

HEALTH EVIDENCE NETWORK SYNTHESIS REPORT 72

What are relevant, feasible and effective approaches to promote acceptance, uptake and adherence to physical distancing measures for COVID-19 prevention and control?

Rebecca E Ryan | Anne Parkhill | Lina Schonfeld | Louisa Walsh | Dianne Lowe |
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Abstract

Physical distancing measures have been implemented worldwide to contain the transmission of COVID-19, but how best to communicate with the public to promote acceptance, uptake and adherence to these measures is less clear. This rapid review analysed evidence regarding communication with individuals and communities within the wider structural and sociopolitical context of the pandemic to support public health decision-makers when planning and implementing physical distancing measures. Findings indicated the critical role played by public communication and information in the pandemic response. Consistent features of effective communication included clear, consistent and actionable content; attention to the timing and currency of messages; consideration of the audiences for communication within and across populations; and deliberate considerations of tailoring and equity to ensure diverse population groups are reached and existing inequalities addressed. Comprehensive practical support, including access to essential services and financial support, was also critical to promote acceptance, uptake and adherence to required measures. Findings also emphasized the importance of building and maintaining public trust in authorities and of engaging communities when planning and delivering messages related to physical distancing measures.

Keywords

COMMUNICABLE DISEASE CONTROL, CORONAVIRUS, HEALTH EDUCATION, RISK ASSESSMENT
SELF CARE, SOCIAL ISOLATION, SOCIOECONOMIC FACTORS

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CONTENTS

- ▶ Abbreviations iv
- ▶ Acknowledgements v
- ▶ Summary vii
- ▶ 1. Introduction 1
 - ▶ 1.1 Background 1
 - ▶ 1.2 Promotion of acceptance of physical distancing measures 3
 - ▶ 1.3 Aim of this report 5
 - ▶ 1.4 Methodology 5
- ▶ 2. Results 7
 - ▶ 2.1 Theme 1: features of public communication: content, timing and duration, and delivery 9
 - ▶ 2.2 Theme 2: recipients of public communication: audience, setting and equity 15
 - ▶ 2.3 Theme 3: support for individual and population behavioural changes 19
 - ▶ 2.4 Theme 4: community engagement to support communication 24
 - ▶ 2.5 Theme 5: public trust and perceptions 25
 - ▶ 2.6 Theme 6: communication regarding distancing measures in schools and workplaces 26
- ▶ 3. Discussion 28
 - ▶ 3.1 Strengths and limitations of this review 28
 - ▶ 3.2 Summary of key findings 31
 - ▶ 3.3 Policy considerations 37
- ▶ 4. Conclusions 38
- ▶ References 39
- ▶ Annex 1. Search strategies and methods 43

ABBREVIATIONS

EEA	European Economic Area
EU	European Union
EVD	Ebola virus disease
MERS	Middle East respiratory syndrome
NPI	non-pharmaceutical intervention
RCT	randomized controlled trial
SARS	severe acute respiratory syndrome
TB	tuberculosis

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SUMMARY

The issue

The COVID-19 pandemic has required populations worldwide to undertake physical distancing measures in order to prevent and control transmission. This has required public health communication to convey knowledge of both why and how to change behaviour in order to protect health. The term physical distancing is used in preference to social distancing as the measures focus on reducing physical contact as a means of interrupting transmission, rather than reduction of social contact alone.

The synthesis question

This rapid review examines the question “What are relevant, feasible and effective approaches to promote acceptance, uptake and adherence to physical distancing measures for COVID-19 prevention and control?”

Types of evidence

Structured, weekly searches from 10 April 2020 to 1 May 2020 examined published and unpublished (grey) sources to identify all existing papers in English from 1946 onwards in the databases that covered all forms of promotion or communication for physical distancing in COVID-19 or similar infectious diseases in settings outside health care. A total of 31 papers were identified, which included guidelines, systematic reviews and primary studies.

Results

Public communication and information during a pandemic form a critical part of the response. How well these are planned and implemented impacts the behaviours of individuals and communities and, therefore, the overall success of measures such as physical distancing. Several features of public information and communication appear critical and were consistently identified in the evidence reviewed.

First, the public needs information that is clear, accurate and timely; provides actionable messages related to physical distancing; and is updated over the whole pandemic course so that people are accurately informed about risk and what they need to do.

Secondly, practical support is also needed, in addition to information and communication, to enable people to adhere as closely as possible to physical distancing measures and ensure their access to essential services such as food, medicines and financial support.

Thirdly, information for the public needs to convey consistent messages using understandable language. Information that is consistent, from different sources and disseminated in multiple ways (platforms, methods or channels) is most likely to be accessible, trusted and acted upon.

Any efforts to communicate with and inform populations need to be tailored to local contexts, to assure acceptability and reach across the community and to meet diverse needs. Public health decision-makers need to consider existing inequalities such as socioeconomic or educational inequalities when planning for the implementation of physical distancing measures; failure to do this may exacerbate difficulties in a pandemic outbreak. Vulnerable or disadvantaged communities may require additional targeted support to take up preventive measures.

Community engagement can help to ensure that messages are tailored to reach specific groups within the population, can help to ensure appropriateness to local contexts and can identify ways to improve the reach of public health communication, including for hard-to-reach groups such as refugees and migrants.

Policy considerations

This review identified consistent features of communication for physical distancing that could promote acceptance, uptake and adherence and be applied to any medium or type of communication in order to have the best chance of success. Based on these findings, the main policy considerations are to:

- clearly define the roles of different levels of government and of health and welfare agencies in promoting physical distancing and establish trusted lines of communication between the community and public health authorities;
- ensure clear, consistent, actionable and timely information about all aspects of physical distancing, including collective benefits and harms, supports and services;
- regularly assess communications for impact and monitor community attitudes and behaviours, particularly with regard to the unforeseeable period over

which physical distancing measures could be needed, so that adjustments can be made to support high-quality, effective public health messages;

- support implementation with practical support and services (e.g. essential services and financial support) and proactively counter stigma related to physical distancing measures, particularly those that are the most restrictive such as quarantine;
- tailor information and support to reach all groups within populations, giving explicit consideration of any inequalities and the needs of hard-to-reach and vulnerable populations;
- engage communities in developing and disseminating information for physical distancing and ensure that advisory mechanisms are in place that involve community members alongside other experts; and
- ensure that existing inequities, and the potential effect of physical distancing measures to magnify these, are considered in policy-making and decision-making for public health protection.

Additional annex that describes performed quality assessment is available on request from epub@who.int.



1. INTRODUCTION

1.1 Background

On 30 January 2020, following the recommendations of the Emergency Committee, the WHO Director-General declared that the outbreak of novel COVID-19 constituted a Public Health Emergency of International Concern (1). The new coronavirus SARS-CoV-2 (COVID-19) is easily transmitted through close contact with an infectious person, through droplets from coughing or sneezing, or from touching infected objects or surfaces. Since January 2020 it has spread across the world, and by 25 October 2020 more than 42 million people had been reported worldwide with confirmed COVID-19, with over 1.1 million deaths. Two coronaviruses new to humans and causing respiratory illness and potentially death have occurred since 2000: SARS-associated coronavirus (SARS-CoV), causing severe acute respiratory syndrome (SARS), was first reported in 2003; and MERS-CoV, causing Middle East respiratory syndrome (MERS), was first reported in 2012.

Numbers of both cases and deaths with COVID-19 are continuing to rise rapidly across the world, with considerable variation geographically (2). However, the COVID-19 pandemic is far more than a global health crisis and has significant detrimental social and economic impacts that will likely be felt for years to come. Furthermore, vulnerable segments of populations across the world have been particularly affected, with the risk that this pandemic will amplify local and global inequities (1,2).

In the absence of a vaccine or an effective treatment for COVID-19, and because population levels of immunity remain low, measures to effectively prevent and control transmission of the disease are essential. As of October 2020, many countries have implemented various readily available non-pharmaceutical interventions (NPIs) to prevent transmission and control the spread of COVID-19. Several countries have successfully used such measures to lower transmission rates within their populations and, depending on the rates achieved, are in different stages of relaxing or reinstating the measures.

NPIs can be implemented both inside and outside health-care settings. This review focuses on NPIs to reduce disease transmission in the community (i.e. not within health-care settings) (3). The focus is physical distancing measures, as one of a possible suite of NPIs more broadly implemented to prevent and contain transmission of COVID-19. More specifically, the focus is on measures to promote and communicate with individuals and populations about physical distancing measures.

Implementing and sustaining behavioural change to enact physical distancing measures on a mass level has proven challenging across the world. However, an analysis of the epidemic progression in the European Union/European Economic Area (EU/EEA) and the United Kingdom indicates that the introduction of community-level physical distancing measures has been partly successful, as some countries are transitioning to, or have reached, a situation where transmission is reduced to localized clusters (4). However, there are still high levels of transmission in many countries across the world, with concerns about emergence of a second wave of the pandemic in many. There is, therefore, significant interest in understanding how to promote acceptance of, adherence to and sustained uptake of such measures, as this will be key for supporting the implementation of physical distancing measures during any further waves of the pandemic should they emerge.

Physical distancing measures comprise a suite of public health measures that can be implemented in efforts to limit the spread of a pandemic disease outbreak such as COVID-19. This review uses the term physical distancing in preference to social distancing as these measures focus on reducing physical contact as a means of interrupting transmission, rather than reduction of social contact alone; however, the concept has also recently been referred to as social and physical distancing measures (3).

Box 1 outlines physical distancing measures that can be implemented singly or in various combinations to prevent and control the spread of infectious diseases (5,6). The measures considered relevant in this review were selected based on consultation with WHO and by drawing on the key physical distancing strategies identified and defined by WHO in relation to pandemic influenza (5). Contact tracing is included as part of the suite of physical distancing measures as it forms one of the key measures outlined by WHO for the control of pandemic influenza and is also a key strategy in containing the spread of pandemic COVID-19 within the community. Similarly, school and workplace measures were also explicitly identified by the WHO pandemic influenza guidelines and, in consultation with WHO, were agreed as specific areas of focus for this review, given the role of both sets of measures in the current pandemic. Physical distancing measures are most often implemented alongside a comprehensive package of NPIs and other response measures rather than in isolation.



Box 1. Definitions for physical distancing measures

Contact tracing. The identification and follow-up of persons who may have come into contact with an infected person, usually in combination with quarantine of identified contacts.

Crowd avoidance. Measures to reduce virus transmission in crowded areas/mass gatherings, including restrictions on gatherings, and approaches for individual distancing in homes, shops, workplaces, public transport and public places.

Isolation. Reduction in virus transmission from an ill person to others by confining symptomatic individuals for a defined period either in a special facility or at home.

