# RCN Independent review of guidelines for the prevention and control of Covid-19 in health care settings in the United Kingdom: evaluation and messages for future infection-related emergency planning

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## Executive summary

- This report acknowledges that there was a need for the rapid synthesis of the available infection prevention and control evidence at the beginning of the pandemic when the novel coronavirus first emerged. Twelve months into the pandemic, the continuing use of the same rapid review to inform UK wide-guidelines for infection prevention and control is questioned, particularly as much more is now known about COVID-19, opinions about the way that it is transmitted have changed and it is becoming apparent that airborne transmission of SARS-CoV-2 beyond the technical process of aerosol generating procedures is possible.
- At the beginning of the pandemic it was assumed that respiratory secretions containing the virus travelled over short distances as droplets and settled quickly under gravity, contaminating the close environment of an infected person. Consequently, physical distancing, fluid resistant surgical face masks (Type 11R) and hand hygiene were regarded as the most important infection prevention measures. Airborne spread was considered less important and the role of respiratory-protection was played down. UK infection prevention and control guidelines to prevent the spread of COVID-19 in health care settings and the rapid reviews of the literature on which it was based still identify droplet spread as the major route and promote hand hygiene as the most important infection prevention measure, based on early advice from the World Health Organization (WHO). Updated evidence indicates that aerosol spread is much more significant and the original advice from the WHO has been superseded. The UK guidelines are still based on this outdated evidence, however. They are fundamentally flawed and need replacing.
- In early 2021 the Royal College of Nursing expressed concern about the UK infection prevention and control guidelines. Recommendations to limit possible aerosol spread and the use of face-protection (e.g .FFP3 masks) as a precautionary principle and a lack of assurance on ventilation in health care premises were the major sources of anxiety.
- Critical appraisal of the UK infection prevention and control guideline evidence base in this report confirms that the UK guidelines and the Rapid

Review on which they are based are no longer fit for purpose. It is not clear how the conclusions drawn in the Rapid Review were reached and there is too little evidence to support its recommendations for face-protection; gloves; and for ventilation.

- Neither the Rapid Review nor the UK guidelines have been appropriately updated to meet the needs of an outbreak situation now progressing into its second year. In particular, the evidence relating to airborne transmission, the ventilation of health care premises and implications for the use of face-protection need to be re-considered and included in UK guidelines.
- This report is an independent review of the evidence underpinning the UK infection prevention and control guidelines as of February 2021, its conclusion and recommendations to inform the next and continuing phase of the pandemic in the UK.

## Conclusion

The analysis undertaken for the RCN has identified that the Rapid Review methodology undertaken to inform the UK guidelines does not meet contemporary standards for the conduct of rapid reviews and consequently the UK infection prevention and control guidelines that draw on it have not been appropriately updated to meet the needs of this pandemic situation, now progressing into its second year. In particular, the evidence relating to airborne transmission, the ventilation of health care premises and the implications for the use of face-protection need to be re-considered.[1]

[1] New information about COVID-19 is arriving rapidly. Since writing this report ARHAI has published a second version of its rapid review relating to airborne spread and the use of respirators. The Lancet covid-19 commission has also produced a key document emphasising the importance of aerosol spread , the importance of ventilation and of undertaking multi-layered infection prevention measures https://covid19commission.org/safe-work-travel

**Glossary**

*Fomite* is the term used to describe a surface that is contaminated and able to transfer infection if touched e.g. computer keyboard, light switch, door-handle.

*Grading of Recommendations, Assessment, Development and Evaluations (GRADE)* is widely used for rating the quality of a body of evidence used to answer a clinical question, presenting a summary of that evidence, and then turning it into a recommendation. Within this system there is clear separation between judgements about the quality of evidence and the strength of recommendations, as there are other factors that need to be taken into account when making recommendations. These are contained within the Evidence to Decision Frameworks, but in summary comprise: the balance between desirable and undesirable outcomes; an assessment of values and preferences and their variability; the resources used; cost-effectiveness; equity; acceptability and feasibility; as well as a judgement about the overall quality of evidence (Alonso-Coello et al., 2016).Making a judgement about each of these provides a guideline development group with evidence to make one of five recommendations: a strong recommendation for or against something; a weak recommendation; or no recommendation at all. Importantly GRADE makes judgements on the body of evidence used to answer a clinical question and separates recommendations into those that are critical, important but not critical, or of limited importance for decision making (Schünemann et al., 2013).

