



UK Health
Security
Agency

The effectiveness and unintended consequences of public health and social measures for respiratory pathogens as part of epidemic or pandemic response

A rapid mapping review

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Main messages

1. This rapid mapping review (search up to 18 November 2024) identified and mapped the available evidence from primary studies and systematic reviews on the effectiveness and unintended consequences of public health and social measures (PHSM) when used to prevent transmission of respiratory pathogens other than SARS-CoV-2 in the context of an epidemic or pandemic.
2. SARS-CoV-2 was excluded from this rapid mapping review as a rapid mapping review and a rapid systematic review on the effectiveness of PHSM to prevent transmission of SARS-CoV-2 have been conducted previously ([1](#), [2](#)). The current rapid mapping review was commissioned to identify available evidence on other respiratory pathogens.
3. There were 54 studies included in this rapid mapping review: 41 primary studies ([3 to 43](#)) and 13 systematic reviews ([44 to 56](#)).
4. Of the 41 primary studies identified, the majority (n=38) assessed the use of PHSM in the context of influenza ([3 to 32](#), [34 to 39](#), [42](#), [43](#)). PHSM used in these studies included hand and respiratory hygiene, facemasks, closure of early years or educational settings, international travel and border restrictions, restrictions on formal public gatherings, ventilation, cleaning and disinfection, or a combination of PHSM. Outcomes of effectiveness assessed included prevention or reduction of transmission, mortality, and healthcare use. Unintended consequences identified included changes in morbidity outcomes, healthcare use, and epidemiology for diseases other than the one for which the PHSM was intended, mental health outcomes, and consequences related to social determinants of health.
5. Three studies assessed the use of PHSM in the context of Severe Acute Respiratory Syndrome (SARS-CoV-1) ([33](#), [40](#), [41](#)). Evidence was identified on hand and respiratory hygiene, face masks, and cleaning and disinfection. All evidence identified related to the effectiveness of these PHSM in reducing transmission of SARS-CoV-1, with no studies identified which evaluated any unintended consequences.
6. An [evidence gap map](#) of primary studies identified has been produced to map the evidence of effectiveness and unintended consequences of PHSM against the respiratory pathogen they were implemented for. The outcome assessed most often was changes in transmission of the disease which the PHSM was intended for, and the most frequently assessed measure was hand and respiratory hygiene.
7. Thirteen systematic reviews were identified for inclusion ([44 to 56](#)). These reviews synthesised available evidence on the effectiveness of PHSM for influenza, SARS-CoV-1, and Middle Eastern Respiratory Syndrome (MERS-CoV). PHSM reviewed were face masks, hand hygiene, restrictions on formal public gatherings, and cleaning and

disinfection. All included systematic reviews synthesised evidence on outcomes related to effectiveness. One systematic review synthesised evidence on unintended consequences.

8. This rapid mapping review provides an overview of the range and characteristics of the available evidence on the effectiveness and unintended consequences of PHSM for respiratory pathogens other than SARS-CoV-2. Due to the nature of this review, a risk of bias assessment was not completed and so the quality of the included studies and systematic reviews is unknown. This rapid mapping review cannot be used to interpret study findings such as the effectiveness of different PHSM for preventing transmission.

Purpose

The purpose of this rapid mapping review was to identify and map the available evidence relating to the effectiveness and unintended consequences of public health and social measures (PHSM) for respiratory pathogens other than SARS-CoV-2 as part of epidemic or pandemic response.

The review question was:

1. What is the available evidence on the effectiveness and unintended consequences of public health and social measures (PHSM) implemented as part of epidemic or pandemic response, to prevent or reduce transmission of respiratory pathogens other than SARS-CoV-2?

The effectiveness and unintended consequences of PHSM for SARS-CoV-2 were not included in this review as both a rapid mapping review and a rapid systematic review have been conducted identifying, mapping, and summarising recent evidence on the effectiveness of PHSM in community settings to reduce transmission of SARS-CoV-2 ([1](#), [2](#)). The current rapid mapping review was commissioned to identify the available evidence on other respiratory pathogens and to help inform whether a rapid systematic review of that evidence should be undertaken.

Effectiveness was reported as any outcome related to transmission of pathogens, as well as mortality, morbidity, and healthcare use.

Unintended consequences were defined as the direct and indirect impacts on the physical and mental health of individuals as a consequence of the implementation of a PHSM at the individual and population level. Macro-level level impacts on the economy, environment, or other societal level factors that are beyond the scope of public health advice were excluded. Metrics for inclusion were premised upon identified individual risk factors or social determinants for poor health such as physical mobility, health service utilisation, and loneliness.

PHSM are interventions that protect the health and wellbeing of communities by reducing the risk of transmission of, or exposure to, infectious diseases. PHSM are often the first and may be the only interventions available to reduce transmission during a pandemic while clinical countermeasures such as vaccines are being developed and/or distributed. Examples of PHSM include hand hygiene, physical distancing, and modifications or restrictions on formal gatherings. PHSM do not include clinical countermeasures or medical interventions such as vaccinations, prophylaxis, or treatment.

Active case finding (testing to identify cases) was considered as a tool to inform the implementation of PHSM, and so was not included as a PHSM. How any PHSM was implemented (for example, whether a measure is voluntary, regulatory, or enforceable by law) and how benefits, harms, and health inequalities were balanced ahead of implementation was not covered by this rapid mapping review.

The list of PHSM included in this review were:

- physical distancing
- reducing informal social contact
- restrictions on formal public gatherings
- lockdowns
- restrictions on public transport
- isolation of cases
- international travel and border restrictions
- shielding
- cleaning and disinfection
- hand and respiratory hygiene
- face masks
- ventilation
- closure of early years and educational settings
- any combination of the above

Pathogens prioritised for inclusion in this review were representative examples of respiratory pathogens that have the potential to cause an epidemic or pandemic in humans in the UK. Other pathogens that transmit via a respiratory route, such as measles or tuberculosis, were not included in this review. While these pathogens have outbreak potential, they are unlikely to cause an epidemic or pandemic in the UK. The respiratory pathogens of interest in this review were:

- influenza (A, avian, swine, zoonotic, or any seasonal influenza)
- severe acute respiratory syndrome (SARS-CoV-1)
- Middle Eastern Respiratory Syndrome (MERS-CoV)
- human coronaviruses
- *Yersinia pestis* (pneumonic plague)

Methods

A rapid mapping review was conducted following streamlined systematic methods to accelerate the review process. A literature search was undertaken to look for relevant primary studies or systematic reviews published or available as preprint, up to 18 November 2024. Studies identified for inclusion in this review following title and abstract and full text screening were used as seed papers for backwards and forwards citation searching. Citation search results were screened by a single reviewer.

A protocol was produced before the literature search was conducted, including the review question, the eligibility criteria, and all other methods. Full details of the methodology are provided in the protocol in [Annexe A](#).

There were no deviations from the protocol.

The following clarifications were made to the study protocol:

- closure of early years and educational settings were only included if they were applied in response to respiratory pathogen transmission. If closures were pre-planned (for example, school holidays), this was not considered a PHSM
- systematic reviews were only included if the authors had intentionally synthesised data from primary studies that met the inclusion criteria of this review. If data were synthesised and included evidence from primary studies that would have been excluded from this review (for example, a synthesis including modelling studies, or of evidence from healthcare settings) then this would have been excluded
- seasonal influenza was defined as influenza A or B and studies were included even if the study occurred outside of a pre-defined influenza season
- interventions that were educational only (for example, an educational assessment on handwashing without provision of hand washing facilities or hand sanitiser) were not included in this review

Screening on title and abstract was undertaken in duplicate by 3 reviewers for 20% of the eligible studies, with the remainder completed by one reviewer. Screening on full text undertaken in duplicate by 3 reviewers for 20% of the eligible studies, with the remainder completed by one reviewer and checked by a second. Disagreements were resolved by discussion between the 3 reviewers.

Data extraction was undertaken in duplicate by 2 reviewers for 20% of included studies, with the remainder extracted by one reviewer and checked by a second. Due to the scoping nature of the review, study findings were not extracted, and risk of bias assessment was not undertaken. Where available, data on the effectiveness and unintended consequences of PHSM on children have been reported separately.

An evidence gap map was produced to provide a visual display of the spread of available evidence from primary studies, with study characteristics coded and mapped using EPPI-Reviewer (57) and the associated EPPI-Mapper tool (58). Respiratory pathogens were assigned as rows and PHSM were assigned as columns. Outcomes were presented in the evidence gap map as colour-coded tiles within each cell of the map. The evidence gap map does not report evidence from children and adults separately.

Evidence

In total, from systematic literature searching and citation searches, 18,431 studies were screened at title and abstract and 303 studies were screened at full text. Of these, 54 studies (41 primary studies and 13 systematic reviews) met the inclusion criteria (3 to 56). The PRISMA diagram showing the flow of studies through this review is available in [Annexe B](#). Studies excluded at full text screening are available with the reasons why in [Annexe C](#).

Evidence from primary studies

Study characteristics

There were 41 primary studies identified for inclusion in this review. These included:

- 13 randomised or cluster-randomised controlled trials (RCTs) (3 to 15)
- sixteen retrospective or prospective cohort studies (16, 17, 19, 21, 23, 24, 27, 29 to 32, 34, 36, 37, 39, 40)
- 9 case-control studies (20, 25, 28, 33, 35, 38, 41 to 43)
- 3 cross-sectional studies (18, 22, 26)

Evidence was identified for the following respiratory pathogens: influenza (n=38) (3 to 32, 34 to 39, 42, 43), SARS-CoV-1 (n=3) (33, 40, 41). No evidence was identified for MERS-CoV, human coronaviruses, or *Yersinia pestis*.

An overview of the evidence from RCTs is presented in [Table D.1](#), and evidence from observational studies (cohorts, case-control, and cross-sectional) is presented in [Table D.2](#).

An [evidence gap map](#) was produced that mapped the outcomes that were evaluated in the primary studies against PHSM and respiratory pathogens.

Influenza

There were 38 primary studies that assessed the effectiveness and unintended consequences of using PHSM in the context of influenza. Of these, 13 were RCTs (3 to 15), and 25 were observational studies (16 to 32, 34 to 39, 42, 43). Fourteen studies were conducted in Asia (6 to 8, 10, 12, 22, 25, 26, 30, 32, 34, 35, 39, 42), 12 in North America (3, 4, 9, 13, 16, 17, 21, 23, 27,

[29](#), [31](#), [37](#)), 8 in Europe ([5](#), [11](#), [14](#), [19](#), [20](#), [28](#), [36](#), [38](#)), one in Africa ([15](#)), one in South America ([18](#)), and 2 conducted across multiple countries ([24](#), [43](#)).

Twenty-four of these studies investigated influenza A (H1N1) ([11](#), [12](#), [16 to 24](#), [26 to 29](#), [31](#), [32](#), [34](#), [36 to 39](#), [42](#), [43](#)). Seven studies examined historical data from the 1918 H1N1 pandemic in the USA ([16](#), [17](#), [21](#), [23](#), [27](#), [29](#), [37](#)), and 16 studies were conducted (at least in part) during the 2009 H1N1 pandemic ([11](#), [12](#), [18 to 20](#), [22](#), [24](#), [26](#), [28](#), [31](#), [32](#), [34](#), [38](#), [39](#), [42](#), [43](#)).

Effectiveness assessed by changes in transmission, mortality, or healthcare use was investigated in 29 studies. The effectiveness of PHSM for the prevention or reduction of transmission was assessed by 23 studies ([3](#), [4](#), [6 to 10](#), [12 to 15](#), [20](#), [24 to 26](#), [32](#), [34 to 36](#), [38](#), [39](#), [42](#), [43](#)). The PHSM evaluated for their effect on transmission were hand and respiratory hygiene (n=19), facemasks (n=10), international travel and border restrictions (n=2), ventilation (n=2), closure of early years or educational settings (n=1), cleaning and disinfection (n=1), or a combination of any of the listed PHSM (n=3). Some studies included more than one PHSM.

Five studies examined effectiveness in terms of mortality (impact on excess death rates) ([17](#), [21](#), [23](#), [29](#), [37](#)). All 5 studies reviewed historical data from the 1918 H1N1 pandemic in the USA. These studies assessed the effect of restrictions on formal public gatherings, closure of early years or educational settings, isolation of cases, or a combination of these PHSM.

One study looked at the effectiveness of PHSM on healthcare use during the 2009 H1N1 pandemic, which examined the effect of hand and respiratory hygiene on hospitalisation from influenza ([28](#)). No studies reported the effect of PHSM in reducing morbidity in the disease the PHSM was intended for.

Unintended consequences of PHSM were reported by 13 studies ([5](#), [8](#), [11](#), [13 to 16](#), [18](#), [19](#), [22](#), [27](#), [30](#), [31](#)), with studies assessing health outcomes or social determinants of health.

Five studies assessed the unintended consequences of PHSM on health outcomes ([8](#), [14](#), [19](#), [27](#), [30](#)):

- morbidity outcomes directly or indirectly related to implementation of the PHSM were reported by 2 studies which assessed potential side effects of using facemasks and hand and respiratory hygiene ([8](#), [14](#))
- healthcare use for diseases other than the one that the PHSM was intended to reduce was reported by one study which assessed the effect of closure of early years and educational settings on physician, outpatient, or emergency department visits, and hospital admissions ([30](#))
- epidemiological changes in diseases other than the one the PHSM was intended to reduce was reported by one study which assessed the effect of handwashing during influenza season on incidence of human coronaviruses ([19](#))

- mental health outcomes were reported by one study which assessed the effect of physical distancing on suicide rates ([27](#))

Eight studies examined the unintended consequences of either closure of early years and educational settings or hand and respiratory hygiene on social determinants of health ([5](#), [11](#), [13](#), [15](#), [16](#), [18](#), [22](#), [31](#)). Studies on closure of early years and educational settings assessed absenteeism or missed school days (n=2) ([16](#), [31](#)), lost parental income (n=2) ([18](#), [22](#)), educational attainment (n=1) ([16](#)), or future individual labour market outcomes (n=1) ([16](#)). Studies on hand hygiene (n=4) all assessed the effect of handwashing on absenteeism ([5](#), [11](#), [13](#), [15](#)).

Eleven studies focused specifically on outcomes in children ([5](#), [6](#), [13](#), [15](#), [16](#), [25](#), [30 to 32](#), [38](#), [39](#)), 2 in young adults (students) who were residing on university campuses ([3](#), [4](#)), and one on children and young people (aged up to 21 years) who were enrolled at a boarding school ([34](#)). The effectiveness of the following PHSM in children and young people were assessed:

- hand and respiratory hygiene was assessed in 8 studies, with 7 studies evaluating the effectiveness of hand and respiratory hygiene in reducing transmission ([3](#), [4](#), [6](#), [13](#), [15](#), [25](#), [32](#), [34](#), [38](#)), and 3 evaluating the effect on absenteeism ([5](#), [13](#), [15](#))
- the effectiveness of the closure of early years and educational settings was evaluated in 4 studies, one of which assessed the effect of closures on transmission ([39](#)), one on healthcare utilisation ([30](#)), one on absenteeism ([31](#)) and one on school attendance and future labour market outcomes ([16](#))
- face masks were evaluated in 4 studies, both of which assessed the effect of face mask use on transmission ([32](#), [38](#))
- a combination intervention of face masks and hand hygiene was evaluated in 2 studies, both of which assessed the outcome of transmission ([3](#), [4](#))
- ventilation was assessed in one study that examined the effect of ventilation on transmission of influenza ([34](#))

SARS-CoV-1

All 3 studies identified on SARS-CoV-1 were observational (case control [n=2] ([33](#), [41](#)), cohort [n=1] ([40](#))). Two studies were conducted in Asia ([33](#), [41](#)), and one in Canada ([40](#)), and all were conducted during the 2003 SARS pandemic.

Evidence was identified for the following PHSM: hand hygiene (n=3) ([33](#), [40](#), [41](#)), face masks (n=3) ([33](#), [40](#), [41](#)), and cleaning and disinfection (n=1) ([33](#)). All evidence identified related to the effectiveness of these PHSM in reducing transmission of SARS-CoV-1, with no studies identified that reported any unintended consequences of using PHSM in this context.

Two of these studies assessed the effectiveness of PHSM for preventing transmission of SARS-CoV-1 in a combined population of children and adults ([40](#), [41](#)), while one study examined

adults only ([33](#)). No studies identified assessed the effectiveness of PHSM exclusively in children.

Evidence from systematic reviews

There were 13 systematic reviews identified for inclusion in this rapid mapping review. These consisted of:

- 10 systematic reviews with or without meta-analysis ([44](#), [47 to 55](#))
- 2 umbrella reviews ([46](#), [56](#))
- one rapid review ([45](#))

Included systematic reviews searched for evidence on any influenza (n=9) ([44](#), [46](#), [47](#), [50](#), [52 to 56](#)), influenza A (H1N1) only (n=1) ([51](#)), SARS-CoV-1 (n=1) ([45](#)), a combination of influenza and SARS-CoV-1 (n=1) ([48](#)), or influenza, SARS-CoV-1 and MERS-CoV (n=1) ([49](#)). PHSM reviewed were face masks with or without hand and respiratory hygiene (n=9) ([44 to 46](#), [49](#), [51](#), [52](#), [54 to 56](#)), hand and respiratory hygiene only (n=7) ([48](#), [50](#), [51](#), [53 to 56](#)), restrictions on formal public gatherings (n=1) ([47](#)), and cleaning and disinfection (n=1) ([55](#)). All included systematic reviews synthesised evidence of effectiveness, including effectiveness in reducing or preventing transmission (n=13) ([44 to 56](#)), and mortality (n=1) ([47](#)). One systematic review also synthesised evidence on the effect of hand hygiene interventions on the unintended consequence of absenteeism ([53](#)).

An overview of the evidence from systematic reviews is presented in [Table D.3](#). There is some overlap between primary studies identified by the included systematic reviews, and the primary studies included in this report. Therefore, to avoid duplication, systematic reviews are not included in the evidence gap map.

Health inequalities

Variations across populations and subgroups were extracted and are presented in data extraction tables in [Annexe D](#) where they were available in the primary studies or systematic reviews identified.

One study that assessed the effect of handwashing during influenza season on incidence of human coronaviruses presented information on Index of Multiple Deprivation scores for the population of interest ([19](#)).

Two primary studies reported rates of pregnancy in their population ([20](#), [28](#)). Presence of pre-existing conditions was reported in 9 studies, with specific conditions presented within each study reported in the data extraction tables in [Annexe D](#) ([5](#), [9](#), [14](#), [18](#), [20](#), [28](#), [32](#), [38](#), [40](#)).

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Fourteen primary studies reported specifically on outcomes in children or young people only ([3 to 6](#), [13](#), [15](#), [16](#), [25](#), [30 to 32](#), [34](#), [38](#), [39](#)). A large proportion of studies identified included a mix of children and adults ([7 to 10](#), [12](#), [14](#), [17 to 19](#), [21 to 29](#), [34](#), [36](#), [37](#), [40 to 43](#)).