Quarantine. Isolation of individuals who contacted a person with proven or suspected viral illness, or travel history to an affected area, for a defined period after last exposure, with the aim of monitoring them for symptoms and ensuring the early detection of cases.

School measures. Closure of schools when virus transmission is observed either in the school or community, or an early planned closure of schools before virus transmission initiates.

Work measures, including closures. Measures to reduce virus transmission in the workplace, or on the way to and from work, by decreasing the frequency and length of social interactions. May include closure of workplaces when virus transmission is observed in the workplace, or an early planned closure of workplaces before virus transmission initiates.

Source: taken from WHO, 2019 (6).

1.2 Promotion of acceptance of physical distancing measures

The primary focus of this review is on approaches to promote acceptance, uptake and adherence to physical distancing; that is, communication to improve acceptance, uptake and adherence rather than the effects of physical distancing per se. The definition of “approaches to promote physical distancing” used was informed by the comprehensive intervention taxonomy of the Cochrane Consumers and Communication Group, which includes all approaches that influence the way in


which people interact with or participate in their health care (7,8). Such approaches include those that

- provide information or education
- remind or reinforce messages
- enable communication and/or decision-making actions
- promote the acquisition of skills and support behavioural change
- involve the community in decision-making.

Adopting such a broad approach enabled this rapid review to assess evidence with wide-ranging purposes related to the promotion of acceptance, uptake and adherence to physical distancing measures for COVID-19 prevention and control. This approach to communication has deliberately been defined broadly. It incorporates current definitions of risk communication (9), which rest on the concepts of two-way sharing of information, support for behavioural change to protect health, engagement with the affected people and communities, and the promotion of informed decision-making in relation to the protection of health. While the term communication is used here, rather than the term risk communication used in other literature, the underlying concepts are similar and embody similar values and purposes.

As defined for this report, communication makes these terms operational in a way that allows assessment of the different purposes of such approaches and to translate them into actionable messages for decision-makers. This is very often critical when evaluating the effects of health communication, much of which involves complex interventions with more than one simultaneous identifiable purpose (e.g. to improve knowledge, remind people of required actions, enable the necessary skills to monitor health and actions required, and change health behaviours). Communication, as used in this review, also makes explicit several purposes that are particularly relevant for the acceptance, uptake and adherence to physical distancing measures and which may go beyond issues of risk. These are to:

- enable people to acquire the new skills needed for physical distancing, such as those required to effectively recognize signs and symptoms;
- provide people with the knowledge needed for identifying when to get tested or to self-isolate;
- reinforce and remind people through public health messaging about the need for and benefits of physical distancing measures;
- ensure that people have the support they need when in isolation and understand how to access such support; and

- 
- enable people to facilitate communication and decision-making (such as prompts to ask questions or seek further information).

At the outset of this review, such purposes of communication were identified as critical to approaches that seek to promote acceptance, uptake and adherence to physical distancing measures.

1.3 Aim of this report

This rapid review focuses on approaches to promote acceptance, uptake and adherence to physical distancing rather than on the effects of physical distancing. It addresses the question “What are relevant, feasible and effective approaches to promote acceptance, uptake and adherence to physical distancing measures for COVID-19 prevention and control?”

1.4 Methodology

A rapid review was undertaken following the McMaster rapid methods (10) as the synthesis question required consideration of evidence from multiple study designs. The focus was on identifying evidence in guideline recommendations, systematic reviews (including reviews of quantitative, qualitative and mixed-methods studies). Primary studies directly related to COVID-19 were also sought, and selected reviews on other diseases relevant to the promotion of physical distancing measures were considered to fill gaps in the identified literature. Searching and screening activities were conducted systematically and weekly from 10 April 2020 to 1 May 2020 through published and unpublished (grey) sources. All existing papers in English from 1946 (database inception) until 1 May 2020 (inclusive) were screened against the selection criteria. In total, 3428 articles were identified and assessed, leading to a final group of 31 papers for inclusion. Of these, 18 papers related to the COVID-19 period: one review of guidelines and other guidance documents (11), one rapid review (12) and 16 primary studies (13–28). The 16 primary studies were conducted during the COVID-19 pandemic, while the two reviews were conducted near the start of the pandemic to explicitly address questions or issues associated with features of the pandemic informed by findings from earlier research (11,12). The other 13 papers dated from the pre-COVID-19 era: three were guideline recommendations (29–31), eight were systematic reviews (32–39), one was a scoping review that examined lessons learned from HIV applied to the context of COVID-19 (40), and one was a review that analysed regional meetings of the United States Centers for Disease Control and Prevention on influenza pandemic planning (41).

Annex 1 gives full details of the search and selection strategy.

The quality of each paper was assessed using a tool appropriate to the methodological design (Annex 1) and data were extracted and organized by the type of physical distancing measure (as defined in Box 1). Findings were mapped to each component of the review question, with a second translational step to identify the promotion or communication purpose and how this might affect interpretation of each paper's findings.



2. RESULTS

Many of the non-COVID-19 papers were synthesized evidence (systematic reviews or guidelines) and came from research undertaken in the context of influenza pandemics. Others focused on the prevention and control of Ebola virus disease (EVD), MERS, SARS or tuberculosis (TB). Studies came from over 35 countries and all WHO regions, covering countries in all income brackets (Box 2). Approximately 75% of studies on COVID-19 were undertaken in high-income countries, and while systematic reviews included studies from countries across income brackets these were again more numerous for high- rather than middle- or low-income countries worldwide. The exception was systematic reviews on EVD, where studies were conducted primarily in West Africa. Guideline documents focused primarily on middle- and high-income countries, although the guideline from National Association of County and City Health Officials explicitly drew on local and national pandemic plans across the United States of America; the plan produced by Johns Hopkins Center for Health Security looked widely at both international literature and expert views on pandemic preparedness and response; and the guidelines by WHO reviewed evidence from all United Nations Member States, but stated that most of the emergency events analysed took place in high- and middle-income countries (across Asia, Europe, North America and Oceania).

Box 2. Geographical location and disease context of included studies

Geographical location

Primary studies on COVID-19 were from Australia (2), Finland (2), China (2) and Hong Kong Special Administrative Region (Hong Kong SAR) plus one each in India, Ireland, Israel, Italy, Pakistan, the United Kingdom and the United States. Two studies surveyed adults across several countries (Germany, Italy and the Netherlands; and China, Italy and Singapore).

Guidelines and the review of guidelines focused on United Nations Member States, EU/EEA and the United Kingdom, and the United States.

Systematic reviews included studies from Argentina, Australia, Bangladesh, Canada, China and China, Hong Kong SAR, the EU (Bulgaria, Germany, Portugal, Spain), Japan, Mexico, New Zealand, Republic of Korea, the Russian Federation, Taiwan, China, the United Kingdom and the United States.

Box 2 contd

Reviews and studies on EVD focused on West Africa (Congo, Guinea, Liberia, Senegal and Sierra Leone).

Reviews and studies on TB came from Ethiopia, EU/EEA, Germany, India, Indonesia, Malawi, Peru, Portugal, South Africa, Spain, the United Kingdom plus members of the Organisation for Economic Co-operation and Development.

Disease context

The COVID-19 pandemic generated 16 primary studies: 11 cross-sectional surveys, one randomized controlled trial (RCT), one cohort study and three qualitative studies.

Pandemic influenza, particularly related to the 2009 H1N1 pandemic influenza outbreak, generated most synthesized evidence (eight systematic reviews and guidelines).

Other systematic reviews were on EVD (3), SARS (2), TB (2) and MERS (1).

Public information and risk communication during pandemic outbreaks are essential components of the response, requiring planning prior to outbreaks and involving communities as well as public health experts (29–31). The evidence indicated that communication between public health authorities and the public in pandemic outbreaks needs to include several key features and issues in order to best promote acceptance, uptake and adherence to preventive measures. The findings are organized under six themes.

- Theme 1. Features of public communication: content, timing, duration and delivery
- Theme 2. Recipients of public communication: audience, setting and equity
- Theme 3. Support for individual and population behavioural changes
- Theme 4. Community engagement to support communication
- Theme 5. Public trust and perceptions
- Theme 6. Communication regarding distancing measures in schools and workplaces.

The results below are organized by initially addressing findings from those papers that most directly addressed the review question, followed by a summary of contextual factors or implementation considerations, informed by a further set of papers. Each section also gives the quality assessment for the papers on which the findings are based (available on request).



2.1 Theme 1: features of public communication: content, timing and duration, and delivery

2.1.1 Links between content quality and knowledge and behaviour

The evidence for this section came from a high-quality guideline (31) and a series of publications of moderate quality.

To improve uptake and adherence to physical distancing measures, public health authorities need to communicate comprehensive, consistent information to the public (12,35) that includes a clear, accurate and timely rationale for the required measures (11,29–31). Confusion or misunderstanding can prevent people undertaking the required measures. Risk messages written in clear, non-technical language are needed as avoiding technical language may increase uptake of mitigation behaviours (31).

Members of the public also need clear, practical information about the actions they are themselves required to undertake (11,12,17,35), so that individuals and communities are clear about what they can and cannot do within the measures set to prevent disease transmission. The public requires clearly written and consistent information that incorporates practical information about the initiation of measures and how to comply, and about the services available to support the measures and how to access them (12,16,17,29–31).

Good communication can encourage individuals to enact the required changes (11) and can promote specific actions that individuals can take to protect their health (21,22,30,31). Communication strategies that aim to increase self-efficacy (i.e. promote specific actions that individuals or communities can take to protect their health), and ensure there is sufficient information for people to do so, may foster readiness to change and so promote positive behavioural changes that align with the required public health measures (19,21).

Public trust is built through transparency of communication: this means providing clear, transparent and consistent (i.e. not conflicting or contradictory) information adapted to local contexts and settings about risk, physical distancing measures and their rationale (22,30,31). Different media and channels should be used to ensure the widest dissemination. Clear and open acknowledgement of uncertainty (what is known and what is not, as related to events, risks and interventions) at a given point in time is also important, particularly for an emerging disease (31).

2.1.1.1 Poor acceptance of measures is linked to inadequate information

The evidence for this section came from a high-quality guideline (31) and a series of publications of moderate or low quality.

Evidence indicated that isolation and physical distancing behaviours (quarantine, school closures) are typically viewed as acceptable and are interpreted as demonstrating social responsibility by protecting others from infection (38). One survey indicated that high levels of perceived effectiveness and feeling adequately informed about required measures occurred where there was strong uptake of physical distancing measures to protect against COVID-19 infection (24). Another survey indicated that providing clear, structured communication of reliable health information can be tailored to benefit people experiencing information overload or continuous impulses to go online and read about a health concern, such as COVID-19 (19).