*PICO* (**P**atient/population; **I**ntervention; **C**omparison; **O**utcomes) is a framework used to formulate research questions to explore the effectiveness of different health care interventions. The findings of epidemiological studies are often presented under PICO headings.

*Selection bias* in a systematic review occurs when only when a selection of the eligible papers are reported on.

## Introduction

Severe acute respiratory syndrome caused by SARS-CoV-2 is fuelling an international public health crisis. Nursing staff and midwives are the largest groups of health workers in close, continuous patient contact. Consequently they are at particularly high risk of occupational health exposure and work related disease. In one analysis of UK data, compared to workers in jobs classified as non-essential, healthcare workers had a much higher risk of contracting severe COVID-19, (Mutambudzi et al., 2020). A study of asymptomatic healthcare workers showed that 2.4% were carrying the virus at the time of testing, and 24.4% were seropositive for antibodies to the virus (Shields et al., 2020). In an analysis of data from one week in December, it was estimated that of a total of 10,150 COVID-19 cases in hospital, 2,414 were transmitted in hospital to patients being treated for other conditions (Discombe, 2020).The UK-approved guidelines for the prevention and control of COVID-19 were derived from a rapid review of the literature initially undertaken by an independent body in March 2020. The Rapid Review has since been updated at approximately monthly intervals and at the time of writing (February 2021) is in its eleventh iteration.

The stated aim of the authors of the independent review was to deliver a rapid review of scientific evidence to inform the infection prevention and control measures required for COVID-19 in healthcare settings. Specific objectives were: to establish the epidemiology of COVID-19; requirement for personal protective equipment (PPE) and hand hygiene, the ability of SARS-CoV-2 to survive in the environment and requirements for cleaning/decontamination. The UK guidelines state that they are based on a systematic review and give a link to the Rapid Review produced by Antimicrobial Resistance and Healthcare Association (ARHAI) Scotland. Links to guidelines by the World Health Organization (WHO) and the National Institute of Health and Care Excellence (NICE) are also given, but they do not provide information relating to PPE or the ventilation in health care settings. A link is also provided to another rapid review undertaken by the same independent body; ARHAI Assessing the evidence base for medical

procedures which create a high risk of respiratory infection transfer from patient to health worker Version 1.1, 10.10. 2020 (Health Protection Scotland, 2020). This second rapid review quotes outdated reference material and the methods used to compile the review lack detail and suffer from similar shortcomings to those of the Rapid Review discussed below.

In December 2020 the Royal College of Nursing and its membership expressed concern about the national guidelines for the prevention and control of COVID-19 in health care settings in the UK. Concerns centred on the emergence of the SARS-Co-V-2 Variants of Concern (VoC) and the implications of increased risk of transmission to patients and staff through exposure in health care settings. The RCN had consistently raised concerns regarding the need for stakeholder engagement and consultation to ensure that as the guidelines were updated, they met the needs of health workers in all hospital and community settings, drawing on the most up-to-date evidence. RCN members had raised specific concerns over recommendations to limit the possible aerosol spread of COVID-19 in patients' homes and prisons and sought assurance on behalf of its members on the effectiveness of surgical face-masks during direct, close proximity patient contact and requested that the quality of ventilation in health care buildings should be investigated. The introduction of a vaccination programme is a positive step in reducing the impact of the pandemic in the UK however the use of PPE remains, and staff and patients remain at risk of acquiring covid-19 as no vaccine offers 100% efficacy and future VoC could render vaccines less effective. These issues therefore continue to be a major source of anxiety but to date the RCN has received no assurance that they are receiving attention.

The RCN has not to date received responses to requests for assurance or investigation of ventilation in health and care premises. Consequently it has undertaken this independent review to assess the methods used to establish and update the recommendations in the UK Infection prevention and control guidance. These guidelines are taken as the decisive guidance for employers and health care workers across the UK.

