#). Nature Human Behaviour, April 30, 2020. [LINK](#)

- “Here we discuss evidence from a selection of research topics relevant to pandemics, including work on navigating threats, social and cultural influences on behaviour, science communication, moral decision-making, leadership, and stress and coping. In each section, we note the nature and quality of prior research, including uncertainty and unsettled issues”

Eaton & Kalichman. [Social and behavioral health responses to COVID-19: lessons learned from four decades of an HIV pandemic](#). Journal of Behavioural Medicine, April 25, 2020. [LINK](#)

- “Here we outline broad, scoping lessons learned from the HIV literature tailored to the nature of what we currently know about COVID-19. We focus on multiple levels of intervention including intrapersonal, interpersonal, community, and social factor.”

Lunn et al. [Using Behavioral Science to help fight the Coronavirus](#). Journal of Behavioral Public Administration, March 29, 2020. [LINK](#)

- Review of multi-disciplinary research addressing five issues: “handwashing, face touching, self-isolation, public-spirited behavior, and responses to crisis communication.”

### From Before the COVID-19 Pandemic

Kelly & Barker. [Why is changing health-related behaviour so difficult?](#) Public Health, May 13, 2016. [LINK](#)

- “Policy makers consistently and habitually commit a number of errors when they set about changing health-related behaviour. Our evidence for this comes from England but our criticisms apply much more broadly. We draw attention to these six errors and suggest a different way of thinking about behaviour change using recent understandings derived from the social and psychological sciences.”

- “Six common errors: 1) It is just common sense; 2) It is about getting the message across; 3) Knowledge and information drive behaviour; 4) People act rationally; 5) People act irrationally; and 6) It is possible to predict accurately.”

Reynolds et al. [The Problem of Behaviour Change: From Social Norms to an Ingroup Focus](#). Social and Personality Psychology Compass, January 6, 2015. [LINK](#)

- “To fully understand behaviour change, it is argued that greater engagement is needed with the links between shifts in social identity, and ingroup norms. As definitions of who “we” are shift, so too does what “we” do. Implications for behaviour change interventions are discussed.”

Bish & Michie. [Demographic and attitudinal determinants of protective behaviours during a pandemic: A review](#). British Journal of Health Psychology, January 10, 2010. [LINK](#)

- “The primary objectives of this review are to identify the key demographic and attitudinal determinants of three types of protective behaviour during a pandemic: preventive, avoidant, and management of illness behaviours, in order to describe conceptual frameworks in which to better understand these behaviours and to inform future communications and interventions...”

Glanz & Bishop. [The Role of Behavioral Science Theory in Development and Implementation of Public Health Interventions](#). Annual Review of Public Health, January 4, 2010. [LINK](#)

- “This article provides an overview of the state of the science of theory use for designing and conducting health-promotion interventions... This summary is followed by a review of the evidence about patterns and effects of theory use in health behavior intervention research. Examples of applied theories in three large public health programs illustrate the feasibility, utility, and challenges of using theory-based interventions. This review concludes by identifying cross-cutting themes and important future directions for bridging the divides between theory, practice, and research.”

## Protocols for Forthcoming Research

Noone et al. [Investigating and evaluating evidence of the behavioural determinants of adherence to social distancing measures – A protocol for a scoping review of COVID-19 research](#). HRB Open Research, September 10, 2020. [LINK](#)

- “This scoping review will focus on answering key questions about the state of the evidence on the behavioural determinants of adherence to social distancing measures in research on COVID-19.”

## Expert Opinion

### Specific to the COVID-19 Pandemic

Henderson et al. [Developing and Maintaining Public Trust During and Post-COVID-19: Can We Apply a Model Developed for Responding to Food Scares?](#) Frontiers in Public Health, July 14, 2020. [LINK](#)

- “This paper discusses how a model for developing and maintaining trust in public health officials during food safety incidents and scandals might be applied to pandemic management. The model identifies ten strategies to be considered, including: transparency; development of protocols and procedures; credibility; proactivity; putting the public first; collaborating with stakeholders; consistency; education of stakeholders and the public; building your reputation; and keeping your promises.”