The perceptions and experiences of individuals undertaking self-isolation and quarantine are fundamentally affected by their access to clear information. Lack of information, contradictory (inconsistent), confusing information or information that is difficult to find while in isolation/quarantine are related to non-adherence (17,33). Further, a lack of information, communication and support may have negative psychological effects on the acceptability of quarantine and self-isolation (33).

A qualitative study of adults undertaking quarantine for COVID-19, for example, indicated that better information and knowledge was needed about required self-isolation and quarantine measures. This includes information to clearly distinguish between self-isolation and quarantine measures and other physical distancing measures (17). Creating and disseminating consistent core information using lay language and incorporating practical information (why, how), including about the services available to support the measures, is, therefore, critical to their implementation (12,17,22,31).

2.1.2 Emphasis on public health benefit may promote acceptance

The evidence for this section came from a series of publications of moderate or low quality.

Communication that emphasizes public health benefits and importance of physical distancing can promote acceptance. Public communication might clearly reinforce the need for mutual community support and emphasize both the importance and the benefits of physical distancing measures for protecting public health, such as



preventing transmission to others, especially those at higher risk (11,12,23,35,37). Where uptake of physical distancing measures is voluntary rather than mandatory, messages stressing that the choice of quarantine or self-isolation is an altruistic and beneficial choice taken on behalf of the community can also encourage adherence (12,33).

Public communication that clearly acknowledges the difficulties of undertaking and adhering to restrictive measures is needed. Such communication might express concern for the public and reassure people that both moral and practical support will be available to help them to complete physical distancing measures (11,16,22).

Actions of authorities, including the government, intended to control the spread of pandemic disease and to support those undertaking physical distancing measures might also be communicated to the public (17,22). Transparency about the decision-making process is also viewed as an important part of communication between authorities and communities (41).

2.1.2.1 Blame or stigma may lead to failure to undertake public health measures

The evidence for this section came from publications of moderate or low quality.

Actual or perceived blame or stigma associated with public health measures such as isolating or quarantine may lead to poor acceptance and adherence. Qualitative research undertaken during the COVID-19 pandemic indicates that those isolating may feel shamed or blamed by public health communication messages, and this may contribute to their perceiving a lack of support for continuing with the measures (17). Similarly, people in isolation may be demotivated to continue if they perceive a lack of government action or response on a population level (17).

Stigma may also be a major factor undermining the effectiveness of public health messages around physical distancing during outbreaks (33,37,40). This has been documented during the COVID-19 pandemic and is based on experiences during previous outbreaks, including EVD, H1N1 pandemic influenza A and SARS (33,35,38).

2.1.3 Timing: knowledge and attitudes change over time

The evidence for this section came from a high-quality guideline (31) and a series of publications of moderate quality.

Public communication and up-to-date information are needed over the course of a pandemic outbreak. This includes immediate initial communication (as early as possible upon recognition of a pandemic) followed by continuous updates over the course of the outbreak. These updates should reflect changes such as in pandemic status, impacts on essential services, actions being taken to address the outbreak and ways that people can use to protect themselves. This continuing adjustment of content is critical in order to promote accurate public knowledge about required public health measures and about how to comply with them (11,30,31,40).

Public health communication about risk may be particularly important early in a pandemic. At this stage, perceived risk might be lower despite the disease already being transmitted. Communication at this early point can increase uptake and adherence to behavioural measures (39).

Qualitative research indicates that public anxiety is typically high when a new infection emerges but decreases over time. This diminishing anxiety can be influenced by people's views of communications: people can become sceptical about the information provided to them and communications may be viewed as unreliable, inconsistent and alarmist (38). Such findings reinforce the need for consistent, accurate up-to-date public information that is disseminated widely throughout the whole course of a pandemic (30,31,40).

A system to monitor public perceptions of both the outbreak and the response is also needed throughout a pandemic (11). Part of the role of such a system may be to identify areas of uncertainty, inaccuracy or misinformation in the public realm (31). Such a system might work, for example, to monitor the circulation of misinformation related to facts about viral transmission, and thus identify opportunities through which such misinformation might be countered.

2.1.3.1 Timing affects awareness and uptake of risk reduction measures

Findings are based on a moderate-quality systematic review (38) and two surveys (21,28). The two surveys were undertaken during the COVID-19 pandemic and suggested that proactive government communication to increase public awareness early about disease outbreaks, risk reduction measures and protective behaviours created earlier opportunities for individuals to take up physical distancing measures. Later communication of such critical information may miss opportunities for the public to engage with and take up preventive measures (21,28).



Qualitative research indicated that people change in their assessment of risk over time during a pandemic. Members of the public may assess their personal risk of a pandemic threat by comparing personal experiences with information released through official channels. Mismatches can lead to doubts about the credibility and trustworthiness of information. In turn, this can cause fatigue related to infection communication and blunting of messages, which may influence behavioural responses and lead people to disregard advice about preventive measures (38). Such findings highlight the fluctuating nature of people's risk perceptions and understanding over time as they experience a pandemic.

2.1.4 Duration and rationale for measures

The evidence for this section came from a review of guidelines (11), a low-quality systematic review (33) and a survey (15).

Public communication messages need to signal the duration of required measures and reinforce the rationale for them. The established negative psychological impacts of physical distancing measures such as quarantine and self-isolation might be minimized by requiring these for the shortest possible time. Duration needs to be based on evidence of incubation times (rather than arbitrary or indefinite time frames), and information about the rationale and guidelines (what is happening and why) should be provided through clear, consistent communication (33).

Public acceptance of physical distancing measures might be facilitated by establishing and clearly communicating the anticipated end date (11,33). Clear communication that measures could be extended, or that some measures may be removed or reduced while others remain in place (11), is also needed to prepare public expectation for the possibility of changes; this is clearly the case during the COVID-19 outbreak, when initial time frames for self-isolation measures were uncertain and restrictions may have needed to be extended (15).

2.1.4.1 Uncertainty about duration of measures influences acceptance and outcomes

Findings regarding duration of measures are derived from just two studies (15,33).

Duration is one of several stressors for people in quarantine, and longer periods are associated with poorer mental health outcomes (33). The psychological effects of quarantine (researched in health workers, and in adults and children) appear substantial and varied, and may be long-lasting.

Results from a survey undertaken during the COVID-19 pandemic indicated that most people intended to maintain their self-isolation behaviours in the context of shifting end-points for restrictions, irrespective of their own expectations of the duration of physical distancing. However, the unexpected extension of restrictions may lead to fewer people intending to increase, and more intending to decrease, adherence with self-isolation measures. This suggests that public health messages need to consider the public's expectations, particularly where there is uncertainty in an emerging disease pandemic that may necessitate extension of restrictions, such as self-isolation measures (15).

2.1.5 Delivery mechanisms

The evidence for this section came from a range of publications with evidence of either high or moderate quality.

Strategies to convey information about risks in a pandemic outbreak can be guided by identifying those information sources most readily used by the public (20). This varies across communities and populations and requires that risk communication efforts are tailored to meet the diverse needs of different groups within and across populations (11,31,39,40).

Information is more likely to be trusted and acted upon when provided from different sources rather than from a single source (31,35). Information could be provided, for example, via traditional media sources, such as newspapers and news broadcasts, and through social media as part of an integrated strategy (31). Establishing trusted lines of communication and using these channels to convey information to the public are also key when planning risk communication efforts (29). Information should be disseminated in multiple ways (platforms, methods, channels) to effectively reach a wide section of the community (31).

Public use of information sources may be influenced by levels of perceived trustworthiness, but accessibility (ease of access) and availability of information also play a major role in determining why people choose to consult particular information sources.

Several studies have noted that even where members of the public are highly knowledgeable about COVID-19, most people actively seek information about the pandemic, community risks and required preventive actions. One survey indicated that both formal (e.g. newspapers, press releases and educational messages) and informal (e.g. social media, online reviews, and family or peer views) information



sources increased perceived understanding, but that formal information sources were associated with greater adherence to physical distancing measures (25). However, other studies indicated that the information sources consulted vary considerably across populations (20,21,24,25).

No single approach for disseminating information, therefore, appears likely to apply to all populations. The critical issue may be that different (multiple) sources are used to convey consistent information and messages to members of the public, and that these sources ensure that information is accessible by everyone in the community.

2.1.5.1 Conflicting messages decrease trust and adherence

The evidence for this section came from a high-quality guideline (31), a low-quality systematic review (33) and a series of primary studies.

Information that is conflicting or contradictory can have negative effects, including loss of trust, decreased acceptance of required measures and diminished adherence (17,31,33).

Even where members of the public are knowledgeable about an outbreak, most also actively seek information (20,21,24,25). However, information sources vary considerably: surveys during the COVID-19 pandemic indicate that social media platforms and websites were the most commonly used in some countries, while more traditional sources, including television or newspaper/news applications, were most often accessed in other countries (20,21,24).

Public access to information sources also determines use (20,24). Perceived trustworthiness of the sources may also influence the frequency of use. However, surveys during the COVID-19 outbreak suggest that trustworthiness and frequency of use may not be directly related: while social media platforms and websites tended to be highly used, they were also rated as reliable by only a minority of people, whereas traditional media and government sources were used less frequently despite being regarded as trustworthy (20,21).

2.2 Theme 2: recipients of public communication: audience, setting and equity

The findings in this section are based on a series of guidelines, reviews and primary studies varying in evidence quality from high to moderate.

2.2.1 Audience and setting

Public communication about physical distancing measures must take account of the context, settings and different audiences and groups in a population because these factors influence adherence. This means that communication has to be planned and tailored to take these factors into account.

Decisions about implementing physical distancing measures, and communication with the public about pandemic health threats and the importance of behavioural mitigation measures need to consider that both the strategies themselves and the communication about them must be tailored to context and setting (11). Comprehensive risk communication strategies should be informed by knowledge of the affected community and combined with strategic planning to ensure that the diverse needs of different groups within a population can be met (31), and that different audiences can be targeted (11,29,30,39,40).

2.2.2 Equity

Several factors influence community awareness of public health messages and these, in turn, influence uptake and adherence (12,35,41). Public health communication intended to inform populations about pandemic disease and physical distancing measures needs to take account of such factors. Communication needs to be as equitable as possible and to achieve as much reach as possible within communities. In doing so, the groundwork will be laid to help ensure the greatest possible adherence to the required measures and, consequently, a consistent community-wide preventive response to a pandemic (35,41).