This report outlines the findings and recommendations of the independent review. We expect the UK Infection prevention and control cell and respective senior health and care leaders across the UK to review this report and take urgent action on its findings.
The report will also be of interest to:

- RCN members, including safety representatives
- Infection prevention and control teams
- Those involved in guideline/policy development
- Health and safety leads in health and care settings

**Recommendations**

- The Rapid Review and UK guidelines should be regarded as emergency level documents no longer suited to protecting health workers at this later stage in the pandemic. They should be replaced by a more targeted interim review with the guidelines updated in accordance, compiled by a multidisciplinary team with multi-professional stakeholder involvement. Key issues for updating include modes of transmission and their implications for the use of PPE, especially recommendations for face-protection and for ventilation in buildings where health and social care are delivered. The RCN expects the interim review to be available within three months (June 2021). This timeline differs from WHO recommendations however the current situation is an exception and therefore this work should be prioritised with appropriate resources allocated by national bodies. It could take the form of a 'living review' updated by a dedicated team under the supervision of a stakeholder steering group with peer review by a multi-professional group. Updating should be monthly as new knowledge becomes available and will need to be responsive to important scientific advances as they become available.

- The interim guidelines should be issued in a form that allows them to be customised to meet the specific needs of the setting in which they will be implemented, as in the WHO guidelines for hand hygiene.

- Professional and scientific stakeholders should be involved in development, implementation and evaluation of the guidelines.

- Throughout the interim guidelines the terms ‘aerosols’, ‘droplet nuclei’, ‘airborne particles’ and ‘small particles’ should be replaced by the same agreed term to avoid confusion.

- The interim guidelines should meet the requirements of equalities legislation and the broader need to reduce health and other inequalities. An equalities statement such as that produced by NICE should be adopted by those responsible for development and updating.

- The team responsible for issuing and updating the interim guidelines could form a post-pandemic group to inform the input of post-COVID strategy into the Five-Year Antimicrobial Action Plan requirement to implement national infection prevention and control guidelines in England. Given the outcomes of this critical appraisal the RCN does not consider the wholesale adoption of the Scottish infection prevention and control manual appropriate without reconsideration and thorough review and stakeholder involvement. Post-COVID strategy development will be necessary in all four countries of the UK.

**Review findings**:

The report acknowledges the need for rapid assessment of available evidence at the beginning of the pandemic as a novel coronavirus emerged. Twelve months into the pandemic, the use of a rapid emergency review to continue to inform crucial UK-wide guidance is questioned, particularly as much more is now known about COVID-19, opinions about the way that it is transmitted have changed and

it is becoming apparent that airborne transmission of SARS-CoV-2 beyond the technical process of aerosol generating procedures (AGPs) is possible.

The aims of this report written for the RCN were to:
1. Evaluate the methods used in the Rapid Review and the UK guidelines.
2. Respond to eleven specific questions asked by the RCN in relation to: the transmission of SARS-CoV-2; recommendations for face-protection; gloves; hand hygiene; environmental cleaning; and ventilation.
3. Formulate recommendations to strengthen infection prevention and control guidance and inform post-pandemic learning for the management of future pandemics.

To undertake detailed evaluation of the methods used in the Rapid Review, we identified evidence of best practice for developing clinical guidelines and how it can be streamlined in emergency situations without excessive loss of rigour.

## Methods employed to compile clinical guidelines

Clinical guidelines are defined as evidence-based recommendations designed to enable clinicians to implement high quality patient care (Thomas, 1999). They are usually informed by well-conducted systematic literature reviews and incorporate an evaluation of the beneficial and harmful effects of alternative strategies (Schünemann et al., 2013). A systematic review protocol is agreed, extensive searches of the published and unpublished ('grey') literature are undertaken, pre-determined quality criteria are applied to select the included studies and critical appraisal is performed with a named critical appraisal tool before drawing up recommendations for practice (Tricco et al., 2017). GRADE (see Glossary) is recommended for assessing quality of the body of evidence (Schünemann et al., 2013). Undertaking a systematic review is time-consuming and resource-intensive; teams usually take at least twelve months to complete a systematic review. Reviews and review guideline methodologies are becoming increasingly complex and multi-disciplinary teams are needed to undertake them.