Bonnell et al. [Harnessing behavioural science in public health campaigns to maintain 'social distancing' in response to the COVID-19 pandemic: key principles](#). Journal of Epidemiology and Community Health, May 8, 2020. [LINK](#)

- "... a body of behavioural science exists which can usefully inform the current interventions [of social distancing] and promote adherence to these restrictive measures. This body of science has been developed through the study of other infections (including other coronaviruses such as MERS and SARS), other areas of health and other areas of behaviour."
- Key principles: 1) Clear and specific guidance; 2) 'Protect each other' messages; 3) 'Stand together' messages; 4) 'This is who we are' messages; 5) Avoid messages based on fear or disgust in relation to other people; 6) Avoid authoritarian messages; 7) 'Make a plan and review it regularly'; 8) Make it possible' messages; 9) Style of messaging; 10) Theory of change; and 11) Co-design.

Finset et al. [Effective health communication – a key factor in fighting the COVID-19 pandemic](#). Patient Education and Counseling, April 23, 2020. [LINK](#)

- Discusses four elements necessary for effective health communication: 1) open admission of knowns and unknowns; 2) consistency and specificity; 3) demonstrate decision making in situations of uncertainty with confidence and honesty; 4) acknowledge emotions.

British Psychological Society. [Behavioural science and disease prevention: Psychological guidance](#). April 14, 2020. [LINK](#)

- Summarizes nine recommendations to "optimise policies and communication", including: messaging design, content, and delivery; structuring communication channels; and using "behavioural scientists and the psychological evidence base to support the Covid-19 response"

Yardley et al. [How can we involve communities in managing the covid-19 pandemic?](#) BMJ Opinion, March 17, 2020. [LINK](#)

- "Research on responses to public health emergencies has shown that people will cooperate to achieve common goals if they feel like they are part of a shared communal effort, and if they believe the people leading this effort are part of the same "community of circumstance" and are acting legitimately on their behalf. Providing clear, detailed information to justify recommended actions promotes trust that leaders and policymakers are acting in the common good, which increases motivation to support and engage with public health advice."

Michie et al. [Slowing down the covid-19 outbreak: changing behaviour by understanding it](#). BMJ Opinion, March 11, 2020. [LINK](#)

- "Changing behaviour is not easy. However, there are many strategies to help people change behaviour that focus on increasing motivation, capability and/or opportunity to perform the behaviours. Here we focus on strategies that improve motivation or capability."
- Behaviour change principles: 1) Create a mental model; 2) Create social norms; 3) Create the right level and type of emotion; 4) Replace one behaviour with another; and 5) Make the behaviour easy.

The following articles are preprints and have not been peer-reviewed. They report new medical research that has yet to be evaluated and so should not be used to guide clinical practice.

Curtis et al. [Strategic thinking in a pandemic: A Blueprint for Government-led National Hygiene Communication Campaigns to combat COVID-19](#). Pre-Print / Not Peer Reviewed, May 3, 2020. [LINK](#)

- “Our aim here is to provide a blueprint that governments and their partners, especially in low income settings, can follow to design, coordinate and resource national communications efforts to combat the COVID-19 pandemic.”

## Primary Research

### Specific to the COVID-19 Pandemic

Gkini. [Health Behaviour Theories and the Norwegian response to COVID-19: a System Dynamics Modeling approach](#). Master's Thesis, August 12, 2020. [LINK](#)

- System Dynamics simulation modeling of Health Behaviour theories, showing “the importance of communication strategies in the management of environmental Threats and, in line with known theories, suggests that it is optimal to share messages that not only highlight the significance of the Threat, but also emphasise the Efficacy of a proposed behavioural response in mitigating it.”
- Addresses the following research questions:
  - Is the behavioural response of the population, in terms of compliance with proposed behavioural measures, significant for the prevalence of Covid-19 in the population?
  - Are there additional mechanisms that can be utilised to enhance compliance with proposed behavioural measures?
  - Can targeted information regarding the effectiveness of the proposed measures have a significant impact?
  - Can existing theoretical frameworks of decision making in response to environmental threats to our wellbeing be combined in a unified framework?

Mækellæ et al. [Perceived efficacy of COVID-19 restrictions, reactions and their impact on mental health during the early phase of the outbreak in six countries](#). Royal Society Open Science, August 12, 2020. [LINK](#)

- “School closings were perceived as having the strongest effect on daily life. Participants who believed their country reacted too mildly perceived the risk of contracting SARS-CoV-2 to be higher, were more worried and expressed reduced beliefs in the ability to control the outbreak. Relatedly, dissatisfaction with governmental reactions corresponded with increased distress levels. Together, we found that satisfaction with one's governmental reactions and fear appraisal play an important role in assessing the efficacy of restrictions during the pandemic and their related psychological outcomes.”