Inequalities, such as those related to educational levels, health literacy levels or socioeconomic circumstances, also need to be clearly and explicitly recognized and addressed when planning and implementing physical distancing measures. The need to communicate comprehensively and clearly to a population, as well as to specific groups within the community, arises because both knowledge and adoption of preventive behaviours are not evenly distributed. Inequalities can influence acceptance, uptake and adherence to public health messages related to physical distancing, and public communication that deliberately recognizes and plans to counteract inequalities is critical for community-wide uptake of physical distancing measures.

Structural or societal inequalities need to be addressed through political or societal decisions to support physical distancing measures, such as the provision of financial



support to those unable to work, particularly for those from disadvantaged or vulnerable groups.

Communication must also be tailored to reach those groups that are less likely to be reached by traditional public health communication. There is the potential for such groups to be less likely or less able to adopt preventive measures, and this can amplify inequalities (31,39). If people are not adequately informed about the risk of disease, or if they incorrectly perceive the severity of the disease or their susceptibility to it to be low, they may be less likely to take up and adhere to preventive measures (35).

Recognizing population groups who are more likely to be non-adherent to preventive measures can also help public health policy-makers to identify target populations for pandemic prevention and education efforts. Public health education measures may be more effective if they target groups more at risk of low knowledge or of risky behaviour (27,35). For example, surveys undertaken during the COVID-19 pandemic indicate that knowledge, attitudes and preventive practices towards COVID-19 may be lower among younger people (aged up to 29 years), who may feel at less personal risk, and among those with lower incomes, who may be driven by financial pressures to risky behaviour (see section 2.3.4) (18,27). Other factors, such as gender and ethnicity, may also be linked to acceptance, uptake and adherence to public health measures, but their effects on these behaviours are less consistently documented and understood (35).

2.2.3 Equity issues for specific population groups

In addition to general equity considerations, specific population groups identified and emphasized most often in the literature include hard-to-reach and vulnerable populations, those speaking languages other than the community's dominant language, people with lower educational levels and those for whom physical distancing may be particularly difficult to reconcile with cultural practices.

Hard-to-reach and vulnerable populations. Public health communication planning that includes consideration of how to reach groups not easily engaged through traditional communication channels are more likely to reach more of the community. Strategies may include employing diverse channels (e.g. public briefings, hotlines or websites) or engaging with community leaders, physicians and others to ensure that public health messages achieve the greatest possible community reach (30,35).

Contact tracing those who are hard to reach. While contact tracing has enormous potential to reduce disease cases, successful implementation relies on trust and the provision of appropriate (culturally sensitive) messages (36). Both can be built by recognizing the needs of, and planning to appropriately reach, specific groups within the community. For example, community health workers from the same migrant community may reach more people within the refugee and migrant population, or peers among drug-using populations may be more likely to be acceptable and able to achieve good communication of risk management measures (34).

Community languages. While communicating information in the main languages within a population is imperative, it is also vital to plan how to target audiences that might be missed, such as those speaking minority languages (11,30). Community leaders, religious groups and mass media can help to promote awareness of accurate information in affected communities, and using these extra conduits is also key to improving acceptance and uptake of behavioural measures (30,36).

Cultural barriers. For most people within a community, physical distancing is challenging because it limits contact with family, friends and others. Within some households and some cultural groups, physical distancing may be viewed as particularly unacceptable as it places limitations on interactions regarded as both socially and culturally necessary. This might include caring for sick family members or funeral duties (38,41). Community engagement may help to identify such factors (see section 2.4). Involvement of community leaders, such as religious leaders, in developing public health messaging can also assist with acceptance and uptake (29,31,41).

Educational inequality. People with higher levels of education tend to be more informed about pandemic risks, suggesting that health communication messages need to be better tailored to those with lower educational levels in order to reduce inequalities across and within populations (35). The link between knowledge and uptake of preventive behaviours has been highlighted by work on influenza, among other diseases, and by surveys on COVID-19. More knowledge is associated with a lower risk of non-adherence to preventive measures (21,27,39).



2.3 Theme 3: support for individual and population behavioural changes

Acceptance, uptake and adherence to physical distancing measures during a pandemic requires behavioural change from individuals and entire communities. Knowledge of what is needed, why it is needed and how to go about it is essential (see section 2.1.1). Evidence also indicates that several practical elements are required to directly support behavioural changes in these circumstances, including direct support services and financial support, and that these need to be considered in any response that involves implementation of physical distancing measures.

2.3.1 Social attitudes and norms

The evidence for this section came from a series of publications of mainly moderate quality.

Communication targeting the population and individual levels, and reinforcing positive social attitudes and norms towards physical distancing, may be necessary. Sustained changes to behaviour, particularly over long periods, typically require approaches targeted at multiple levels rather than simply the individual, taking broader social and structural systems into account and ensuring regular communication and reiteration of messages over time (11,21,40). Communication seeking to shift and reinforce social norms, such as strong social pressure to adhere to physical distancing measures, may be beneficial, as may active promotion of solidarity, mutual community support, and a sense of altruism in adopting and adhering to physical distancing measures once implemented (11,12,21,35,40). Such communication may be more successful in improving uptake of and adherence to public health measures than communication aiming for individual behavioural change alone.

Related to this, to improve acceptance and adherence to measures, stigma related to physical distancing measures needs to be proactively addressed by reinforcing that everyone in the population is at risk of an emerging disease (11). Providing accurate information about the necessity, effectiveness, acceptability and feasibility of the measures, and addressing key barriers such as stigma associated with some physical distancing measures may be valuable (38). Where possible, positively framing messages (expressing advice in terms of maintaining well-being rather than avoiding infection) may also reduce stigma and encourage adherence to public health measures (38).

Information about how to transition safely out into the community for those who have been quarantining needs to be given in clearly understandable language regarding ongoing COVID-19 transmission risks. Public education and information to reduce stigma due to fear of community transmission are needed to avoid negative impacts on testing and contact tracing, which threaten the effectiveness of public health measures (16,37).

2.3.1.1 Factors that can impede behavioural change

Findings are based on papers of moderate or low quality.

Stigma and lack of acceptance of public health messaging can decrease uptake and adherence. Previous research on SARS, H1N1 pandemic influenza A and EVD indicates that stigma related to physical distancing measures poses a significant barrier to uptake, acceptance and adherence (33,38). A study undertaken in the context of COVID-19 reinforces this, noting the presence of stigma based on fear of community transmission once quarantine has ended (16).

Other research indicates that perceived or actual stigma may reduce adherence with contact tracing (37), quarantine (33) and physical distancing more generally (40,41). Such impacts negatively affect patients, health-care workers and, in some cases, whole minority groups within communities (33). For example, people within a community may believe the source of an infectious disease to be solely related to a particular group (e.g. foreign nationals or people coming from abroad) (22).

2.3.2 Perceptions of vulnerability and risk

The evidence for this section came from high- or moderate-quality systematic reviews and four primary studies.

While public knowledge is essential for implementation of physical distancing, people's views and perceptions of physical distancing and risk of the disease (perceived personal vulnerability, transmission and severity of the disease) also influence their acceptance, uptake and adherence to required behavioural measures (22,38,39). Public risk communication that addresses common public beliefs and concerns about the necessity and effectiveness of the measures, and which addresses key barriers such as perceptions of personal vulnerability, is more likely to improve adoption of measures (22,26,38).



Communication strategies that emphasize the likelihood of infecting vulnerable people or large numbers of people can help to motivate physical distancing by increasing people's intention to be cautious in their own physical distancing behaviours. Such strategies can also change people's attitudes to be less accepting of marginal physical distancing behaviours in others, thereby adopting a more cautious attitude to physical distancing. Communication might, therefore, be most effective when aiming to emphasize the impact of non-compliance with physical distancing measures on identifiable people and numbers of infections (23).

In pandemic situations, the existence of differences between intended and actual behaviours may be particularly critical and correlate with people's perceived risk of infection (19,39). When faced with an emerging pandemic risk, people typically accept that this creates risk to the community. However, some identify themselves as being less vulnerable or more capable (e.g. than people with chronic health problems) and this can decrease their own likelihood of adopting physical distancing measures (38).

2.3.2.1 Groups lacking a perceived need for risk reduction

Measures to highlight the immediacy and susceptibility of the community to a pandemic health risk may be necessary to improve adoption of, and adherence to, preventive measures. Accordingly, public communication might benefit from targeting such perceptions of susceptibility and personal risk in order to improve uptake among groups with little or no intention of adopting physical distancing measures (19). Framing messages in terms of maintaining well-being rather than avoiding risks may also improve the perceived relevance of preventive measures among those who do not acknowledge that they are at risk of infection (38).

2.3.3 Essential services to support quarantine or isolation

The findings in this section are based on papers of moderate or low evidence quality.

Comprehensive support systems and services are needed for those undertaking restrictive measures, such as quarantine and isolation (11). These support people as they try to adhere to measures and may reduce long-term physical and mental ill health.

A critical aspect of such systems is to ensure access to essential supplies and services. This includes easily accessed food and medication; meaningful activities and communication with social networks (including support lines); specialist services

such as mental health services, maternal and child health services; and financial support (11,12,16,17,33).

Information about the availability of essential services needs to be communicated widely so that people are clearly informed about how to access the services; the services themselves must be easily accessed (11,16,17).

Clear lines of communication are needed for people in quarantine or isolation should they develop symptoms. These include telephone or online services staffed by health professionals (16,17,33).

Planning for and providing public information about how people can access their usual medical care if it is unavailable through the usual routes is also critical (30). Encouraging and supporting people to develop quarantine plans ahead of time may also be beneficial (16).

Support systems and access to social services appear particularly critical for vulnerable groups, including elderly people, homeless people, refugees and migrants, and ethnic minority groups (11). Since mental health issues may affect the ability to adhere to physical distancing and may impact long-term psychological health (11,17,33), a widespread need for community access to mental health services has also been highlighted (16,17,26). Such services can enable people to adhere to restrictive measures while mitigating long-term physical and mental health effects (11,12,16,17,33).

2.3.3.1 Lack of support is linked to non-adherence

The findings regarding the role of support in adherence are based on a review of guidelines and papers of moderate or low evidence quality.

Research during the COVID-19 outbreak clearly indicates that support services must be available, known about and accessible for those undertaking physical distancing measures (11,16,17). When people must rely primarily on family or friends for help, with little support from services, they feel vulnerable and this reduces adherence (11,12,16,17).

Evidence also indicates that support services that are difficult to access cause problems. For example, difficulties in accessing financial support while in isolation cause distress and non-adherence (17).



Several studies highlight the need for access to mental health services (11,12,16,17,33). During home-based isolation or quarantine, people are at higher risk of new or recurring mental health problems (17). Long-term psychological impacts (33) may be exacerbated by uncertainty about the pandemic and responses to the pandemic by the population and by the public health services (17).

