



Project

A systematic review of
exclusion measures in
preventing the spread of
infectious diseases in
education and care settings

Prepared for

The Commonwealth of Australia

as represented by

National Health and Medical Research
Council | Staying Healthy Advisory
Committee

Appendices

prepared by

HTANALYSTS Pty Ltd

CONFIDENTIAL

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Report information

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Dates

This technical report and accompanying evidence evaluation report received approval from the ONHMRC Staying Healthy Advisory Committee (SHAC) on 14 February 2023.

History

The ONHMRC is seeking to update the evidence underpinning the *2013 Staying Healthy – Preventing infectious diseases in early childhood education and care services* (Staying Healthy) resource. The NHRMC's SHAC has met twice to consider the information provided by the sector, through stakeholder surveys, email enquiries and preliminary scoping reviews of the literature. While there are many topics outlined in this resource, the SHAC has identified two key priority areas that require a systematic review of the literature to provide evidence-based guidance.

To support the ONHMRC in the conduct of the systematic review, HTANALYSTS has been engaged to conduct a systematic review for research question two, which focuses on the exclusion of ill children, educators and other staff as a way of preventing infection.

This Research Protocol has been developed by HTANALYSTS in conjunction with the ONHMRC and SHAC to provide a framework outlining the methodology that will be used to review the evidence about exclusion measures in child education and care services. It is intended that all associated materials will be developed in a robust and transparent manner in accordance with relevant best practice standards (1-3).

Contents

Report information	2
List of tables	6
List of figures	7
List of abbreviations	8
Appendix A Searching, selection criteria and screening results.....	9
A1 Search methods.....	9
A1.1 Electronic searches	9
A1.2 Other resources	9
A1.3 Publication date	9
A1.4 Studies published in languages other than English	10
A2 Search strategy.....	11
A3 Search results.....	14
A3.1 Embase	14
A3.2 Medline (via Ovid.com)	17
A3.3 Cochrane Systematic Reviews (via Ovid.com)	20
A3.4 Cochrane Controlled Trials (via Ovid.com).....	23
A3.5 EBSCOHost.....	26
A3.6 PubMed	29
A3.7 Alternate Sources	31
A4 Study selection criteria.....	31
A4.1 Types of studies.....	31
A4.2 Types of participants	32
A4.3 Types of interventions	33
A4.4 Types of outcome measures.....	33
A5 Selection of studies (inclusion decisions)	35
A5.1 Studies identified in the literature searches	35
A5.2 Studies published in languages other than English	35
A5.3 Collation of studies	36
A6 Summary of screening results.....	36
A6.1 Search of published literature	36

Appendix B	Methods used for data appraisal, collection and analysis.....	38
B1	Critical appraisal.....	38
B1.1	Tools used.....	38
B1.2	Assessment process	40
B2	Data extraction process.....	40
B2.1	Data items.....	40
B2.2	Requests for data.....	41
B2.3	Missing outcome data	41
B3	Data analysis.....	41
B3.1	Data synthesis.....	41
B4	Evidence statements.....	42
B4.1	Summary of findings and certainty of the evidence.....	42
B4.2	Development of evidence statements.....	43
Appendix C	Studies assessed at full text but not included	44
C1	Excluded studies (not eligible).....	44
C2	Studies awaiting classification.....	50
C3	Ongoing studies.....	56
Appendix D	Critical appraisal of included studies	57
D1	Gastrointestinal disease.....	57
D1.1	Systematic reviews.....	57
D1.2	Primary studies	58
D2	Influenza-like illnesses.....	59
D2.1	Systematic reviews.....	59
D2.2	Primary studies	61
D3	Rash.....	65
D3.1	Systematic reviews.....	65
D3.2	Primary studies	66
D4	Other infectious diseases.....	67
D4.1	Systematic reviews.....	67
D4.2	Primary studies	68
Appendix E	Characteristics of included studies.....	69
E1	Various.....	69

E2	Gastrointestinal diseases	83
E3	Influenza/COVID.....	88
E4	Rash	122
E5	Other infectious diseases.....	127
Appendix F	Differences between protocol & review	134
F1	Methods not implemented.....	134
F2	Changes from protocol	135
	Contributions of authors.....	136
	Declarations of interest.....	136
	References	137

List of tables

Table A.1	Search strategy	11
Table A.2	Search results: Embase	14
Table A.3	Search results: Medline.....	17
Table A.4	Search results: Cochrane Systematic Reviews	20
Table A.5	Search results: CCRCT	23
Table A.6	Search results: EBSCOHost.....	26
Table A.7	Search results: PubMed	29
Table A.8	Sample Preliminary data extraction.....	36
Table A.9	Screening result: studies identified in the literature search	36
Table 10	AMSTAR-2: Domain classification.....	38
Table C.1	Details of studies screened and excluded at full text.....	44
Table C.2	Characteristics of studies awaiting classification – indirect evidence.....	50
Table C.3	Characteristics of studies awaiting classification – studies published in languages other than English	55
Table C.4	Characteristics of studies awaiting classification – studies unable to be retrieved	55
Table C.5	Overview of ongoing studies.....	56
Table D.1	AMSTAR quality of included systematic reviews: Gastrointestinal diseases.....	57
Table D.2	Risk of bias of included primary studies: Gastrointestinal diseases.....	58
Table D.3	AMSTAR Quality: Influenza-like illness	59
Table D.4	Risk of bias of included RCT	61
Table D.5	Risk of bias of including primary studies: Influenza-like illnesses.....	63
Table D.6	AMSTAR Quality: Rash.....	65
Table D.7	Risk of bias of including primary studies: Rash.....	66
Table D.8	AMSTAR Quality: Other infectious diseases.....	67
Table D.9	Risk of bias of including primary studies: Other infectious diseases	68

List of figures

Figure 1	Schematic representation of literature review hierarchy	32
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List of abbreviations

CDC	Centre for Disease Control and Prevention
CDNA	Communicable Diseases Network Australia
CI	Confidence interval
GRADE	Grading of Recommendations Assessment, Development and Evaluation
HR	Hazard ratio
JBI	Joanna Briggs Institute
MD	Mean difference
MeSH	Medical Subject Headings
ONHMRC	The Office of National Health and Medical Research Council
NICE	The National Institute for Health and Care Excellence
OR	Odds ratios
PICO	Population, Intervention, Comparator, Outcome
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	Randomised controlled trial
RoB	Risk of bias
RR	Risk ratio
SD	Standard deviation
SHAC	Staying Healthy Advisory Committee
SHIC	Staying Healthy in Childhood
SMD	Standardised mean difference
SoNGs	Series of National Guidelines
SR	Systematic review
WHO	World Health Organisation

Appendix A Searching, selection criteria and screening results

A1 Search methods

This appendix documents the search strategy used to inform the systematic review on the effect of exclusion measures for preventing the spread of infectious diseases in early childhood and education care services.

A1.1 Electronic searches

The literature search strategy (see Table A.1) was developed in Ovid (for Embase, Cochrane and MEDLINE) based on the key element of research question (i.e. the population, intervention, setting and outcome). Methodological filters developed in-house (based on SIGN, Cochrane, and other sources) were used for identifying SRs, RCTs and cohort studies to assist in the screening process. In developing the search strategy, we appraised and adapted keywords and MeSH terms previously reported; with the search strategies of SRs identified in the scoping report also reviewed to identify additional potentially relevant concepts. Terms or concepts proven not suitable were removed and other terms added.

No language or geographic limitations were applied when conducting the search of English language databases.

The search strategy was adapted to suit the required syntax for the following electronic bibliographic databases:

- Embase (via Ovid)
- MEDLINE (via Ovid)
- Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Trials (via Cochrane Library)
- CINAHL (via *EBSCOHost*) – Cumulative Index to Nursing and Allied Health Literature
- PubMed (limited to in-process citations and citations not indexed in MEDLINE) – to retrieve citations not yet indexed in OVID

Details of the search strategy and the number of hits for each database are provided in **Appendix A2**.

A1.2 Other resources

In addition to the above databases, simple text searches of the following databases were conducted:

- OpenGrey
- Clinical trial registries (ClinicalTrials.gov, WHO International Clinical Trials Registry Platform)
- Websites of suitable international and national agencies including WHO, CDC, NICE, CADTH, Agency for Healthcare Research Quality, State and Commonwealth Departments of Health.
- Guideline databases (MAGICApp, Guidelines International Network)

A1.3 Publication date

There were no publication date limits applied to the search strategy, however the suggested publication date range included publications from 2000 onwards. Eligible studies that were published after the literature search date were to be listed within the '*Studies awaiting classification*' table of the evaluation report, and a brief statement about the study and its potential impact on the overall conclusions of the evidence review was to be included under the relevant section of the review.

No studies were identified or submitted after the literature search date.

A1.4 Studies published in languages other than English

The literature search was not limited by language of publication. Non-English databases were not searched, however studies in languages other than English may be identified via the English-language databases. For pragmatic reasons, potentially eligible studies did not undergo full-text translation or data extraction but are documented as awaiting classification (see Section **Error! Reference source not found.**).

A2 Search strategy

The search strategy was developed in-house for the Ovid interface and was adapted to suit EBSCOHost, the Cochrane Library and PubMed (limited to in-process citations and citations not indexed in MEDLINE).