Park et al. [Americans' COVID-19 Stress, Coping, and Adherence to CDC Guidelines](#). Journal of General Internal Medicine, May 29, 2020. [LINK](#)

- “CDC guideline adherence was generally high, but several key social distancing and hygiene behaviors showed suboptimal adherence, particularly for men and younger adults... Subgroups less likely to adhere to CDC guidelines may benefit from targeted information campaigns. These findings may guide mental health interventions and inform policy-making regarding implications of specific public health measures.”



Michie et al. [Reducing SARS-CoV-2 transmission in the UK: A behavioural science approach to identifying options for increasing adherence to social distancing and shielding vulnerable people](#). British Journal of Health Psychology, May 19, 2020. [LINK](#)

- “For promoting social distancing, 10 options were identified for improving adherence. They covered improvements in ways of achieving the [Behaviour Change Wheel (BCW)] intervention types of education, persuasion, incentivization, and coercion. For promoting shielding of vulnerable people, four options were identified covering the BCW intervention types of incentivization, coercion, and enablement.”

Lohiniva et al. [Understanding coronavirus disease \(COVID-19\) risk perceptions among the public to enhance risk communication efforts: a practical approach for outbreaks, Finland, February 2020](#). Eurosurveillance, April 2, 2020. [LINK](#)

- Examines five risk perception domains: 1) Catastrophic potential, 2) Probability of death, 3) Reasons for exposure, 4) Controllability of beliefs, 5) Trust; and provides recommendations for communication strategies for mitigation.

The following articles are preprints and have not been peer-reviewed. They report new medical research that has yet to be evaluated and so should not be used to guide clinical practice.

Everett et al. [The effectiveness of moral messages on public health behavioral intentions during the COVID-19 pandemic](#). PsyArXiv Preprints, September 23, 2020. [LINK](#)

- “... our preliminary results suggest that public health messaging focused on duties and responsibilities toward family, friends and fellow citizens is a promising approach for future studies of interventions to slow the spread of COVID-19 in the US.”

From Before the COVID-19 Pandemic

Moran & Sussman. [Translating the Link Between Social Identity and Health Behavior Into Effective Health Communication Strategies: An Experimental Application Using Antismoking Advertisements](#). Health Communication, January 21, 2014. [LINK](#)

- “Specifically, we found that as participants identified more with the group targeted by the ad, they subsequently had stronger levels of one key antismoking belief presented by the ad.”

## News Articles

World Economic Forum. [How behavioral science can promote positive actions during COVID-19](#). June 10, 2020. [LINK](#)

- Behavioral studies have shown how certain techniques can help persuade people to carry out desirable behaviors during COVID-19.
- Policing hand washing and social distancing is difficult, but through nudges and heuristics, can be achieved.
- The power of conformity has been proven to rapidly change people's behaviour.

The Conversation. [Coronavirus: why changing human behaviour is the best defence in tackling the virus](#). March 26, 2020. [LINK](#)

- “The World Health Organization (WHO) recognises the value of human behaviour in managing pandemics. Its Outbreak Communications Planning Guide suggests behaviour changes can reduce the spread by as much as 80%.”



## Methodology

Newfoundland and Labrador Centre for Applied Health Research (NLCAHR) COVID-19 Quick Response reports are initiated by, and shared with, our partners in the provincial health system, including the four Regional Health Authorities, the Departments of Health and Community Services and Children, Seniors and Social Development, and public health officials.

NLCAHR staff work with topic submitters to clarify the research question. We then search for related systematic reviews, meta-analyses, other reviews, interim and other guidance statements, primary research, expert opinion and health and science reporting.

NLCAHR researchers carried out individual internet searches (Google and Google Scholar), and divided, and searched, the following databases:

- [Alberta Health Services](#)
- [CADTH](#)
- [Canadian Pharmacists Association](#)
- [Campbell Collaboration](#)
- [Cochrane Collaboration](#)
- [Centre for Disease Control](#)
- [Centre for Evidence Based Medicine](#)
- [Evidence for Policy and Practice Information and Co-ordinating Centre](#)
- [European Centre for Disease Prevention and Control](#)
- [Health Canada](#)
- [HIQA \(Ireland\)](#)
- [Joanna Briggs Institute](#)
- [MedRxiv](#)
- [National Collaborating Centres on Methods and Tools \(NCCMT\)](#)
- [National Institutes of Health](#)
- [National Institute of Allergy and Infectious Diseases](#)
- [National Library of Medicine](#)
- [Public Health Agency of Canada](#)
- [Trip Database](#)
- [World Health Organization](#)

Each researcher screened the search results and extracted data, and checked the other's work. The two researchers wrote and edited the report together.

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