*Rapid reviews and emergency advice guidelines*

Rapid advice guidelines are developed from rapid reviews of the literature generated to meet urgent public health need. As speed is the essence, rapid reviews are always a compromise of the traditional systematic review (Polisena et al., 2015). Development is more fluid and iterative than for traditionally-conducted systematic reviews (Garritty et al., 2021). The product is highly focused, can be based on previously available reviews if these exist and should be generated within three months. Rapid review methodology is a developing and fast-moving field (Garritty et al., 2021). Key players are the WHO (Tricco et al., 2017), the Cochrane Collaboration (Garritty et al., 2021) and the GIN-McMaster Guideline Development Unit (Morgan et al., 2018). The limitations inherent in rapid reviews are well-established: reduced transparency and reproducibility; increased risk of errors; and of excluding unpublished data and negative findings. They need updating to meet changing circumstances as the emergency progresses (Garritty et al., 2021) and when circumstances permit, should be replaced by guidelines based on full-scale systematic reviews (Polisena et al., 2015).

Rapid reviews are based on the same core principles as traditional systematic reviews but the development process is streamlined. The short-cuts taken depend on the specific circumstances surrounding the emergency. Language restrictions may be considered permissible depending on the countries affected, searching may be restricted to a limited number of high-yield databases and the 'grey' literature might be limited or omitted from searching depending upon the subject, timetable and purpose of the review. The aim is to expedite the review process without unnecessary sacrifice of rigour (Garritty et al., 2021; Tricco et al., 2017). Rapid reviews are not regarded as substitutes for systematic reviews but can nevertheless fulfil real need in the face of a public health crisis (Polisena et al., 2015). The guidelines for PPE written in 2014 to protect health workers during the Ebola outbreak in West Africa are regarded as a positive example of rapid guideline development and implementation (WHO, 2014). At the time, little information was available to inform the Ebola guidelines. Consequently,

stakeholder involvement played an important part in their development and implementation.

*Interim guidelines*

The WHO differentiates between rapid advice and interim guidelines. The differences are in terms of the purpose of the review, its scope, development and the period of time available for completion (Tricco et al., 2017). While still focused on a specific topic, the aim of an interim guideline is to generate additional recommendations within 6-9 months, building on new information as the emergency situation progresses. Once conditions permit, the interim review should be replaced by a consolidated review incorporating the earlier findings with a full-scale systematic review (Garritty et al., 2021).

## Critique of the Rapid Review (version 11)

Detailed critique of the Rapid Review is based on the WHO's guidelines for emergency advice reviews and recommendations arising from them (Tricco et al., 2017). We used the WHO guidelines to form a critical appraisal tool because of the three sets of guidelines available, these adopted the most pragmatic approach, were developed for use in fast-moving fieldwork situations and have been positively evaluated (Garritty et al., 2021; Tricco et al., 2017).

*Applying the World Health Organization's criteria for developing emergency advice guidelines to the Rapid Review*

Four of the 18 criteria denoting good practice by the WHO were partially met. The remaining 14 criteria were not met. Detailed consideration is given below.

1. Is there evidence that existing high-quality guidelines were used/adapted?
*Partially met* Early guidelines from the WHO for COVID-19 (WHO, 2020a) are cited although they have now been updated placing much greater emphasis on the importance of face-protection (WHO, 2020b). A number of government documents are cited, for example to support the choice of face-protection (ref 447) but other key information is omitted.

2. Has a similar, previously encountered event that could be used to inform the rapid advice guidelines occurred? If it has, is there evidence that it has informed the review?
*Partially met* Learning from previous experience with SARS and MERS is included but not comprehensively.

3. Are arrangements in place for managing the review e.g. a steering group with stakeholders to oversee the guideline development process and quality assurance?
*Not met* No arrangements are mentioned. The identity, skills and expertise of the two reviewers responsible for compiling the Rapid Review are not revealed. Ability to critique evidence depends on both methodological and specific knowledge of the subject, emphasising the importance of involving people from a wide-range of specialities. Research teams in the fields of engineering, mathematics and the physical sciences, for example the team led by (Noakes et al., 2006) have contributed to our understanding of the mode of transmission for SARS-CoV-2 as well as epidemiologists and virologists. Their expertise would have been invaluable. There is no indication that the Rapid Review was subjected to peer review.