Table A.1 Search strategy

#	Concept	Search strategy
1	Study design limits	exp meta analysis or meta analysis.mp. or exp systematic review or systematic review.mp. or pooled analysis.mp. or ((exp review or review.mp.) and (systemat* or pool*).mp.)
2		exp comparative study/ OR comparative study.mp. OR exp clinical trial/ OR clinical trial.mp. OR randomized controlled trial.mp. OR randomi?ed controlled trial.mp. OR exp randomized controlled trial/ OR exp randomization/ OR randomization.mp. OR randomi?ation.mp. OR exp single blind procedure/ OR single blind procedure.mp. OR exp double blind procedure/ OR double blind procedure.mp. OR exp triple blind procedure/ OR triple blind procedure.mp. OR exp crossover procedure/ OR crossover procedure.mp. OR exp placebo/ OR placebo*.mp. OR random*.mp. OR rct.mp. OR single blind.mp. OR single blinded.mp. OR double blind.mp. OR double blinded.mp. OR treble blind.mp. OR triple blind.mp. OR triple blinded.mp. OR exp prospective study/ OR prospective study.mp.
3		exp clinical study/ OR exp case control study/ OR exp family study/ OR exp longitudinal study/ OR exp retrospective study/ OR exp cohort analysis/ OR (cohort adj1 stud*).mp. OR (case control adj1 stud*).mp. OR (exp prospective study/ not randomi?ed controlled trials.mp.) OR (follow up adj1 stud*).mp. OR (observational adj1 stud*).mp. OR (epidemiologic* adj1 stud*).mp. OR (cross sectional adj1 stud*).mp.
4		letter.pt
5		(editorial or comment or historical article).pt.
6		Population
7	Setting	kindergarten/ or child care/ or child day care/
8		school/
9		*(creche? or preschool\$ or pre-school\$ or pre?school\$ or minischool\$ or mini-school\$ or mini?school\$ or childcare\$ or child-care\$ or child?care\$).ti,ab.
10		(family adj (daycare or day-care or day?care)).ti,ab.
11		((childcare or child-care or child?care).ti,ab.
12		((daycare or day-care or day?care). ti,ab.
13		OR/ 7-12
14	Population or Setting	6 OR 13
15	Intervention: Exclusion measures	physical distancing/
16		quarantine/ or quarantine.ti,ab.
17		((exclusion and (period\$ or measure\$ or policy)) or temporary exclusion\$).ti,ab.
18		((school\$ or classroom\$) and (closure\$ or closed)).ti,ab.
19		case isolation.ti,ab.
20		cohorting.ti,ab.
21		((isolation adj2 room*) or isolation strateg*).ti,ab.
22		isolation/ or Home Isolation/ or contact isolation/
23		or/15-22
24		Intervention: Disease control
25	infection control/	
26	((infectio\$ or bacteri\$ or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) adj4 (control or prevent*).ti,ab.	
27	or/24-26	
28	Outcome	

#	Concept	Search strategy
29		fomite transmission/ or vector transmission/ or oral transmission/ or bacterial transmission/ or asymptomatic transmission/ or mother to child transmission/ or parasite transmission/ or droplet transmission/ or child to adult transmission/ or airborne transmission/ or virus transmission/ or aerosol transmission/ or fecal oral transmission/ or pathogen transmission/
30		((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission).ti,ab.
31		or/28-30
32	Outcome	infection rate/
33		infection risk/
34		((Secondary attack or Secondary infection or infection) and (rate or risk)).ti,ab.
35		((infectious or transmission) and period).ti,ab.
36		or/32-35
37	Disease focus	(diarrhoea or gastroenteritis or diarrh?ea or salmonell\$ or gastroenter\$ or shigell\$ or enterococc\$ or campylobacter or cryptospor\$ or giardi\$ or rotavirus).ti,ab.
38		("hand foot and mouth" or coxsackie or enterovir\$ or measles\$ or norovir\$ or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir\$).ti,ab.
39		(Influenz\$ or Pertussis or whooping cough or croup or haemophilus or bronchit\$ or tuberculosis or listeriosis or listeria).ti,ab.
40		(herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river).ti,ab.
41		(candid\$ or thrush or ringworm or tinea or scabies or pediculosis or tapeworm\$ or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis).ti,ab.
42		(conjunctivitis or streptococc\$ or pneumococc\$ or "ear infection" or impetigo or "school sores" or meningitis or meningococ\$).ti,ab.
43		infectious disease/
44		communicable disease/
45		or/37-44
46	Setting AND Disease	13 and 45
47	Population OR Setting AND Disease	14 and 45
48	Population OR Setting AND Disease AND Exclusion measures	47 and 23
49	Setting AND Disease AND Infection control	46 and 27
50	Disease AND Outcomes	45 and (31 or 36)
51	Setting AND Disease AND Outcome	46 and 50
52	Total Hits	48 or 49 or 51
53	SRs	1 and 52
54	RCTs	(2 and 52) not 53
55	NRSIs	(3 and 52) not (53 or 54)
56	letters	(4 and 52) not (53 or 54 or 55)
57	editorials	(5 and 52) not (53 or 54 or 55)
58	ALL	53 or 54 or 55 or 56

#	Concept	Search strategy
59	Other	52 not 58

The above search strategy was designed in OVID (Embase and Medline), then adapted to suit EBSCO (CINAHL), the Cochrane Library and PubMed.

As noted in the protocol, a hierarchical approach to screening was applied. This meant citations identified in Line 53 were screened before those identified in Line 54, Line 55, and Line 56. At each point a decision was made to either stop screening (meaning we were confident we had sufficient evidence to answer the research questions) or continue to the next step. Publication date limits or further targeting to specific diseases or outcomes were made at each stage. Citations identified in Line 59 were also screened for those relating to mechanistic studies.

A3 Search results

This appendix documents the results of the literature search and screening for a systematic review on the effect of exclusion measures for preventing the spread of infectious diseases in childhood education and care services. The literature search strategy was developed and conducted as described in **Appendix A1**.

A3.1 Embase

The search for eligible studies was conducted on 16 September 2022. Databases searched were as follows:

- Embase Classic+Embase 1947 to 2022 September 14

Table A.2 Search results: Embase

#	Concept	Search string	Results
1	Study Design Limits	exp meta analysis or meta analysis.mp. or exp systematic review or systematic review.mp. or pooled analysis.mp. or ((exp review or review.mp.) and (systemat* or pool*).mp.)	728192
2		exp comparative study/ OR comparative study.mp. OR exp clinical trial/ OR clinical trial.mp. OR randomized controlled trial.mp. OR randomi?ed controlled trial.mp. OR exp randomized controlled trial/ OR exp randomization/ OR randomization.mp. OR randomi?ation.mp. OR exp single blind procedure/ OR single blind procedure.mp. OR exp double blind procedure/ OR double blind procedure.mp. OR exp triple blind procedure/ OR triple blind procedure.mp. OR exp crossover procedure/ OR crossover procedure.mp. OR exp placebo/ OR placebo*.mp. OR random*.mp. OR rct.mp. OR single blind.mp. OR single blinded.mp. OR double blind.mp. OR double blinded.mp. OR treble blind.mp. OR triple blind.mp. OR triple blinded.mp. OR exp prospective study/ OR prospective study.mp.	5327771
3		exp clinical study/ OR exp case control study/ OR exp family study/ OR exp longitudinal study/ OR exp retrospective study/ OR exp cohort analysis/ OR (cohort adj1 stud*).mp. OR (case control adj1 stud*).mp. OR (exp prospective study/ not randomi?ed controlled trials.mp.) OR (follow up adj1 stud*).mp. OR (observational adj1 stud*).mp. OR (epidemiologic* adj1 stud*).mp. OR (cross sectional adj1 stud*).mp.	12177435
4		letter.pt	1239366
5		(editorial or comment or historical article).pt.	737488
6	Population	child/ or infant/ or school teacher/ or preschool child/	2748424
7	Setting	kindergarten/ or child care/ or child day care/	44821
8		school/	83499
9		(creche? or preschool\$ or pre-school\$ or pre?school\$ or minischool\$ or mini-school\$ or mini?school\$ or childcare\$ or child-care\$ or child?care\$).ti,ab.	47422
10		(family adj (care or day-care or day?care)).ti,ab.	124
11		(childcare\$ or child-care\$ or child?care\$).ti,ab.	13342
12		(daycare or day-care or day?care\$).ti,ab.	12840
13		or/7-12	186365
14	Population or setting	6 or 13	2828036
15	Intervention:	physical distancing/	7239
16	Exclusion measures	quarantine/ or quarantine.ti,ab.	15510
17		((exclusion and (period\$ or measure\$ or policy)) or temporary exclusion\$).ti,ab.	58644
18		((school\$ or classroom\$) and (closure\$ or closed)).ti,ab.	4635

#	Concept	Search string	Results
19		case isolation.ti,ab.	148
20		cohorting.ti,ab.	847
21		((isolation adj2 room*) or isolation strateg*).ti,ab.	1562
22		isolation/ or Home Isolation/ or contact isolation/	6904
23		or/15-22	92495
24	Intervention: Disease control	communicable disease control/	3719
25		infection control/	99707
26		((infectio\$ or bacteri\$ or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) adj4 (control or prevent*).ti,ab.	190017
27		or/24-26	261810
28	Outcome	Disease Transmission, Infectious/	109273
29		fomite transmission/ or vector transmission/ or oral transmission/ or bacterial transmission/ or asymptomatic transmission/ or mother to child transmission/ or parasite transmission/ or droplet transmission/ or child to adult transmission/ or airborne transmission/ or virus transmission/ or aerosol transmission/ or fecal oral transmission/ or pathogen transmission/	109144
30		((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission).ti,ab.	145963
31		or/28-30	304075
32	Secondary outcome	infection rate/	39563
33		infection risk/	99323
34		((Secondary attack or Secondary infection or infection) and (rate or risk)).ti,ab.	23958
35		((infectious or transmission) and period).ti,ab.	65155
36		or/32-35	206352
37	Target disease	(diarrhoea or gastroenteritis or diarrh?ea or salmonell\$ or gastroenter\$ or shigell\$ or enterococc\$ or campylobacter or cryptospor\$ or giardi\$ or rotavirus).ti,ab.	450382
38		("hand foot and mouth" or coxsackie or enterovir\$ or measles\$ or norovir\$ or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir\$).ti,ab.	110051
39		(Influenz\$ or Pertussis or whooping cough or croup or haemophilus or bronchit\$ or tuberculosis or listeriosis or listeria).ti,ab.	505726
40		(herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river).ti,ab.	870079
41		(candid\$ or thrush or ringworm or tinea or scabies or pediculosis or tapeworm\$ or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis).ti,ab.	705276
42		(conjunctivitis or streptococc\$ or pneumococc\$ or "ear infection" or impetigo or "school sores" or meningitis or meningococ\$).ti,ab.	261806
43		infectious disease/	407580
44		communicable disease/	36537
45		or/37-44	3012646
46		Setting AND	13 and 45