2.3.4 Financial issues leading to non-adherence

The findings in this section are based on a review of guidelines and papers of moderate or low evidence quality.

Financial insecurity can lead to non-adherence to physical distancing measures. Many studies, therefore, stress that financial support or compensation for lost income is needed for people undertaking physical distancing measures (11-14,16,17,33).

Socioeconomic inequalities may also diminish the capacity of some groups within the population to take up and follow physical distancing measures (13,41), even where willingness is high. Capacity to comply with physical distancing measures may be lower in disadvantaged communities; for example, fewer of those with the lowest household incomes may be able to work from home or self-isolate. Issues such as residing in high-density settings (e.g. poor-quality multi-resident buildings or refugee communities) also commonly have an impact on capacity to adhere to physical distancing in economically disadvantaged communities (13,41). People from lower-income backgrounds, therefore, need tailored financial assurance and assistance in order to be able to undertake protective measures (13,38,41).

Measures to compensate communities financially for losses (restricted income or employment) linked to restrictive physical distancing measures might, therefore, represent another means of promoting adherence (11,16,17).

2.3.4.1 Socioeconomic barriers to adherence

Two primary studies were found examining socioeconomic barriers to adherence.

Distress linked to difficulties in accessing financial support while in isolation may lead to non-compliance. People may also take additional risks once quarantine/self-isolation is completed in order to survive financially, such as continuing to work in close contact with other people despite a lack of physical distancing measures (17). A recent survey indicated that financial security is important for guaranteeing adherence to a proposed two-week self-quarantine period during the COVID-19

outbreak: 94% of respondents indicated an intention to adhere to the self-quarantine period when compensated for lost wages but the rate of intended adherence decreased substantially when compensation was removed (14).

2.4 Theme 4: community engagement to support communication

The findings in this section are based on papers of high or moderate evidence quality.

Involvement of local stakeholders and community engagement in planning and communication of the response to pandemic outbreaks (e.g. through collaborative decision-making) may inform tailoring and improving the reach of public health messages. For example, community engagement may identify those factors that are most important to groups, communities and the wider population, thus improving the cultural appropriateness and acceptability of public health interventions. Ensuring communications are attuned to local conditions can help to communicate key messages and move populations from awareness to action (29,31,41). These measures can all help to strengthen the response to outbreaks.

Community engagement activities undertaken prior to an outbreak event are likely to be more successful than those undertaken only during an event (31). Such engagement can also help to incorporate community views and values into difficult decisions that may arise during outbreaks, thus helping to ensure broad support for required measures (29).

Engagement and dialogue with the community can also help to strengthen alternative channels for communication, and identify responses specific to a particular community or group related to pandemic measures (29–31).

Despite wide recognition of the importance of community engagement in developing and delivering communication in situations such as during a pandemic, there is a lack of evidence directly comparing different methods for involving community members in such activities (29,31,42). A range of methods can be adopted, with the most commonly used including engaging local leaders and key people, tailoring interventions, using local people to mobilize responses, engaging local groups, and listening as well as telling (31). As yet, there is no clear evidence on which of these approaches is most effective or whether other approaches should be considered.



2.4.1 Inappropriate messages can reduce adherence

The findings in this section are based on papers of high or moderate evidence quality.

Communications need to be tailored to the target community to meet their diverse range of needs if acceptance and adherence to public health messages about physical distancing measures are to be heeded (11,30,31,39,40). This is fundamentally important when reaching out to particularly vulnerable groups (12,35,41). Relevant local knowledge is essential when tailoring information and communications, and community engagement can be a critical way to incorporate and use local knowledge to inform approaches to promote acceptance, uptake and adherence to vital preventive behaviours (29,31,41).

2.5 Theme 5: public trust and perceptions

The findings in this section are based on three guidelines, one of high-quality and two of moderate-quality evidence.

Public trust is an essential element of effective communication before, during and after a pandemic outbreak (29,31). It is mentioned directly or implied by several of the findings of this review, which indicate that trust can be built or eroded by the approaches to or consequences of physical distancing. Ideally public trust in authorities would be established and consolidated prior to an outbreak, but this is not always the case, and governments and authorities need to be mindful of the need to build trust among the population when planning communication related to a pandemic.

To build trust, risk communication interventions by authorities to the public must be timely, transparent, easy to understand, consistent (i.e. not conflicting) and widely disseminated (29,31,41). Communication from authorities to the public could also aim to encourage engagement and dialogue (29,31) as this may also help to identify ways that people might respond in a crisis that differ from those predicted (30).

2.5.1 Uptake and adherence are linked to trust in authorities

The findings in this section are based on papers of high or moderate evidence quality.

Higher levels of trust in the ability of governments and public officials to work to control a pandemic outbreak are associated with a greater likelihood of

recommended actions, such as physical distancing measures, being adopted by the community (22,28,29,31,35).

2.6 Theme 6: communication regarding distancing measures in schools and workplaces

The findings in this section are based on papers of moderate or low evidence quality.

School and/or workplace measures (closures) may also be employed in a pandemic situation as part of the suite of physical distancing measures to prevent and control disease. Evidence indicates that school closures are generally accepted and taken up by parents if they perceive benefits from the measure, most commonly related to protecting health (child, household and community). Communicating effectively and consistently with parents to ensure that they understand that both school closure and avoiding social contacts are important, and why, is crucial to determining success (32). As parents are likely to miss or reduce work when schools are closed, financial compensation might improve the uptake of and adherence to school measures (11,32).

Financial compensation may also be necessary to improve acceptance, uptake and adherence to workplace measures. While remote work arrangements may be possible for some people, this is not viable for all and financial losses may result (11).

If services such as child care or school are unavailable during a pandemic, it is beneficial if employers and public health authorities work together to support employees (30), particularly if any restrictions exceed a few weeks in duration (11,32).

Workplaces (administrators, managers, supervisors) could promote tools and techniques for supporting staff with mental health needs during the crisis. Measures may include training staff to help employees to cope with grief, anger, exhaustion and fear (30).

2.6.1 Inconsistent information, uncertainty and lack of support

Where information from schools conflicts with public health advice, there may be negative effects on parental acceptance of school closures (32). Parents may not accept school closures if they do not perceive the measure will decrease infection risk, or they have concerns about the practicalities and impacts of the closure (32). Concerns may include uncertainty about the likely duration; unequal access to



digital education, which impacts on education continuity; or economic impacts such as lost parental income (11).

Short school closures of up to two weeks may be manageable by parents but longer closures, such as those that may be required for mitigating the risk of pandemic waves, may be more challenging. Child-care arrangements outside the home have the potential to increase disease transmission. Public health officials might consider how best to support parents to mitigate these effects within communities (32).

3. DISCUSSION

3.1 Strengths and limitations of this review

3.1.1 Strengths and limitations of the review approach

Within the practical constraints of time and resources available, this systematic rapid review of evidence crosses diverse evidence types and disciplines. The methodology was informed by the McMaster 30-day rapid response model (10). Screening and selection, data extraction and quality appraisal steps were performed by one reviewer, with the analysis and synthesis checked by a second reviewer. These procedures strengthen the findings of the review and add to confidence in the findings.

Comprehensive search strategies were designed by a Cochrane Information Specialist (a librarian with specialist skills in searching academic and grey literature databases) with extensive knowledge of the communication field and there was expert input both for suggesting additional source material and for ensuring that appropriate key terms were used. Numerous databases and grey literature were searched and citations were checked forward and backward, as were reference lists. Weekly searches were carried out from 10 April 2020 to 1 May 2020 to ensure that as much recent evidence as possible was identified.

Despite these activities, it is possible that some studies meeting the inclusion criteria were missed. Evidence included in the review was scattered across sources and some relevant items may not have been identified. The rapid methods prioritized guidelines and systematic reviews, and so databases specializing in systematic reviews of health service and social science literature were searched plus the sites of all major guideline producers for English-language guidelines. These are widely accepted as primary sources of such synthesized evidence for public health communication.

Given the time constraints for undertaking this rapid review, some degree of pragmatism was needed. Similarly, because of the speed with which new research is emerging, it is likely that further relevant studies are already available that address gaps or focus on COVID-19-specific issues. Whether further relevant studies have been published since 1 May, and whether these would substantially alter the findings of the review or fill significant gaps in evidence, is not clear but it does add uncertainty to the findings and their currency.



There are several areas where there was little identified research. One was work measures (closures), as little was identified in this rapid review that dealt with the complexity of decision-making and support for behavioural change related directly to employment and to the relationships and communication between employers and employees. There was also relatively less evidence on school measures and none dealing with the long-term implications of school closures, such as the impact on the learning and safety of vulnerable students. No evidence was found that related to diverse formats for communication tools, for communicating with people with disabilities or for dealing with stigma related to those who may be unable to physically isolate. This may reflect the review's focus on communication rather than system-level organizational changes; the latter might more comprehensively capture evidence related to school and/or work-based physical distancing measures.

Relatively little evidence was also identified related to promoting acceptance, uptake and adherence for contact tracing. This too may reflect the predominant drive for contact tracing from public health authorities and systems. Given the growing role of contact tracing (e.g. as a key component of current test and trace policies), this might be expected to be an emerging area of research related to the current pandemic.

A further gap in the assembled evidence relates to financial incentives offered for adherence to physical distancing measures and/or fines for non-adherence. Such approaches may be commonly used by governments in the context of COVID-19 but were not identified in any of the research evaluated here. Similarly, communication related to shielding of vulnerable individuals within the population, or to specific contexts such as public transport, was not identified in the assembled evidence here, but may emerge in future studies as the pandemic progresses.

Another gap in the identified evidence relates to the relaxation of physical distancing measures and how to communicate with individuals and the public more broadly about these. For example, as disease transmission within a community is brought under control and the more restrictive physical distancing measures such as quarantine or self-isolation are relaxed, there will be a need for clear communication of critical public messages. These messages will need to convey that while such strict measures are no longer needed there is still a need to practice a different and more cautious set of behaviours, such as largely staying at home, maintaining physical space from others and avoiding crowds.

One final noteworthy gap relates to the relative effectiveness of community engagement strategies. While the importance of engaging community members in the planning and delivery of communication was highlighted by several papers, and has been accepted or desirable practice for decades, no document was identified that assessed how best to undertake these activities. This has been noted as a gap in previous research (31,42) and remains an important question, given the critical roles for community engagement and participation in building trust and in helping to plan and disseminate information and reach different groups within the population throughout a pandemic.

This review includes both quantitative and qualitative research, without restricting study design. This approach has strengths. For example, qualitative findings may help to identify barriers or enablers to the use of particular strategies, which might not be reported by purely quantitative studies. However, including different study designs makes general messages about quality of the evidence difficult to formulate, and our judgements about this and the certainty with which the findings might be regarded should be interpreted as a general, rather than exhaustive and detailed, approach to the quality of the evidence.