No evidence was identified in those residing in communal accommodation in specific settings such as prisons or homeless accommodations.

Where included studies presented information on different ethnic minority groups, this was extracted using the terminology applied in those studies. This may not always reflect the preferred terminology for ethnic minority groups.

Evidence gaps

No evidence was identified from primary studies that examined the effectiveness in preventing reducing transmission or the unintended consequences of using PHSM in the context of an epidemic or pandemic caused by MERS-CoV, human coronaviruses, or *Yersinia pestis*. Neither was any evidence identified on certain PHSM including reducing informal social contact, lockdowns, restrictions on public transport, or shielding. No evidence was identified on the effectiveness of any PHSM to reduce morbidity of the respiratory disease it was intended for.

Evidence on unintended consequences was very limited.

Evidence from systematic reviews was limited. No systematic reviews searched for evidence on the effectiveness or unintended consequences of using PHSM in the context of human coronaviruses or *Yersinia pestis*. No systematic reviews were identified that synthesised evidence on the closure of school or early years, ventilation, restrictions on public transport, shielding, lockdowns, or reducing informal social contacts. Only one systematic review reported on unintended consequences of using PHSM (absenteeism), with no evidence identified on health outcomes other than what the PHSM was intended for.

Limitations

This rapid mapping review used streamlined systematic methods to accelerate the review process, so it is possible relevant evidence may have been missed.

The [evidence gap map](#) produced alongside this review maps the evidence identified from primary studies by respiratory pathogen, PHSM and outcome(s). Evidence could not be mapped by any additional criteria (for example, also by population or by study design) as the Eppi-Mapper tool is only able to map across 3 criteria.

The review provides an overview of the range and characteristics of the available evidence on the effectiveness and unintended consequences of PHSM for respiratory pathogens other than

SARS-CoV-2. However, it cannot be used to interpret study findings such as the effectiveness of different PHSM for preventing transmission. In addition, due to the nature of the review a risk of bias assessment was not completed, and the quality of the included studies is unknown.

Conclusion

In summary, this rapid mapping review identified evidence from 41 primary studies and 13 systematic reviews that evaluated the effectiveness or unintended consequences of PHSM when used in the context of reducing or preventing transmission of respiratory pathogens other than SARS-CoV-2.

It was beyond the scope of this rapid mapping review to complete a risk of bias assessment on the available evidence from either primary studies and systematic reviews, or to synthesise the findings, and so a summary of findings with the quality of the studies included in this review has not been reported.

Next steps will include consideration of whether a rapid systematic review including critical appraisal and synthesis evidence identified in this rapid mapping review to inform the effectiveness or unintended consequences of PHSM when used in the context of reducing or preventing transmission of other respiratory pathogens. This may be particularly beneficial to inform whether evidence for PHSM used for SARS-CoV-2 differs from other respiratory pathogens.

An [evidence gap map](#) was produced to accompany this rapid mapping review to provide an overview of the range and characteristics of available evidence from primary studies and highlight gaps in the evidence. Evidence identified from primary studies was mostly for influenza (either in the context of an epidemic or pandemic, or seasonal influenza), with limited evidence identified for SARS-CoV-1. The majority of evidence identified was on the use of hand and respiratory hygiene or face masks for the prevention or reduction of transmission of influenza. Unintended consequences identified included changes in morbidity outcomes, healthcare use and epidemiological changes for diseases other than the one for which the PHSM was intended, mental health outcomes, and consequences related to social determinants of health (such as absenteeism).

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Disclaimer

UKHSA's rapid reviews and evidence summaries aim to provide the best available evidence to decision makers in a timely and accessible way, based on published peer-reviewed scientific papers, and papers on preprint servers.

Please note that the reviews:

- use accelerated methods and may not be representative of the whole body of evidence publicly available
- have undergone an internal independent peer review but not an external peer review
- are only valid as of the date stated on the review

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51. Saunders-Hastings P and others. '[Effectiveness of personal protective measures in reducing pandemic influenza transmission: A systematic review and meta-analysis](#)' Epidemics 2017: volume 20, pages 1 to 20
52. Takahashi S and others. '[Antiviral Face Masks for the Prevention of Influenza Infection: a Meta-analysis](#)' General Medicine 2014: volume 15, issue 2, pages 126 to 135
53. Warren-Gash C and others. '[Hand hygiene to reduce community transmission of influenza and acute respiratory tract infection: a systematic review](#)' Influenza and other respiratory viruses 2013: volume 7, issue 5, pages 738 to 749
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Annexe A. Protocol

The review question is:

1. What is the available evidence on the effectiveness and unintended consequences of public health and social measures (PHSM) implemented as part of epidemic or pandemic response, to prevent or reduce transmission of respiratory infections other than SARS-CoV-2?

This rapid mapping review aims to identify and map the relevant evidence addressing the above research question. A search for primary evidence to answer this review question will be conducted up to 18 November 2024.

Effectiveness will be reported as any outcome related to transmission of infection, as well as mortality, morbidity, and adverse events (see also unintended consequences).

Unintended consequences are defined as the direct and indirect impacts on the physical and mental health of individuals as a consequence of the implementation of a PHSM at individual and population level. This excludes macro – level impacts on the economy, environment or other societal level factors that are beyond the scope of public health advice. Metrics for inclusion are premised upon identified individual risk factors/ social determinants for poor health, such as physical mobility, health service utilisation and loneliness.

PHSM for respiratory infections have been defined as:

- physical distancing
- reducing informal social contact
- restrictions on formal public gatherings
- lockdowns
- restrictions on public transport
- isolation of cases
- international travel and border restrictions
- shielding
- cleaning and disinfection
- hand and respiratory hygiene
- face masks
- ventilation
- closure of early years and educational settings

The respiratory infections of interest in this review are:

- influenza (A, avian, swine, or zoonotic)
- SARS-CoV-1

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- MERS-CoV
- human coronaviruses
- *Yersinia pestis* (pneumonic plague)

These infections were prioritised for inclusion in this review as representative examples of respiratory infections that have the potential to cause an epidemic or pandemic in humans in the UK. Evidence identified on these infections is considered likely to be transferable to other respiratory infections. Other infections that transmit via a respiratory route, such as measles or tuberculosis, were not included as while these have outbreak potential, they are unlikely to cause an epidemic or pandemic in the UK.

Eligibility criteria

Table A.1 Inclusion and exclusion criteria

	Included	Excluded
Population	All humans • adults (aged 18 years and over) • children (aged up to 18 years) • young people (aged between 18 and 25 years and still in education or have a healthcare plan)	Animals
Context	Any respiratory infection epidemic or pandemic not caused by SARS-CoV-2: • influenza A (any strain, including: H3N2, H1N1, H1N2, H1N1/09, H5N1, H5, H9N2, H7 and H10 or unspecified subtype), avian, swine, zoonotic • SARS-CoV-1 • MERS-CoV • human coronaviruses (OC43, 229E, NL63, HKU1, or unspecified) • <i>Yersinia pestis</i> (pneumonic plague) Or any seasonal influenza	COVID-19 pandemic (SARS CoV-2) PHSM used outside the context of an outbreak, epidemic or pandemic.
Settings	Community settings	Health and social care settings
Intervention or exposure	Public health and social measures, including: • physical distancing • reducing informal social contact	Medical interventions (vaccines, treatment, or prophylaxis)

	Included	Excluded
	• restrictions on formal public gatherings • lockdowns • restrictions on public transport • isolation of cases • international travel and border restrictions • shielding • cleaning and disinfection • hand and respiratory hygiene • face masks • ventilation • closure of early years and educational settings • any combination of the above	
Comparator	• each other • placebo or active control • no public health and social measures	
Outcomes	Effectiveness related to the disease the PHSM is intended for: • any measure of transmission • morbidity • health care use (for example admission to A&E or ICU) • mortality Unintended consequences 1. Health outcomes unrelated to the disease the PHSM is intended for: ○ epidemiological changes in diseases other than the one the PHSM is intended to reduce (such as changes in incidence rates, prevalence, attack rates, mortality) ○ health service utilisation patterns and demand for routine care for	• macroeconomics. Metrics at a national or international scale, that are not regarded as a risk factor for poor health to an individual or a social determinant of health. For example, economic productivity or growth, GDP, national income, inflation, widening economic inequalities • environmental or ecological outcomes. For example, transportation, parks, playgrounds • political outcomes. For example, public trust, political polling

	Included	Excluded
	diseases other than the one the PHSM is intended to reduce (such as changes in attendance at routine appointments, A&E attendance, ICU attendance, or admission to hospital) ○ morbidity outcomes directly or indirectly related to implementation of the PHSM (such as changes in mobility, pain or discomfort, voice parameters [perceptual, acoustic, aerodynamic, physiological], skin conditions) ○ mental health outcomes (such as anxiety, depression, stress, post-traumatic stress disorder, disordered eating, suicide, suicidal ideation) ○ individual risk factors for poor health (such as substance misuse, violence or domestic violence, sleep disturbance or other sleep-related issues, reduced physical activity or increase in sedentary behaviour, nutritional status, diet or body mass index, loneliness) 2. outcomes related to the social determinants of health: ○ social outcomes. For example, social cohesion, early childhood development, educational attainment, number of days spent in school, absenteeism, and disability. Also, increased exposure to risk factors like sexual abuse and criminal exploitation in children and young people, widening social inequalities like gender disparities	• legal or human rights-related outcomes. For example, crime rates • technological outcomes. For example, development and use of technology tools, telehealth, use of artificial intelligence

	Included	Excluded
	economic outcomes. For example, household or individual economic hardship, poverty, food insecurity, homelessness or access to housing, unemployment, or job insecurity	
Language	English	Any other language
Date of search	Up to 18 November 2024	
Study design	Systematic (or rapid) reviews Experimental studies including randomised-controlled trials, quasi-experimental studies, cross-over designs, before-and-after studies Observational studies including cross-sectional, case-control, cohort	Narrative reviews or literature reviews Modelling studies Case series Case reports Qualitative studies Mixed methods studies
Publication type	Peer-reviewed published research Preprints	Conference abstracts Editorials Letters News articles Grey literature

Identification of studies

The following databases and trial registries will be searched for studies published up to 18 November 2024: Ovid Medline, Ovid Embase, Ovid Emcare, SOCIndex PsycInfo and Web of Science Preprint Citation Index. The [search strategy](#) is presented below.

Screening

Screening of title and abstract, and full texts will be undertaken in duplicate by 2 reviewers for at least 20% of the eligible studies, with the remainder completed by one reviewer. Disagreement will be resolved by discussion or with involvement of a third reviewer where necessary.

All studies excluded at full text screening will be checked by a second reviewer.

Studies included following full text screening will be used as seed papers for backwards and forwards citation searching. Results of citation searches will be cross checked against results of

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database searches, to remove duplicates. Remaining citation search results will be screened by a single reviewer.

Data extraction

Summary information for each study will be extracted and reported in tabular form. Information to be extracted will include respiratory infection, country, study period, study design, inclusion and exclusion criteria, number included (either number of studies in a systematic review, or number of participants in a primary study), participant demographics (age, sex, ethnicity as a minimum), type of PHSM, setting, outcomes related to effectiveness or unintended consequences of the PHSM.

Data extraction will be undertaken in duplicate by 2 reviewers for at least 20% of included studies, with the remainder extracted by one reviewer and checked by a second.

Risk of bias assessment

As this is a scoping review, study findings will not be extracted, and risk of bias assessment is not required.

Synthesis

A description of the evidence including the number of studies and their characteristics will be presented. Studies will be grouped by respiratory infection, and study design, type of PHSM, and outcome type will be coded to produce a visual synthesis of the data in the form of an evidence gap map, using the EPPI-mapper tool within EPPI-reviewer. Where possible, the outcome (whether positive, negative or no effect) will be mapped visually against the type of PHSM, or group of PHSM, and with segmentation by study type. The categories for PHSM and outcomes are predefined as above.

Health inequalities

Variations across populations and subgroups will be considered, where evidence is available. This may include groups living in different social or economic circumstances, residing in communal accommodation in specific settings (such as prisons, homeless accommodation or in care homes with or without nursing) or geographical locations (including rural or urban), pregnancy, or the presence of other pre-existing health conditions. Other groups, including inclusion health groups, outlined in the CORE20PLUS framework will also be considered, where evidence is available.

Search strategy

Ovid MEDLINE(R) ALL (1946 to 18 November 2024)

1. Severe Acute Respiratory Syndrome/ (5,755)
2. Severe acute respiratory syndrome*.tw,kf. (49,764)
3. SARS.tw,kf. (161,000)
4. ((human* or zoono*) adj3 Coronavirus).tw,kf. (3,165)
5. 1 or 2 or 3 or 4 (168,954)
6. (exp COVID-19/ or SARS-CoV-2/) not Severe Acute Respiratory Syndrome/ (285,519)
7. 5 not 6 (65,675)
8. ((Covid* or sarscov2 or sars cov 2) not (sars or sars cov or Hcov or SARS1 or SARSCov1 or SARS Cov 1 or SARS Cov1 or SARS coronavirus 1)).kw. (222,558)
9. 7 not 8 (31,299)
10. SARS1.tw,kf. (17)
11. SARS 1.tw,kf. (30)
12. HCov-SARS.tw,kf. (10)
13. SARS-Cov1.tw,kf. (27)
14. SARS virus.tw,kf. (423)
15. SARS coronavirus.tw,kf. (2,219)
16. SARS associated coronavirus.tw,kf. (332)
17. "Severe acute respiratory syndrome 1".tw,kf. (2)
18. (SARS adj5 ("2002" or "2003" or "2004")).tw,kf. (1,346)
19. non-SARS-Cov-2.tw,kf. (251)
20. "non severe acute respiratory syndrome coronavirus-2".tw,kf. (15)
21. "other than severe acute respiratory syndrome coronavirus-2".tw,kf. (10)
22. other than SARS-Cov-2.tw,kf. (85)
23. non Covid.tw,kf. (4,049)
24. other than covid.tw,kf. (217)
25. Middle East Respiratory Syndrome Coronavirus/ (2,152)
26. mers.tw,kf. (8,856)
27. merscov.tw,kf. (19)
28. MERS-CoV.tw,kf. (4,080)
29. merbecovirus.tw,kf. (32)
30. middle east respiratory syndrome.tw,kf. (3,952)
31. Coronavirus 229E, Human/ (436)
32. Coronavirus NL63, Human/ (158)
33. Coronavirus OC43, Human/ (400)
34. Coronavirus 229E.tw,kf. (471)
35. (cov229e or cov 229e).tw,kf. (59)
36. (Hcov229e or Hcov 229e).tw,kf. (762)
37. coronavirus oc43.tw,kf. (419)
38. (covoc43 or cov oc43).tw,kf. (42)

39. (Hcovoc43 or HCov oc43).tw,kf. (716)
40. coronavirus hku1.tw,kf. (102)
41. (HCovhku1 or Hcov hku1).tw,kf. (281)
42. (covhku1 or cov hku1).tw,kf. (35)
43. coronavirus nl63.tw,kf. (223)
44. (covnl63 or cov nl63).tw,kf. (39)
45. (HCovnl63 or HCov nl63).tw,kf. (486)
46. Yersinia pestis/ (4310)
47. bacillus pestis.tw,kf. (24)
48. bacterium pestis.tw,kf. (0)
49. pasteurilla pestis.tw,kf. (481)
50. pestisella pestis.tw,kf. (0)
51. yersinia pestis.tw,kf. (3,947)
52. y pestis.tw,kf. (2,307)
53. "y.pestis".tw,kf. (22)
54. plague.tw,kf. (10,757)
55. exp Yersinia Infections/ (9,896)
56. (flu or influenza*).tw,kf. (155,581)
57. Influenza, Human/ (60,508)
58. exp Influenza A virus/ (51,188)
59. AH1N1*.tw,kf. (115)
60. H1N1*.tw,kf. (21,211)
61. AH3N2*.tw,kf. (22)
62. H3N2*.tw,kf. (8,296)
63. AH9N2*.tw,kf. (1)
64. H9N2*.tw,kf. (2,010)
65. AH5*.tw,kf. (154)
66. AH7*.tw,kf. (117)
67. AH10*.tw,kf. (283)
68. AH1N2*.tw,kf. (2)
69. H1N2*.tw,kf. (486)
70. AH5N1*.tw,kf. (13)
71. H5N1*.tw,kf. (7,695)
72. or/10-71 (199,453)
73. 9 or 72 (223,484)
74. NPI*.tw,kf. (5,819)
75. ((non-pharm* or nonpharm*) adj intervention*).tw. (9,662)
76. (intervention* and (non-pharm* or nonpharm*)).kf. (1,702)
77. "public health measure*".tw,kf. (5,301)
78. PHSM.tw,kf. (54)
79. social measure*.tw,kf. (610)
80. Social Isolation/ (17,045)
81. (physical* adj3 isolat*).tw,kf. (1,784)

82. (patient* adj3 isolat*).ti,kf. or (patient* adj3 isolat*).ab. /freq=3 (10,003)
83. (case* adj3 isolat*).ti,kf. or (case* adj3 isolat*).ab. /freq=3 (2,760)
84. (social* adj3 isolat*).ti,kf. or (social* adj3 isolat*).ab. /freq=3 (5,537)
85. ((room* or unit* or procedure*) adj isolat*).tw,kf. (471)
86. (infection control and isolation).tw,kf. (2,159)
87. (lockdown* or lock-down*).ti,kf. or (lockdown* or lock-down*).ab. /freq=3 (11,796)
88. bubble.tw,kf. (18,659)
89. ((stay adj2 home) or shielding).tw,kf. (22,198)
90. Physical Distancing/ (2,494)
91. ((physical* or social*) adj distan*).ti,kf. or ((physical* or social*) adj distan*).ab. /freq=3 (4,182)
92. ((social* or societal* or gathering* or meeting* or event* or visit*) adj3 (reduc* or restrict* or prohibit* or limit* or ban* or cancel*)).tw,kf. (48,051)
93. (tier* adj2 restric*).tw,kf. (28)
94. cohorting.tw,kf. (622)
95. exp Disinfectants/ or Disinfection/ (91,624)
96. disinfect*.tw,kf. (41,654)
97. Decontamination/ (5,954)
98. decontaminat*.tw,kf. (17,408)
99. (clean or cleaning or cleaner).tw,kf. (95,422)
100. exp Hand Hygiene/ (8,445)
101. (hand wash* or handwash*).tw,kf. (7,106)
102. (saniti#e* or saniti#ation or saniti#ing or saniti#er).tw,kf. (4,772)
103. ((hand or personal) adj hygiene).tw,kf. (9,846)
104. (facemask* or mask*).ti,kf. or (facemask* or mask*).ab. /freq=3 (34,630)
105. N95.tw,kf. (3,349)
106. Masks/ (7,906)
107. exp Respiratory Protective Devices/ (2,849)
108. (face adj2 (cover* or protect*)).tw,kf. (1,246)
109. (mouth adj2 (cover* or protect*)).tw,kf. (394)
110. (nose adj2 (cover* or protect*)).tw,kf. (167)
111. (respirator or respirators).tw,kf. (7,231)
112. respiratory hygiene.tw,kf. (110)
113. ((education* or universit* or college* or school* or nursery or nurseries or early years or playschool* or childcare) adj3 clos*).tw,kf. (4,615)
114. ((work or workplace or office*) adj3 (closure* or closed or closing)).tw,kf. (534)
115. (home adj3 (worker or work or working)).tw,kf. (7,179)
116. ((hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) adj3 clos*).tw,kf. (504)
117. border health.tw,kf. (293)
118. (Travel* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (4,483)
119. (transport* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (13,333)
120. (Border* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (2,113)