4. Do existing high-quality systematic reviews or recent landmark papers exist? If they do, is there evidence that they have been drawn on to inform the rapid review?
*Not met* A number of existing reviews (see for example Rothan and Byrareddy (Rothan and Byrareddy, 2020) Tran et al (Tran et al., 2012)) are used to support specific recommendations but no indication of their quality is provided. The work of key authors (Fennelly, 2020; Hamilton et al., 2021; Marr et al., 2019; Milton et al., 2013; Noakes et al., 2006; Tang et al., 2021) whose research focuses on the transmission of respiratory viruses is omitted. All types of evidence are considered and receive equal weight in the Rapid Review (e.g. randomised and non-randomised trials), literature reviews adopting different methodologies (e.g. systematic reviews with and without meta-analysis) and single and multiple-centre studies.

5. Is there evidence of adequate searching? For emergency advice guidelines, searches are usually restricted to 2-3 of the most relevant databases.
*Partially met* Embase and Medline were searched. One hundred and ninety two of the 537 works cited were pre-print papers but there is no mention of the use of a pre-print tool such as the Pubmed COVID-19 Portfolio Tool (https://icite.od.nih.gov/covid19/search/) to search for them. This is a key omission: in 2020 100,000 – 200,000 articles relating to COVID-19 were posted online before undergoing peer review (Else, 2020).

6. Has a search strategy been provided? What restrictions are there compared to a standard review?
*Not met* The reviewers claim to provide details of the searches in an appendix but it contains only the search terms. They do not explain how the Rapid Review differs from a full systematic review in terms of the methods used to undertake it or the recommendations. The methods used to periodically update the Rapid Review are not revealed.

7. Have appropriate search terms been applied?
*Not met* Eighteen search terms were identified and shown in an appendix. None of these search terms is likely to have resulted in the retrieval of papers in the disciplines of mathematics, the physical sciences or engineering although as noted in (**4**) above, research teams working in these areas are conducting important work relating to the possible modes of transmission of SARS-CoV-2 with implications for infection prevention and control. Hand-searching was reported in the Rapid Review but the details were not revealed. These omissions are of concern in a rapidly developing situation where information might be contributed from a wide variety of disciplines and sources.

8. Have arrangements for stakeholder involvement been put in place?
*Not met* Stakeholder involvement is not mentioned.

9. Were adequate processes put in place to screen and select the included studies?
*Not met* 527 works are included. The screening and selection procedures are not identified. The action taken in cases of disagreement concerning selection of the included works and arrangements for third-party arbitration in cases of disagreement are not disclosed.

10. Are the procedures for extracting and synthesising the data from the included studies adequate?
*Not met* Details of data extraction and synthesis are not provided.

11. Is the procedure used to assess the quality of the evidence adequate? The quality of the body of evidence for each recommendation should be assessed, ideally with the GRADE framework.
*Not met* Methods to assess quality of the evidence are not mentioned. GRADE does not appear to have been used, although GRADE terminology is occasionally mentioned (e.g. 'certainty of the evidence'). The application of GRADE would have increased the utility of the Rapid Review as much of the supporting evidence has been obtained from low-quality evidence (e.g. cohort and case-series studies) and single-centre studies. Use of a formal evidence-to-decision framework would show where other factors had influenced recommendations. Appendix 1 provides an example of how GRADE might be applied to an existing systematic review.

12. Is the rapid review reported in enough detail to be replicated by other interested organisations or readers? A Preferred Reporting Items for Systematic reviews and Meta-Analyses flow diagram is recommended.
*Not met* The level of detail is insufficient for replication. PRISMA flow diagrams are not provided.

13. Is the PICO or another framework used to structure the searches?
*Not met* PICO is not mentioned. No other framework to structure the research questions and findings is mentioned.

14. Does the rapid review report and clearly summarise the results of the review?
*Partially met* Conclusions are summarised in bullet points at the end of each section. The use of GRADE would have helped improve clarity here.