This rapid review also purposively targeted synthesized evidence (guidelines and systematic reviews) as these represent large collections of some of the best available evidence in particular areas and so enable rapid analysis of a large body of research. These syntheses too demonstrated variable quality.

3.1.2 Strengths and limitations of the reviewed evidence

Evidence of different designs was included in this rapid review, with each design appraised with an appropriate methodological tool. Most systematic reviews and guidelines were of moderate quality, as was the single included RCT and the included qualitative primary studies. Surveys (of which 12 were included) were typically limited, with response rates difficult to determine and details of how representative they were lacking in all but a few. Several publications were available before peer review and this needs to be taken into account when interpreting the findings. Overall, methodological quality was moderate across the body of evidence. Likely limitations to the design and conduct of most included studies means that the findings should be interpreted with caution.

A strength of this review is that the major findings and themes emerged from several different data sources, often with quantitative and qualitative data reporting or



emphasizing similar findings. This adds to confidence in the findings and serves to confirm coherence across different designs, populations and settings.

Similarly, evidence was identified from studies on several relevant diseases, with over half of included studies (18/31) focusing on the COVID-19 pandemic itself. Most of these COVID-19-specific studies (16/18) were, unsurprisingly, primary studies, but their inclusion adds to confidence that the results of this review are applicable and relevant to the pandemic. The two reviews with an explicit focus on COVID-19 were conducted near the beginning of the pandemic to directly address questions or issues associated with the emerging pandemic using findings from previous research (11,12). These also help to build evidence related clearly to the pandemic.

3.2 Summary of key findings

Much of the identified evidence included in this rapid review stressed the importance of high-quality public information and communication during pandemic outbreaks: this required planning, consistent messaging, continuous updating and involvement of communities as well as public health experts. The evidence assembled here consistently indicates that there are a number of features of communication between public health authorities and the public that can be applied in pandemic outbreaks irrespective of the medium or type of communication, and that these are key to effectively promoting acceptance, uptake and adherence to physical distancing measures. Since communication to support and promote physical distancing during a pandemic is very complex, many governments are using multiple media or types of communication at any given time, with the aim of communicating effectively to all their population. Findings presented here can, therefore, help to inform decisions about how the content, timing and currency for communication might best be framed to promote acceptance, uptake and adherence among the audience targeted.

Readers familiar with comprehensive guidelines developed pre-COVID-19 will find considerable similarities in the findings here with those earlier guidelines. What is unique here is the global context in terms of how interconnected countries are and how widespread the virus is; this means that knowledge of how best to communicate with and support populations will evolve as the pandemic progresses. Earlier guidance regarding physically distancing will, however, still be relevant and governments may still learn useful lessons from this synthesis.

The findings presented here of emerging knowledge directly related to COVID-19 have started to clarify ideas about what the content and features of effective public communication might look like in this current pandemic. These ideas are consistent with the key underpinning concepts in the field of risk communication, and with key findings related to communication from recent sources developed during COVID-19 (3). These include ideas related to:

- providing assurance that both moral and practical supports are available to people when isolating and that the public is well informed about these supports and how to access them;
- ensuring that details of how to undertake the required behavioural changes are clear to all;
- meeting the public desire for information about why restrictive measures are needed and their duration, and balancing communications to include uncertainties about duration where these exist (as is the case for COVID-19); and
- recognizing the clear negative effects of poor or contradictory information on the physical distancing behaviours of individuals and communities during a pandemic and counteracting these.

The focus of this rapid review on communication related to acceptance, uptake and adherence to physical distancing measures is important to enable identification of key messages about public communication that may inform public health decisions during a pandemic. However, such communication occurs within a complex social and political environment, the influences of which vary across countries and regions worldwide. This will affect the implementation of physical distancing measures within communities and have a complex interplay with many of the key findings here. For example, structural and financial inequalities may mean that individuals or communities are unable to take up some protective measures. For this reason, it is important that decision-makers consider the structural, ethical, political and social factors that exist in the population they are targeting alongside communications related to physical distancing measures.

Major findings are summarized below under the six major themes and identify major features of approaches to promote acceptance, uptake and adherence to physical distancing measures. The approaches are in line with the WHO risk communication and community engagement action plan guidance (COVID-19 Preparedness and Response) (43).



3.2.1 Theme 1: features of public communication

The evidence reviewed suggests that public communications about the pandemic and physical distancing might deliberately consider specific features related to the messages:

- clear, comprehensive and consistent messages that provide a rationale for physical distancing measures or for any changes in requirements (11,12,17,19,24,29–31,33,35);
- content that encourages individuals to enact required changes and that imparts clear information about how and what they can do to protect their health (11,12,16,17,21,22,29–31,35);
- content that makes the public health benefits clear and that stresses the importance of physical distancing measures as both personal protection and altruistic actions taken on behalf of the community to prevent transmission (12,16,17,29–31);
- provision of reassurance that support will be available for people to complete the required measures (where these systems and supports are in place) (12,16,17,29–31);
- transparent content that clearly acknowledges uncertainty (what is known and what is not) at any given time point, particularly in the case of an emerging disease (31);
- content that is tailored to meet the diverse needs of different groups (11,31,39,40); and
- content that clearly conveys information about the actions that authorities are undertaking to control the spread of disease and to support those undertaking physical distancing measures (11,17,22,31).

A system to monitor public perceptions of the outbreak and outbreak response is also needed so that the success of messaging can be assessed continually and areas of public uncertainty, inaccuracy or misinformation can be identified (11,17,22,31).

There was also evidence that indicated that public information and communication about a pandemic outbreak should consider aspects of the timing, duration and delivery of messages in order to:

- keep the public informed over the course of the outbreak, starting as early as possible upon pandemic recognition and updating continuously, to ensure accurate public knowledge about risk reduction measures, including physical distancing, and about how to comply with these (11,30,31,40);

- provide information about the rationale and guidelines for those undertaking quarantine or self-isolation and use evidence of incubation times to define isolation time as short as possible (33);
- clearly inform the public about the expected duration of required measures, possible end date and possible changes to end dates that might occur due to uncertainty of time frames (11,15,33); and
- include information from varied sources and disseminate it across multiple platforms, methods and channels (20–22,24,25,30,31,35).

3.2.2 Theme 2: recipients of public communication

Public trust in authorities was a feature of many of the identified articles and can be built or eroded by communication and approaches related to physical distancing measures. To ensure that consistent public health messages reach all the population, consideration could be given to:

- the complex context, settings and audiences to be targeted because knowledge about, and adherence with, preventive behaviours are not evenly distributed within a population (11,29,30,39,40);
- appropriate tailoring of messages in order to reach those who are less likely to be reached by traditional public health communication or who may be less likely to take up preventive measures, including those who are vulnerable or hard to reach, those who may have a language barrier, those with educational disadvantage and those whose cultural background may make physical distancing measures particularly unacceptable (11,12,18,21,27,29–31,34–36,39,41); and
- the inequalities that are present in a population as these can influence acceptance, uptake and adherence (30,31,34,35,39,41).

3.2.3 Theme 3: support for individual and population behavioural changes

Public communication to support behavioural change requires knowledge of what is needed, why it is needed and how to go about it. For the implementation of physical distancing measures, the reviewed evidence also indicates that such communication requires planning so that:

- both the population as a whole and individuals are targeted (11,21,40);
- positive social attitudes and/or norms towards physical distancing are understood and reinforced, such as strong social pressure for adherence (11,12,21,35,40);

- stigma related to physical distancing measures is proactively addressed by reinforcing that everyone in the population is at risk (11,16,17,22,33,35,37,38,40,41); and
- public perceptions of vulnerability and risk, which influence physical distancing behaviours, are taken into account by highlighting the immediacy and susceptibility of the community to a pandemic health risk and emphasizing the likelihood of infecting vulnerable people or large numbers of people (11,16,19,22,23,26,33,38,39).

Communications occur within a context of structural and other issues, including practical elements such as financial support and the availability of essential services to those undertaking restrictive measures. Such practical elements also directly influence behavioural change and need to be included in the planning of any implementation of physical distancing measures. Essential services might include:

- comprehensive support systems and services to enable people to adhere as closely as possible to isolation while reducing long-term physical and mental health effects (11,12,16);
- systems to ensure access to essential supplies and services, including food, medications and specialist services (11,12,16,17,33);
- systems for meaningful activities and communication with social networks (including support lines) while isolating (11,12,16,17,33);
- clear lines of communication (e.g. telephone or online services staffed by health professionals) for those in isolation or quarantine who develop symptoms (16,17,33);
- easily accessible services with clear public information about their availability and how to access them (11,16,17);
- provision of usual medical care with clear public information about how to access this if it is unavailable through the usual routes (30);
- support systems and access to social services, which are particularly critical for vulnerable groups, including elderly people, homeless people, refugees and migrants, and ethnic minority groups (11,12,16,17,26,33); and
- mental health services with community access as a more widespread need for these occurs during pandemics (11,12,16,17,26,33).

Financial insecurity can decrease acceptance, uptake and adherence to physical distancing measures and diminish the capacity to comply. The evidence indicates that:

- measures to compensate communities financially for losses (arising from restricted income or employment) can promote adherence to restrictive physical distancing measures (11–14,16,17,33); and

- people from lower-income and/or disadvantaged backgrounds require tailored financial assurance and assistance to be able to adopt and adhere to more restrictive measures (13,38,41).

3.2.4 Theme 4: community engagement to support communication

Involving local stakeholders and engaging the community in the planning and communication of the outbreak response may be critical to improving acceptance, uptake and adherence to public health messages for physical distancing (29–31,41). The evidence reviewed indicates that such engagement:

- improves cultural appropriateness and acceptability of public health interventions;
- ensures public health interventions are attuned to local conditions;
- incorporates community values into difficult decisions; and
- strengthens alternative communication channels within communities.

3.2.5 Theme 5: public trust and perceptions

The evidence reviewed suggests that building and maintaining public trust in authorities, including governments, is critically linked to acceptance, uptake and adherence to public health measures such as physical distancing. To build trust, timely, transparent, easy-to-understand and consistent communication by authorities to the public, with clear acknowledgement of what is known and what is not at any given point in time, is imperative (22,29,31,35,39,41).

3.2.6 Theme 6: communication regarding distancing measures in schools and workplaces

Both parents and employees need to receive consistent messages to ensure that they understand why school/workplace closures are needed. Acceptance, uptake and adherence will be improved:

- where parents perceive benefits from school closures (11,32);
- where issues of income loss are considered, for example with provision of financial compensation to reduce the impact of losses (11,32);
- where additional support is available if needed for employees and parents who may struggle if school or child care is unavailable, particularly if this is for an extended timeframe (11,30,32); and
- where additional mental health-care support for employees is available in workplaces (11,30,32).