121. ((entrance or Entry) adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (6,089)
122. (Movement* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (15,960)
123. ((ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or air qualit* or indoor air)).tw,kf. (9,922)
124. Ventilation/ (6,461)
125. (air flow* or airflow* or aerodynamic* or air condition*).tw,kf. (40,927)
126. Air Conditioning/ (2,923)
127. (air filter* or air purif* or air filtration).tw,kf. (3,224)
128. Air Filters/ (669)
129. (air chang* or air exchang*).tw,kf. (2,032)
130. (air adj3 (recondition* or re condition*)).tw,kf. (1)
131. (air adj3 replac*).tw,kf. (432)
132. (indoor air adj3 qualit*).tw,kf. (3,388)
133. HVAC.tw,kf. (673)
134. Air Microbiology/ (8,543)
135. (physical barrier* or physical intervention*).tw,kf. (5,967)
136. or/74-135 (548,830)
137. 73 and 136 (7,841)
138. limit 137 to (comment or editorial or letter or news) (295)
139. 137 not 138 (7,546)

Embase (1974 to 18 November 2024)

1. severe acute respiratory syndrome/ (11,829)
2. Severe acute respiratory syndrome*.tw,kf. (52,364)
3. SARS.tw,kf. (188,178)
4. ((human* or zoono*) adj3 Coronavirus).tw,kf. (3,453)
5. 1 or 2 or 3 or 4 (200,068)
6. (exp coronavirus disease 2019/ or exp Severe acute respiratory syndrome coronavirus 2/) not severe acute respiratory syndrome/ (454,875)
7. 5 not 6 (43,393)
8. ((Covid* or sarscov2 or sars cov 2) not (sars or sars cov or Hcov or SARS1 or SARSCov1 or SARS Cov 1 or SARS Cov1 or SARS coronavirus 1)).kw. (216,958)
9. 7 not 8 (31,741)
10. SARS1.tw,kf. (23)
11. SARS 1.tw,kf. (40)
12. HCov-SARS.tw,kf. (16)
13. SARS-Cov1.tw,kf. (39)
14. SARS virus.tw,kf. (547)
15. SARS coronavirus.tw,kf. (2,452)
16. SARS associated coronavirus.tw,kf. (368)
17. "Severe acute respiratory syndrome 1".tw,kf. (9)
18. (SARS adj5 ("2002" or "2003" or "2004")).tw,kf. (1,526)
19. non-SARS-Cov-2.tw,kf. (303)

20. "non severe acute respiratory syndrome coronavirus-2".tw,kf. (13)
21. "other than severe acute respiratory syndrome coronavirus-2".tw,kf. (13)
22. other than SARS-Cov-2.tw,kf. (102)
23. non Covid.tw,kf. (5,515)
24. other than covid.tw,kf. (270)
25. exp Middle East respiratory syndrome coronavirus/ (5,916)
26. mers.tw,kf. (9,835)
27. merscov.tw,kf. (113)
28. MERS-CoV.tw,kf. (4,443)
29. merbecovirus.tw,kf. (42)
30. middle east respiratory syndrome.tw,kf. (4,224)
31. human coronavirus 229e/ (1,102)
32. human coronavirus nl63/ (917)
33. human coronavirus hku1/ (548)
34. human coronavirus oc43/ (1,243)
35. Coronavirus 229E.tw,kf. (553)
36. (cov229e or cov 229e).tw,kf. (69)
37. (Hcov229e or Hcov 229e).tw,kf. (852)
38. coronavirus oc43.tw,kf. (500)
39. (covoc43 or cov oc43).tw,kf. (51)
40. (Hcovoc43 or HCov oc43).tw,kf. (805)
41. coronavirus hku1.tw,kf. (127)
42. (HCovhku1 or Hcov hku1).tw,kf. (317)
43. (covhku1 or cov hku1).tw,kf. (37)
44. coronavirus nl63.tw,kf. (279)
45. (covnl63 or cov nl63).tw,kf. (48)
46. (HCovnl63 or HCov nl63).tw,kf. (551)
47. exp Yersinia pestis/ (5,790)
48. bacillus pestis.tw,kf. (1)
49. bacterium pestis.tw,kf. (0)
50. pasteurella pestis.tw,kf. (30)
51. pestisella pestis.tw,kf. (0)
52. yersinia pestis.tw,kf. (4,374)
53. y pestis.tw,kf. (2,512)
54. "y.pestis".tw,kf. (55)
55. plague.tw,kf. (9,716)
56. exp Yersinia infection/ (9,982)
57. (flu or influenza*).tw,kf. (183,684)
58. exp influenza/ (115,347)
59. exp influenzavirus a/ (23,514)
60. AH1N1*.tw,kf. (229)
61. H1N1*.tw,kf. (27,266)
62. AH3N2*.tw,kf. (35)

63. H3N2*.tw,kf. (9,745)
64. AH9N2*.tw,kf. (0)
65. H9N2*.tw,kf. (2,156)
66. AH5*.tw,kf. (250)
67. AH7*.tw,kf. (149)
68. AH10*.tw,kf. (331)
69. AH1N2*.tw,kf. (3)
70. H1N2*.tw,kf. (522)
71. AH5N1*.tw,kf. (15)
72. H5N1*.tw,kf. (8,661)
73. or/10-72 (253,922)
74. 9 or 73 (276,709)
75. NPI*.tw,kf. (9,258)
76. ((non-pharm* or nonpharm*) adj intervention*).tw. (12,141)
77. (intervention* and (non-pharm* or nonpharm*)).kf. (1,946)
78. "public health measure*".tw,kf. (5,859)
79. PHSM.tw,kf. (60)
80. social measure*.tw,kf. (723)
81. exp social isolation/ (35,882)
82. (physical* adj3 isolat*).tw,kf. (2,101)
83. (patient* adj3 isolat*).ti,kf. or (patient* adj3 isolat*).ab. /freq=3 (13,502)
84. (case* adj3 isolat*).ti,kf. or (case* adj3 isolat*).ab. /freq=3 (2,942)
85. (social* adj3 isolat*).ti,kf. or (social* adj3 isolat*).ab. /freq=3 (6,418)
86. ((room* or unit* or procedure*) adj isolat*).tw,kf. (634)
87. (infection control and isolation).tw,kf. (3,287)
88. (lockdown* or lock-down*).ti,kf. or (lockdown* or lock-down*).ab. /freq=3 (11,759)
89. bubble.tw,kf. (22,184)
90. ((stay adj2 home) or shielding).tw,kf. (25,482)
91. social distancing/ (13,311)
92. ((physical* or social*) adj distan*).ti,kf. or ((physical* or social*) adj distan*).ab. /freq=3 (3,834)
93. ((social* or societal* or gathering* or meeting* or event* or visit*) adj3 (reduc* or restrict* or prohibit* or limit* or ban* or cancel*)).tw,kf. (68,620)
94. (tier* adj2 restric*).tw,kf. (33)
95. cohorting.tw,kf. (939)
96. exp *disinfectant agent/ or exp *disinfection/ (223,095)
97. disinfect*.tw,kf. (48,249)
98. exp decontamination/ (8,419)
99. decontaminat*.tw,kf. (21,101)
100. (clean or cleaning or cleaner).tw,kf. (120,155)
101. exp hand washing/ (22,076)
102. (hand wash* or handwash*).tw,kf. (9,077)
103. (saniti#e* or saniti#ation or saniti#ing or saniti#er).tw,kf. (5,462)

104. ((hand or personal) adj hygiene).tw,kf. (14,340)
105. (facemask* or mask*).ti,kf. or (facemask* or mask*).ab. /freq=3 (40,207)
106. N95.tw,kf. (6,059)
107. exp *mask/ (13,292)
108. exp respiratory protection/ (8,537)
109. (face adj2 (cover* or protect*)).tw,kf. (1,328)
110. (mouth adj2 (cover* or protect*)).tw,kf. (408)
111. (nose adj2 (cover* or protect*)).tw,kf. (222)
112. (respirator or respirators).tw,kf. (7207)
113. respiratory hygiene.tw,kf. (162)
114. ((education* or universit* or college* or school* or nursery or nurseries or early years or playschool* or childcare) adj3 clos*).tw,kf. (5,096)
115. ((work or workplace or office*) adj3 (closure* or closed or closing)).tw,kf. (642)
116. (home adj3 (worker or work or working)).tw,kf. (8,753)
117. ((hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) adj3 clos*).tw,kf. (552)
118. border health.tw,kf. (378)
119. (Travel* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (5,264)
120. (transport* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (14,603)
121. (Border* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (2,676)
122. ((entrance or Entry) adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (7,471)
123. (Movement* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (20,451)
124. ((ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or air qualit* or indoor air)).tw,kf. (14,060)
125. Ventilation/ (22,942)
126. (air flow* or airflow* or aerodynamic* or air condition*).tw,kf. (55,508)
127. air conditioning/ (25,367)
128. room ventilation/ (1,739)
129. (air filter* or air purif* or air filtration).tw,kf. (3,785)
130. exp air filter/ (2,825)
131. (air chang* or air exchang*).tw,kf. (2,807)
132. (air adj3 (recondition* or re condition*)).tw,kf. (4)
133. (air adj3 replac*).tw,kf. (507)
134. (indoor air adj3 qualit*).tw,kf. (4,657)
135. HVAC.tw,kf. (844)
136. exp microbiology/ and exp air/ (456)
137. (physical barrier* or physical intervention*).tw,kf. (7,092)
138. or/75-137 (836,220)
139. 74 and 138 (11,639)
140. limit 139 to (conference abstract or conference paper or editorial or letter) (2,469)
141. 139 not 140 (9,170)

Ovid Emcare (1995 to 2024 Week 46)

1. severe acute respiratory syndrome/ (4,098)
2. Severe acute respiratory syndrome*.tw,kf. (13,204)
3. SARS.tw,kf. (44,568)
4. ((human* or zoono*) adj3 Coronavirus).tw,kf. (571)
5. 1 or 2 or 3 or 4 (48,640)
6. (exp coronavirus disease 2019/ or exp Severe acute respiratory syndrome coronavirus 2/) not severe acute respiratory syndrome/ (181,778)
7. 5 not 6 (7,154)
8. ((Covid* or sarscov2 or sars cov 2) not (sars or sars cov or Hcov or SARS1 or SARSCov1 or SARS Cov 1 or SARS Cov1 or SARS coronavirus 1)).kw. (86,680)
9. 7 not 8 (5,989)
10. SARS1.tw,kf. (6)
11. SARS 1.tw,kf. (16)
12. HCov-SARS.tw,kf. (1)
13. SARS-Cov1.tw,kf. (9)
14. SARS virus.tw,kf. (117)
15. SARS coronavirus.tw,kf. (314)
16. SARS associated coronavirus.tw,kf. (65)
17. "Severe acute respiratory syndrome 1".tw,kf. (5)
18. (SARS adj5 ("2002" or "2003" or "2004")).tw,kf. (435)
19. non-SARS-Cov-2.tw,kf. (75)
20. "non severe acute respiratory syndrome coronavirus-2".tw,kf. (7)
21. "other than severe acute respiratory syndrome coronavirus-2".tw,kf. (5)
22. other than SARS-Cov-2.tw,kf. (28)
23. non Covid.tw,kf. (1,705)
24. other than covid.tw,kf. (69)
25. exp Middle East respiratory syndrome coronavirus/ (1,428)
26. mers.tw,kf. (1,942)
27. merscov.tw,kf. (18)
28. MERS-CoV.tw,kf. (923)
29. merbecovirus.tw,kf. (4)
30. middle east respiratory syndrome.tw,kf. (1,064)
31. human coronavirus 229e/ (214)
32. human coronavirus nl63/ (192)
33. human coronavirus hku1/ (123)
34. human coronavirus oc43/ (235)
35. Coronavirus 229E.tw,kf. (66)
36. (cov229e or cov 229e).tw,kf. (13)
37. (Hcov229e or Hcov 229e).tw,kf. (110)
38. coronavirus oc43.tw,kf. (56)
39. (covoc43 or cov oc43).tw,kf. (11)
40. (Hcovoc43 or HCov oc43).tw,kf. (109)

41. coronavirus hku1.tw,kf. (19)
42. (HCovhku1 or Hcov hku1).tw,kf. (46)
43. (covhku1 or cov hku1).tw,kf. (5)
44. coronavirus nl63.tw,kf. (40)
45. (covnl63 or cov nl63).tw,kf. (10)
46. (HCovnl63 or HCov nl63).tw,kf. (76)
47. exp Yersinia pestis/ (633)
48. bacillus pestis.tw,kf. (0)
49. bacterium pestis.tw,kf. (0)
50. pasteurilla pestis.tw,kf. (0)
51. pestisella pestis.tw,kf. (0)
52. yersinia pestis.tw,kf. (380)
53. y pestis.tw,kf. (249)
54. "y.pestis".tw,kf. (4)
55. plague.tw,kf. (1,720)
56. exp Yersinia infection/ (2,106)
57. (flu or influenza*).tw,kf. (35,139)
58. exp influenza/ (31,244)
59. exp influenzavirus a/ (4,033)
60. AH1N1*.tw,kf. (41)
61. H1N1*.tw,kf. (6,175)
62. AH3N2*.tw,kf. (3)
63. H3N2*.tw,kf. (1,403)
64. AH9N2*.tw,kf. (0)
65. H9N2*.tw,kf. (254)
66. AH5*.tw,kf. (13)
67. AH7*.tw,kf. (17)
68. AH10*.tw,kf. (25)
69. AH1N2*.tw,kf. (0)
70. H1N2*.tw,kf. (63)
71. AH5N1*.tw,kf. (3)
72. H5N1*.tw,kf. (1,420)
73. or/10-72 (52,793)
74. 9 or 73 (56,667)
75. NPI*.tw,kf. (2,442)
76. ((non-pharm* or nonpharm*) adj intervention*).tw. (5,140)
77. (intervention* and (non-pharm* or nonpharm*)).kf. (1,035)
78. "public health measure*".tw,kf. (2,362)
79. PHSM.tw,kf. (20)
80. social measure*.tw,kf. (285)
81. exp social isolation/ (16,196)
82. (physical* adj3 isolat*).tw,kf. (676)
83. (patient* adj3 isolat*).ti,kf. or (patient* adj3 isolat*).ab. /freq=3 (2,545)

84. (case* adj3 isolat*).ti,kf. or (case* adj3 isolat*).ab. /freq=3 (507)
85. (social* adj3 isolat*).ti,kf. or (social* adj3 isolat*).ab. /freq=3 (3,266)
86. ((room* or unit* or procedure*) adj isolat*).tw,kf. (124)
87. (infection control and isolation).tw,kf. (1,216)
88. (lockdown* or lock-down*).ti,kf. or (lockdown* or lock-down*).ab. /freq=3 (5,015)
89. bubble.tw,kf. (3,960)
90. ((stay adj2 home) or shielding).tw,kf. (6,691)
91. social distancing/ (7,348)
92. ((physical* or social*) adj distan*).ti,kf. or ((physical* or social*) adj distan*).ab. /freq=3 (2,202)
93. ((social* or societal* or gathering* or meeting* or event* or visit*) adj3 (reduc* or restrict* or prohibit* or limit* or ban* or cancel*)).tw,kf. (24,094)
94. (tier* adj2 restric*).tw,kf. (15)
95. cohorting.tw,kf. (341)
96. exp *disinfectant agent/ or exp *disinfection/ (54,746)
97. disinfect*.tw,kf. (11,212)
98. exp decontamination/ (2,691)
99. decontaminat*.tw,kf. (5,088)
100. (clean or cleaning or cleaner).tw,kf. (24,793)
101. exp hand washing/ (10,158)
102. (hand wash* or handwash*).tw,kf. (3,799)
103. (saniti#e* or saniti#ation or saniti#ing or saniti#er).tw,kf. (1,872)
104. ((hand or personal) adj hygiene).tw,kf. (5,982)
105. (facemask* or mask*).ti,kf. or (facemask* or mask*).ab. /freq=3 (13,801)
106. N95.tw,kf. (1,567)
107. exp *mask/ (6,245)
108. exp respiratory protection/ (3,224)
109. (face adj2 (cover* or protect*)).tw,kf. (537)
110. (mouth adj2 (cover* or protect*)).tw,kf. (162)
111. (nose adj2 (cover* or protect*)).tw,kf. (71)
112. (respirator or respirators).tw,kf. (2,225)
113. respiratory hygiene.tw,kf. (67)
114. ((education* or universit* or college* or school* or nursery or nurseries or early years or playschool* or childcare) adj3 clos*).tw,kf. (2,409)
115. ((work or workplace or office*) adj3 (closure* or closed or closing)).tw,kf. (215)
116. (home adj3 (worker or work or working)).tw,kf. (4,501)
117. ((hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) adj3 clos*).tw,kf. (237)
118. border health.tw,kf. (287)
119. (Travel* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (1,922)
120. (transport* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (1,977)
121. (Border* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (622)
122. ((entrance or Entry) adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (1,162)

123. (Movement* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw,kf. (5,571)
124. ((ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or air qualit* or indoor air)).tw,kf. (3,498)
125. Ventilation/ (11,738)
126. (air flow* or airflow* or aerodynamic* or air condition*).tw,kf. (10,920)
127. air conditioning/ (11,738)
128. room ventilation/ (683)
129. (air filter* or air purif* or air filtration).tw,kf. (768)
130. exp air filter/ (613)
131. (air chang* or air exchang*).tw,kf. (529)
132. (air adj3 (recondition* or re condition*)).tw,kf. (0)
133. (air adj3 replac*).tw,kf. (95)
134. (indoor air adj3 qualit*).tw,kf. (976)
135. HVAC.tw,kf. (209)
136. exp microbiology/ and exp air/ (48)
137. (physical barrier* or physical intervention*).tw,kf. (1,686)
138. or/75-137 (229,869)
139. 74 and 138 (3,535)
140. limit 139 to (conference abstract or conference paper or editorial or letter) (286)
141. 139 not 140 (3,249)

APA PsycInfo (1806 to November 2024 Week 2)