#	Concept	Search string	Results
	Disease		
47	Population OR Setting AND Disease	14 and 45	321886
48	Population OR Setting AND Disease AND Intervention	47 and 23	1487
49	Setting AND Disease AND Intervention	46 and 27	1178
50	Disease AND Outcome	45 and (31 or 36)	187863
51	Setting AND Disease AND Outcome	46 and 50	2534
52	TOTAL HITS	48 or 49 or 51	4599
53	Systematic reviews	1 and 52	158
54	RCTs/Comparative studies (not SRs)	(2 and 52) not 53	804
55	NSRIs not RCTs or SRs	(3 and 52) not (53 or 54)	1501
56	Letters	(4 and 52) not (53 or 54 or 55)	51
57	Editorials	(5 and 52) not (53 or 54 or 55)	30
58	Combined	53 or 54 or 55 or 56	2514
59	Excess	52 not 58	2085

A3.2 Medline (via Ovid.com)

The search for eligible studies was conducted on 16 September 2022. Databases searched were as follows:

- Ovid MEDLINE(R) 1946 to September 14, 2022

Table A.3 Search results: Medline

#	Concept	Search string	Results
1	Study Design Limits	exp meta analysis or meta analysis.mp. or exp systematic review or systematic review.mp. or pooled analysis.mp. or ((exp review or review.mp.) and (systemat* or pool*).mp.)	490871
2		exp comparative study/ OR comparative study.mp. OR exp clinical trial/ OR clinical trial.mp. OR randomized controlled trial.mp. OR randomi?ed controlled trial.mp. OR exp randomized controlled trial/ OR exp randomization/ OR randomization.mp. OR randomi?ation.mp. OR exp single blind procedure/ OR single blind procedure.mp. OR exp double blind procedure/ OR double blind procedure.mp. OR exp triple blind procedure/ OR triple blind procedure.mp. OR exp crossover procedure/ OR crossover procedure.mp. OR exp placebo/ OR placebo*.mp. OR random*.mp. OR rct.mp. OR single blind.mp. OR single blinded.mp. OR double blind.mp. OR double blinded.mp. OR treble blind.mp. OR triple blind.mp. OR triple blinded.mp. OR exp prospective study/ OR prospective study.mp.	4155130
3		exp clinical study/ OR exp case control study/ OR exp family study/ OR exp longitudinal study/ OR exp retrospective study/ OR exp cohort analysis/ OR (cohort adj1 stud*).mp. OR (case control adj1 stud*).mp. OR (exp prospective study/ not randomi?ed controlled trials.mp.) OR (follow up adj1 stud*).mp. OR (observational adj1 stud*).mp. OR (epidemiologic* adj1 stud*).mp. OR (cross sectional adj1 stud*).mp.	4039348
4		letter.pt	1193466
5		(editorial or comment or historical article).pt.	1754818
6	Population	child/ or infant/ or school teacher/ or preschool child/	2362692
7	Setting	kindergarten/ or child care/ or child day care/	5998
8		school/	48705
9		(creche? or preschool\$ or pre-school\$ or pre?school\$ or minischool\$ or mini-school\$ or mini?school\$ or childcare\$ or child-care\$ or child?care\$).ti,ab.	38035
10		(family adj (care or day-care or day?care)).ti,ab.	112
11		(childcare\$ or child-care\$ or child?care\$).ti,ab.	11618
12		(daycare or day-care or day?care\$).ti,ab.	9585
13		or/7-12	107185
14	Population or setting	6 or 13	2398862
15	Intervention:	physical distancing/	2177
16	Exclusion measures	quarantine/ or quarantine.ti,ab.	13344
17		((exclusion and (period\$ or measure\$ or policy)) or temporary exclusion\$).ti,ab.	32270
18		((school\$ or classroom\$) and (closure\$ or closed)).ti,ab.	3775
19		case isolation.ti,ab.	148
20		cohorting.ti,ab.	572
21		((isolation adj2 room*) or isolation strateg*).ti,ab.	1112
22		isolation/ or Home Isolation/ or contact isolation/	4437
23		or/15-22	56365
24	Intervention:	communicable disease control/	29905
25	Disease control	infection control/	28455
26		((infectio\$ or bacteri\$ or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) adj4 (control or prevent*).ti,ab.	148488

#	Concept	Search string	Results
27		or/24-26	193543
28	Outcome	Disease Transmission, Infectious/	10914
29		fomite transmission/ or vector transmission/ or oral transmission/ or bacterial transmission/ or asymptomatic transmission/ or mother to child transmission/ or parasite transmission/ or droplet transmission/ or child to adult transmission/ or airborne transmission/ or virus transmission/ or aerosol transmission/ or fecal oral transmission/ or pathogen transmission/	28786
30		((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission).ti,ab.	124133
31		or/28-30	142322
32	Secondary outcome	infection rate/	0
33		infection risk/	0
34		((Secondary attack or Secondary infection or infection) and (rate or risk)).ti,ab.	17546
35		((infectious or transmission) and period).ti,ab.	44165
36		or/32-35	61170
37	Target disease	(diarrhoea or gastroenteritis or diarrh?ea or salmonell\$ or gastroenter\$ or shigell\$ or enterococc\$ or campylobacter or cryptospor\$ or giardi\$ or rotavirus).ti,ab.	311851
38		("hand foot and mouth" or coxsackie or enterovir\$ or measles\$ or norovir\$ or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir\$).ti,ab.	85078
39		(Influenz\$ or Pertussis or whooping cough or croup or haemophilus or bronchit\$ or tuberculosis or listeriosis or listeria).ti,ab.	411830
40		(herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river).ti,ab.	648508
41		(candid\$ or thrush or ringworm or tinea or scabies or pediculosis or tapeworm\$ or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis).ti,ab.	539967
42		(conjunctivitis or streptococc\$ or pneumococc\$ or "ear infection" or impetigo or "school sores" or meningitis or meningococ\$).ti,ab.	198045
43		infectious disease/	32374
44		communicable disease/	32374
45		or/37-44	2066716
46	Setting AND Disease	13 and 45	7784
47	Population OR Setting AND Disease	14 and 45	233792
48	Population OR Setting AND Disease AND Intervention	47 and 23	866
49	Setting AND Disease AND Intervention	46 and 27	574
50	Disease AND Outcome	45 and (31 or 36)	71647
51	Setting AND	46 and 50	813

#	Concept	Search string	Results
	Disease AND Outcome		
52	TOTAL HITS	48 or 49 or 51	2000
53	Systematic reviews	1 and 52	84
54	RCTs/Comparative studies (not SRs)	(2 and 52) not 53	387
55	NSRIs not RCTs or SRs	(3 and 52) not (53 or 54)	335
56	Letters	(4 and 52) not (53 or 54 or 55)	20
57	Editorials	(5 and 52) not (53 or 54 or 55)	33
58	Combined	53 or 54 or 55 or 56	826
59	Excess	52 not 58	1174

A3.3 Cochrane Systematic Reviews (via Ovid.com)

The search for eligible studies was conducted on 16 September 2022. Databases searched were as follows:

- EBM Reviews - Cochrane Database of Systematic Reviews 2005 to September 14, 2022

Table A.4 Search results: Cochrane Systematic Reviews

#	Concept	Search string	Results
1	Study Design Limits	exp meta analysis or meta analysis.mp. or exp systematic review or systematic review.mp. or pooled analysis.mp. or ((exp review or review.mp.) and (systemat* or pool*).mp.)	0
2		exp comparative study/ OR comparative study.mp. OR exp clinical trial/ OR clinical trial.mp. OR randomized controlled trial.mp. OR randomi?ed controlled trial.mp. OR exp randomized controlled trial/ OR exp randomization/ OR randomization.mp. OR randomi?ation.mp. OR exp single blind procedure/ OR single blind procedure.mp. OR exp double blind procedure/ OR double blind procedure.mp. OR exp triple blind procedure/ OR triple blind procedure.mp. OR exp crossover procedure/ OR crossover procedure.mp. OR exp placebo/ OR placebo*.mp. OR random*.mp. OR rct.mp. OR single blind.mp. OR single blinded.mp. OR double blind.mp. OR double blinded.mp. OR treble blind.mp. OR triple blind.mp. OR triple blinded.mp. OR exp prospective study/ OR prospective study.mp.	0
3		exp clinical study/ OR exp case control study/ OR exp family study/ OR exp longitudinal study/ OR exp retrospective study/ OR exp cohort analysis/ OR (cohort adj1 stud*).mp. OR (case control adj1 stud*).mp. OR (exp prospective study/ not randomi?ed controlled trials.mp.) OR (follow up adj1 stud*).mp. OR (observational adj1 stud*).mp. OR (epidemiologic* adj1 stud*).mp. OR (cross sectional adj1 stud*).mp.	0
4		letter.pt	0
5		(editorial or comment or historical article).pt.	0
6		Population	child/ or infant/ or school teacher/ or preschool child/
7	Setting	kindergarten/ or child care/ or child day care/	00
8		school/	00
9		(creche? or preschool\$ or pre-school\$ or pre?school\$ or minischool\$ or mini-school\$ or mini?school\$ or childcare\$ or child-care\$ or child?care\$).ti,ab.	37
10		(family adj (care or day-care or day?care)).ti,ab.	0
11		(childcare\$ or child-care\$ or child?care\$).ti,ab.	15
12		(daycare or day-care or day?care\$).ti,ab.	23
13		or/7-12	68
14	Population or setting	6 or 13	68
15	Intervention: Exclusion measures	physical distancing/	0
16		quarantine/ or quarantine.ti,ab.	0
17		((exclusion and (period\$ or measure\$ or policy)) or temporary exclusion\$).ti,ab.	75
18		((school\$ or classroom\$) and (closure\$ or closed)).ti,ab.	5
19		case isolation.ti,ab.	0
20		cohorting.ti,ab.	3
21		((isolation adj2 room*) or isolation strateg*).ti,ab.	3
22		isolation/ or Home Isolation/ or contact isolation/	0
23		or/15-22	84
24		Intervention: Disease	communicable disease control/
25	infection control/		0