3.3 Policy considerations

This review identified consistent features of communication for physical distancing that could promote acceptance, uptake and adherence and be applied to any medium or type of communication in order to have the best chance of success. Based on these findings, the main policy considerations are to:

- clearly define the roles of different levels of government and of health and welfare agencies in promoting physical distancing and establish trusted lines of communication between the community and public health authorities;
- ensure clear, consistent, actionable and timely information about all aspects of physical distancing, including collective benefits and harms, supports and services;
- regularly assess communications for impact and monitor community attitudes and behaviours, particularly with regard to the unforeseeable period over which physical distancing measures could be needed, so that adjustments can be made to support high-quality, effective public health messages;
- support implementation with practical support and services (e.g. essential services and financial support) and proactively counter stigma related to physical distancing measures, particularly those that are the most restrictive such as quarantine;
- tailor information and support to reach all groups within populations, giving explicit consideration of any inequalities and the needs of hard-to-reach and vulnerable populations;
- engage communities in developing and disseminating information for physical distancing and ensure that advisory mechanisms are in place that involve community members alongside other experts; and
- ensure that existing inequities, and the potential effect of physical distancing measures to magnify these, are considered in policy-making and decision-making for public health protection.

4. CONCLUSIONS

This report summarizes the results of a rapid review to identify evidence on ways to promote acceptance, uptake and adherence to physical distancing measures related to the current COVID-19 pandemic. It assessed evidence from diverse sources, both quantitative and qualitative, and across infectious disease contexts, including studies undertaken during the current pandemic period.

Findings across studies were organized by the purpose of the communication approach and used to identify major themes as well as implementation and contextual issues that might influence the degree to which physical distancing measures are accepted and taken up by individuals and by communities.

The synthesis presents a comprehensive summary of the key approaches that might be adopted by health authorities and/or governments to communicate more effectively with their populations about physical distancing measures during a pandemic. These approaches are in line with the WHO risk communication and community engagement action plan guidance for COVID-19 preparedness and response. Many approaches rely on the availability and continuous dissemination of high-quality information about the pandemic health threat, public health measures and current status of the disease in the community. There is also a need to understand community knowledge, attitudes and barriers to being able to meet distancing requirements in various situations. Such approaches need to be accompanied by systems to practically support the enactment of physical distancing measures by individuals and by communities. With such key approaches in place, the need and rationale for physical distancing measures are likely to be well understood and the practical and necessary steps to undertake physical distancing will be clearer to members of the public. Ultimately, it is individuals who must decide to undertake and maintain the required behaviours and this is reinforced by both public attitudes and practical measures to support physical distancing. Under such conditions, physical distancing measures are likely to be effectively put in place to support the prevention and control of COVID-19 transmission.



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ANNEX 1. SEARCH STRATEGIES AND METHODS

This rapid review used the definitions for different aspects of physical distancing outlined in Box 1.

A rapid review methodology was chosen based on the McMaster 30-day rapid response model (1) as the question required consideration of evidence from multiple study designs and within guideline recommendations, systematic reviews (including reviews of quantitative, qualitative and mixed-methods studies) and primary studies directly related to COVID-19. Selected reviews on other diseases relevant to the promotion of physical distancing measures were considered to fill gaps in identified literature. Although it is possible that there may be some overlap between the primary studies included in guidelines and those evaluated by the systematic reviews, the effects of any such overlap on the findings of this review are likely to be minimal given that the systematic reviews typically had a narrower focus than the guidelines, and the analysis here relied on translation and thematic synthesis rather than on calculation of quantitative estimates of effects.

Databases and websites

Searching and screening activities were conducted systematically and weekly from 10 April 2020 to 1 May 2020 for the six public health measures in the physical distancing category (contact tracing, isolation, quarantine, school measures/closures, workplace measures/closures and crowd avoidance) and also for background and general references: Cochrane Library, including the Cochrane study register for COVID-19; Embase (Ovid); Google Scholar; Health Evidence; Health Systems Evidence; Medline (Ovid); PDQ-Evidence; PubMed; and Social Sciences Evidence. Searches were also carried out in the websites of the European Centre for Disease Prevention and Control, the Johns Hopkins Center for Health Security, the Oxford Centre for Evidence-Based Medicine, the United Kingdom National Institute for Health and Care Excellence, the United States Centers for Disease Control and Prevention, WHO and registers of systematic reviews and trials. Public Health England's daily website, Finding the evidence: Coronavirus, was also searched. The Cumulated Index to Nursing and Allied Health Literature and PsycInfo were assessed before the search and considered as not having sufficiently unique references to be valuable within the review's short time frame. Reference lists of key

studies were searched together with articles cited by key papers. Key informants were also consulted for additional sources of relevant evidence.

Search strategy

Qualitative, quantitative and mixed-methods evidence available in English from 1946 (database inception) onwards were screened against the selection criteria. The search strategy combined key terms and synonyms related to individual and public health communication interventions for promoting physical distancing measures. The search strategies were peer reviewed by Robin Featherstone (Information Specialist, Cochrane Editorial and Methods Department) and Andrew Booth (Consultant Information Specialist, Health Evidence Network, WHO Regional Office for Europe). Although the peer review feedback was received late in the search time frame, small adjustments (where feasible) were made to the database strategies.

While the search was wide and included suggestions from experts, citation checking forward and backward and reference list checking, in addition to the database and website searches, it is possible that some papers that met the inclusion criteria were missed. Searches were carried out weekly up to 1 May 2020 to ensure that as much recent evidence as possible was included because of the speed with which new research on COVID-19 is emerging.

The Medline search strategy is provided in Table A1.1 and these terms were adjusted for other databases as appropriate. Full search terms and strategies are available from the authors upon request.

Table A1.1. Medline search strategies

Disease terms strategy

1. exp Coronaviridae/
2. Coronavirus Infections/
3. *Hemorrhagic Fever, Ebola/
4. *Tuberculosis/
5. *Disease Outbreaks/
6. ^epidemics/ or *pandemics/
7. *Influenza, Human/
8. (nCoV or 2019-nCoV or ((new or novel or wuhan) adj3 coronavirus) or covid19 or COVID-19 or SARS-CoV-2 or "Severe Acute Respiratory Syndrome Coronavirus 2").mp
9. (coronavirus* or coronovirus* or coronoravirus* or coronaravirus* or corono-virus* or corona-virus*).ti
10. (pneumonia or respiratory-illness* or respiratory-symptom* or respiratory disease*).ti
11. (ebola or tuberculosis or pneumonia or SARS or MERS).ti
12. or/1-11

Intervention terms strategy

1. health education/ or consumer health information/ or patient education as topic/
2. exp information literacy/
3. exp Communication/ or exp "Treatment Adherence and Compliance"/
4. exp Decision Making/
5. competitive behavior/ or cooperative behavior/ or mass behavior/ or social skills/
6. exp social support/
7. Pamphlets/
8. Communications Media/
9. ((health or medical or clinical or advice or patient*) adj3 (educat* or inform*)).ti,ab,kw
10. ((patient* or communit* or population or mass) adj3 (literatur* or material* or information* or guide or guides or instruction*)).ti,ab,kw
11. ((print* or written or text* or social) adj3 (material* or information* or guide or guides or instruction* or advice or advis* or messag* or note or notes or media)).ti,ab,kw
12. ((handout* or guidebook* or information) adj3 (card or cards or postcard*)).ti,ab,kw
13. (information adj2 (pack* or sheet*)).ti,ab,kw
14. (mhealth or M#health).ti,ab,kw
15. (communit* adj3 leader*).ti,ab,kw
16. (self-monitor* or self monitor*).ti,ab,kw
17. or/1-16

Table A1.1. contd

Public health measure: contact tracing

1. Contact Tracing/
 2. ((trace or identif*) adj2 contact*).ti,ab,kw
 3. ((case* or early) adj2 (detect or detecting or detection or find*)).ti,ab,kw
 4. or/1-3
-

Public health measure: isolation

1. Patient Isolation/
 2. Social Isolation/
 3. self-isolat*.ti,ab,kw
 4. ((patient* or case* or voluntary or home or social or self) adj2 isolation).ti,ab,kw
 5. or/1-3
-

Public health measure: quarantine

1. Quarantine/
 2. quarantin*.ti,ab,kw
 3. or/1-2
-

Public health measure: school measures/closures

1. (school adj2 (closure* or closing or holiday*)).ti,ab,kw
 2. school*.ti
 3. class dismiss*.ti,ab,kw
 4. or/1-3
-

Public health measure: workplace measures/closures

1. exp Work/
 2. Workplace/
 3. (work site* or business* or organization* or office*).ti,ab,kw
 4. or/1-3
 5. (closure* or close* or closing or cease or cessation* or leave).ti,ab,kw
 6. and/4-5
 7. *social behavior/ or *social distance/
 8. telework.ti,ab,kw
 9. social mixing.ti,ab,kw
 10. (community adj2 mitigat*).ti,ab,kw
 11. non pharmaceutical intervention*.ti,ab,kw
 12. non?pharmaceutical intervention*.ti,ab,kw
 13. NPI*.ti,ab,kw
 14. or/6-13
-



Table A1.1. contd

Public health measure: crowd avoidance, individual physical distancing measures
1. ("event" or "meeting" or "sport" or "concert" or "pilgrimage" or "park" or "conference" or "mass" or "public" or "community" or "large" or "general" or "church").mp
2. ("gather*" or "crowd*" or "avoid*").mp
3. and/1-2
4. ((physical or social) adj2 distanc*).mp
5. *Avoidance Learning/
6. or/3-5

As this was a rapid review, searching and screening activities were undertaken sequentially to identify relevant synthesized evidence (guidelines and systematic reviews) in the first instance and then considering highly relevant single (primary) studies as required to fill in any gaps identified in the evidence at that point (Table A1.2).

