The following information resources have been selected by the National Health Library and Knowledge Service Evidence Virtual Team in response to a request to collate the best available evidence and guidance on the following question: what is the effectiveness of social distancing to prevent transmission of COVID-19? The resources are listed in our estimated order of relevance to practicing healthcare professionals confronted with this scenario in an Irish context. In respect of the evolving global situation and rapidly changing evidence base, the Evidence Team has provided link-outs to continually updating sources of information rather than prescriptive or static statements of evidence; it is therefore advised to use the hyperlinks in this document to ensure that the information you are disseminating to the public is the most current, valid and accurate.

The following information is in response to the question on social distancing.

SUMMARY

Shenjie et al. argues for early and integrated non-pharmaceutical interventions to minimize health, social and economic impacts. Admed et al. supports social distancing in non-healthcare settings, but there is a paucity of well-designed epidemiological studies. Hoang et al. notes that respiratory tract infections are the leading cause of infections in a sample mass gathering [Hajj religious festival]. Wilder-Smith and Freedman note that isolation of patients is particularly effective in interrupting transmission if early detection is possible before overt viral shedding. Social distancing is designed to reduce interactions between people in a broader community, in which individuals may be infectious but have not yet been identified and hence not yet isolated. As diseases transmitted by respiratory droplets require a certain proximity of people, social distancing of persons will reduce transmission. Social distancing is particularly useful in settings where community transmission is believed to have occurred, but where the linkages between cases is unclear and where restrictions placed only on persons known to have been exposed is considered insufficient to prevent further transmission. Examples for social distancing include closure of schools or office buildings and suspension of public events or gatherings. If these measures are deemed to be insufficient, community-wide containment may need to be implemented.

There is also a good resource available via the European Centre for Disease Prevention and Control.

European Centre for Disease Prevention and Control

Considerations Relating to Social Distancing Measures in Response to the COVID-19 Epidemic[1]

Social distancing is an action taken to minimise contact with other individuals. Social distancing measures comprise one category of non-pharmaceutical countermeasures aimed at reducing disease transmission and thereby also reducing pressure on health services.

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[1] https://www.ecdc.europa.eu/en/publications-data/considerations-relating-social-distancing-measures-response-covid-19-epidemic.

…from Embase/Medline

Shenjie et al. Effect of Non-Pharmaceutical Interventions for Containing the COVID-19 Outbreak: An Observational and Modelling Study[2]

Background: The COVID-19 outbreak containment strategies in China based on non-pharmaceutical interventions [NPIs] appear to be effective. Quantitative research is still needed however to assess the efficacy of different candidate NPIs and their timings to guide ongoing and future responses to epidemics of this emerging disease across the World. Methods: We built a travel network-based susceptible-exposed-infectious-removed model to simulate the outbreak across cities in mainland China. We used epidemiological parameters estimated for the early stage of outbreak in Wuhan to parameterise the transmission before NPIs were implemented. To quantify the relative effect of various NPIs, daily changes of delay from illness onset to the first reported case in each county were used as a proxy for the improvement of case identification and isolation across the outbreak. Historical and near-real time human movement data, obtained from Baidu location-based service, were used to derive the intensity of travel restrictions and contact reductions across China. The model and outputs were validated using daily reported case numbers, with a series of sensitivity analyses conducted. Findings: We estimated that there were a total of 114,325 COVID-19 cases (interquartile range [IQR] 76,776 - 164,576) in mainland China as of February 29, 2020, and these were highly correlated (p<0.001, R2=0.86) with reported incidence. Without NPIs, the number of COVID-19 cases would likely have shown a 67-fold increase (IQR: 44 - 94), with the effectiveness of different interventions varying. The early detection and isolation of cases was estimated to prevent more infections than travel restrictions and contact reductions, but integrated NPIs would achieve the strongest and most rapid effect. If NPIs could have been conducted one week, two weeks, or three weeks earlier in China, cases could have been reduced by 66%, 86%, and 95%, respectively, together with significantly reducing the number of affected areas. However, if NPIs were conducted one week, two weeks, or three weeks later, the number of cases could have shown a 3-fold, 7-fold, and 18-fold increase across China, respectively. Results also suggest that the social distancing intervention should be continued for the next few months in China to prevent case numbers increasing again after travel restrictions were lifted on February 17, 2020. Conclusion: The NPIs deployed in China appear to be effectively containing the COVID-19 outbreak, but the efficacy of the different interventions varied, with the early case detection and contact reduction being the most effective. Moreover, deploying the NPIs early is also important to prevent further spread. Early and integrated NPI strategies should be prepared, adopted and adjusted to minimize health, social and economic impacts in affected regions around the World.