26	control	((infectio\$ or bacteri\$ or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) adj4 (control or prevent*)).ti,ab.	262
27		or/24-26	262
28	Outcome	Disease Transmission, Infectious/	0
29		fomite transmission/ or vector transmission/ or oral transmission/ or bacterial transmission/ or asymptomatic transmission/ or mother to child transmission/ or parasite transmission/ or droplet transmission/ or child to adult transmission/ or airborne transmission/ or virus transmission/ or aerosol transmission/ or fecal oral transmission/ or pathogen transmission/	0
30		((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission).ti,ab.	94
31		or/28-30	94
32	Secondary outcome	infection rate/	0
33		infection risk/	0
34		((Secondary attack or Secondary infection or infection) and (rate or risk)).ti,ab.	25
35		((infectious or transmission) and period).ti,ab.	34
36		or/32-35	59
37	Target disease	(diarrhoea or gastroenteritis or diarrh?ea or salmonell\$ or gastroenter\$ or shigell\$ or enterococc\$ or campylobacter or cryptospor\$ or giardi\$ or rotavirus).ti,ab.	270
38		("hand foot and mouth" or coxsackie or enterovir\$ or measles\$ or norovir\$ or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir\$).ti,ab.	24
39		(Influenz\$ or Pertussis or whooping cough or croup or haemophilus or bronchit\$ or tuberculosis or listeriosis or listeria).ti,ab.	167
40		(herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river).ti,ab.	43
41		(candid\$ or thrush or ringworm or tinea or scabies or pediculosis or tapeworm\$ or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis).ti,ab.	94
42		(conjunctivitis or streptococc\$ or pneumococc\$ or "ear infection" or impetigo or "school sores" or meningitis or meningococ\$).ti,ab.	109
43		infectious disease/	0
44		communicable disease/	0
45		or/37-44	977
46	Setting AND Disease	13 and 45	8
47	Population OR Setting AND Disease	14 and 45	8
48	Population OR Setting AND Disease AND Intervention	47 and 23	0
49	Setting AND Disease AND Intervention	46 and 27	2

50	Disease AND Outcome	45 and (31 or 36)	59
51	Setting AND Disease AND Outcome	46 and 50	1
52	TOTAL HITS	48 or 49 or 51	2

A3.4 Cochrane Controlled Trials (via Ovid.com)

The search for eligible studies was conducted on 16 September 2022. Databases searched were as follows:

- EBM Reviews - Cochrane Central Register of Controlled Trials August 2022

Table A.5 Search results: CCRCT

#	Concept	Search string	Results
1	Study Design Limits	exp meta analysis or meta analysis.mp. or exp systematic review or systematic review.mp. or pooled analysis.mp. or ((exp review or review.mp.) and (systemat* or pool*).mp.)	34048
2		exp comparative study/ OR comparative study.mp. OR exp clinical trial/ OR clinical trial.mp. OR randomized controlled trial.mp. OR randomi?ed controlled trial.mp. OR exp randomized controlled trial/ OR exp randomization/ OR randomization.mp. OR randomi?ation.mp. OR exp single blind procedure/ OR single blind procedure.mp. OR exp double blind procedure/ OR double blind procedure.mp. OR exp triple blind procedure/ OR triple blind procedure.mp. OR exp crossover procedure/ OR crossover procedure.mp. OR exp placebo/ OR placebo*.mp. OR random*.mp. OR rct.mp. OR single blind.mp. OR single blinded.mp. OR double blind.mp. OR double blinded.mp. OR treble blind.mp. OR triple blind.mp. OR triple blinded.mp. OR exp prospective study/ OR prospective study.mp.	1475002
3		exp clinical study/ OR exp case control study/ OR exp family study/ OR exp longitudinal study/ OR exp retrospective study/ OR exp cohort analysis/ OR (cohort adj1 stud*).mp. OR (case control adj1 stud*).mp. OR (exp prospective study/ not randomi?ed controlled trials.mp.) OR (follow up adj1 stud*).mp. OR (observational adj1 stud*).mp. OR (epidemiologic* adj1 stud*).mp. OR (cross sectional adj1 stud*).mp.	223502
4		letter.pt	7965
5		(editorial or comment or historical article).pt.	2404
6		Population	child/ or infant/ or school teacher/ or preschool child/
7	Setting	kindergarten/ or child care/ or child day care/	99
8		school/	2538
9		(creche? or preschool\$ or pre-school\$ or pre?school\$ or minischool\$ or mini-school\$ or mini?school\$ or childcare\$ or child-care\$ or child?care\$).ti,ab.	5219
10		(family adj (care or day-care or day?care)).ti,ab.	7
11		(childcare\$ or child-care\$ or child?care\$).ti,ab.	1274
12		(daycare or day-care or day?care\$).ti,ab.	1647
13		or/7-12	10129
14	Population or setting	6 or 13	74177
15	Intervention: Exclusion measures	physical distancing/	14
16		quarantine/ or quarantine.ti,ab.	276
17		((exclusion and (period\$ or measure\$ or policy)) or temporary exclusion\$).ti,ab.	24348
18		((school\$ or classroom\$) and (closure\$ or closed)).ti,ab.	280
19		case isolation.ti,ab.	0
20		cohorting.ti,ab.	10
21		((isolation adj2 room*) or isolation strateg*).ti,ab.	67
22		isolation/ or Home Isolation/ or contact isolation/	51
23		or/15-22	25006
24		Intervention: Disease	communicable disease control/
25	infection control/		575

#	Concept	Search string	Results
26	control	((infectio\$ or bacteri\$ or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) adj4 (control or prevent*)).ti,ab.	10731
27		or/24-26	11236
28	Outcome	Disease Transmission, Infectious/	119
29		fomite transmission/ or vector transmission/ or oral transmission/ or bacterial transmission/ or asymptomatic transmission/ or mother to child transmission/ or parasite transmission/ or droplet transmission/ or child to adult transmission/ or airborne transmission/ or virus transmission/ or aerosol transmission/ or fecal oral transmission/ or pathogen transmission/	689
30		((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission).ti,ab.	4344
31		or/28-30	4654
32	Secondary outcome	infection rate/	1
33		infection risk/	0
34		((Secondary attack or Secondary infection or infection) and (rate or risk)).ti,ab.	2397
35		((infectious or transmission) and period).ti,ab.	3249
36		or/32-35	5608
37	Target disease	(diarrhoea or gastroenteritis or diarrh?ea or salmonell\$ or gastroenter\$ or shigell\$ or enterococc\$ or campylobacter or cryptospor\$ or giardi\$ or rotavirus).ti,ab.	27210
38		("hand foot and mouth" or coxsackie or enterovir\$ or measles\$ or norovir\$ or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir\$).ti,ab.	2625
39		(Influenz\$ or Pertussis or whooping cough or croup or haemophilus or bronchit\$ or tuberculosis or listeriosis or listeria).ti,ab.	19991
40		(herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river).ti,ab.	52507
41		(candid\$ or thrush or ringworm or tinea or scabies or pediculosis or tapeworm\$ or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis).ti,ab.	24710
42		(conjunctivitis or streptococc\$ or pneumococc\$ or "ear infection" or impetigo or "school sores" or meningitis or meningococ\$).ti,ab.	11500
43		infectious disease/	2249
44		communicable disease/	2249
45		or/37-44	128898
46		Setting AND Disease	13 and 45
47	Population OR Setting AND Disease	14 and 45	9249
48	Population OR Setting AND Disease AND Intervention	47 and 23	34
49	Setting AND Disease AND	46 and 27	70

#	Concept	Search string	Results
	Intervention		
50	Disease AND Outcome	45 and (31 or 36)	3505
51	Setting AND Disease AND Outcome	46 and 50	49
52	TOTAL HITS	48 or 49 or 51	144

A3.5 EBSCOHost

The search for eligible studies via EBSCOHost was conducted on 20 September 2022. Databases searched were as follows:

- CINAHL Complete (inception to 20 September 2022)

Table A.6 Search results: EBSCOHost

#	Concept	Search string	Syntax	Results
1	Population	child or infant or school teacher or preschool child	MH	790817
2	Setting	kindergarten or child care or child day care	MH	7559
3		(MH "Schools, Elementary") OR (MH "Schools, Special") OR (MH "Schools, nursery")	MH	8115
4		TI (creche? or preschool# or pre-school# or pre#school# or minischool# or mini-school# or mini?school# or childcare# or child-care# or child?care#) OR AB (creche? or preschool# or pre-school# or pre#school# or minischool# or mini-school# or mini?school# or childcare# or child-care# or child?care#)	TI/AB	21,883
5		TI (family N0 (care or day-care or day?care)) OR AB (family N0 (care or day-care or day?care))	TI/AB	2659
6		TI (childcare# or child-care# or child#care#) OR AB (childcare# or child-care# or child#care#)	TI/AB	7884
7		TI (daycare or day-care or day?care#) OR AB (daycare or day-care or day?care#)	TI/AB	3959
8		or/2-7	--	38988
9		Population or setting	1 or 8	--
10	Intervention: Exclusion measures	TI (physical distancing) or AB (physical distancing)	TI/AB	715
11		quarantine	MH	1714
12		TI ((exclusion and (period# or measure# or policy)) or temporary exclusion#) OR AB ((exclusion and (period# or measure# or policy)) or temporary exclusion#)	TI/AB	9495
13		TI ((school# or classroom#) and (closure# or closed)) OR AB ((school# or classroom#) and (closure# or closed))	TI/AB	1338
14		TI (case isolation) OR AB (case isolation)	TI/AB	492
15		TI (cohorting) OR AB (cohorting)	TI/AB	232
16		TI((isolation N0 room*) or isolation strateg*) OR AB ((isolation N0 room*) or isolation strateg*)	TI/AB	712
17		TI (isolation or Home Isolation or contact isolation) OR AB (isolation or Home Isolation or contact isolation)	TI/AB	29882
18	or/10-17	--	42702	
19	Intervention: Disease control	(MH "Communicable Diseases+/PC")	MH	2776
20		infection control	MH	29636
21		TI ((infection# or bacteri# or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) N0 (control or prevent*)) OR AB ((infection# or bacteri# or viral or virus or pathogen or fungal or fungus or fungi or protozoa or mite or parasite or worm) N0 (control or prevent*))	TI/AB	19879
22		or/19-22	--	43269
23	Outcome	Disease Transmission or Infectious	MH	56955
24		TI (fomite transmission or vector transmission or oral	TI/AB	8397