Table A1.2. Sequence of review search activities


1	2	3
Search for and select guidelines, systematic reviews and single studies on COVID-19	Map against questions by extracting brief data on: <ul style="list-style-type: none">• reference/source• country of included study• population• intervention• phenomenon of interest	Identify key gaps
Search sources to include sources 1–3 (above) concurrently		
Include any guideline or systematic review that <ul style="list-style-type: none">• addresses social distancing• includes primary research of intervention/ experience/views/case report or register data related to communication purposes above		

Table A1.2. contd

4	5	6
<p>Search for guidelines and systematic reviews (no single studies) related to other infectious diseases (including Ebola, influenza, MERS, SARS, TB and other potentially pandemic diseases)</p> <p>Search sources to include sources 1–3 (above) concurrently</p> <p>Include any guideline or systematic review that:</p> <ul style="list-style-type: none"> • address social distancing • include primary research of intervention/experience/views related to communication purposes above 	<p>Map against questions by extracting brief data on:</p> <ul style="list-style-type: none"> • reference/source • country of included study • population • intervention • phenomenon of interest 	<p>Identify key gaps</p>
7	8	
<p>Contact experts to check data sources and for advice on gaps</p>	<p>Consider any further searches identified from expert consultation to fill outstanding gaps by searching for single studies</p>	

Study selection

Papers were selected for inclusion in a two-stage process: screening of titles and abstracts against the selection criteria by a single reviewer, followed by screening of full text papers. A second reviewer checked a sample of the excluded papers and/or provided a second opinion as needed. Any citations identified as potentially relevant were obtained in full text and screened against the selection criteria in a similar manner. At the drafting stage, experts were also asked to review to ensure



scientific rigour and systems relevance. Their feedback was incorporated into the final version of the review. Findings of included evidence sources were extracted by a single reviewer and checked by a second reviewer.

Any disagreements were resolved by discussion to reach consensus.

In all cases, the choice of outcomes on which to focus for data extraction was based on the decision of the review team regarding the importance of the outcome(s) for decision-makers. Reasons for exclusion were recorded systematically and are available from the authors upon request.

Inclusion and exclusion criteria

Population and context

Documents were included if they focused on:

- physical distancing measures for prevention and/or control of COVID-19 or other similar infectious diseases (including SARS, MERS, influenza, EBV and TB); and
- promotion of physical distancing measures in settings outside health-care settings (i.e. measures put in place in community settings).

Documents were excluded if they focused on:

- disease surveillance or clinical outcomes related to implementation of physical distancing measures;
- health-care settings (e.g. infection and disease control measures in hospitals);
- diseases for which physical distancing measures are not considered a primary means of prevention and/or control; and
- communication with patients/family members about decision-making for personal treatment in situations of isolation.

Interventions (approaches)

Documents were included if they focused on:

- communication with individuals, organizations, communities and/or systems; and
- physical distancing communication, defined as that undertaken with any one or more of the following purposes (2): informing/educating, reminding, facilitating communication or decision-making, enabling communication, acquiring skills or supporting behavioural change.

These purposes for communication were used to operationalize (i.e. frame the review in terms of relevant strategies) in the context of COVID-19 and physical distancing measures.

Documents were excluded if they focused on:

- strategies for enhancing community ownership;
- strategies for (personal) support, such as psychosocial support for individuals, as these fall outside the current scope of the review;
- strategies aiming primarily to minimize risks or harms to individuals or to communities, which were considered an outcome in the context of this review (e.g. individual risk and population risk mitigation such as informing individuals about the importance of vaccination for influenza in the context of COVID-19 pandemic);
- quality-improvement strategies looking at implementation of physical distancing measures, rather than acceptance, uptake and adherence to such measures (if such strategies included a focus on communication of measures for physical distancing they were then considered as eligible for inclusion);
- strategies without a communication element (as listed above), for example those assessing effectiveness of physical distancing measures themselves; and
- studies that modelled various effectiveness scenarios.

Additional exclusion criteria at review stage

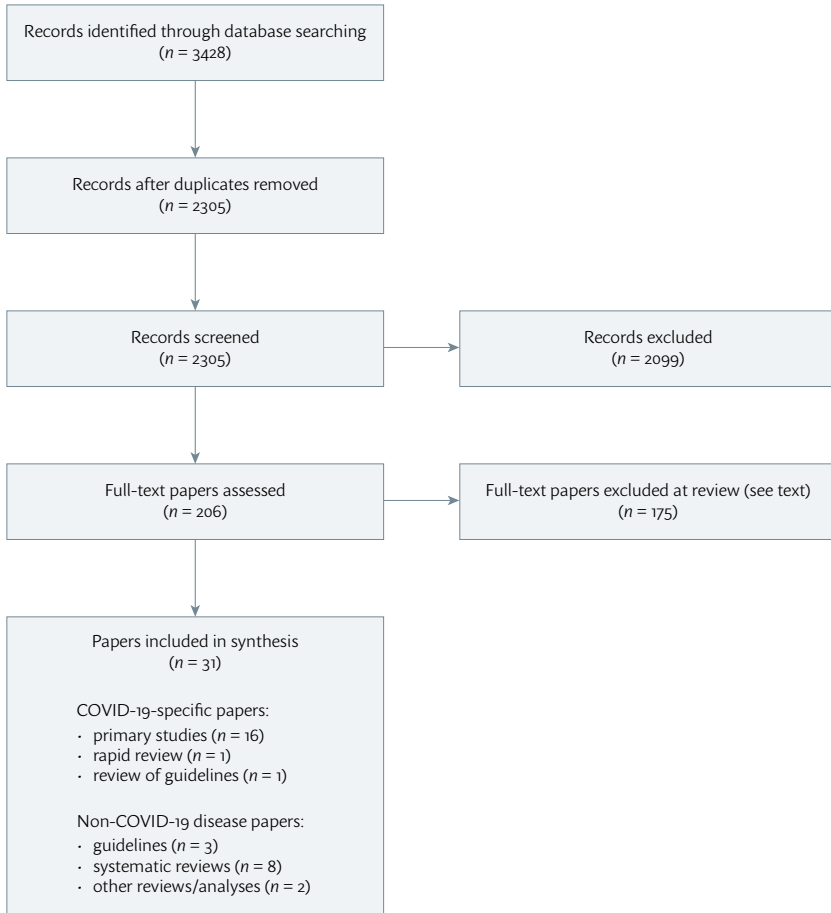
At the review stage, when selecting relevant papers for inclusion, the following exclusion criteria were added:

- papers on mobile/digital health applications without an explicit focus on physical distancing measures;
- assessments of knowledge of pandemic risks and/or perceptions of risks without a focus on physical distancing measures;
- public/consumer information materials on physical distancing; and
- non-empirical papers (e.g. letters, opinion pieces or editorials).

From searches carried out up until 1 May 2020, a total of 3428 papers were identified and assessed based on their titles and abstracts; full text was screened for 206 of these and a final group of 31 papers from published and unpublished sources were selected for inclusion: 18 directly related to COVID-19 (16 primary studies, one rapid review and one review of guidelines plus other guidance documents) and 13 from the pre-COVID-19 era (eight systematic reviews, three guideline recommendations and two non-systematic reviews related to other diseases (HIV and influenza)).

Citations excluded at the full text stage were recorded. Fig. A1.1 outlines the selection of policies and studies based on the PRISMA statement (3).

Fig. A1.1. Selection of documents



Data extraction and evidence synthesis

Data were extracted using a standardized template that was developed and piloted prior to use. Data extraction focused on information related to key elements, including source, country, types of research, types of included studies, population, intervention or phenomenon of interest and major results.

In all cases, data were extracted by a single reviewer and checked for accuracy and completeness by a second reviewer. Any disagreements were resolved by discussion. Identified evidence was then mapped systematically against the review questions by a single reviewer, with a second reviewer checking a sample of the evidence. Evidence gaps were identified and used to inform subsequent stages of search activities. In this way, a progressive map of evidence addressing the review questions was developed.

Data were initially extracted and organized to present the key features and findings in a structured way in relation to specific physical distancing measures and then synthesized narratively. Almost half (14/31) of the included papers focused on crowd avoidance measures, including personal physical distancing measures. Two guidelines outlined general considerations for preparedness planning for pandemic influenza or for emergency risk communication. Little direct evidence was identified on school or work measures. This initial organization by specific physical distancing measures was found to be unhelpful because many aspects of knowledge, understanding, intention and subsequent behaviour are interlinked, which led to considerable repetition and lack of clarity in key messages. Consequently, the specific components were collapsed into a common physical distancing element and the focus moved to the purposes of the identified communication.

The communication intervention taxonomy was used as a basis for thematically organizing the findings and identifying common purposes among the included evidence. Papers were systematically grouped according to shared communication features, including aspects of intervention delivery and/or design, intended target populations, and/or barriers and enablers.

A further issue in terms of evidence synthesis was that many of the sources were already synthesized from papers using a range of study designs and concentrated on surveys, population studies and qualitative research studies; for example, a guideline might combine effects and insights from various studies in order to produce guidance from the best available evidence. Consequently, the initial intention



to analyse quantitative (focusing on effectiveness) and qualitative (focused on identifying views, experiences, contexts, etc.) research separately was not feasible and the synthesis presented here does not represent a hierarchy of evidence or effectiveness as this was neither possible nor meaningful.

As a result, different study designs were analysed concurrently to identify major thematic categories and data were extracted and findings mapped to each component of the review question (e.g. acceptance or adherence) with a second translational step to identify the promotion or communication purpose and how this might affect interpretation of the study findings. All analysis steps were undertaken by a single reviewer and checked by a second reviewer.

The analysis considered population features, intervention characteristics and contextual factors or implementation considerations. Where possible, public health communication approaches targeting individual members of the public were identified. Much of the evidence identified was at the population level and focused on public pandemic risk messaging, including information to the public, or to specific groups within populations, to promote physical distancing measures.

Quality assessment

This review includes both quantitative and qualitative research, without restricting study design. This approach has strengths in that qualitative findings may help to identify barriers or enablers to the use of particular strategies that might not be reported by purely quantitative studies. Around half of the included papers focused on the COVID-19 pandemic itself. Most of these papers were, unsurprisingly, primary studies rather than synthesized evidence. Twelve surveys were included but for most of these response rates and representativeness were difficult to determine; several were also pre-peer review. Papers were appraised by a single reviewer and checked by a second reviewer using a tool appropriate to the methodology, with most guidelines and systematic reviews assessed as of moderate quality, as were the other primary studies (RCTs and qualitative studies):

- systematic reviews: AMSTAR (A Measurement Tool to Assess Systematic Reviews) (4);
- guidelines: AGREE II (5);
- survey/cross-sectional: adapted from an approach by Bults et al., 2015 (6);
- qualitative studies: CASP (Critical Appraisal Skills Programme) tool for qualitative studies (7); and
- RCTs: CASP tool for randomized trials (8).

While similar findings emerged from several different data sources, both quantitative and qualitative, including several different types of study design makes general messages about quality of the evidence difficult to formulate and it is hard to judge with certainty which findings should be regarded as general, rather than exhaustive and detailed, based on the quality of the evidence. A detailed quality assessment is available from the authors in an annex as is a detailed mapping of the papers against the six key physical distancing measures (contact tracing, isolation, quarantine, school measures/closures, workplace measures/closures and crowd avoidance).

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