Ahmed et al. Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review[3]

RESULT(S): Fifteen studies, representing 12 modeling and three epidemiological, met the eligibility criteria. The epidemiological studies showed that social distancing was associated with a reduction in influenza-like illness and seroconversion to 2009 influenza A (H1N1). However, the overall risk of bias in the epidemiological studies was serious. The modeling studies estimated that workplace social distancing measures alone produced a median reduction of 23% in the cumulative influenza attack rate in the general population. It also delayed and reduced the peak influenza attack rate. The reduction in the cumulative attack rate was more pronounced when workplace social distancing was combined with other nonpharmaceutical or pharmaceutical interventions. However, the effectiveness was estimated to decline with higher basic reproduction number values, delayed triggering of workplace social distancing, or lower compliance.

CONCLUSION(S): Modeling studies support social distancing in non-healthcare workplaces, but there is a paucity of well-designed epidemiological studies. SYSTEMATIC REVIEW REGISTRATION NUMBER: PROSPERO registration # CRD42017065310.

[2] https://www.medrxiv.org/content/10.1101/2020.03.03.20029843v2.
[3] https://www.ncbi.nlm.nih.gov/pubmed/29669545.

Hoang et al. Infectious Diseases and Mass Gatherings[4]

Purpose of Review: Mass gatherings (MGs) are characterized by a high concentration of people at a specific time and location. Infectious diseases are of particular concern at MGs. The aim of this review was to summarize findings in the field of infectious diseases with a variety of pathogens associated with international MGs in the last 5 years. Recent Findings: In the context of Hajj, one of the largest religious MGs at Mecca, Saudi Arabia, respiratory tract infections are the leading cause of infectious diseases in pilgrims with a prevalence of 50-93%. The most commonly acquired respiratory viruses were human rhinovirus, followed by human coronaviruses and influenza A virus, in decreasing order. Haemophilus influenzae, Staphylococcus aureus, and Streptococcus pneumoniae were the predominant bacteria. The prevalence of Hajj-related diarrhoea ranged from 1.1 to 23.3% and aetiologies included Salmonella spp., and Escherichia coli, with evidence of acquisition of antimicrobial-resistant bacteria. In other MGs such as Muslim, Christian, and Hindu religious events, sports events, and large-scale open-air festivals, outbreaks have been reported less frequently. The most common outbreaks at these events involved diseases preventable by vaccination, notably measles and influenza. Gastrointestinal infections caused by a variety of pathogens were also recorded.

Wilder-Smith et al. Isolation, quarantine, social distancing and community containment: pivotal role for old-style public health measures in the novel coronavirus (2019-nCoV) outbreak[5]

Public health measures were decisive in controlling the SARS epidemic in 2003. Isolation is the separation of ill persons from non-infected persons. Quarantine is movement restriction, often with fever surveillance, of contacts when it is not evident whether they have been infected but are not yet symptomatic or have not been infected. Community containment includes measures that range from increasing social distancing to community-wide quarantine. Whether these measures will be sufficient to control 2019-nCoV depends on addressing some unanswered questions.

Produced by the members of the National Health Library and Knowledge Service Evidence Team.[†] Current as at 11 March 2020.This evidence summary collates the best available evidence at the time of writing. Emerging literature or subsequent developments in respect of COVID-19 may require amendment to the information or sources listed in the document. Although all reasonable care has been taken in the compilation of content, the National Health Library and Knowledge Service Evidence Team makes no representations or warranties expressed or implied as to the accuracy or suitability of the information or sources listed in the document. This evidence summary is the property of the National Health Library and Knowledge Service and subsequent re-use or distribution in whole or in part should include acknowledgement of the service.

The following PICO(T) was used as a basis for the evidence summary:

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[4] https://www.ncbi.nlm.nih.gov/pubmed/30155747.
[5] https://www.ncbi.nlm.nih.gov/pubmed/32052841.

Population person, location, condition/patient characteristic	COVID-19
Intervention length, location, type	Social distancing
Comparison another intervention, no intervention, location of the intervention	
Outcome	Optimal patient outcome. Containment of infection.

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BMJ Best Practice

Cochrane Clinical Answers