15. Does the review team identify gaps in the evidence and need for future research?
*Partially met* The Rapid Review presents areas for further research in Section 9 (page 39). The authors identify the novel nature of SARS-CoV-2 and the limited ability for research in the early stages of the outbreak as the main gaps. Need for further research to establish the viability of the virus to help determine the infectious dose and provide evidence concerning the duration of infectivity and need for more robust epidemiological evidence is identified. Additional gaps for further research are indicated at points sporadically throughout text (e.g. on page 37 it is suggested that the use of air disinfection might be considered in view of mounting interest in the role of aerosol spread for SARS-Cov-2). Unfortunately these omissions are not presented in a systematic manner and because the text is dense, it is hard to extract them. The issue of ventilation to reduce risks in health care premises is not explored except in relation to disinfection more generally.

16. Is there written disclosure that the rapid review is not intended to be a 'gold standard' systematic review and that the results should be interpreted with caution and viewed within a specific context?
*Not met* Disclosures are not provided.

17. Were the recommendations formulated with a guideline development steering group, preferably using GRADE?
*Not met* Recommendations are highlighted but a guideline development steering group is not mentioned.

18. Is there evidence that implementation and the context in which implementation will take place were considered?

*Not met* Implementation and context are not mentioned.

### Specific issues raised by the Royal College of Nursing

**1.** Are the Rapid Review and its updates sufficient to inform infection prevention and control guidance at this stage in the pandemic (February 2021) satisfactory?
*Not satisfactory* Applying the critical appraisal tool, it was established that the methods used to undertake the Rapid Review fell short of the criteria for emergency advice guidelines suggested by the WHO:

- It is not clear how the sources of evidence were selected. It is likely that selection bias was introduced.

- It is not clear how the sources of evidence were critically appraised. Many key sources of information in relation to the nosocomial transmission of SARS-CoV-2 are absent. Key omissions include reports from the Healthcare Safety Investigation Branch for the nosocomial transmission of COVID-19 (Healthcare Safety Investigation Branch, 2020), international reports (e.g. Parliament of Victoria, 2021) and failure to cite the work of important authors (Fennelly, 2020; Hamilton et al., 2021; Marr et al., 2019; Milton et al., 2013; Noakes et al., 2006; Tang et al., 2021). Government briefings which may contain valuable data were not mentioned. Work ongoing at the Oxford Centre for Evidence-Based Medicine (Oxford CEBM, 2021) has not been cited.

- Failure to include key search terms such as ‘aerosol’, ‘droplet’ and ‘fomite-mediated transmission’ which would have helped to formulate advice about PPE requirements were not mentioned.

- Information concerning aerosol-generation resulting from coughing and speech is missing. Key studies indicate that ordinary speech can generate more aerosols than medical procedures such as intubation and suction (Hamilton et al., 2021; Wilson et al., 2020).

Overall the Rapid Review provides a superficial account of 527 publications without the focused approach recommended in the WHO guidelines and has not been satisfactorily updated to meet the standards expected of an interim guideline.

**2a.** Is the Rapid Review robust enough to inform current recommendations for the level of protection required to protect health workers?
*Not satisfactory* The Rapid Review does not appear robust enough to inform current recommendations for the level of protection required to protect health workers. Omission is particularly wanting in relation to the evidence underpinning the latest information concerning airborne transmission and the implications for infection prevention and control (face-protection) and ventilation in the health care estate. As stated above, the works of key authors have been excluded. This shortcoming has arisen because the model of transmission used to underpin evidence throughout the Rapid Review is outdated and depends on early guidelines from the WHO (WHO, 2020a) which have now been updated (World Health Organization, 2020b). An additional rapid review specifically relating to the use of respirators was published on 25.1.2021 but suffers from the same methodological shortcomings of as the Rapid Review.

**2b.** Is the evidence underpinning need for health workers in clinical areas where AGPs are **not** undertaken satisfactory in terms of providing protection from airborne SARS-CoV-2?
*Not satisfactory* Key references (Hamilton et al., 2021; Wilson et al., 2020) suggesting that transmission is possible in the absence of AGPs are not presented. Consequently the recommendation from the UK guidelines to restrict the use of higher-grade face protection to situations where AGPs are generated is questionable, especially in locations where ventilation to dilute aerosol particles is poor or non-existent.