		transmission or bacterial transmission or asymptomatic transmission or mother to child transmission or parasite transmission or droplet transmission or child to adult transmission or airborne transmission or virus transmission or aerosol transmission or fecal oral transmission or pathogen transmission) OR AB (fomite transmission or vector transmission or oral transmission or bacterial transmission or asymptomatic transmission or mother to child transmission or parasite transmission or droplet transmission or child to adult transmission or airborne transmission or virus transmission or aerosol transmission or fecal oral transmission or pathogen transmission)		
25		TI ((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission) OR AB ((fomite or vector or oral or bacterial or asymptomatic or "mother to child" or parasite or droplet or "child to adult" or airborne or virus or aerosol or "fecal oral" or pathogen or secondary) and transmission)	TI/AB	18031
26		or/23-25	--	71211
27	Secondary outcome	TI (infection rate) OR AB (infection rate)	TI/AB	16142
28		TI (infection risk) OR AB (infection risk)	TI/AB	31052
29		TI ((Secondary attack or Secondary infection or infection) and (rate or risk)) OR AB (Secondary attack or Secondary infection or infection) and (rate or risk))	TI/AB	114789
30		TI ((infectious or transmission) and period) OR AB ((infectious or transmission) and period)	TI/AB	7459
31		or/27-30		120011
32		Target disease	TI (diarrhoea or gastroenteritis or diarrh#ea or salmonell? or gastroenter? or shigella? or enterococc# or campylobacter or cryptospor? or giardia? or rotavirus) OR AB (diarrhoea or gastroenteritis or diarrh#ea or salmonell? or gastroenter? or shigella? or enterococc# or campylobacter or cryptospor? or giardia? or rotavirus)	TI/AB
33		TI ("hand foot and mouth" or coxsackie or enterovir? or measles# or norovir? or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir?) OR AB ("hand foot and mouth" or coxsackie or enterovir? or measles# or norovir? or varicella or chickenpox or rubella or "german measles " or mumps or roseola or parvovir?)	TI/AB	9661
34		TI (Influenz# or Pertussis or whooping cough or croup or haemophilus or bronchit? or tuberculosis or listeriosis or listeria) OR AB (Influenz# or Pertussis or whooping cough or croup or haemophilus or bronchit? or tuberculosis or listeriosis or listeria)	TI/AB	52118
35		TI (herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river) OR AB (herpes or "cold sores" or cytomegalovirus or "glandular fever" or hepatitis or HIV or ross river)	TI/AB	144500
36		TI (Candid? or thrush or ringworm or tinea or scabies or pediculosis or tapeworm# or hydatid or lice or molluscum contagiosum or papilloma or warts or	TI/AB	10223

		toxoplasmosis) OR AB (Candid? or thrush or ringworm or tinea or scabies or pediculosis or tapeworm# or hydatid or lice or molluscum contagiosum or papilloma or warts or toxoplasmosis)		
37		TI (conjunctivitis or streptococc? or pneumococc? or "ear infection" or impetigo or "school sores" or meningitis or meningococ?) OR AB (conjunctivitis or streptococc? or pneumococc? or "ear infection" or impetigo or "school sores" or meningitis or meningococ?)	TI/AB	10767
38		MH ("Communicable Diseases+/TM/SS/ET/RF")	MH	1463
39		TI (communicable disease) OR AB (communicable disease)	TI/AB	6218
40		or/32-40	--	246788
41	Setting AND Disease	8 AND 40	--	1371
42	Population OR Setting AND Disease	9 and 40	--	1044
43	Population OR Setting AND Disease AND Intervention	42 and 18	--	47
44	Setting AND Disease AND Intervention	41 and 22	--	80
45	Outcome	26 or 31	--	172289
46	Disease AND Outcome	40 and 45	--	52703
47	Setting AND Disease AND Outcome	41 and 46	--	407
	TOTAL HITS	43 or 44 or 47	--	467
	Systematic reviews	PT: Systematic Review	--	12
	RCTs	PT: Randomised Controlled Trial	--	12
	NSRIs	PT: Case Study, Clinical Trial, Journal Article	--	370
	Letters	PT: Letter	--	3
	Editorials	PT: Editorial	--	1
	Combined	49 or 50 or 51 or 52	--	398
	Excess	48 not 54	--	40

Expanders – Apply equivalent subjects; Search modes – Boolean/Phrase

A3.6 PubMed

The PubMed search was restricted to records not indexed for MEDLINE and to records recently added to PubMed (i.e. in-process citations and citations from journals (or parts of journals) that are not currently MEDLINE-indexed). The search comprised free-text terms only and replicated the free-text sets in the Embase search (converted from the Ovid syntax).

The search for eligible studies was conducted on 16 September 2022.

Table A.7 Search results: PubMed

#	Concept	Search string	Results
1	Population	"child"[mesh:noexp] OR "infant"[mesh:noexp] OR "school teacher"[tiab] OR "preschool child"[tiab]	2231407
2	Setting	"kindergarten"[tiab] OR "child care"[mesh:noexp] OR "child day care"[tiab]	12388
3		"school"[tiab]	262908
4		"creche"?[tiab] OR preschool*[tiab] OR pre-school*[tiab] OR pre?school*[tiab] OR mini school*[tiab]	40010
5		("family"[tiab] AND ("care"[tiab] OR "day-care"[tiab] OR day?care[tiab]))	117732
6		(childcare*[tiab] OR child-care*[tiab] OR child?care*[tiab])	12257
7		("daycare"[tiab] OR "day-care"[tiab] OR day?care*[tiab])	9680
8		#2 OR #3 OR #4 OR #5 OR #6 OR #7	423006
9		Population or setting	#1 OR #7
10	Intervention: Exclusion measures	"physical distancing"[mesh:noexp]	2170
11		"quarantine"[mesh:noexp] OR "quarantine"[tiab]	13772
12		((("exclusion"[tiab] AND (period*[tiab] OR measure*[tiab] OR "policy"[tiab])) OR temporary exclusion*[tiab])	32529
13		((school*[tiab] OR classroom*[tiab]) AND (closure*[tiab] OR "closed"[tiab]))	3813
14		"case isolation"[tiab]	151
15		"cohorting"[tiab]	571
16		(("isolation"[tiab] AND room*[tiab]) OR isolation strateg*[tiab])	3648
17		"Home Isolation"[tiab] OR "contact isolation"[tiab]	721
18		#10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17	56138
19	Intervention: Disease control	"communicable disease control"[mesh:noexp]	29784
20		"infection control"[mesh:noexp]	28446
21		(infectio*[all] OR bacteri*[all] OR "viral"[all] OR "virus"[all] OR "pathogen"[all] OR "fungal"[all] OR "fungus"[all] OR "fungi"[all] OR "protozoa"[all] OR "mite"[all] OR "parasite"[tiab] OR "worm"[tiab]) AND ("control"[tiab] OR prevent*[tiab])	770188
22		#19 OR #20 OR #21	805986
23	Outcome	"Disease Transmission, Infectious"[mesh:noexp]	10912
24		"fomite transmission"[tiab] OR "vector transmission"[tiab] OR "oral transmission"[tiab] OR "bacterial transmission"[tiab] OR [all]	1003
25		"fomite"[all] OR "vector"[all] OR "oral"[all] OR "bacterial"[all] OR "asymptomatic"[all] OR "mother to child"[all] OR "parasite"[all] OR "droplet"[all] OR [all]"child to adult"[tiab] OR "airborne"[tiab] OR "virus"[tiab] OR "aerosol"[tiab] OR "fecal oral"[tiab] OR "pathogen"[tiab] OR "secondary"[tiab] AND "transmission"[tiab]	83145
26		#23 OR #24 OR #25	92342

27	Secondary outcome	"infection rate"[tiab]	17250
28		"infection risk"[tiab]	7084
29		((("Secondary attack"[tiab] OR "Secondary infection"[tiab] OR "infection"[tiab]) AND ("rate"[tiab] OR "risk"[tiab]))	349376
30		((("infectious"[tiab] OR "transmission"[tiab]) AND "period"[tiab]))	45185
31		#27 OR #28 OR #29 OR #30	386576
32	Target disease	"diarrhoea"[all] OR "gastroenteritis"[all] OR "diarrh"?ea[all] OR salmonell*[all] OR gastroenter*[all] OR shigell*[all] OR enterococc* or[all] "campylobacter"[tiab] OR cryptospor*[tiab] OR giardi*[tiab] OR "rotavirus"[tiab]	39345
33		"hand foot"[all] AND "mouth"[all] OR "coxsackie"[all] OR enterovir*[all] OR measles*[all] OR norovir*[all] OR "varicella"[all] OR "chickenpox"[all] OR [all] "rubella"[tiab] OR "german measles "[tiab] OR "mumps"[tiab] OR "roseola"[tiab] OR parvovir*[tiab]	20373
34		Influenz*[all] OR "Pertussis"[all] OR "whooping cough"[all] OR "croup"[all] OR "haemophilus"[all] OR bronchit*[all] OR "tuberculosis"[all] OR [all] "listeriosis"[tiab] OR "listeria"[tiab]	23664
35		"herpes"[tiab] OR "cold sores"[tiab] OR "cytomegalovirus"[tiab] OR "glandular fever"[tiab] OR "hepatitis"[tiab] OR "HIV"[tiab] OR "ross river"[tiab]	658358
36		candid*[all] OR "thrush"[all] OR "ringworm"[all] OR "tinea"[all] OR "scabies"[all] OR "pediculosis"[all] OR tapeworm*[all] OR "hydatid"[all] OR "lice"[all] OR [all] "molluscum contagiosum"[tiab] OR "papilloma"[tiab] OR "warts"[tiab] OR "toxoplasmosis"[tiab]	41621
37		"conjunctivitis"[all] OR streptococc*[all] OR pneumococc*[all] OR "ear infection"[all] OR "impetigo"[all] OR "school sores"[all] OR [all] "meningitis"[tiab] OR meningococ*[tiab]	17663
38		"infectious disease"[tiab]	45443
39		"communicable disease"[tiab]	6496
40		#32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39	834027
41		Setting AND Disease	#8 AND #40
42	Population OR Setting AND Disease	#9 AND #40	84212
43	Population OR Setting AND Disease AND Intervention	#42 AND #18	258
44	Setting AND Disease AND Intervention	#41 AND #22	4985
45	Disease AND Outcome	#40 AND (#26 OR #31)	118894
46	Setting AND Disease AND Outcome	#41 AND #45	3375
47	All PubMed hits	#43 OR #44 OR #46	6846
48	PubMed not Medline	pubmednotmedline[sb]	4482520
49	TOTAL HITS	#47 AND #48	496

A3.7 Alternate Sources

Nine additional studies were identified from alternate sources. Six National Guidelines were identified by searching Government websites (Communicable Diseases Network Australia, CDNA) and the remaining three studies were identified in the literature search conducted for the second review of non-pharmaceutical measures for respiratory diseases.