1. severe acute respiratory syndrome/ (428)
2. Severe acute respiratory syndrome*.tw. (1,025)
3. SARS.tw. (4,252)
4. ((human* or zoono*) adj3 Coronavirus).tw. (33)
5. 1 or 2 or 3 or 4 (4,423)
6. exp covid-19/ not severe acute respiratory syndrome/ (41,360)
7. 5 not 6 (1,323)
8. SARS1.tw. (0)
9. SARS 1.tw. (2)
10. HCov-SARS.tw. (1)
11. SARS-Cov1.tw. (1)
12. SARS virus.tw. (15)
13. SARS coronavirus.tw. (23)
14. SARS associated coronavirus.tw. (2)
15. "Severe acute respiratory syndrome 1".tw. (0)
16. (SARS adj5 ("2002" or "2003" or "2004")).tw. (147)
17. non-SARS-Cov-2.tw. (2)
18. "non severe acute respiratory syndrome coronavirus-2".tw. (0)
19. "other than severe acute respiratory syndrome coronavirus-2".tw. (0)
20. other than SARS-Cov-2.tw. (1)
21. non Covid.tw. (214)

22. other than covid.tw. (15)
23. middle east respiratory syndrome/ (65)
24. mers.tw. (213)
25. merscov.tw. (2)
26. MERS-CoV.tw. (47)
27. merbecovirus.tw. (0)
28. middle east respiratory syndrome.tw. (82)
29. Coronavirus 229E.tw. (1)
30. (cov229e or cov 229e).tw. (0)
31. (Hcov229e or Hcov 229e).tw. (2)
32. coronavirus oc43.tw. (3)
33. (covoc43 or cov oc43).tw. (0)
34. (Hcovoc43 or HCov oc43).tw. (2)
35. coronavirus hku1.tw. (0)
36. (HCovhku1 or Hcov hku1).tw. (1)
37. (covhku1 or cov hku1).tw. (0)
38. coronavirus nl63.tw. (0)
39. (covnl63 or cov nl63).tw. (0)
40. (HCovnl63 or HCov nl63).tw. (1)
41. bacillus pestis.tw. (0)
42. bacterium pestis.tw. (0)
43. pasteurella pestis.tw. (0)
44. pestisella pestis.tw. (0)
45. yersinia pestis.tw. (12)
46. y pestis.tw. (2)
47. "y.pestis".tw. (0)
48. plague.tw. (1,357)
49. (flu or influenza*).tw. (4,442)
50. exp influenza/ (1,792)
51. AH1N1*.tw. (5)
52. H1N1*.tw. (594)
53. AH3N2*.tw. (0)
54. H3N2*.tw. (38)
55. AH9N2*.tw. (0)
56. H9N2*.tw. (1)
57. AH5*.tw. (23)
58. AH7*.tw. (0)
59. AH10*.tw. (0)
60. AH1N2*.tw. (0)
61. H1N2*.tw. (0)
62. AH5N1*.tw. (0)
63. H5N1*.tw. (66)
64. or/8-63 (6,523)

65. 7 or 64 (7,557)
66. NPI*.tw. (1,941)
67. ((non-pharm* or nonpharm*) adj intervention*).tw. (2,489)
68. "public health measure*".tw. (719)
69. PHSM.tw. (2)
70. social measure*.tw. (334)
71. exp social isolation/ (10,569)
72. (physical* adj3 isolat*).tw. (701)
73. (patient* adj3 isolat*).ti. or (patient* adj3 isolat*).ab. /freq=3 (181)
74. (case* adj3 isolat*).ti. or (case* adj3 isolat*).ab. /freq=3 (52)
75. (social* adj3 isolat*).ti. or (social* adj3 isolat*).ab. /freq=3 (2,820)
76. ((room* or unit* or procedure*) adj isolat*).tw. (55)
77. (infection control and isolation).tw. (85)
78. (lockdown* or lock-down*).tw. (6,524)
79. bubble.tw. (863)
80. ((stay adj2 home) or shielding).tw. (2,243)
81. physical distancing/ (1,585)
82. ((physical* or social*) adj distan*).ti. or ((physical* or social*) adj distan*).ab. /freq=3 (1,874)
83. ((social* or societal* or gathering* or meeting* or event* or visit*) adj3 (reduc* or restrict* or prohibit* or limit* or ban* or cancel*)).tw. (20,368)
84. (tier* adj2 restric*).tw. (11)
85. cohorting.tw. (19)
86. disinfectants/ (8)
87. disinfect*.tw. (334)
88. hygiene/ (2,185)
89. decontaminat*.tw. (159)
90. (clean or cleaning or cleaner).tw. (6,592)
91. (hand wash* or handwash*).tw. (820)
92. (saniti#e* or saniti#ation or saniti#ing or saniti#er).tw. (437)
93. ((hand or personal) adj hygiene).tw. (941)
94. (facemask* or mask*).ti. or (facemask* or mask*).ab. /freq=3 (7,036)
95. N95.tw. (161)
96. face masks/ (272)
97. (face adj2 (cover* or protect*)).tw. (309)
98. (mouth adj2 (cover* or protect*)).tw. (35)
99. (nose adj2 (cover* or protect*)).tw. (15)
100. (respirator or respirators).tw. (181)
101. respiratory hygiene.tw. (9)
102. ((education* or universit* or college* or school* or nursery or nurseries or early years or playschool* or childcare) adj3 clos*).tw. (3,403)
103. ((work or workplace or office*) adj3 (closure* or closed or closing)).tw. (183)
104. (home adj3 (worker or work or working)).tw. (6,097)

105. ((hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) adj3 clos*).tw. (227)
106. border health.tw. (70)
107. (Travel* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw. (732)
108. (transport* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw. (839)
109. (Border* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw. (474)
110. ((entrance or Entry) adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw. (583)
111. (Movement* adj5 (ban* or restrict* or limit* or prevent* or stop*)).tw. (3,003)
112. ((ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or air qualit* or indoor air)).tw. (190)
113. (air flow* or airflow* or aerodynamic* or air condition*).tw. (1,429)
114. (air filter* or air purif* or air filtration).tw. (36)
115. (air chang* or air exchang*).tw. (21)
116. (air adj3 (recondition* or re condition*)).tw. (0)
117. (air adj3 replac*).tw. (17)
118. (indoor air adj3 qualit*).tw. (106)
119. HVAC.tw. (35)
120. (physical barrier* or physical intervention*).tw. (760)
121. or/66-120 (81,229)
122. 65 and 121 (551)
123. limit 122 to ("column/opinion" or "comment/reply" or editorial or letter) (43)
124. 122 not 123 (508)

SocIndex

Date of search: 19 November 2024

#	Query	Results
S1	DE "SARS disease"	313
S2	"Severe acute respiratory syndrome*"	468
S3	"SARS-Cov" OR "HCov-SARS" OR "SARS-Cov1" OR "SARS virus" OR "SARS coronavirus" OR "SARS associated coronavirus"	33
S4	((human* OR zoono*) N3 Coronavirus)	16
S5	SARS	1,888
S6	"non-SARS-Cov-2"	0
S7	"non severe acute respiratory syndrome coronavirus-2"	0
S8	"other than severe acute respiratory syndrome coronavirus-2"	0
S9	"other than SARS-Cov-2"	0
S10	"non Covid"	14
S11	"other than covid"	3

#	Query	Results
S12	mers	595
S13	mers-cov	6
S14	"MERS-CoV"	6
S15	merbecovirus	0
S16	"middle east respiratory syndrome"	363
S17	"Coronavirus 229E"	1
S18	cov229e or cov 229e	0
S19	Hcov229e or Hcov 229e	0
S20	"coronavirus oc43"	1
S21	covoc43 or "cov oc43"	0
S22	Hcovoc43 or "HCov oc43"	0
S23	"coronavirus hku1"	0
S24	HCovhku1 or "Hcov hku1"	0
S25	covhku1 or "cov hku1"	0
S26	"coronavirus nl63"	0
S27	covnl63 or "cov nl63"	0
S28	HCovnl63 or "HCov nl63"	0
S29	"bacillus pestis"	12
S30	"bacterium pestis"	11
S31	"pasteurella pestis"	11
S32	"pestisella pestis"	11
S33	"yersinia pestis"	295
S34	"y pestis"	4
S35	"y.pestis"	0
S36	plague	1,588
S37	flu or influenza*	2,640
S38	DE "INFLUENZA"	529
S39	AH1N1*	6
S40	H1N1*	231
S41	AH3N2*	0
S42	H3N2*	26
S43	AH9N2*	0
S44	H9N2*	0

#	Query	Results
S45	H5*	266
S46	AH5*	3
S47	H7*	145
S48	AH7*	1
S49	AH10*	0
S50	H10*	18
S51	AH1N2*	0
S52	H1N2*	0
S53	AH5N1*	0
S54	H5N1*	68
S55	NPI*	193
S56	((("non-pharm*" or nonpharm*) N1 intervention*)	215
S57	"public health measure*"	379
S58	"social measure*"	905
S59	DE "SOCIAL isolation"	5,295
S60	(physical* N3 isolat*)	262
S61	(patient* N3 isolat*)	296
S62	(case* N3 isolat*)	234
S63	(social* N3 isolat*)	7,672
S64	((room* or unit* or procedure*) N1 isolat*)	105
S65	("infection control" and isolation)	37
S66	lockdown* or "lock-down*"	2,865
S67	bubble	911
S68	("rule of six" or "rule of 6")	6
S69	((stay N2 home) or shielding)	2,615
S70	((physical* or social*) N1 distan*)	3,949
S71	((social* or societal* or gathering* *) N3 (reduc* or reor meeting* or event* or visitstrict* or prohibit* or limit* or ban* or cancel*))	12,946
S72	(tier* N2 restric*)	6
S73	cohorting	12
S74	disinfect*	374
S75	decontaminat*	146
S76	(clean or cleaning or cleaner)	5,200

#	Query	Results
S77	("hand wash*" or handwash*)	355
S78	(saniti?e* or saniti?ation or saniti?ing or saniti?er)	336
S79	((hand or personal) N1 hygiene)	303
S80	facemask* or mask*	5,100
S81	N95	13
S82	(face N2 (cover* or protect*))	210
S83	(mouth N2 (cover* or protect*))	18
S84	(nose N2 (cover* or protect*))	4
S85	respirator or respirators	168
S86	"respiratory hygiene"	2
S87	((education* or universit* or college* or school* or nursery or nurseries or early years or playschool* or childcare) N3 clos*)	2,798
S88	((work or workplace or office*) N3 (closure* or closed or closing))	205
S89	(home N3 (worker or work or working))	5,069
S90	((hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) N3 clos*)	434
S91	"border health"	76
S92	(Travel* N5 (ban* or restrict* or limit* or prevent* or stop*))	553
S93	(transport* N5 (ban* or restrict* or limit* or prevent* or stop*))	437
S94	(Border* N5 (ban* or restrict* or limit* or prevent* or stop*))	724
S95	((entrance or Entry) N5 (ban* or restrict* or limit* or prevent* or stop*))	592
S96	(Movement* N5 (ban* or restrict* or limit* or prevent* or stop*))	1,639
S97	((ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or air qualit* or indoor air))	101
S98	("air flow*" or airflow* or aerodynamic* or "air condition*")	565
S99	("air filter*" or "air purif*" or "air filtration")	28
S100	("air chang*" or "air exchang*")	8
S101	(air N3 (recondition* or "re condition*"))	0
S102	(air N3 replac*)	9
S103	"indoor air" N3 qualit*	83
S104	HVAC	20
S105	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR	7,374

#	Query	Results
	S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46 OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54	
S106	S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 OR S65 OR S66 OR S67 OR S68 OR S69 OR S70 OR S71 OR S72 OR S73 OR S74 OR S75 OR S76 OR S77 OR S78 OR S79 OR S80 OR S81 OR S82 OR S83 OR S84 OR S85 OR S86 OR S87 OR S88 OR S89 OR S90 OR S91 OR S92 OR S93 OR S94 OR S95 OR S96 OR S97 OR S98 OR S99 OR S100 OR S101 OR S102 OR S103 OR S104	53,902
S107	S105 AND S106	434

Web of Science Preprint Citation Index

Date of search: 19 November 2024

TS=("Severe acute respiratory syndrome*") OR TS=(SARS) OR TS=((human* or zoono*) NEAR/2 Coronavirus)) OR TS=(SARS1 OR "sars cov" or Hcov or SARS1 or SARSCov1 or "SARS Cov 1" or "SARS Cov1" or "SARS coronavirus 1") OR TS=(SARS1) OR TS=("SARS 1") OR TS=(HCov-SARS) OR TS=(SARS-Cov1) OR TS=("SARS virus") OR TS=("SARS coronavirus") OR TS=("SARS associated coronavirus") OR TS=("Severe acute respiratory syndrome 1") TS=(SARS NEAR/5 ("2002" or "2003" or "2004")) OR TS=(non-SARS-Cov-2) OR TS=("non severe acute respiratory syndrome coronavirus-2") OR TS=("other than severe acute respiratory syndrome coronavirus-2") OR TS=("other than SARS-Cov-2") OR TS=("non Covid") OR TS=("other than covid")

OR TS=(mers) OR TS=(merscov) OR TS=(MERS-CoV) OR TS=(merbecovirus) OR TS=("middle east respiratory syndrome") OR TS=("Coronavirus 229E") OR TS=((cov229e or "cov 229e")) OR TS=((Hcov229e or "Hcov 229e")) OR TS=("coronavirus oc43") OR TS=((covoc43 or "cov oc43")) OR TS=((Hcovoc43 or "HCov oc43")) OR TS=("coronavirus hku1") OR TS=((HCovhku1 or "Hcov hku1")) OR TS=((covhku1 or "cov hku1")) OR TS=("coronavirus nl63") OR TS=((covnl63 or "cov nl63")) OR TS=((HCovnl63 or "HCov nl63")) OR TS=("bacillus pestis") OR TS=("bacterium pestis") OR TS=("pasteurella pestis") OR TS=("pestisella pestis") OR TS=("yersinia pestis") OR TS=("y pestis") OR TS=("y.pestis") OR TS=(plague) OR TS=((flu or influenza*)) OR TS=(AH1N1*) OR TS=(H1N1*) OR TS=(AH3N2*) OR TS=(H3N2*) OR TS=(AH9N2*) OR TS=(H9N2*) OR TS=(AH5*) OR TS=(AH7*) OR TS=(AH10*) OR TS=(AH1N2*) OR TS=(H1N2*) OR TS=(AH5N1*) OR TS=(H5N1*)

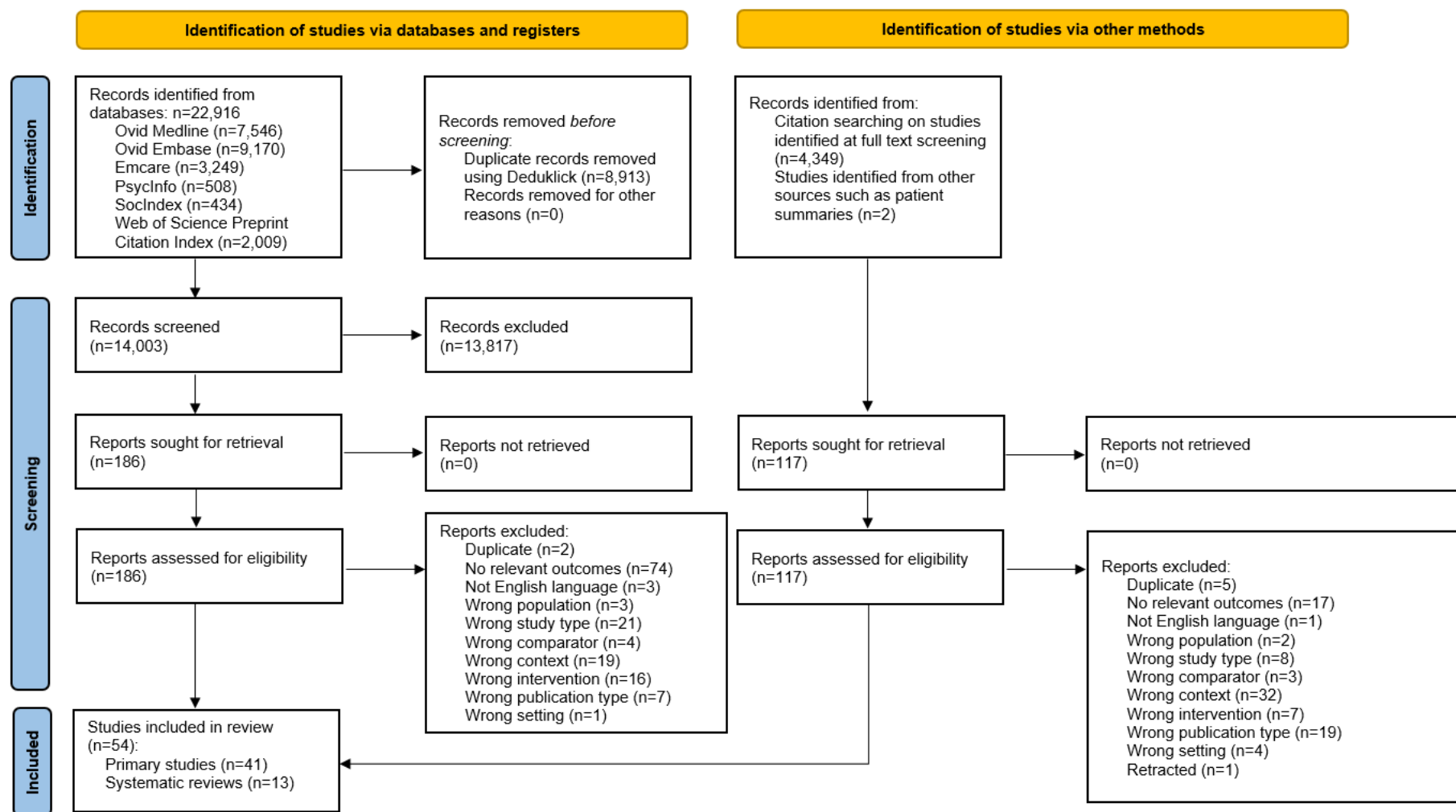
AND:

TS=(NPI*) OR TS=((((non-pharm* or nonpharm*) NEAR/0 intervention*)) OR KP=((intervention* and (non-pharm* or nonpharm*))) OR TS=("public health measure*") OR TS=(PHSM) OR TS=("social measure*") OR TS=((physical* NEAR/2 isolat*)) OR TS=((patient* NEAR/2 isolat*)) OR TS=((case* NEAR/2 isolat*)) OR TS=((social* NEAR/2 isolat*)) OR TS=((((room* or unit* or procedure*) NEAR/0 isolat*)) OR TS=((("infection control" and isolation)) OR TS=((lockdown* or lock-down*)) OR TS=(bubble) OR TS=((("stay NEAR/1 home) or shielding)) OR TS=((((physical* or social*) NEAR/0 distan*)) OR TS=((("social* or societal* or gathering* or meeting* or event* or visit*) NEAR/2 (reduc* or restrict* or prohibit* or limit* or ban* or cancel*))) OR TS=((tier* NEAR/1 restric*)) OR TS=(cohorting) OR TS=(disinfect*) OR TS=(decontaminat*) OR TS=((clean or cleaning or cleaner)) OR TS=((("hand wash*" or handwash*)) OR TS=((saniti*e* or saniti?ation or saniti?ing or saniti?er)) OR TS=((("hand or personal) NEAR/0 hygiene)) OR TS=((facemask* or mask*)) OR TS=(N95) OR TS=((face NEAR/1 (cover* or protect*))) OR TS=((mouth NEAR/1 (cover* or protect*))) OR TS=((nose NEAR/1 (cover* or protect*))) OR TS=((respirator or respirators)) OR TS=("respiratory hygiene") OR TS=((education* or universit* or college* or school* or nursery or nurseries or "early years" or playschool* or childcare) NEAR/2 clos*)) OR TS=((("work or workplace or office") NEAR/2 (closure* or closed or closing))) OR TS=((home NEAR/2 (worker or work or working))) OR TS=((("hospitalit* or restaurant* or cafe* or venue* or shop* or retail* or hotel* or leisure or gym* or cinema*) NEAR/2 clos*)) OR TS=("border health") OR TS=((Travel* NEAR/4 (ban* or restrict* or limit* or prevent* or stop*))) OR TS=((transport* NEAR/4 (ban* or restrict* or limit* or prevent* or stop*))) OR TS=((Border* NEAR/4 (ban* or restrict* or limit* or prevent* or stop*))) OR TS=((("entrance or Entry) NEAR/4 (ban* or restrict* or limit* or prevent* or stop*))) OR TS=((Movement* NEAR/4 (ban* or restrict* or limit* or prevent* or stop*))) OR TS=((("ventilation or ventilated) and (transmission* or distanc* or dispers* or aerosol* or airborne or "air qualit*" or "indoor air")) OR TS=((("air flow*" or airflow* or aerodynamic* or "air condition*")) OR TS=((("air filter*" or "air purif*" or "air filtration")) OR TS=((("air chang*" or "air exchang*")) OR TS=((air NEAR/2 (recondition* or "re condition*")) OR TS=((air NEAR/2 replac*)) OR TS=((("indoor air" NEAR/2 qualit*)) OR TS=(HVAC) OR TS=((("physical barrier*" or "physical intervention*"))

2,009 results.