**3.** Is the evidence underpinning recommendations for hand hygiene in relation to SARS-CoV-2 satisfactory?

*Satisfactory* The Rapid Review provides three references (Kratzel et al., 2020; Leslie et al., 2020; Rabenau et al., 2005) demonstrating that coronaviruses are deactivated by alcohol-based hand hygiene products. SARS-CoV-2 is a fragile, lipid-enveloped coronavirus and this supporting evidence is adequate for the purposes of infection prevention and control in health care settings where the use of alcohol handrubs and gels is routine.

**4.** Is the evidence underpinning for recommendations for glove use in relation to SARS-CoV-2 satisfactory?
*Not satisfactory* The Rapid Review does not present any information specifically in relation to the use of gloves. It recommends the use of standard infection control precautions in all situations regardless of the infectious nature of the patient. The only supporting evidence is to two references to the UK guidelines (references 14 and 427 in the Rapid Review). There is no mention of research demonstrating that health workers use non-sterile disposable gloves inappropriately or that they are frequently over-used, often at the expense of hand hygiene, thus increasing rather than decreasing infection risks (Wilson et al., 2017).

**5.** Is the evidence underpinning recommendations for environmental cleaning in relation to SARS-CoV-2 that has implications for nursing and midwifery practice satisfactory?
*Not satisfactory* The Rapid Review mentions a number of research studies but these are dismissed as providing unclear evidence. Instead the recommendations appear very general and are based on the UK guidelines and guidance to the the National Infection Prevention and Control Manual: NHS National Services Scotland (NHS Scotland - National Services Scotland, 2020) (reference 332) which are based on the Rapid Review.

**6a.** Is the Rapid Review transparent in terms of the level of evidence used to inform the UK guidelines?
*Not transparent* As discussed above, transparency is lacking in terms of the search strategy, selection of the included works and the processes used to

critically appraise them and assess quality of the evidence, for example with the use of GRADE.

**6b.** If the response to **6a** above is negative, what level of evidence is provided in the Rapid Review?
*Uncertain* It is not possible to determine the level of evidence provided by the Rapid Review for all the reasons given in **6a above**.

**7.** Are the search strategies used in the Rapid Review appropriate and sufficient to inform UK infection control and prevention guidance?
*Not sufficient* The search strategies are not described in the Rapid Review. From the number and quality of the included works, it is possible to deduce that these strategies were not appropriate or sufficient to inform UK infection and prevention guidance at this point in the pandemic. As indicated above, key information is omitted.

**8.** Are there any gaps in the evidence base identified in the Rapid Review?
*Response* Recommendations to support the use of face-protection and environmental decontamination are inadequate. There are no recommendations concerning the role of ventilation to prevent and control the transmission of SARS-CoV-2 in health care settings.

**9.** If the Rapid Review is not sufficient at this time, what is needed to inform guideline development?
*Response* The Rapid Review needs to be replaced by an interim review adopting the criteria from the WHO for interim reviews of the literature. The research team should be multidisciplinary and include stakeholders from key professional groups at the frontline, their professional bodies and patient groups.

*Additional points of concern*
It is not always possible to determine the source of the evidence underpinning the Rapid Review because of extensive cross-referencing between the documents. At intervals throughout the text, the Rapid Review cites the UK

guidelines as the source of information but according to the UK guidelines, the Rapid Review is the source of its underpinning evidence.

The WHO and other scientific works use the terms ‘aerosols’, ‘droplet nuclei’, ‘airborne’ and ‘small particles’ interchangeably. The Rapid Review further adds to this confusion by creating a new term: ‘air-mediated transmission’.

## CONCLUSION

The UK guidelines are over-reliant on the Rapid Review at the expense of other sources of evidence**.** The Rapid Review does not meet contemporary standards for the conduct of rapid reviews although such guidelines adapted for emergency situations exist and there are recent good examples. The Rapid Review and consequently the UK guidelines that draw on it have not been appropriately updated to meet the needs of an outbreak situation now progressing into its second year. In particular, the evidence relating to airborne transmission, the ventilation of health care premises and the implications for the use of face-protection need to be re-considered.