A4 Study selection criteria

This appendix documents the criteria used to identify studies eligible for inclusion in the systematic review on the effect of exclusion measures for the prevention of infectious diseases in childhood education and care services.

A4.1 Types of studies

A4.1.1 Eligible studies

Eligible studies were systematic reviews, RCTs and observational studies that examined the effectiveness of exclusion measures in early childhood education and care services compared to control or an alternative intervention. Grey literature, reports and guidelines from reputable international and national agencies were also eligible for inclusion.

The systematic review was conducted using a stepped process (see Figure 1), in which evidence of higher certainty was assessed before evidence of lower certainty was considered. The order of preference is as follows:

1. Systematic review of RCTs and prospective cohort studies
2. Randomised controlled trials
3. Comparative nonrandomised studies with preference for prospective cohort studies over retrospective cohort studies¹
4. Mechanistic studies focused on surrogate markers relating to infectiousness or a period of infectiousness (including viral load, fomite).

A systematic review was considered the highest level of evidence. If the top tier evidence effectively addresses the specified outcomes of interest, assessment of RCTs and nonrandomised comparative studies was not conducted.

If no relevant systematic reviews were identified, the literature screening was expanded to identify relevant RCTs. If no RCTs were identified, the process was repeated to identify relevant nonrandomised comparative studies and so forth. For primary and secondary outcomes not addressed by systematic review or RCT evidence, screening for nonrandomised comparative studies was conducted for that outcome only.

The minimum design features of eligible nonrandomised comparative studies include the following:

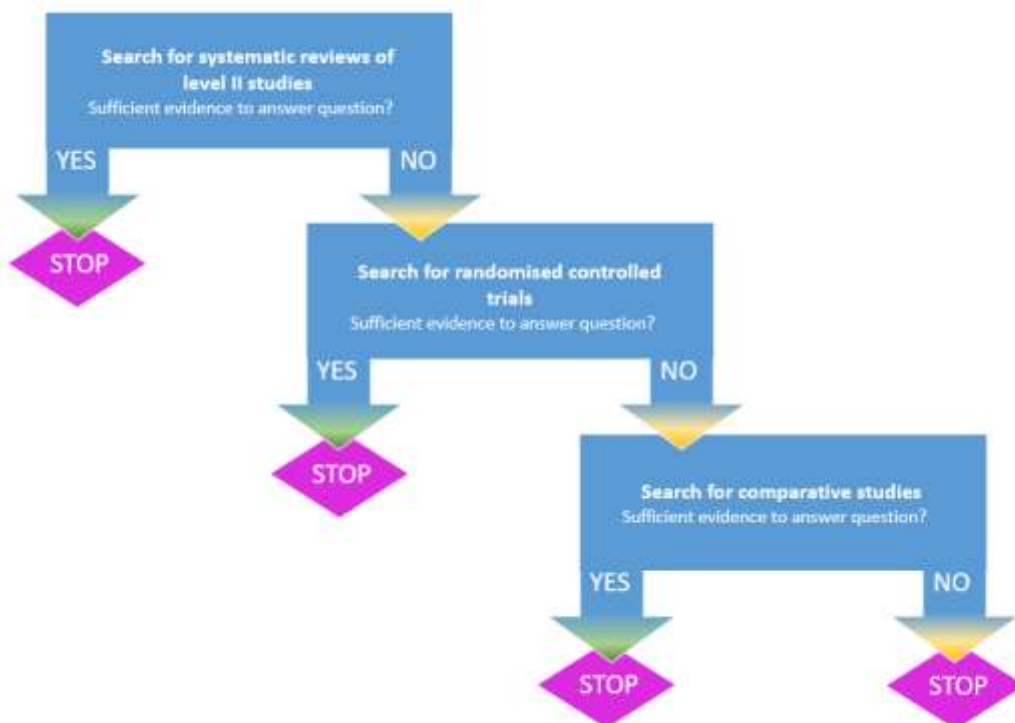
- allocation to, or practice of, the intervention occurs by choice (by the participant or other)
- researchers used methods to control for confounding, either:
 - in principle (for any confounding)
 - in principle (for time invariant unobserved confounding), or
 - for confounding (by observed covariates)

¹ Studies in which the effect of the intervention is compared with a concurrent control group will be considered before studies that use a historical (or non-parallel or non-concurrent) control group. This is due to higher concerns of bias related to residual confounding or unmeasurable changes in clinical practice over time.

- potential confounders were measured before the intervention

Single arm studies (e.g. case series with post-test or pre-test/post-test outcomes), cross-sectional studies and case reports were not eligible for inclusion, as the design features of these study designs make it difficult to attribute observed changes in outcomes at this level.

Figure 1 Schematic representation of literature review hierarchy



A4.2 Types of participants

Four subcategories of study participants were eligible for inclusion:

- Children aged 0-4 and 5-12 years who are symptomatic²
- Children aged 0-4 and 5-12 years who are non-symptomatic
- Adults (working or entering facilities) who are symptomatic
- Adults (working or entering facilities) who are non-symptomatic

To ensure the review was manageable, data analysis was inclusive of the 43 conditions identified by the NHMRC in the 5th Edition of the *Staying Healthy* Guidelines as well as any other conditions relevant to childhood education and care services in Australia. The evidence reviewers screened literature for eligible studies and compiled a list of all disease conditions with evidence available.

Exclusion measures relating to respiratory diseases were eligible for inclusion in this review but were searched for and selected in a separate review that focused on nonpharmaceutical interventions for reducing the risk of transmission of respiratory infections in early childhood education.

² defined as exhibiting or involving medical symptoms, which are signs of a condition or disease

Settings: Eligible settings were inclusive (but not limited to) early childhood education and care settings, out-of-hour school care, family day care, schools, household settings and other community settings that involve infants and children.

Studies set in aged care; tertiary hospitals and other acute health care settings were not eligible for inclusion.

A4.3 Types of interventions

A4.3.1 Intervention

Any exclusion measure that intended to limit transmission or prevent secondary infections was eligible for inclusion. There were no restrictions on the duration of exclusion or period when the exclusion commenced. To allow for potential subgroup analyses (and to inform decision-making), eligible studies were to be stratified based on the symptoms experienced (such as fever, diarrhoea, vomiting, rash, or other), and from when the exclusion period commenced (i.e. from the first observed, first notified, or first confirmed symptom).

Additional nonpharmaceutical measures such as hand hygiene and masks were not eligible for inclusion.

A4.3.2 Comparators

There were no restrictions on comparators, noting that the review stratified the evidence into two comparisons: (i) no exclusion intervention and (ii) other 'active' alternative infection control measures.

Where the control is poorly described it was considered an 'inactive' comparator (i.e. no exclusion intervention). Where exclusion measures were delivered as an adjunct to another infection control measure (e.g., exclusion measures plus environmental cleaning versus environmental cleaning alone), the study was also considered alongside those studies that use an inactive intervention. Other 'active' comparators included (but were not limited to) effective hand hygiene, use of gloves, cough and sneeze etiquette, or other forms of effective environmental cleaning.

In addition to the studied intervention, co-interventions (e.g. effective cleaning protocols, education programs, or medication) may be administered simultaneously to the treatment and control group. Studies with co-interventions were included if all arms of a study received the same co-interventions (i.e. the effectiveness of exclusion measures was not confounded).

Head-to-head studies comparing different duration or timing of exclusion measures (e.g. first observed, first notified, or first confirmed symptom) were excluded. This is because the main objective of the review was to examine the effects of exclusion measures, rather than the comparative effects of different exclusion measures.

A4.4 Types of outcome measures

A4.4.1 Outcome role

Outcomes were not used as a criterion for including or excluding studies.

A4.4.2 Outcome domains of interest

Outcomes were intended to align with the reasons why children and/or educators were subjected to exclusion periods.

The primary outcomes of interest were:

- Transmission related outcomes (e.g. number of cases of any type of infectious disease).
- Adverse events (including safety) related to the exclusion intervention.

The secondary outcomes of interest were:

- Absenteeism
- Length of illness
- Behaviour or practice change

It was out of scope of this review to assess personal health care preferences, patient experience measures (PREMS) (e.g. satisfaction with care), or economic/cost outcomes.

A4.4.3 Outcome measures and timepoints of interest

Outcome measures included both confirmed and clinically accepted measures used to determine infection or adverse events (preferably accepted surrogate outcome measures such as cerebrospinal fluid examination for meningococcal disease, or lung function tests for respiratory infections) and patient-reported outcome measures (PROMS) (preferably measured using validated tools).

All outcomes measured (or pre-specified in protocols or clinical trial registries) in each eligible study were listed in the '*Characteristics of included studies*' tables. Results were extracted for the pre-specified primary and secondary outcomes identified for this review, with results for eligible outcomes reported in summary of findings tables. It was intended that GRADE summary tables, with corresponding evidence statements would be developed, however given the variety of available evidence, this was not possible (see Appendix F).

A5 Selection of studies (inclusion decisions)

This appendix documents how studies were identified, collected and managed so as to conduct the systematic review on the effect of exclusion measures for preventing the spread of infectious diseases in childcare settings.

A5.1 Studies identified in the literature searches

A5.1.1 Title/abstract screening

Citations (title/abstracts) retrieved by the literature searches were imported into EndNote and duplicates removed. Citations were then imported to Covidence (www.covidence.org), an online tool that streamlines the screening and data extraction stages of a systematic review. As described in Figure 1, citations were imported in a hierarchical fashion, beginning with SRs before moving onto RCTs.

Each citation (title/abstract) was screened by a single evidence reviewer (SM) who discarded ineligible studies (marked as irrelevant and tagged with a reason for exclusion) and retained potentially eligible ones (marked as relevant or maybe). Where there was uncertainty regarding relevance, a decision was made through discussion with the lead reviewer (MJ), who decided to either mark the citation as irrelevant or take it through to full text. Citations that were published in a language other than English were tagged and managed as described below (see *Studies published in languages other than English*).