Annexe B. Study selection flowchart

Figure B.1. PRISMA diagram



Text version of Figure B.1. PRISMA diagram

A PRISMA diagram showing the flow of studies through this review, ultimately including 54 studies.

From identification of studies via databases and registers, n=22,916 records identified from databases:

Ovid Medline (n=7,546)
Ovid Embase (n=9,170)
Emcare (n=3,249)
PsychInfo (n=508)
SocIndex (n=434)
Web of Science (n=2,009)

From these, records removed before screening:

- duplicate records removed using Deduklick (n=8,913)
- duplicate records removed manually (n=0)
- records marked as ineligible by automation tools (n=0)
- records removed for other reasons (n=0)

n=14,003 records screened, of which n=13,817 were excluded, leaving n=186 papers sought for retrieval, of which n=0 were not retrieved.

n=4,351 studies were identified from identification of studies via other methods: n=4,338 studies were identified through citation searching of included studies, n=2 studies were identified from other sources, of which n=4,234 were excluded, leaving n=117 papers sought for retrieval, of which n=0 were not retrieved

Of the n=302 papers assessed for eligibility, n=249 reports were excluded:

- duplicate (n=7)
- no relevant outcomes (n=91)
- not English language (n=4)
- wrong population (n=5)
- wrong study type (n=29)
- wrong comparator (n=7)
- wrong context (n=51)
- wrong intervention (n=23)
- wrong publication type (n=26)
- wrong setting (n=5)
- retracted (n=1)

n=54 papers were included in this review.

Annexe C. Excluded full texts

Duplicate (7 studies)

Al-Ansary and others. '[Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 2 - Hand hygiene and other hygiene measures: systematic review and meta-analysis](#)' medRxiv 2020

Calatayud and others. '[Pandemic \(H1N1\) 2009 virus outbreak in a school in London, April–May 2009: an observational study](#)' Epidemiology and Infection 2009: volume 138, issue 2, pages 183 to 191

Effler and others. '[Household Responses to Pandemic \(H1N1\) 2009–related School Closures, Perth, Western Australia](#)' Emerging Infectious Diseases 2010: volume 16, issue 2, pages 205 to 211

Jefferson and others. '[Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 1 - Face masks, eye protection and person distancing: systematic review and meta-analysis](#)' medRxiv 2020

Markel and others. '[Nonpharmaceutical Influenza Mitigation Strategies, US Communities, 1918–1920 Pandemic](#)' Emerging Infectious Diseases 2006: volume 12, issue 12, pages 1,961 to 1,964

Mitchell and others. '[Non-Pharmaceutical Interventions during an Outbreak of 2009 Pandemic Influenza A \(H1N1\) Virus Infection at a Large Public University, April–May 2009](#)' Clinical Infectious Diseases : an official publication of the Infectious Diseases Society of America 2010: volume 52, issue Supplement 1, pages S138 to S145

Ryu and others. '[Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—International Travel-Related Measures](#)' Emerging Infectious Diseases 2020: volume 26, issue 5, pages 961 to 966

No relevant outcomes (91 studies)

Aggarwal and others. '[Facemasks for prevention of viral respiratory infections in community settings: A systematic review and meta-analysis](#)' Indian Journal of Public Health 2020: volume 64, issue Supplement, pages S192 to S200

Agolory and others. '[Implementation of non-pharmaceutical interventions by New York City public schools to prevent 2009 influenza A](#)' PLOS One [Electronic Resource] 2013: volume 8, issue 1, e50916

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Ahmed and others. '[Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review](#)' BMC Public Health 2018: volume 18, issue 1, page 518

Aiello and others. '[Design and methods of a social network isolation study for reducing respiratory infection transmission: The eX-FLU cluster randomized trial](#)' Epidemics 2016: volume 15, pages 38 to 55

Ainsworth and others. '[Using an Analysis of Behavior Change to Inform Effective Digital Intervention Design: How Did the PRIMIT Website Change Hand Hygiene Behavior Across 8993 Users?](#)' Annals of Behavioral Medicine 2017: volume 51, issue 3, pages 423 to 431

Allison and others. '[Feasibility of elementary school children's use of hand gel and facemasks during influenza season](#)' Influenza and Other Respiratory Viruses 2010: volume 4, issue 4, pages 223 to 229

Alqahtani and others. '[Exploring barriers to and facilitators of preventive measures against infectious diseases among Australian Hajj pilgrims: cross-sectional studies before and after Hajj](#)' International Journal of Infectious Diseases 2016: volume 47, pages 53 to 59

Anonymous. '[Public health measures taken at international borders during early stages of pandemic influenza A \(H1N1\) 2009: preliminary results](#)' Weekly Epidemiological Record 2010: volume 85, issue 21, pages 186 to 195

Awofisayo and others. '[Challenges and lessons learned from implementing a risk-based approach to school advice and closure during the containment phase of the 2009 influenza pandemic in the West Midlands, England](#)' Public Health 2013: volume 127, issue 7, pages 637 to 643

Azman and others. '[Household transmission of influenza A and B in a school-based study of non-pharmaceutical interventions](#)' Epidemics 2013: volume 5, issue 4, pages 181 to 186

Bakhit and others. '[Downsides of face masks and possible mitigation strategies: a systematic review and meta-analysis](#)' 2020

Barasheed and others. '[Uptake and effectiveness of facemask against respiratory infections at mass gatherings: a systematic review](#)' International Journal of Infectious Diseases 2016: volume 47, pages 105 to 111

Basrur and others. '[SARS: A local public health perspective](#)' Canadian Journal of Public Health 2004: volume 95(1), page 22

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Bin-Reza and others. '[The use of masks and respirators to prevent transmission of influenza: a systematic review of the scientific evidence](#)' Influenza and Other Respiratory Viruses 2012: volume 6, issue 4, pages 257 to 267

Biswas and others. '[An outbreak of pandemic influenza A \(H1N1\) in Kolkata, West Bengal, India, 2010](#)' Indian Journal of Medical Research 2012: volume 135, issue 4, pages 529 to 533

Bitar and others. '[International travels and fever screening during epidemics: a literature review on the effectiveness and potential use of non-contact infrared thermometers](#)' Euro Surveillance: Bulletin Européen sur les Maladies Transmissibles, European Communicable Disease Bulletin 2009: volume 14, issue 6, page 12

Brainard and others. '[Community use of face masks and similar barriers to prevent respiratory illness such as COVID-19: a rapid scoping review](#)' Euro Surveillance: Bulletin Européen sur les Maladies Transmissibles, European Communicable Disease Bulletin 2020: volume 25, issue 49, page 12

Briffault. '[Weekly influenza-like-illness rates were significantly lower in areas where schools were not in session in the United States during the 2009 H1N1 pandemic](#)' PLoS currents 2011: volume 3, pages RRN1234

Burdick and others. '[Are masks effective as source control in index influenza patients? a Systematic review](#)' Clinical Infection in Practice 2021: volume 12

Cheatley and others. '[The effectiveness of non-pharmaceutical interventions in containing epidemics: a rapid review of the literature and quantitative assessment](#)' medRxiv 2020

Condon and others. '[Who is that masked person: the use of face masks on Mexico City public transportation during the Influenza A \(H1N1\) outbreak](#)' Health Policy 2010: volume 95, issue 1, pages 50 to 56

Copeland and others. '[Effectiveness of a school district closure for pandemic influenza A \(H1N1\) on acute respiratory illnesses in the community: a natural experiment](#)' Clinical Infectious Diseases 2013: volume 56, issue 4, pages 509 to 516

Cowling and others. '[Face masks to prevent transmission of influenza virus: a systematic review](#)' Epidemiology and Infection 2010: volume 138, issue 4, pages 449 to 456

Craig Kelly and others. '[Effectiveness of Contact Tracing for Viral Disease Mitigation and Suppression: Evidence-Based Review](#)' JMIR public health and surveillance 2021: volume 7, issue 10, page e32468

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Davis and others. '[The effect of reactive school closure on community influenza-like illness counts in the state of Michigan during the 2009 H1N1 pandemic](#)' Clinical Infectious Diseases 2015: volume 60, issue 12, pages e90 to 97

De Angelis and others. '[Hand hygiene and facemask use to prevent droplet-transmitted viral diseases during air travel: a systematic literature review](#)' BMC Public Health 2021: volume 21, issue 1, page 760

Dill and others. '[Novel influenza A \(H1N1\) outbreak on board a US navy vessel](#)' Disaster Medicine and Public Health Preparedness 2009: volume 3 Supplement 2, pages S117 to 120

Fielding and others. '[The spread of influenza A\(H1N1\)pdm09 in Victorian school children in 2009: implications for revised pandemic planning](#)' PLOS One [Electronic Resource] 2013: volume 8, issue 2, e57265

Gautret and others. '[Protective measures against acute respiratory symptoms in French pilgrims participating in the Hajj of 2009](#)' Journal of Travel Medicine 2011: volume 18, issue 1, pages 53 to 55

Halton and others. '[A systematic review of community-based interventions for emerging zoonotic infectious diseases in Southeast Asia](#)' JBI Database of Systematic Reviews and Implementation Reports 2013: volume 11, issue 2, pages 1 to 235

Han and others. '[A Systematic Review for Effective Preventive Public Education of Respiratory Infection](#)' International Journal of Environmental Research and Public Health 2021: volume 18, issue 8, page 3,927

Hoffmann and others. '[Soap versus sanitiser for preventing the transmission of acute respiratory infections in the community: a systematic review with meta-analysis and dose-response analysis](#)' BMJ Open 2021: volume 11, issue 8, e046175

Hong and others. '[Unintended health benefits of adopting preventive behaviors during a virus outbreak](#)' Health Economics (United Kingdom) 2023: volume 32(2), pages 324 to 342

Hsueh and others. '[Pandemic \(H1N1\) 2009 Vaccination and Class Suspensions after Outbreaks, Taipei City, Taiwan](#)' Emerging Infectious Diseases 2010: volume 16, issue 8, pages 1,309 to 1,311

Iuliano and others. '[Investigating 2009 pandemic influenza A \(H1N1\) in US schools: what have we learned?](#)' Clinical Infectious Diseases 2011: volume 52 Supplement 1, pages S161 to S167

Jackson and others. '[School closures and student contact patterns](#)' Emerging Infectious Diseases 2011: volume 17, issue 2, pages 245 to 247

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Jefferson and others. '[Physical interventions to interrupt or reduce the spread of respiratory viruses](#)' Cochrane Database of Systematic Reviews 2020: volume 11, CD006207

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Jefferson and others. '[Physical interventions to interrupt or reduce the spread of respiratory viruses: systematic review](#)' The BMJ 2008: volume 336, issue 7635, pages 77 to 80

Jongcherdchootrakul and others. '[First pandemic A \(H1N1\) pdm09 outbreak in a private school, Bangkok, Thailand, June 2009](#)' Journal of the Medical Association of Thailand 2014: volume 97 Supplement 2, pages S145 to 152

Kollepara Pratyush and others. '[Unmasking the mask studies: why the effectiveness of surgical masks in preventing respiratory infections has been underestimated](#)' Journal of Travel Medicine 2021: volume 28, issue 7

Kumar and others. '[Association of Major Disease Outbreaks With Adolescent and Youth Mental Health in Low- and Middle-Income Countries: A Systematic Scoping Review](#)' JAMA Psychiatry 2022: volume 79, issue 12, pages 1,232 to 1,240

Lambert and others. '[Reducing burden from respiratory infections in refugees and immigrants: a systematic review of interventions in OECD, EU, EEA and EU-applicant countries](#)' BMC Infectious Diseases 2021: volume 21, issue 1, page 872

Li and others. '[Efficacy and practice of facemask use in general population: a systematic review and meta-analysis](#)' Translational Psychiatry 2022: volume 12, issue 1, article number 49

Liang and others. '[Efficacy of face mask in preventing respiratory virus transmission: A systematic review and meta-analysis](#)' Travel Medicine and Infectious Disease 2020: volume 36, 101751

Loustalot and others. '[Household transmission of 2009 pandemic influenza A \(H1N1\) and nonpharmaceutical interventions among households of high school students in San Antonio, Texas](#)' Clinical Infectious Diseases 2011: volume 52 Supplement 1, pages S146 to S153

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Mangklakeree and others. '[Effectiveness of influenza control using nonpharmaceutical interventions at primary schools in Nakhon Phanom Province, Northeast Thailand](#)' Asian Biomedicine 2014: volume 8(3), pages 405 to 410

Mangklakeree and others. '[Brief communication \(Original\). Effectiveness of influenza control using nonpharmaceutical interventions at primary schools in Nakhon Phanom Province, Northeast Thailand](#)' Asian Biomedicine 2014: volume 8, issue 3, pages 405 to 410

Mateus and others. '[Effectiveness of travel restrictions in the rapid containment of human influenza: a systematic review](#)' Bulletin of the World Health Organization 2014: volume 92, issue 12, pages 868 to 880D

McGuinness and others. '[Effect of hygiene interventions on acute respiratory infections in childcare, school and domestic settings in low- and middle-income countries: a systematic review](#)' Tropical Medicine and International Health 2018: volume 23, issue 8, pages 816 to 833

McVernon and others. '[Recommendations for and compliance with social restrictions during implementation of school closures in the early phase of the influenza A \(H1N1\) 2009 outbreak in Melbourne, Australia](#)' BMC Infectious Diseases 2011: volume 11, page 257

Memish Ziad and others. '[Establishment of public health security in Saudi Arabia for the 2009 Hajj in response to pandemic influenza A H1N1](#)' Lancet (London, England) 2009: volume 374, issue 9703, pages 1,786 to 1,791

Merk and others. '[Associations of hand-washing frequency with incidence of acute respiratory tract infection and influenza-like illness in adults: a population-based study in Sweden](#)' BMC Infectious Diseases 2014: volume 14, page 509

Mitchell and others. '[Non-pharmaceutical interventions during an outbreak of 2009 pandemic influenza A \(H1N1\) virus infection at a large public university, April-May 2009](#)' Clinical Infectious Diseases 2011: volume 52 Supplement 1, pages S138 to S145

Mo and others. '[The effect of hand hygiene frequency on reducing acute respiratory infections in the community: a meta-analysis](#)' Epidemiology and Infection 2022: volume 150

Moncion and others. '[Effectiveness of hand hygiene practices in preventing influenza virus infection in the community setting: A systematic review](#)' Canada Communicable Disease Report 2019: volume 45, issue 1, pages 12 to 23

Mondal and others. '[Utility of Cloth Masks in Preventing Respiratory Infections: A Systematic Review](#)' medRxiv 2020

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Nasrullah and others. '[Response to 2009 pandemic influenza A H1N1 among public schools of Georgia, United States--fall 2009](#)' International Journal of Infectious Diseases 2012: volume 16, issue 5, pages e382 to e390

Perez and others. '[Systematic review of economic evaluations of preparedness strategies and interventions against influenza pandemics](#)' PLOS One [Electronic Resource] 2012: volume 7, issue 2, e30333

Public Health England. '[Impact of School Closures on an Influenza Pandemic: Scientific Evidence Base Review](#)' Department of Health 2014 [NATIONAL ARCHIVES]

Renson and others. '[Interventions on Socioeconomic and Racial Inequities in Respiratory Pandemics: a Rapid Systematic Review](#)' Current Epidemiology Reports 2022: volume 9, issue 2, pages 66 to 76

Riley and others. '[Transmission dynamics of the etiological agent of SARS in Hong Kong: impact of public health interventions](#)' Science 2003: volume 300, issue 5627, pages 1,961 to 1,966

Ryu and others. '[Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings-International Travel-Related Measures](#)' Emerging Infectious Diseases 2020: volume 26, issue 5, pages 961 to 966

Sadique and others. '[Estimating the costs of school closure for mitigating an influenza pandemic](#)' BMC Public Health 2008: volume 8, page 135

Saijonkari and others. '[Face masks for preventing respiratory infections in the community: A systematic review](#)' medRxiv 2020

Sakaguchi and others. '[Assessment of border control measures and community containment measures used in Japan during the early stages of Pandemic \(H1N1\) 2009](#)' PLOS One [Electronic Resource] 2012: volume 7, issue 2, e31289

Saunders-Hastings and others. '[Assessing the State of Knowledge Regarding the Effectiveness of Interventions to Contain Pandemic Influenza Transmission: A Systematic Review and Narrative Synthesis](#)' PLOS One 2016: volume 11, issue 12, e0168262

Schlaich and others. '[Infection control measures on ships and in ports during the early stage of pandemic influenza A \(H1N1\) 2009](#)' International Maritime Health 2012: volume 63, issue 1, pages 17 to 23

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Serra María. '[Prevention of respiratory infections at day care centers: recommendations and systematic review of the evidence](#)' Archivos Argentinos de Pediatría 2014: volume 112, issue 4, pages 323 to 331

Sharma and others. '[Scoping review of non-pharmacological interventions to control H1N1 in India](#)' Clinical Epidemiology and Global Health 2019: volume 7(3), pages 504 to 508

Shaterian and others. '[Facemask and Respirator in Reducing the Spread of Respiratory Viruses; a Systematic Review](#)' Archives of Academic Emergency Medicine 2021: volume 9, issue 1, page e56