**Appendix**

Here we demonstrate how the full GRADE and GRADE Evidence to Decision Framework could be applied. The question is whether N95/FFP2 masks should be used by nurses. The most recent systematic review was used to inform this decision; however there were a number of limitations in the application of this evidence to answer the question – most notably that the studies were looking at influenza transmission not Covid-19. More recent reviews might be found in pre-publication databases. If this is not the case a full systematic review needs to be conducted. It is important to note that this is not a recommendation from the authors, but an example of how one could be made.

**Author(s)**: Dinah Gould, Edward Purssell
**Question**: Do medical masks vs. N95/FFP2 masks result in greater transmission of Covid-19?
**Outcome: Laboratory-confirmed infection with any respiratory viruses**
**Setting**: Inpatient wards
**Bibliography**: Barycka, K., Szarpak, L., Filipiak, K. J., Jaguszewski, M., Smereka, J., Ladny, J. R., & Turan, O. (2020). Comparative effectiveness of N95 respirators and surgical/face masks in preventing airborne infections in the era of SARS-CoV2 pandemic: A meta-analysis of randomized trials. PLOS ONE, 15(12), e0242901. https://doi.org/10.1371/journal.pone.0242901

| Certainty assessment | | | | | | | N° of patients | | Effect | | Certainty | Importance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N° of studies | Study design | Risk of bias | Inconsistency | Indirectness | Imprecision | Other considerations | Medical masks | N95/ FFP2 masks | Relative (95% CI) | Absolute (95% CI) | | |
| **Laboratory-confirmed infection with any respiratory viruses** | | | | | | | | | | | | |
| 4 | randomised trials | not serious | serious [a] | very serious [b] | serious [c] | none | 108/ 1370 (7.9%) | 104/ 1832 (5.7%) | **RR 1.12** (0.88 to 1.41) | **7 more per 1,000** (from 7 fewer to 23 more) | ⨁◯◯◯ VERY LOW | CRITICAL |

**CI:** Confidence interval; **RR:** Risk ratio

Explanations

a. $I^2$ 26%, but one study with opposite outcome
b. Studies on influenza
c. Wide confidence intervals

**SUMMARY OF JUDGEMENTS**

| | JUDGEMENT | | | | | | |
|---|---|---|---|---|---|---|---|
| **PROBLEM** | No | Probably no | Probably yes | **Yes** | | Varies | Don't know |
| **DESIRABLE EFFECTS** | Trivial | Small | Moderate | **Large** | | Varies | Don't know |
| **UNDESIRABLE EFFECTS** | Large | Moderate | **Small** | Trivial | | Varies | Don't know |
| **CERTAINTY OF EVIDENCE** | **Very low** | Low | Moderate | High | | | No included studies |
| **VALUES** | Important uncertainty or variability | Possibly important uncertainty or variability | Probably no important uncertainty or variability | **No important uncertainty or variability** | | | |
| **BALANCE OF EFFECTS** | Favours the comparison | Probably favours the comparison | Does not favour either the intervention or the comparison | **Probably favours the intervention** | **Favours the intervention** | Varies | Don't know |
| **RESOURCES REQUIRED** | Large costs | Moderate costs | Negligible costs and savings | Moderate savings | Large savings | Varies | **Don't know** |
| **CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES** | Very low | **Low** | Moderate | High | | | No included studies |
| **COST EFFECTIVENESS** | Favours the comparison | Probably favours the comparison | **Does not favour either the intervention or the comparison** | Probably favours the intervention | Favours the intervention | Varies | No included studies |
| **EQUITY** | Reduced | Probably reduced | Probably no impact | Probably increased | **Increased** | Varies | Don't know |
| **ACCEPTABILITY** | No | Probably no | **Probably yes** | Yes | | Varies | Don't know |
| **FEASIBILITY** | No | Probably no | **Probably yes** | Yes | | Varies | Don't know |

**TYPE OF RECOMMENDATION**

| Strong recommendation against the intervention | Conditional recommendation against the intervention | Conditional recommendation for either the intervention or the comparison | **Conditional recommendation for the intervention** | Strong recommendation for the intervention |
|---|---|---|---|---|
| ○ | ○ | ○ | ● | ○ |

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