A5.1.2 Full text screening

Full text articles identified for possible inclusion in the evidence synthesis were retrieved and assessed for inclusion by a single reviewer (SM). A prespecified, hierarchical approach was used to annotate reasons for exclusion, with the results of the study selection process illustrated in a PRISMA flow. Where there was uncertainty regarding inclusion, a decision was made through discussion (KN, MJ).

Trial registration numbers, author names and study titles, locations and dates were used to identify multiple reports arising from the same study (and linked within Covidence). Published errata or corrigenda identified in the search were checked and linked to the appropriate study.

Details of studies assessed at full text but not included in the evidence review (with reasons for exclusion) are listed in Appendix C1 (Table C.1). Studies awaiting classification are listed in Appendix C2. Citations referring to eligible systematic review protocols or clinical trial registries (for which published results are not available) are listed in Appendix O (Table C.5).

A5.2 Studies published in languages other than English

To identify studies published in languages other than English, citations (title and/or abstract) identified in our searches that already had an English translation available were screened in Covidence as described above (see Appendix A5.1). In the absence of an English translation, we used Google translate to facilitate understanding of the title and/or abstract. If only the title was identified in the search, we retrieved the abstract directly from the journal or publishing house (if available).

Translated titles and abstracts were reviewed and evaluated against the study selection criteria outlined in Appendix A4. Irrelevant citations were removed (marked as irrelevant and tagged with a reason for exclusion) and citations deemed as potentially eligible were retained (marked as 'awaiting classification' and 'publication not in English').

Full text translation did not occur to determine eligibility. Studies published in languages other than English that were assessed as potentially eligible for inclusion in the review are listed in Appendix C2 (Table C.3). No studies in a language other than English were included in the evidence synthesis.

A5.3 Collation of studies

All potential studies identified for inclusion were sorted according to the study type and infectious disease category. The Study ID incorporated all citations that related to the same trial (i.e., could be associated with more than one citation and, if available, included the clinical trial registry number). The Study ID (usually automatically assigned in Covidence) was the first author surname followed by the first publish date (conference abstract or full study report).

Preliminary data extraction for each Study ID then ensued, which included a summary of the PICO criteria entered into specified columns (illustrated in Table A.8). To facilitate assignment to a population (P), reviewers reviewed the trial enrolment criteria, and attributed a population based on the primary underlying condition.

Table A.8 Sample Preliminary data extraction

STUDY ID	STUDY TYPE	POPULATION	SETTING	DISEASE	OUTCOMES
Burns 2021	Modelling study	School children	School, USA	Influenza COVID-19	Attack rate Outbreak duration Peak number of simultaneously infected

Each Study ID was assessed or checked by the project lead (MJ). The focus was to ensure the study had been assigned to the most appropriate intervention (I); being that which was considered the primary method used to prevent infection and to ensure each study would only contribute to the synthesis for one intervention group.

For example, a study that assessed the effect of isolation and hand hygiene on influenza was assigned to the exclusion measures influenza-like illnesses group; but the study could also be included in the non-pharmaceutical interventions for respiratory diseases. Judgement between reviewers and the project lead (MJ) was made in determining which systematic review the study belonged to.

A6 Summary of screening results

A6.1 Search of published literature

Results of the literature search and application of the study selection criteria are summarised in Table A.9.

Studies were excluded based on hierarchical, prespecified exclusion criteria, with all citations returned by the literature searches reviewed based on information in the publication title and abstract (where available). Potentially relevant publications were then retrieved and reviewed in full text before a final decision was made on their inclusion or exclusion for the review.

Table A.9 Screening result: studies identified in the literature search

Database (number of hits)	Total hits
Embase 1974 to September 14, 2022	2085
MEDLINE 194 to September 14, 2022	1174
Cochrane (SRs)	2
Cochrane (RCTs)	144
CINAHL	398
PubMed (not MEDLINE)	496
Nonpharmaceutical literature search	2
National Guidelines	6
TOTAL	4307

Database (number of hits)	Total hits
Studies not uploaded or screened (nonrandomised studies, etc)	2187
Studies uploaded to Covidence for screening (Systematic reviews and RCTs)	2120
Duplicates removed by Covidence	402
Duplicate citation (found at title/abstract)	10
TOTAL DUPLICATES	412
Number of citations screened TITLE/ABSTRACT	1708
intervention out of scope	500
population out of scope	741
comparator out of scope	5
outcome out of scope	32
setting out of scope	33
published prior to 2000	3
study design out of scope	
<i>transmission study</i>	17
<i>prevalence study</i>	158
publication out of scope	
<i>opinion piece, commentary, poster etc.</i>	5
<i>not an interventional study</i>	1
<i>economic analysis</i>	13
TOTAL irrelevant	1508
Number of citations screened FULL TEXT	200
studies in respiratory illnesses (2nd review)	27
non-human study	1
intervention out of scope	18
population out of scope	7
outcome out of scope	10
comparator out of scope	3
published prior to 2000	2
study design out of scope	
<i>opinion piece</i>	4
<i>not an interventional study</i>	2
duplicate data	3
TOTAL EXCLUDED	77
RELEVANT CITATIONS	123
Additional follow-up needed	
<i>Ongoing study</i>	2
<i>Awaiting classification</i>	94
TOTAL INCLUDED CITATIONS	27
CORRESPONDING NUMBER OF STUDIES	26

Appendix B Methods used for data appraisal, collection and analysis

This appendix documents the methods used to critically appraise, data extract, synthesise and develop evidence statements about the effect of exclusion measures for preventing the transmission of infectious childhood diseases.

B1 Critical appraisal

B1.1 Tools used

The quality of included systematic reviews and the risk of bias of included primary studies was assessed using the most appropriate tool according to the type of study as follows:

- Systematic reviews: AMSTAR-2 quality assessment checklist (4)
- RCTs: Revised Cochrane Risk of Bias (RoB) tool v2.0 (5, 6)
- Nonrandomised comparative studies: JBI checklist (7)

B1.1.1 Systematic reviews

The quality of included systematic reviews was assessed using the AMSTAR-2 quality assessment checklist (4). The AMSTAR-2 consists of 16 domain questions that are answered as 'yes', 'no', or 'partial yes'; with a 'yes' answer denoting a positive result. For this review, four domains have been classified as being a 'critical flaw' (see Table 10).

Table 10 AMSTAR-2: Domain classification

Critical flaw	Critical weakness	
Domain 4: Adequacy of the literature search Domain 8: Detailed description of included studies Domain 9: Risk of bias from individual studies being included in the review Domain 11: Appropriateness of meta-analytical methods	Domain 1: Inclusion of PICO in research questions and inclusion criteria Domain 2: Registration of protocol before commencement of the review Domain 3: Discussion of selection of study designs for inclusion Domain 5: Duplicate study selection Domain 6: Duplicate data extraction Domain 7: Justification for excluding individual studies	Domain 10: Review of sources of funding for included studies Domain 12: Discussion of impact of risk of bias of included studies on meta-analysis results Domain 13: Consideration of risk of bias when interpreting the results of the review Domain 14: Discussion of heterogeneity Domain 15: Assessment of presence and likely impact of publication bias Domain 16: Reporting of potential sources of conflict of interest including any funding received

Source: Adapted from Shea 2017 (4)

An overall judgement summarising the overall confidence in the results of the SR was reported based on the potential impact of an inadequate rating for each item, noting that multiple noncritical weaknesses may diminish confidence in the review (4). It is noted that the AMSTAR-2 leads to a judgement of the methodological quality (or limitations) of a systematic review, not a judgement about the risk of bias of the body of evidence included within the review.

Judgements were guided by (but not limited to) the following rating criteria:

- *High (no or one noncritical weakness)* – the systematic review provides an accurate and comprehensive summary of the results of the available studies that address the question of interest.
- *Moderate (more than one noncritical weakness)* – the systematic review has more than one weakness but no critical flaws. It may provide an accurate summary of the results of the available studies that were included in the review.
- *Low (one critical flaw with or without noncritical weaknesses)* – the review has a critical flaw and may not provide an accurate and comprehensive summary of the available studies that address the question of interest.
- *Critically low (more than one critical flaw with or without noncritical weaknesses)* – the review has more than one critical flaw and should not be relied on to provide an accurate and comprehensive summary of the available studies.

B1.1.2 Randomised controlled trials

RoB v2.0 consists of five domains that assess bias arising from the randomisation process: bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome; and bias in selection of the reported result. Each domain was assessed for bias, which was recorded as 'high', 'low', or 'some concerns'. Concerns of bias were raised when it is considered plausible (i.e. likely, probable, possible or conceivable) that bias was present, with the algorithm provided for the RoB v2.0 used to guide decision making (available online at <https://www.riskofbias.info>). Versions of the RoB v2.0 relevant to different study designs (i.e. cluster randomised control trials and crossover trials) will be used where appropriate.

An overall risk of bias for each outcome in the RCT was judged based on the following criteria:

- *overall low risk of bias* – low risk of bias for all domains
- *some concerns* – at least one domain has some concerns raised, but none are found to be at high risk of bias
- *overall high risk of bias* – high risk of bias for one or more domains

B1.1.3 Nonrandomised studies

Critical appraisal of nonrandomised studies and modelling studies was guided by the methods described in the JBI Risk of Bias checklist (7). The JBI Critical Appraisal checklist for Cohort Studies is made up of eleven key questions of which an answer of yes, no, unclear or not applicable is answered.

The overall appraisal judgement for a specific study was defined as either '*include*', '*exclude*', or '*seek further info*' and is based upon the following guide:

- Were the two groups similar and recruited from the same population?
- Were the exposures measured similarly to assign people to both exposed and unexposed groups?
- Was the exposure measured in a valid and reliable way?
- Were confounding factors identified?
- Were strategies to deal with confounding factors stated?
- Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?
- Were the outcomes measured in a valid and reliable way?
- Was the follow up time reported and sufficient to be long enough for outcomes to occur?
- Was follow up complete, and if not, were the reasons to loss to follow up described and explored?
- Were strategies to address incomplete follow up utilized?
- Was appropriate statistical analysis used?

B1.2 Assessment process

The risk of bias for each included study was assessed by one reviewer (SM). A second reviewer then checked and confirm all assessments made (KN). Disagreements were resolved by discussion, with advice sought from a third reviewer (MJ) if agreement could not be reached.