Smith and others. '[Use of non-pharmaceutical interventions to reduce the transmission of influenza in adults: A systematic review](#)' Respiriology 2015: volume 20, issue 6, pages 896 to 903

Sonthichai and others. '[Effectiveness of Non-pharmaceutical Interventions in Controlling an Influenza A Outbreak in a School, Thailand, November 2007](#)' Outbreak, Surveillance and Investigation Reports 2011: volume 4, issue 2, page 611

Sugisaki and others. '[Effective school actions for mitigating seasonal influenza outbreaks in Niigata, Japan](#)' PLOS One 2013: volume 8, issue 9, e74716

Summers and others. '[The influenza pandemic of 1918-1919 in two remote island nations: Iceland and New Zealand](#)' New Zealand Medical Journal 2011: volume 126, issue 1,373

Thornton and others. '[The impact of heating, ventilation and air conditioning \(HVAC\) design features on the transmission of viruses, including the 2019 novel coronavirus \(COVID-19\): A systematic review of humidity](#)' PLOS One [Electronic Resource] 2022: volume 17, issue 10, e0275654

Thornton and others. '[The impact of heating, ventilation, and air conditioning design features on the transmission of viruses, including the 2019 novel coronavirus: A systematic review of ventilation and coronavirus](#)' PLOS Global Public Health 2022: volume 2, issue 7, e0000552

Thornton and others. '[The impact of heating, ventilation, and air conditioning design features on the transmission of viruses, including the 2019 novel coronavirus: A systematic review of filtration](#)' PLOS Global Public Health 2023: volume 3, issue 9, e0002389

Tran and others. '[Efficacy of face masks against respiratory infectious diseases: a systematic review and network analysis of randomized-controlled trials](#)' Journal of Breath Research 2021: volume 15, issue 4, page 13

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Tsalik and others. '[An Infection Control Program for a 2009 influenza A H1N1 outbreak in a university-based summer camp](#)' Journal of American College Health 2011: volume 59, issue 5, pages 419 to 426

Viner and others. '[Impacts of school closures on physical and mental health of children and young people: a systematic review](#)' medRxiv 2021

Wang and others. '[A cluster-randomised controlled trial to test the efficacy of facemasks in preventing respiratory viral infection among Hajj pilgrims](#)' Journal of Epidemiology and Global Health 2015: volume 5, issue 2, pages 181 to 189

Wang and others. '[The effectiveness of social distancing in reducing transmission during influenza epidemics: A systematic review](#)' Public Health Nursing 2023: volume 40, issue 1, pages 208 to 217

Westgard and others. '[COVID-19 and Influenza Infection Prevention and Control Measures in U.S. Jails, Prisons, and Detention Centers: A Scoping Review](#)' medRxiv 2023, volume 05

Willmott and others. '[Effectiveness of hand hygiene interventions in reducing illness absence among children in educational settings: a systematic review and meta-analysis](#)' Archives of Disease in Childhood 2016: volume 101, issue 1, pages 42 to 50

Xun and others. '[Associations of hand washing frequency with the incidence of illness: A systematic review and meta-analysis](#)' Annals of Translational Medicine 2021: volume 9(5)

Yu and others. '[Transmission dynamics, border entry screening, and school holidays during the 2009 influenza A \(H1N1\) pandemic, China](#)' Emerging Infectious Diseases 2012: volume 18, issue 5, pages 758 to 766

Zhu and others. '[Respiratory infectious disease outbreaks among people experiencing homelessness: a systematic review of prevention and mitigation strategies](#)' Annals of Epidemiology 2023: volume 77, pages 127 to 135

Zviedrite and others. '[School Closures due to Seasonal Influenza: Experience from Eleven Influenza Seasons - United States, 2011-2022](#)' medRxiv 2023, volume 31

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Barajas-Nava. '[Physical interventions to interrupt or reduce the spread of respiratory viruses](#)' Boletín Médico del Hospital Infantil de México 2020: volume 77, issue 3, pages 142 to 145

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Encrenaz and others. '[Outbreak of influenza A\(H1N1\)2009 in a summer camp, Haute-Savoie, France, August 2009](#)' Bulletin Epidemiologique Hebdomadaire 2010: volume 34 to 36, pages 375 to 377

Wang and others. '[Epidemiological characteristics of severe acute respiratory syndrome in Tianjin and the assessment of effectiveness on measures of control](#)' Zhonghua liu xing bing xue za zh, Zhonghua liuxingbingxue zazhi 2003: volume 24, issue 7, pages 565 to 569

Wrong population (5 studies)

Cai and others. '[Protective measures and H5N1-seroprevalence among personnel tasked with bird collection during an outbreak of avian influenza A/H5N1 in wild birds, Ruegen, Germany, 2006](#)' BMC infectious diseases 2009: volume 9, issue 1, pages 170 to 170

Huneau-Salaun and others. '[Cleaning and disinfection of crates and trucks used for duck transport: field observations during the H5N8 avian influenza outbreaks in France in 2017](#)' Poultry Science 2020: volume 99, issue 6, pages 2,931 to 2,936

Metras and others. '[Identification of potential risk factors associated with highly pathogenic avian influenza subtype H5N1 outbreak occurrence in Lagos and Kano States, Nigeria, during the 2006-2007 epidemics](#)' Transboundary and Emerging Diseases 2013: volume 60, issue 1, pages 87 to 96

te Beest and others. '[Effectiveness of personal protective equipment and oseltamivir prophylaxis during avian influenza A \(H7N7\) epidemic, the Netherlands, 2003](#)' Emerging Infectious Diseases 2010: volume 16, issue 10, pages 1,562 to 1,568

Pan and others. '[Inward and outward effectiveness of cloth masks, a surgical mask, and a face shield](#)' medRxiv 2020: volume 55, issue 6, pages 718 to 733

Wrong study type (29 studies)

Agusto and others. '[Optimal control and cost-effective analysis of the 2017 meningitis outbreak in Nigeria](#)' Infectious Disease Modelling 2019: volume 4, pages 161 to 187

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Annexe D. Data extraction tables

Table D.1. Summary of randomised controlled trials included

Abbreviations: ILI: influenza-like illness, IQR: interquartile range, PHSM: public health and social measures, RCT: randomised controlled trial, SD: standard deviation

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Azor-Martinez and others, 2014 (5) Spain Cluster RCT	October 2009 to May 2010 School	Influenza (unspecified)	n=1,609 students across 5 public schools - intervention group: n=823, 7.8 years (SD: 2.4 years), 48.4% female, 14.3% non-Spanish, 14.8% reported chronic illness - control group: n=788, 8.0 years (SD: 2.2 years), 50.6% female, 15.8% non-Spanish, 13.5% reported chronic illness	Inclusion criteria: - school children aged between 4 and 12 years who were enrolled in pre-determined schools and whose parents and tutors had consented to their participation in the study Exclusion criteria: - school children enrolled at pre-determined schools whose parents had not consented to their participation in the study	hand and respiratory hygiene	No PHSM	None	Social determinants of health (absenteeism)
Aiello and others, 2010 (3) USA Cluster RCT	2006 to 2007 University	Influenza A or B	n=1,297 participants (18.7 years [SD: 0.8 years], 34.0% male, ethnicity: 67.0% white, 8.0% black, 3.0% Hispanic, 16.0% Asian, 5.0% other ethnicity - intervention group (face mask and hand hygiene): n=367, mean age 18.6 years (SD: 0.8 years), 51.0% male, ethnicity: 75.0% white, 5.0% black, 2.0% Hispanic, 14.0% Asian, 4.0% other ethnicity - intervention group (face mask): n=378, mean age 18.7 years (SD: 0.8 years), 39.0% male, ethnicity: 56.0% white, 14.0% black, 4.0% Hispanic, 20.0% Asian, 6.0% other ethnicity - control group: n=552, mean age 18.4 years (SD: 0.9 years), 18.0% male, ethnicity: 70.0% white, 6.0%	Inclusion criteria: - living in halls of residence - at least 18 years of age - willing to wear a face mask, use alcohol-based hand sanitiser, provide a throat specimen when ill and complete baseline and weekly surveys across the study period Exclusion criteria: - potential skin allergy to alcohol	- face mask - combination of face mask and hand hygiene [note 2]	No PHSM, each other	Transmission (incidence of influenza)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			black, 4.0% Hispanic, 15.0% Asian, 5.0% other ethnicity No information on groups at risk of health inequalities reported.					
Aiello and others, 2012 (4) USA Cluster RCT	2007 to 2008 University	Influenza A or B	n=1,111 participants (mean age 19.0 years [SD: 0.9 years], 45.0% male, ethnicity: 64.0% white, 9.0% black/African American, 20.0% Asian, 6.0% other [5.0% Hispanic or Latino, 95% not Hispanic or Latino] - intervention group (face mask and hand hygiene): n=349, 19.0 years (SD: 0.9 years), 48.0% male, ethnicity: 60.0% white, 11.0% black/African American, 21.0% Asian, 8.0% other - intervention group (face mask): n=392, 19.0 years (SD: 1.0 years), 42.0% male, ethnicity: 68.0% white, 11.0% black/African American, 21.0% Asian, 8.0% other - control group: n=370, 18.9 years (SD: 0.9 years), 44.0% male, ethnicity: 64.0% white, 10.0% black/African American, 22.0% Asian, 5.0% other No information on groups at risk of health inequalities reported.	Inclusion criteria: - young adults living in university residence halls - willing to wear a face mask, use alcohol-based hand sanitiser, provide a throat swab when sick and complete baseline and weekly surveys throughout study Exclusion criteria: - reported allergy to alcohol-based hand sanitiser	- face mask - combination of face mask and hand hygiene	No PHSM	Transmission (incidence of influenza, risk ratios)	None
Biswas and others, 2019 (6) Bangladesh Cluster RCT	June 2015 to September 2015 School	Influenza A or B	n=10,855 students - intervention group: n=5,077, age not reported, mean students per school by gender: boys=200 (SD: 117), girls=223 (SD: 129), ethnicity not reported - control group: n=5,778 students, age not reported, mean students	Inclusion criteria: students from government or private schools with at least 100 students, where the headteacher had given consent for the school to participate. Exclusion criteria:	hand and respiratory hygiene	No PHSM	Transmission (incidence of influenza)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			per school by gender: boys=223 (SD: 161), girls=256 (SD: 171), ethnicity not reported. Reports information on whether school handwashing facilities are indoor or outdoor, and household assets such as electricity. No information on groups at risk of health inequalities reported.	- students from any school that offered education to grade 5 or above - students from any school that had previously received hand or respiratory hygiene interventions.				
Cowling and others, 2008 (8) Hong Kong Cluster RCT	February 2007 to September 2007 Household	Influenza A or B	n=128 households - intervention group (face mask): n=22 households, age groups of index patients: 41% aged 2 to 15 years, 14% aged 16 to 30 years, 27% aged 31 to 50 years, 18% aged 50 years and over, age groups of household contacts: 17% aged 2 to 15 years, 20% aged 16 to 30 years, 43% aged 31 to 50 years, 18% aged 50 years and over, ethnicity not reported - intervention group (hand hygiene): n=32 households, age groups of index patients: 38% aged 2 to 15 years, 19% aged 16 to 30 years, 31% aged 31 to 50 years, 12% aged 50 years and over, age groups of household contacts: 15% aged 2 to 15 years, 18% aged 16 to 30 years, 38% aged 31 to 50 years, 27% aged 50 years and over, ethnicity not reported - control group: n=74 households, age groups of index patients: 45% aged 2 to 15 years, 14% aged 16 to 30 years, 23% aged 31 to 50 years,	Inclusion criteria: - residents of Hong Kong who were at least 2 years of age and reported at least 2 symptoms of ILI that were subsequently laboratory-confirmed as influenza. - index patients had to be living in a household with at least 2 other individuals, none of whom had reported ILI symptoms in the previous 14 days prior to enrolment Exclusion criteria: - none reported	- hand and respiratory hygiene - face masks (surgical)	No PHSM, each other	Transmission (secondary attack rate, odds ratio for contracting influenza)	Health outcomes (adverse events)

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			19% aged 50 years and over, age groups of household contacts: 15% aged 2 to 15 years, 20% aged 16 to 30 years, 43% aged 31 to 50 years, 20% aged 50 years and over, ethnicity not reported No information on groups at risk of health inequalities reported.					
Cowling and others, 2009 (7) Hong Kong Cluster RCT	January 2008 to September 2008 Household	Influenza A or B	n=259 households, with 794 household contacts - intervention group (hand hygiene only): n=85 households, median age of index patients 11 years (IQR: 8 to 28 years), median age of household contacts 40 years (IQR: 28 to 49 years), index patients 48% male, household contacts 40% male, ethnicity not reported - intervention group (face mask and hand hygiene): n=83 households, median age of index patients 10 years (IQR: 6 to 20 years), median age of household contacts 38 years (IQR: 27 to 48 years), index patients 40% male, household contacts 38% male, ethnicity not reported - control group: n=91 households, median age of index patients 9 years (IQR: 6 to 12 years), median age of household contacts 38 years (IQR: 26 to 45 years), index patients 48% male, household contacts 38% male, ethnicity not reported	Inclusion criteria: - individuals who presented at outpatient clinics reporting at least 2 symptoms of acute respiratory illness with symptom onset in the last 48 hours and who lived in a household with at least 2 other people who had not reported any symptoms of acute respiratory illness in the previous 14 days Exclusion criteria: - none reported	- hand and respiratory hygiene - combination of hand and respiratory hygiene and face masks (surgical)	No PHSM, each other	Transmission (secondary attack rate, odds ratio for contracting influenza)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			No information on groups at risk of health inequalities reported.					
Larson and others, 2010 (9) USA Cluster RCT	November 2006 to July 2008 Household	Influenza A or B	n=509 households with 2,788 members (age groups: 29.2% aged 0 to 5 years, 11.1% aged 6 to 11 years, 7.0% aged 12 to 17 years, 40.7% aged 18 to 40 years, 10.7% aged 41 to 64 years, 1.3% aged 65 years and over; 48.0% male, 96.2% Hispanic, 3.8% other ethnicity, 9.6% had a history of chronic respiratory diseases) - intervention group (hand hygiene): n=169 households, age groups: 27.6% aged 0 to 5 years, 11.1% aged 6 to 11 years, 6.4% aged 12 to 17 years, 41.8% aged 18 to 40 years, 10.8% aged 41 to 64 years, 2.0% aged 65 years and over; 50.1% male, 94.2% Hispanic, 5.8% other ethnicity, 9.9% had a history of chronic respiratory diseases - intervention group (hand hygiene and face mask): n=166 households, age groups: 30.9% aged 0 to 5 years, 11.3% aged 6 to 11 years, 6.8% aged 12 to 17 years, 40.4% aged 18 to 40 years, 10.0% aged 41 to 64 years, 0.6% aged 65 years and over; 47.5% male, 96.4% Hispanic, 3.6% other ethnicity, 8.3% had a history of chronic respiratory diseases - control group: n=174 households, age groups: 29.2% aged 0 to 5 years, 10.6% aged 6 to 11 years, 7.8% aged 12 to 17 years, 39.8% aged 18 to 40 years, 11.5% aged 41 to 64 years, 1.1% aged 65 years	Inclusion criteria: - at least 3 people living in the household, at least one of whom was at preschool or elementary school - participants must have been able to speak English or Spanish, own a telephone, be willing to complete assessments and have bi-monthly home visits and not routinely use alcohol-based sanitiser Exclusion criteria: - not reported	- hand and respiratory hygiene - face masks (surgical)	No PHSM, each other	Transmission (incidence of influenza)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			and over; 46.7% male, 98.1% Hispanic, 1.9% other ethnicity, 10.6% had a history of chronic respiratory diseases Participants were recruited from a neighbourhood in New York that was predominantly immigrant Latino, with a mean household size of 4.5 people per one bedroom apartment.					
Ram and others, 2015 (10) Bangladesh Cluster RCT	2009 to 2010 Household	Influenza A or B	n=590 index patients from 318 households, with 3,290 household contacts - intervention group: n=193 index patients (mean age 121.2 months [SD: 181.7 months], 60% male, ethnicity not reported, health inequalities not reported), with n=1,661 household contacts (mean age 24.9 years [SD: 19.2 years], 47.0% male, ethnicity not reported) - control group: n=184 index patients (mean age 92.5 months [SD: 141.0 months], 61.0% male, ethnicity not reported, health inequalities not reported) with n=1,498 household contacts (mean age 25.7 years [SD: 19.6 years], 46.0% male, ethnicity not reported) Only 64.0% of intervention households and 61% of control households had electricity in the home. No information on groups at risk of health inequalities reported.	Inclusion criteria: - index patient had acute fever onset within 7 days preceding presentation to healthcare clinic and resided within 30 minutes travel of the health facility - none of the index case's household contacts were reported to have fever in the 3 days prior to index case enrolment in the study Exclusion criteria: - index patient admitted to healthcare facility	hand and respiratory hygiene	No PHSM	Transmission (secondary attack rates)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Savolainen-Kopra and others, 2010 (11) Finland Cluster RCT	January 2009 to May 2010 Workplace	Influenza A (H1N1)	n=683 participants - intervention group (soap-and-water): n=257, 45.1 years (age range: 22 to 64 years, SD: 10.3 years), sex not reported, ethnicity not reported) - intervention group (alcohol-based hand rub): n=202, 42.7 years (age range: 20 to 63 years, SD: 10.1 years), sex not reported, ethnicity not reported) - control group: n=224, 42.8 years (age range: 21 to 62 years, SD: 11.1 years), sex not reported, ethnicity not reported) No information on groups at risk of health inequalities reported.	Inclusion criteria: - working in one of the 21 offices selected for intervention Exclusion criteria: - open wounds or chronic eczema on hands	hand and respiratory hygiene	No PHSM, each other	None	Social determinants of health (absenteeism for any reason, absenteeism from sickness)
Simmerman and others, 2011 (12) Thailand Cluster RCT	April 2008 to August 2009 Household	Influenza A (H1, H1N1, H3) or B	n=465 index cases (median age: 5.5 years [IQR: not reported]) from 442 households, with 1,147 household contacts (median age: 34 years [IQR: 24 to 42 years]), 55.2% male - intervention group (face mask): n=110, age groups: 10.9% aged 0 to one years, 20.9% aged 2 to 3 years, 17.3% aged 4 to 5 years, 34.6% aged 6 to 10 years, 16.4% aged 11 to 15 years, 57.3% male, ethnicity not reported - intervention group (hand hygiene): n=119, age groups: 10.1% aged 0 to one years, 21.9% aged 2 to 3 years, 16.0% aged 4 to 5 years, 38.7% aged 6 to 10 years, 13.5% aged 11 to 15 years, 50.4% male, ethnicity not reported	Inclusion criteria: - aged between one month and 15 years and reside in Bangkok metropolitan area - onset of illness within 48 hours before respiratory specimens tested positive for influenza - index patient must have at least 2 other household members aged at least one month who planned to sleep inside the house for 21 days following enrolment, and who did not report any ILI in the 7 days prior to enrolment Exclusion criteria: - those at high risk of severe influenza complications - those treated with influenza antiviral medications	- hand and respiratory hygiene - face masks (surgical)	No PHSM, each other	Transmission (secondary attack rates)	None

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			control group: n=119, age groups: 21.0% aged 0 to 1 years, 14.3% aged 2 to 3 years, 12.6% aged 4 to 5 years, 39.5% aged 6 to 10 years, 12.6% aged 11 to 15 years, 58.0% male, ethnicity not reported No information on groups at risk of health inequalities reported.					
Stebbins and others, 2011 (13) USA Cluster RCT	November 2007 to April 2008 School	Influenza A or B	n=3,360 children across 10 schools - intervention group (hand hygiene): n=1,695 (from 5 schools), age not reported, sex not reported, ethnicity: 41.0% white, 49.0% black, 10.0% other ethnicity - control group: n=1,665 (from 5 schools), age not reported, sex not reported, ethnicity: 44.0% white, 42.0% black, 13.0% other ethnicity No information on groups at risk of health inequalities reported.	Inclusion criteria: - all students at participating schools who were on the roster at the beginning and end of the school year were eligible if parental consent provided Exclusion criteria: - not reported	hand and respiratory hygiene	No PHSM	Transmission (incidence of influenza)	Social determinants of health (absenteeism due to influenza or other illness)
Suess and others, 2012 (14) Germany Cluster RCT	November 2009 to January 2010, January 2011 to April 2011 Household	Influenza A, influenza B [note 1]	n=84 households across 2 influenza seasons 2009/2010 influenza season: n=41 households intervention group (face masks): n=11 households, index patients: median age 7 years (IQR: 5 to 10 years), household contacts: median age 37 years (IQR: 12 to 43 years), all: 45.0% male, ethnicity not reported, index patients: 9.0% diagnosed with chronic illness, household contacts: 7.0% diagnosed with chronic illness	Inclusion criteria: - presented at study site within 2 days of symptom onset and with positive influenza test - at least 2 years of age - the only household member with respiratory disease in the 14 days before symptom onset Exclusion criteria: - those who were pregnant, with severely reduced health status or HIV infection - those who lived alone in single-person households	- hand and respiratory hygiene - face mask (surgical)	No PHSM, each other	Transmission (secondary attack rates, incidence of influenza)	Health outcomes (side effects of mask use)

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			- intervention group (face masks and hand hygiene): n=17 households, index patients: median age 7 years (IQR: 4 to 10 years), household contacts: median age: 34 years (IQR: 19 to 42 years), all: 59% male, ethnicity not reported, index patients: 0% diagnosed with chronic illness, household contacts: 8.0% diagnosed with chronic illness - control group: n=13 households, index patients: median age 8 years (IQR: 7 to 10 years), household contacts: median age 35 years (IQR: 18 to 40 years), all: 39.0% male, ethnicity not reported, index patients: 8.0% diagnosed with chronic illness, household contacts: 9.0% diagnosed with chronic illness 2010/2011 influenza season: n=43 households: - intervention group (face masks): n=15 households, index patients: median age 5 years (IQR: 4 to 9 years), household contacts: median age 35 years (IQR: 17 to 42 years), all: 67.0% male, ethnicity not reported, index patients: 13.0% diagnosed with chronic illness, household contacts: 21.0% diagnosed with chronic illness - intervention group (face masks and hand hygiene): n=11 households, index patients: median age 7 years (IQR: 5 to 9 years), household contacts: median age: 35 years (IQR: 15 to 43 years), all: 64.0%					

Author, year country, study type	Time period, Setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			male, ethnicity not reported, index patients: 0% diagnosed with chronic illness, household contacts: 11.0% diagnosed with chronic illness control group: n=17 households, index patients: median age 8 years (IQR: 6 to 11 years), household contacts: median age 38 years (IQR: 12 to 43 years), all: 77.0% male, ethnicity not reported, index patients: 17.0% diagnosed with chronic illness, household contacts: 28.0% diagnosed with chronic illness					
Talaat and others, 2011 (15) Egypt Cluster RCT	16 February 2008 to 12 May 2008 School	Influenza A, influenza B [note 1]	Students from 60 elementary schools (median age: 8 years, 51.0% male): - intervention group: n=20,882 from 30 schools, sex not reported, ethnicity not reported - control group: n=23,569 from 30 schools, sex not reported, ethnicity not reported No information on groups at risk of health inequalities reported.	Inclusion criteria: - all children enrolled at intervention schools were included in hand hygiene intervention, but absenteeism and illness data were only collected from children in the first 3 primary grades Exclusion criteria: - not reported	hand and respiratory hygiene	No PHSM	Transmission (incidence of influenza)	Social determinants of health (absenteeism)

Note 1: Where respiratory pathogen is designated “influenza a, influenza b” this denotes that outcomes were reported separately for influenza A and influenza B.

Note 2: All participants, including control group, received basic hand hygiene and cough etiquette education.

Table D.2. Summary of observational studies included

Abbreviations: ARI: acute respiratory infection, COPD: chronic obstructive pulmonary disease, ILI: influenza-like illness, IMD: index of multiple deprivation, PHSM: public health and social measure, RT-PCR: reverse transcription polymerase chain reaction, SARS-CoV-1: severe acute respiratory syndrome, SD: standard deviation, WHO: World Health Organisation

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Ager and others, 2024 (16) USA Retrospective cohort	1918 to 1919 School	Influenza A (H1N1)	n=not reported (population taken from those aged 0 to 25 years in 165 US cities in the 1910 or 1920 census) - age, sex, ethnicity or health inequalities breakdowns not reported - adult outcomes (for example, the effect of school closures on labour outcomes later in life), were calculated for males only	Inclusion criteria: - US cities with schools that had reported opening and closure dates and complete school attendance information in the full-count decennial census data Exclusion criteria: - not reported	closure of early years and educational settings	Each other (long vs short closures), placebo	None	Social determinants of health (educational attainment, school attendance, individual labour market outcomes [note 1])
Barro and others, 2022 (17) USA Retrospective cohort	September 1918 to February 1919 School, Community	Influenza A (H1N1)	n=not reported (population taken from 45 US cities) age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	- closure of early years and educational settings - restrictions on formal public gatherings - isolation of cases - a combination of these	Each other	Mortality (flu-related excess death rate)	None
Basurto-Davila and others, 2013 (18) Argentina Cross-sectional	September 2009	Influenza A (H1N1)	n=226 households - age, sex, ethnicity or health inequalities breakdowns not reported - information reported on health conditions for high-risk of influenza and household income also reported	Inclusion criteria: - families of children who attended one of 3 public schools across 2 cities in Argentina Exclusion criteria: - not reported	closure of early years and educational settings	No PHSM [note 2]	None	Social determinants of health (lost parental income)
Beale and others, 2020 (19)	2006 to 2009	Influenza A (H1N1) or	n=1,633 participants age groups: 5.8% aged 0 to 4 years, 14.3% aged 5 to 15 years,	Inclusion criteria: participants enrolled in the flu-watch study from 2006 to 2009;	hand and respiratory hygiene	Each other (frequency)	None	Health outcomes (incidence of laboratory

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
UK Prospective cohort	Household, community	influenza (unspecified)	28.2% aged 16 to 44 years, 35.2% aged 45 to 64 years, 16.5% aged 65 years and over 47.7% male - ethnicity: 96.3% white, 2.8% non-white, 0.9% unknown ethnicity - IMD breakdowns: 5.9% considered IMD 1 (most deprived), 14.3% considered IMD 2, 29.0% considered IMD 3, 29.7% considered IMD 4, 22.0% considered IMD 5 (least deprived)	full household agreed to follow-up for the duration of the flu season and individuals aged 16 years and over agreed to provide blood samples Exclusion criteria: - residing in a household of 6 or more people - diagnosis with terminal or severe illness or incapacity - substantial involvement in other ongoing research projects				confirmed human coronaviruses)
Castilla and others, 2013 (20) Spain Case-control	July 2009 to February 2010 Community	Influenza A (H1N1)	n=962 participants - cases: n=481, mean age 43.2 years (SD: 13.7 years, 56.8% less than 45 years, 36.4% aged 45 to 64 years, 6.9% aged 65 years and over), 37.5% male, ethnicity not reported, 11.4% pregnant, 15.6% had at least one major risk condition - controls: n=481, mean age 47.0 years (SD: 15.9 years, 46.8% less than 45 years, 38.7% aged 45 to 64 years, 14.6% aged 65 years and over), 37.4% male, ethnicity not reported, 2.7% pregnant, 25.6% had at least one major risk condition	Inclusion criteria: - cases were recruited from hospitalised patients with laboratory-confirmed influenza - controls were patients who had consulted for reasons other than ILI, ARI or gastroenteritis. Exclusion criteria: - previous diagnosis of influenza A (H1N1)09 - inability to respond to interview	hand and respiratory hygiene	No PHSM, Each other (frequency)	Transmission (odds ratio for influenza)	None
Chapelle and others, 2022 (21) USA	1918 to 1922 Community	Influenza A (H1N1)	n=not reported (population taken from 43 US cities), mean age in 1910: 28.4 years (SD: 1.3 years), sex not reported, ethnicity not reported No information on groups at risk of health inequalities reported.	Inclusion criteria: - not reported Exclusion criteria: - not reported	a combination of closure of early years and educational settings, restrictions on formal public gatherings,	Each other (duration)	Mortality (excess death rate, monthly excess death rate)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Retrospective cohort					and isolation of cases			
Chen and others, 2011 (22) Taiwan Cross-sectional	May 2009 to June 2009 School	Influenza A (H1N1)	n=232 households of students aged between 5 and 12 years: age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - children in one randomly selected class in each grade from each of the 3 participating schools were invited to participate Exclusion criteria: - not reported	closure of early years and educational settings	No PHSM [note 2]	None	Social determinants of health (loss of parental income)
Correia and others, 2022 (23) USA Retrospective cohort	1918 to 1919 Community	Influenza A (H1N1)	n=not reported (population taken from 46 US cities): age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	- closure of early years and educational settings - restrictions on formal public gatherings - isolation of cases - a combination of these	No PHSM, each other	Mortality (weekly excess death rate)	None
Cowling and others, 2010 (24) Global Retrospective cohort	July 13 2009 to August 22 2009 Airport	Influenza A (H1N1)	n=not reported (data from 35 countries included) age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - nations that had notified 100 or more confirmed influenza A (H1N1) cases to WHO by July 6 2009 (except for Mexico and USA where local transmission occurred prior to WHO global alert) Exclusion criteria: - not reported	international travel and border restrictions	No PHSM, each other (medical checks before disembarking, symptom screening, thermal scanners, health declaration forms)	Transmission (time to untraceable local case)	None
Doshi and others, 2015 (25)	March 2009 to April 2010	Influenza A or B	n=486 participants cases: n=145, 29.7% aged between 12 and 24 months, 70.3% aged between 24 and 60	Inclusion criteria: participants were recruited from a larger study examining household	hand and respiratory hygiene	Each other (level of soap consumption)	Transmission (odds ratio for influenza)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Bangladesh Case-control			months, 51.0% male, ethnicity not reported controls: n=341, 42.5% aged between 12 and 24 months, 57.5% aged between 24 and 60 months, 44.6% male, ethnicity not reported Households with 4 or more people sleeping in the same room as the child (index case): 72% cases, 62% controls No information on groups at risk of health inequalities reported.	risk factors for respiratory disease among young children - cases were at least 12 months old with laboratory-confirmed influenza who presented within 120 hours of onset of symptoms of respiratory illness. They could not have severe malnutrition, or enrolment in any other clinical trial - controls were children in the study area who had not visited the clinic for any respiratory illness in the 6 months prior to enrolment Exclusion criteria: - children under 12 months				
Fujita and others, 2011 (26) Japan Cross-sectional	28 April 2008 to 22 May 2009 Airport	Influenza A (H1N1)	n=120,069 passengers on 500 flights who were subject to border control measures - age, sex, ethnicity or health inequalities breakdowns not reported Population of Japan, United Kingdom and United States - age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - passengers on flights arriving in Japan from USA, Canada or Mexico during the study period Exclusion criteria: - not reported	international travel and border restrictions, including quarantine	No PHSM	Transmission (incidence of influenza)	None
Gaddy and others, 2021 (27) USA Retrospective cohort	1918 Community	Influenza A (H1N1)	n=not reported age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	physical distancing	Each other (differing durations of social distancing)	None	Health outcomes (suicide rates)

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Godoy and others, 2012 (28) Spain Case-control	July 2009 to February 2010 Community	Influenza A (H1N1)	n=3,087 participants from 36 hospitals - cases: n=813, mean age 38.5 years (SD: 22.8 years, 24.0% aged 0 to 17 years, 63.6% aged 18 to 65 years, 50.4% aged 65 years and over), 49.6% male, ethnicity: 86.9% white, 2.4% Romany, 6.6% Amerindian, 2.7% Arab or North African, 1.4% other ethnicity, 14.0% pregnant, 15.1% diagnosed with COPD, 16.7% diagnosed with Asthma, 10.0% diagnosed with chronic cardiovascular disease, 12.1% diagnosed with diabetes, 2.6% diagnosed with AIDs/HIV, 26.4% diagnosed with 2 or more risk factors - controls: n=2,274, mean age 39.1 years (SD: 22.7 years, 22.7% aged between 0 and 17 years, 64.2% aged 18 to 65 years, 13.1% aged 65 years and over), 48.5% male, ethnicity: 92.8% white, 0.7% Romany, 3.7% Amerindian, 1.1% Arab or North African, 1.7% other ethnicity, 6.1% pregnant, 4.8% diagnosed with COPD, 3.8% diagnosed with Asthma, 9.0% diagnosed with chronic cardiovascular disease, 10.1% diagnosed with diabetes, 1.1% diagnosed with AIDs/HIV, 18.9% diagnosed with 2 or more risk factors Other health conditions, including renal failure or nephrotic syndrome,	Inclusion criteria: - cases were patients who were hospitalised with influenza, acute respiratory infection, septic shock or multiple organ failure who subsequently had influenza A (H1N1)pdm09 virus confirmed by RT-PCR Exclusion criteria: - patients who had nosocomial infection (defined as influenza infection 48 hours or more after admission for other reasons) were excluded	hand and respiratory hygiene	No PHSM, Each other (frequency)	Healthcare use (Incidence of hospitalisation with influenza [odds ratio])	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			disabling neurological disease, neoplasms, history of organ transplant, use of systemic or inhaled corticosteroids also reported on for both groups.					
Hatchett and others, 2007 (29) USA Retrospective cohort	1918 Community	Influenza A (H1N1)	n=not reported (taken from population of 17 US cities) age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	- closure of early years and educational settings - restrictions on formal public gatherings - isolation of cases	Each other, no PHSM (variations in implementation, if PHSM implemented late or not at all)	Mortality (weekly excess death rate from pneumonia or influenza)	None
Heymann and others, 2004 (30) Israel Retrospective cohort	2000 School	Influenza (unspecified, but influenza A suspected)	n=186,094 students aged between 6 and 12 years age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	closure of early years and educational settings	No PHSM	None	Health outcomes (healthcare utilisation)
Janusz and others, 2011 (31) USA Retrospective cohort	April 2009 to May 2009 School	Influenza A (H1N1)	n=not reported (population is students from 5 elementary schools) age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - students who were enrolled at one of 5 elementary schools in Chicago that had a large number of influenza A (H1N1) cases Exclusion criteria: - not reported	closure of early years and educational settings	No PHSM	None	Social determinants of health (school absenteeism)
Kim and others, 2012 (32) South Korea	18 November 2009 to 8 December 2009	Influenza A (H1N1)	n=7,448 students (mean age 13.0 years [SD: 3.0 years; 42.1% primary school age, 34.3% middle school age, 23.5% high school age], 42.2% male, ethnicity not reported, 2.3%	Inclusion criteria: not reported Exclusion criteria:	- hand and respiratory hygiene, - face masks	No PHSM, each other (frequency)	Transmission (odds ratio for influenza)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Retrospective cohort	School		diagnosed with asthma, 0.3% diagnosed with cardiac disease. 0.1% diagnosed with diabetes, 12.0% diagnosed with atopy, 0.2% diagnosed with renal disease, 0.1% diagnosed with liver disease - cases: n=417, mean age 13.2 years (SD: 2.9 years; 39.5% primary school age, 34.5% middle school age, 25.9% high school age], 54.0% male, ethnicity not reported, 4.3% diagnosed with asthma, 0.5% diagnosed with cardiac disease. 0% diagnosed with diabetes, 14.4% diagnosed with atopy, 0% diagnosed with renal or liver disease - controls: n=7,031, age not reported, sex not reported, ethnicity not reported, health inequalities not reported	- if the principal did not give consent for the school to participate - if data on BMI, waist circumference or diagnosis with H1N1 infection were missing - if antiviral medications were taken before H1N1 infection was confirmed - if the student met the exclusion criteria for vaccination or parents did not consent				
Lau and others, 2004 (33) Hong Kong Case-control	April 2003 to June 2003 Community	SARS-CoV-1	n=330 (males: mean age 47.1 years [SD:18.8 years], females: 47.1 years [SD: 19.9 years]), 48.0% male, ethnicity not reported Age, sex, ethnicity, or health inequalities breakdowns not reported individually for cases and controls. No information on groups at risk of health inequalities reported.	Inclusion criteria: - all probable SARS patients whose cases were reported to the Department of Health on or before 16 May 2003 Exclusion criteria: - anyone aged under 16 years	- cleaning and disinfection - face masks - hand and respiratory hygiene	No PHSM, each other (frequency of hand washing)	Transmission (odds ratio for SARS-CoV-1)	None
Li and others, 2011 (34) China	2009 School	Influenza A (H1N1)	n=1,570 (14.0% aged 15 years, 38.9% aged 16 years. 30.8% aged 17 years. 9.7% aged 18 years, 6.5% 19 to 21 years; 69.0% male; ethnicity not reported)	Inclusion criteria: - not reported Exclusion criteria: - not reported	- hand and respiratory hygiene - ventilation	Each other (frequency)	Transmission (odds ratio for influenza)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Retrospective cohort			No information on groups at risk of health inequalities reported					
Liu and others, 2016 (35) China Case-control	March 2009 to June 2009 Community	Influenza A (H1, H3) or B (Victoria and Yamagata)	n=200 participants - cases: n=100, median age 10 years (IQR: 5.5 to 25.0 years), 59.0% male, ethnicity not reported - controls: n=100, median age 10 years (IQR: 5.0 to 25.0 years), 52.0% male, ethnicity not reported No information on groups at risk of health inequalities reported.	Inclusion criteria: - cases were patients aged 3 years and over who tested positive for influenza - control participants were matched to cases by age and city of residence and recruited through random digit dialling. They must have had no symptoms of influenza nor been treated with antivirals in the 7 days prior to enrolment - cases and controls must speak Putonghua (Mandarin Chinese) Exclusion criteria: - not reported	hand and respiratory hygiene	No PHSM	Transmission (odds ratio for influenza)	None
Mansiaux and others, 2014 (36) France Prospective cohort	Two consecutive seasonal influenza periods: 2010 to 2011 and 2011 to 2012 Household	Influenza A (H1N1)	n=1,318 participants from 559 households, 19.5% aged less than 15 years, 41.3% aged between 15 and 50 years, 39.2% 50 years or over, 46.4% male, ethnicity not reported No information on groups at risk of health inequalities reported.	Inclusion criteria: - participants were recruited from the CoPanFlu-France cohort, households were randomly selected for inclusion in this cohort between December 2009 and July 2010 Exclusion criteria: - not reported	hand and respiratory hygiene	No PHSM	Transmission (incidence of influenza)	None
Markel and others, 2007 (37) USA	September 1918 to February 1919 Community	Influenza A (H1N1)	n=not reported (population taken from 43 cities in the US with a combined population of approximately 23 million [22.0% of total US population]) age, sex, ethnicity or health inequalities breakdowns not reported	Inclusion criteria: - not reported Exclusion criteria: - not reported	- closure of early years and educational settings - restrictions on public gatherings	Each other	Mortality (weekly excess death rate)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Retrospective cohort					- isolation of cases - a combination of these			
Torner and others, 2015 (38) Spain Case-control	July 2009 to May 2011 Community	Influenza A (H1N1)	n=478 participants - cases: n=239, mean age 5.4 years (SD:4.5 years, 56.1% aged 0 to 4 years, 44.0% aged 5 to 17 years), 43.3% female, 88.9% white, 3.8% Romany, 3.0% Amerindian, 2.6% Arab or North African, 1.7% other ethnicity, 9.6% pneumonia in previous 2 years. 11.3% had a diagnosis of asthma, 0.4% had a diagnosis of diabetes - controls: n=239, mean age 5.3 years (SD:4.6 years, 56.5% aged 0 to 4 years, 43.5% aged 5 to 17 years), 45.2% female, 92.8% white, 2.1% Romany, 2.6% Amerindian, 1.3% Arab or North African, 1.3% other ethnicity, 3.3% pneumonia in previous 2 years. 5.4% had a diagnosis of asthma, 0.8% had a diagnosis of diabetes Other health conditions, including renal failure or nephrotic syndrome, disabling neurological disease, neoplasms, history of organ transplant, use of systemic or inhaled corticosteroids, obesity and previous antibiotic use also reported on for both groups	Inclusion criteria: - cases were outpatients aged between 6 months and 17 years with laboratory-confirmed influenza - controls were matched on age, location and date of consultation, and were recruited after attending primary healthcare centres for conditions other than ILI or ARI - cases and controls were recruited from multiple primary healthcare centres across 7 regions in Spain Exclusion criteria: - not reported	- hand and respiratory hygiene, - face masks	No PHSM, each other (frequency)	Transmission (odds ratio for influenza)	None
Uchida and others, 2012 (39)	August 2009 to March 2010	Influenza A (H1N1)	n=2,141 children from 57 classes in 4 schools aged between 7 and 15 years	Inclusion criteria: students from 4 schools (elementary and Junior High) in 2	closure of early years and educational settings	No PHSM, each other (school closure)	Transmission (incidence of influenza)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
Japan Prospective cohort	School		age, sex, ethnicity or health inequalities breakdowns not reported	districts of Japan that were 70km apart Exclusion criteria: staff members (teachers, administrators)		vs targeted class closure)		
Wilson-Clark and others, 2006 (40) Canada Retrospective cohort	May 2003 to October 2003 Household	SARS-CoV-1	n=250 participants (37 years of age [age range: 1 to 79 years], 52.8% female, ethnicity not reported, 48.0% had an underlying or pre-existing health condition) - index cases: n=74, 43.5 years (range: 1.5 to 77.0 years), 67.6% female, ethnicity not reported, 56.8% had an underlying or pre-existing health condition - secondary cases: n=18, 34.5 years (range: 6 to 78.0 years), 55.6% female, ethnicity not reported, 38.9% had an underlying or pre-existing health condition - household members: n=158, 34.0 years (range: 1.0 to 79.0 years), 45.6% female, ethnicity not reported, 44.9% had an underlying or pre-existing health condition	Inclusion criteria: - households were eligible for inclusion if one or more person lived in the household with the index case from SARS symptom onset to isolation of the patient Exclusion criteria: - if place of residence was an institution	- hand and respiratory hygiene - face masks	No PHSM (handwashing), each other (frequency of mask wearing)	Transmission (secondary attack rate of SARS-CoV-1 within household)	None
Wu and others, 2004 (41) China Case-control	April 2003 to July 2003 Community	SARS-CoV-1	n=375 participants - cases: n=94, median age 29 years (IQR: 14 to 84 years), 50.0% male, ethnicity not reported - controls: n=281, median age 31 years (IQR: 14 to 82 years), sex not reported, ethnicity not reported	Inclusion criteria: - cases were included if they met the case definition and reported no close contact with probable or suspected SARS patients - hospitalised between April 28 and June 9 2003 Exclusion criteria:	- hand and respiratory hygiene - face masks	No PHSM	Transmission (odds ratio for SARS-CoV-1)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
			No information on groups at risk of health inequalities reported	- healthcare workers - controls aged under 14 years				
Zhang and others, 2013a (42) China Case-control	August 2009 to September 2009 Household	Influenza A (H1N1)	n=162 households - cases: n=54 households, age groups: 16.7% aged between 0 and 9 years, 46.3% aged between 10 and 19 years, 20.4% aged between 20 and 29 years, 11.1% aged between 30 and 39 years, 1.9% aged between 40 and 49 years, 3.7% aged 50 years or older, sex not reported, ethnicity not reported - controls: n=108 households, age groups: 18.5% aged between 0 and 9 years, 44.4% aged between 10 and 19 years, 21.3% aged between 20 and 29 years, 10.2% aged between 30 and 39 years, 3.7% aged between 40 and 49 years, 1.9% aged 50 years or older, sex not reported, ethnicity not reported No information on groups at risk of health inequalities reported.	Inclusion criteria: - case households must have an index patient with influenza A (H1N1)pdm09 in the household between 1 August 2009 and 30 September 2009 who quarantined in the household from diagnosis to 7 days after illness onset and the presence of secondary cases in the household. Secondary cases must have had potential contact with the index patient with symptom onset within 7 days of contact with the index patient while they were infectious - control households were included if they had an index patient of influenza A (H1N1)pdm09 in the household between 1 August to 30 September 2009 who quarantined in the household from diagnosis to 7 days after illness onset and no secondary cases during the infectious period of the index case in family members who has potential close-contact with the index patient Exclusion criteria: - case households were excluded if index patient quarantined alone, or if any household members had previous vaccination with a vaccine against influenza A (H1N1)pdm09	- hand and respiratory hygiene - face masks - ventilation - cleaning and disinfection	No PHSM	Transmission (odds ratio for influenza)	None

Author, year country, study type	Time period, setting	Respiratory pathogens	Population (demographics, health inequalities)	Inclusion or exclusion criteria	PHSMs	Comparator	Outcomes related to effectiveness of PHSM	Outcomes related to unintended consequences of PHSM
				- control households were excluded if any household members had previous vaccination with a vaccine against influenza A (H1N1)pdm09 - secondary cases were excluded if infection transmitted by others outside the household				
Zhang and others, 2013b (43) USA, China, Hong Kong Case-control	May 2009 Passenger aircraft	Influenza A (H1N1)	n=41 passengers - cases: n=9, 44.0% less than 20 years of age, 44.0% aged between 20 and 40 years, 11.0% aged over 40 years, 56.0% male, 89.0% Chinese ethnicity - controls: n=32, 12.0% less than 20 years of age, 47.0% aged between 20 and 40 years, 41.0% aged over 40 years, 47.0% male, 100.0% Chinese ethnicity No information on groups at risk of health inequalities reported	Inclusion criteria: - infected and non-infected persons on relevant flights who were aged 5 years or older, agreed to be interviewed and provided complete information Exclusion criteria: - passengers who travelled in business class, and aircraft crew members	- hand and respiratory hygiene - face masks	No PHSM	Transmission (incidence of influenza, odds ratio for influenza)	None

Note 1: In the study by Ager and others (16), “individual labour market outcomes” refers to labour market outcomes experienced by the children affected by closure of early years and educational settings later in life.

Note 2: In these studies (18, 22), the comparison to “No PHSM” refers to the question asked on lost income which has been interpreted as a comparison of before-and-after.

Table D.3. Overview of systematic reviews identified

Abbreviations: MERS: middle eastern respiratory syndrome, PHSM: public health and social measures, PPE: personal protective equipment, RCTs: randomised controlled trials, SARS: severe acute respiratory syndrome

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
Chaabna and others, 2021 (44) Systematic review with meta-analysis	Up to 12 May 2020	Influenza	Primary studies (clinical trials or observational studies) on the use of face masks in community settings. Type of face mask had to be specified, but could include cloth or medical face masks. Face masks could be used with or without other intervention, and had to be used in the context of preventing transmission of respiratory infection in an epidemic, pandemic, or outbreak.	Primary studies that were case series, case reports, or experimental laboratory studies were excluded. Studies on the effectiveness of face mask use during mass gatherings or passenger flights were excluded.	5	face masks (surgical) with or without hand hygiene	No PHSM	Effectiveness: Transmission (incidence of influenza)
Chou and others, 2020 (45) Rapid review [note 3]	2003 to 14 April 2020	SARS-CoV-1	Primary studies (RCTs, cohort, or case-control studies) in healthcare workers or community members at risk of contracting respiratory infection due to workplace or community exposure. Face masks could be: N95 or equivalent, surgical masks, cloth masks. Comparator could be: different mask type, no mask.	Primary studies that examined bacterial or other non-viral, non-respiratory infections. Studies that evaluated the effectiveness of powered air-purifying respirators, reusable N95 elastomeric respirators, or other PPE were excluded.	3	face masks	No PHSM, each other	Effectiveness: Transmission (infection with SARS-CoV-1)
Dugre and others, 2020 (46)	Up to May 5th 2020	Influenza	Systematic reviews were included if they reported at least one RCT comparing mask use to a control group. Mask use could be with or without another intervention.	Systematic reviews of observational studies, surrogate experimental studies or studies in laboratory settings were excluded.	8	face masks	No PHSM	Effectiveness: Transmission (incidence of influenza)

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
Umbrella Review			Systematic reviews had to be published in English Language.					
Fong and others, 2020 (47) Systematic review	1946 until October 17 2018	Influenza	Primary studies (epidemiological or simulation) on the effectiveness of avoiding crowding in public areas.	Primary studies that reported outbreak events in a crowded area or perceptions on mass gatherings without specific data on the effectiveness on avoiding crowding in public areas were excluded. Reviews, letters, news, and summary articles were excluded.	3	restrictions on formal public gatherings	No PHSM, each other	Effectiveness: Transmission (influenza attack rates) Effectiveness: mortality (excess death rate)
Gozdzielewska and others, 2022 (48) Systematic review	2002 until February 2022	Influenza, SARS-CoV-1	Primary studies (experimental, quasi-experimental, observational) that investigated the effectiveness of hand hygiene interventions for the public in community settings on the acquisition or transmission of confirmed SARS, MERS, or influenza were included.	Non-primary research studies, and studies on healthcare workers, workplaces or with outcomes at the population level or related to serological testing, hand hygiene compliance, or school or work absenteeism were excluded.	14	hand and respiratory hygiene	No PHSM, each other	Effectiveness: Transmission (incidence of influenza, secondary attack rate of influenza, incidence of SARS-CoV-1 [odds ratio, risk ratio])
Kim and others, 2022 (49) Systematic review and network meta-analysis	Up to 5 February 2021	Influenza, SARS CoV-1, MERS-CoV	Primary studies (RCTs, non-randomised controlled trials, prospective or retrospective cohort studies) on the effectiveness of N95 respirators or their equivalent, or surgical, medical, or non-medical masks when compared to each other, not wearing masks or very low compliance with wearing masks. Included studies may be published or unpublished.	The following study designs were excluded: literature review with qualitative synthesis, theoretical explanations, opinions, comments, simulation studies. Studies not written in English language were excluded. Studies that did not provide information or isolated analysis by mask type, in-vitro studies and studies on animals were excluded.	6	face masks	No PHSM, each other	Effectiveness: Transmission (incidence of infection, risk of infection)

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
Ross and others, 2023 (50) Systematic review and meta-analysis	Up to May 25 2021	Influenza	Primary studies (RCTs, quasi- or non-randomised controlled trials) on populations residing in LMIC, as defined by the World Bank 2019-2020 classification, were included. Studies in domestic, school and childcare settings were included. To be included, studies had to evaluate the effectiveness of promoting handwashing with soap (which included providing associated facilities and products such as soap) at the individual, household, or community level. If handwashing interventions were delivered with another intervention, these were included if the effect of handwashing was reported separately, or if handwashing was the main component of the intervention. Studies that evaluated the effectiveness of handwashing against a control group, placebo, or other intervention were included. Studies could be published in English or French.	Primary studies were excluded if the intervention was anything other than promoting handwashing with soap, including hand sanitisers. Studies conducted in healthcare or in the workplace were excluded. Studies without intervention, such as assessing self-reported handwashing, were excluded.	3	hand and respiratory hygiene	No PHSM, each other, placebo	Effectiveness: Transmission (incidence of influenza)
Saunders-Hastings and others, 2017	Up to June 30 2016	Influenza A (H1N1)	Primary studies (RCTs, case-controls, cohort, cross-sectional) were included if they	The following study designs were excluded: mathematical modelling studies, case reports, case-series, case-	5	hand and respiratory hygiene,	No PHSM, each other	Effectiveness: Transmission

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
(51) Systematic review and meta-analysis			assessed the use of face masks or hand or respiratory hygiene interventions in humans exposed to a pandemic influenza. Studies that compared the use of face masks or hand or respiratory hygiene interventions to no intervention or other forms of intervention and assessed change in pandemic influenza transmission were included.	crossover, crossover, before-and-after, exologic, expert opinion, editorials, systematic reviews and meta-analysis. Studies that evaluated interventions recommended for healthcare, such as goggles, gowns, and gloves, were not included. In-vivo, in-vitro, and animal studies were excluded. Studies with no intervention, or where studies included vaccination, antiviral use, school or workplace closure, or contacts reduction were excluded. Studies with no comparator and/or no quantifiable outcome were excluded.		face masks		
Takahashi and others, 2014 (52) Systematic review and meta-analysis	1980 to June 2012	Influenza	Primary studies (RCTs, quasi-RCTS) were included if they compared those who wore face masks against those who did not, and if the outcome was secondary infection of influenza in families of patients suffering with influenza were included. Only studies published in English were included.	Studies that did not examine secondary prevention of influenza were excluded.	7	- face masks - face masks and hand hygiene	No PHSM	Effectiveness: Transmission (incidence of influenza)
Warren-Gash and others, 2013 (53) Systematic review	Medline: 1946 to 13 February 2012 Embase: 1974 to 13	Influenza	Primary studies (RCTs, quasi-randomised controlled trials, crossover trials, and cohort, case-control and cross-sectional studies) conducted in community or household settings were included. To be included, studies must have	The following study designs were excluded: before-and after, ecological. Studies that described multicomponent hygiene interventions, were conducted in hospitals or care homes, or described multicomponent interventions that tested several measures of hand hygiene without	6	hand and respiratory hygiene	No PHSM	Effectiveness: Transmission Unintended consequences: Social determinants of health (absenteeism)

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
	February 2012 Global Health: 1910 to 13 February 2012		reported a measure on the effect of hand hygiene on influenza.	adjustment for this multiple testing were excluded.				
Wong and others, 2024 (54) Systematic review and meta-analysis	Up to 30 August 2022	Influenza	Primary studies (RCTs, observational) on the effectiveness of PHSM against laboratory-confirmed influenza in households with 2 or more members in the same unit with common housekeeping were included.	Primary studies on institutional households where need for shelter and sustenance is provided for (for example, student dormitories or homes for the elderly) were excluded.	9	- hand and respiratory hygiene - face masks	No PHSM	Effectiveness: Transmission (incidence of influenza)
Xiao and others, 2020 (55) Systematic review and meta-analysis	Hand hygiene: 1946 up to August 13, 2018 Respiratory hygiene: 1946 to 5 November 2018 Face masks: 1946 to 27 July 2018 Surface and object cleaning: 1946 up to	Influenza	Hand hygiene: RCTs that compared hand hygiene interventions to no intervention in preventing laboratory-confirmed influenza infection in community settings were included. Respiratory hygiene: Primary studies written in any language were included that investigated the use of respiratory hygiene or cough etiquette as the intervention, with a study outcome of laboratory-confirmed influenza infection, were included. Face masks: RCTs published in any language that evaluated the	Hand hygiene: Exclusion criteria not reported. Respiratory hygiene: Studies that reported use of face mask as part of the respiratory etiquette were excluded because they were included for face masks rather than respiratory hygiene. Face masks: Exclusion criteria not reported. Surface and object cleaning: Simulation studies, recommendations, commentaries, and editorials were excluded.	25	- hand and respiratory hygiene, - face masks, - surface and object cleaning	No PHSM	Effectiveness: Transmission (incidence of influenza)

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
	October 14 2018		use of face masks with or without other intervention in community settings, with a study outcome of laboratory-confirmed influenza infection, were included. Surface and object cleaning: RCTs or other epidemiological studies published in any language that evaluated any type of surface and object cleaning on laboratory-confirmed influenza infection, influenza-like illness or respiratory illness were included.					
Zhao and others, 2022 (56) Umbrella review	1 January 2020 to 31 December 2020	Influenza	Systematic reviews on the impact of PHSM (face masks, hand hygiene, social distancing, nasal rinses, mouthwashes, school closure, change in Government policy) used in community settings (mass gatherings, households, workplaces, schools, childcare centres, assisted living facilities, military settings, general community settings). Systematic reviews with or without meta-analysis were included, and could include one or more relevant RCT and/or observational study (cohort, case-control, cross-sectional, case series or case reports) whose conclusions	Systematic reviews not published in English, those published in healthcare settings only or combined community and healthcare settings were excluded. Systematic reviews about healthcare workers were excluded, as were those that combined results with modelling data, Studies with only one author, non-original publications, and conference abstracts were excluded.	5	- hand and respiratory hygiene, - face masks, - face masks and hand hygiene	No PHSM	Effectiveness: Transmission (incidence of influenza)

Author, Year, Review type	Search dates	Respiratory pathogen(s)	Inclusion criteria	Exclusion criteria	Number of relevant [note 1] studies included (n)	PHSMs	Comparator [note 2]	Outcomes
			could be separated from modelling and healthcare population study data. To be included, systematic reviews must have been published in peer review journals between January 1 and December 31, 2020.					

Note 1: Number of relevant studies refers to the number of studies synthesised in the review that were relevant to the research question asked in this mapping review.

Note 2: Comparator is as stated in review’s protocol.

Note 3: Chou and others ([45](#)) is a living review with several updates, however, only the original rapid review is included in this systematic review, as subsequent updates did not include relevant information to this mapping review.

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