The assessment was based on the primary outcome for that study (if a primary outcome is not stated, the assessment will be on the main/key outcome of the report). When conducting the evidence synthesis (i.e. when examining the outcome results of the study for inclusion in a meta-analysis), it was intended that the focus of the assessment would be checked to be consistent specific to the outcome of interest. No meta-analysis was performed.

For each study we have reported our judgement of quality or risk of bias (e.g. low, moderate, high, critical) by domain and provided a rationale for the judgement with supporting information (see Appendix D).

B2 Data extraction process

The characteristics of all included studies was extracted by one reviewer (SM) using a standardised data collection form. Studies were grouped according to the disease category and study type to which they had been categorised.

All data extraction forms were checked for completeness and accuracy by a second reviewer (MJ), with checks made at the same time as the evidence synthesis. Where there was uncertainty or disagreement about included data, a decision was made through discussion with the lead reviewer (MJ).

B2.1 Data items

A standardised data collection form was used to collect all data items relating to the study features. This included (but was not limited to) the following:

- Study identifier (author date)
- Study Reference (including all citations)
- Study design (SR, Modelling study, RCT, cohort)
- Author affiliation
- Source of funds
- Declared interests of study authors
- Setting (such as childcare centre, school, community)
- Country(s) & region (if reported)
- Length of followup (time period for including studies in SRs and intervention time for RCTs)
- Description of population (including the number of participants, inclusion and exclusion criteria and any notable demographics)
- Description of intervention & comparators (including the type of exclusion measure and control used)
- Method of analysis
- Internal validity including the overall quality or risk of bias of the study
- List of Outcomes, including the following:
 - Comparison (Exclusion measure vs control or exclusion measure vs. alternate intervention)
 - Number of participants in the intervention group / comparator group
 - Reported results in the intervention group / comparator group (e.g. means and standard deviations or medians and interquartile ranges)
 - Estimates of effect (e.g. mean differences or adjusted mean differences), 95% confidence intervals, p-values)

B2.2 Requests for data

No attempts were made to obtain or clarify data from published peer-reviewed studies. There was also no attempt made to obtain additional data from eligible primary studies not published in English, ongoing trials and studies published as conference abstracts.

B2.3 Missing outcome data

All outcomes measured in the included studies were extracted into the study details sheet (see Appendix E).

No imputation for missing outcome data within a study was conducted. Investigations into missing data within a study through a review of the clinical trial protocol or registry entry if available) was considered and noted when assessing the risk of bias for that study. Implications of the missing data was considered when interpreting the evidence.

B3 Data analysis

Due to the nature of the reported outcomes for the included studies, many systematic reviews and primary studies did not include any measures of effect. As such, a non-quantitative narrative summary of the available evidence was provided.

B3.1 Data synthesis

Given the size and breadth of this review and the lack of quantitative data from included studies, a broad approach to data synthesis was implemented. This meant that summary estimates were focussed on narrative summaries and any new evidence when comparing to the 2013 *Staying Healthy in Childhood* guidelines.

B3.1.1 Quantitative synthesis

When available, data synthesis was performed by extracting and presenting results data in data tables. Due to the lack of quantitative data, they were not analysed or considered further. These data are presented as an 'evidence inventory' and provide a snapshot of the available evidence comparing exclusions measures with no or alternate interventions.

B3.1.2 Non-quantitative synthesis

The narrative summary included a brief description of the condition and studies identified (including study design, size and population demographics). Where possible, a visual representation of the results of included studies was presented in a forest plot (without a summary estimate) grouped by study design features.

Results from each study were reported, with the range and magnitude of observed effects noted. If the results of a study were not completely reported (i.e., only the direction of effect of reported; the effect estimate is reported but with no confidence intervals; or the direction of effect is reported along with a *p*-value, but there is of no effect estimate), we reported the available information.

B3.1.3 Addressing risk of bias

All studies were included in the review, regardless of judgements made regarding quality and risk of bias. The impact of the study quality and risk of bias was noted and discussed in the narrative summary for that condition or outcome.

B4 Evidence statements

B4.1 Summary of findings and certainty of the evidence

Across each population, we assessed the certainty of the evidence using the GRADE approach (3). Evidence comparing exclusions measures with either a 'control' or alternate intervention was considered.

GRADE certainty of evidence is categorised as follows:

- High ($\oplus\oplus\oplus\oplus$): further research is very unlikely to change the confidence in the estimate of effect
- Moderate ($\oplus\oplus\oplus\ominus$): further research is likely to have an important impact in the confidence in the estimate of effect
- Low ($\oplus\oplus\ominus\ominus$): further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
- Very low ($\oplus\ominus\ominus\ominus$): any estimate of effect is very uncertain

The GRADE process provides a framework for determining the certainty of the evidence and is based on consideration of the following five factors:

- *Risk of bias.* Based on a summary assessment (i.e. the overall risk of bias) across studies for each outcome reported (9). Serious concerns were raised if the outcome result was influenced by the inclusion of studies judged to be at high risk of bias (i.e. removing these studies changed the size of the effect) (see Appendix D). Serious concerns were also raised if it was considered plausible (i.e. likely, probable or conceivable) that missing outcome data made a difference to the estimated effect (considering the weight of studies that had substantial missing data).
- *Inconsistency.* Based on heterogeneity in the observed intervention effects across studies that suggests important differences in the effect of the intervention and whether this can be explained (10). This included considering measures of statistical heterogeneity (e.g. I^2 statistic) and any non-overlap of confidence intervals (suggesting important difference in the observed effect). Inconsistency was not downgraded when there was only one study.
- *Indirectness.* Based on important differences between the review questions and the characteristics of included studies (population or intervention) that may lead to important differences in the intervention effects (12). For example, a judgement on whether evidence in older women is also generalisable to young men (sensible to apply) or if Pilates was delivered as typically practised in Australia.
- *Imprecision.* Based on interpretation of the upper and lower confidence limits of the pooled result in relation to a minimal clinically important threshold (i.e. the confidence interval includes both appreciable benefit and harm); and whether the optimal information size has been reached (i.e. the total number of patients meets the required sample size for a sufficiently powered individual study) (11). In the absence of a published clinically important threshold a rough guide was used: for dichotomous outcomes a 25% relative risk reduction or increase; for continuous outcomes based on the threshold defined for a small effect (the mean difference being less than 10% of the scale)
- *Publication bias.* Based on the extent to which the evidence is available. This included: checking trial registries for missing outcome results in published studies, checking the ongoing studies and studies awaiting classification (including those published in a language other than English) and making a judgement on whether the studies were not complete, failed to report an outcome, were not published (or translated) due to the nature of their results (i.e., selective non-reporting of results). Given most of the outcome results came from small studies, any missing results due to non-reporting in a meta-analysis was considered likely to impact the results. Publication bias was also suspected when the evidence was limited to a small number of small trials (13).

B4.2 Development of evidence statements

As part of the summary of findings table, an evidence statement pertaining to each outcome was included. The evidence statement was guided by the prescribed format provided in GRADEPro (14), with the preferred statement selected listed in Table B.11.

Table B.11 List of informative statements to communicate results of systematic reviews

SIZE OF THE EFFECT ESTIMATE	SUGGESTED STATEMENTS *
HIGH Certainty of the evidence	
Large effect	X results in a large reduction/increase in outcome
Moderate effect	X reduces/increases outcome
Small important effect	X reduces/increases outcome slightly
Trivial, small unimportant effect or no effect	X results in little to no difference in outcome
MODERATE Certainty of the evidence	
Large effect	X probably results in a large reduction/increase in outcome
Moderate effect	X probably reduces/increases outcome
Small important effect	X probably results in a slight reduction/increase in outcome
Trivial, small unimportant effect or no effect	X probably results in little to no difference in outcome
LOW Certainty of the evidence	
Large effect	The evidence suggests X results in a large reduction/increase in outcome
Moderate effect	The evidence suggests X results in a reduction/increase in outcome
Small important effect	The evidence suggests X results in a slight reduction/increase in outcome
Trivial, small unimportant effect or no effect	The evidence suggests that X results in little to no difference in outcome
VERY LOW Certainty of the evidence	
Any effect	The evidence is very uncertain about the effect of X on outcome

Source: modified from Santesso et al. (2020) (14)

* Replace X with intervention, replace 'reduce/increase' with direction of effect, replace 'outcome' with name of outcome, include 'when compared with Y' when needed)

Appendix C Studies assessed at full text but not included

C1 Excluded studies (not eligible)

This appendix documents the studies that were screened in full text for a systematic review on the effect of exclusion measures for preventing infectious diseases in childcare settings but were not included in the evidence synthesis as they did not meet the eligibility criteria.

Table C.1 Details of studies screened and excluded at full text

Study ID	Title	Exclusion Reasons	Reviewer Notes
Li 2022	Investigation of mouse hepatitis virus strain A59 inactivation under both ambient and cold environments reveals the mechanisms of infectivity reduction following UVC exposure	Nonhuman study;	Transmission study
Kano 2007	Duration of isolation of children with influenza A treated with oseltamivir	Comparator out of scope;	
Ponka 2004	The Effect of Enhanced Hygiene Practices on Absences Due to Infectious Diseases among Children in Day Care Centers in Helsinki	Comparator out of scope;	Observational cohort (with control group)
Carrat 2006	A 'small-world-like' model for comparing interventions aimed at preventing and controlling influenza pandemics	Comparator out of scope;	
Cauchemez 2014	School closures during the 2009 influenza pandemic: National and local experiences	Intervention out of scope	Systematic review
Chaabna 2021	Facemask use in community settings to prevent respiratory infection transmission: A rapid review and meta-analysis	Intervention out of scope;	Systematic review; Wrong intervention
Glatman-Freedman 2012	Attack Rates Assessment of the 2009 Pandemic H1N1 Influenza A in Children and Their Contacts: A Systematic Review and Meta-Analysis	Intervention out of scope;	Transmission study
Laycock 2021	Tuberculosis in adolescents and young adults: Emerging data on tb transmission and prevention among vulnerable young people	Intervention out of scope;	Transmission study
Cowling 2008	Effects of school closures, 2008 winter influenza season, Hong Kong	Intervention out of scope;	School closure = holidays instead of isolation periods ;
Forsyth 2007	Prevention of pertussis: Recommendations derived from the second Global Pertussis Initiative roundtable meeting	Intervention out of scope;	
Kelso 2010	The impact of case diagnosis coverage and diagnosis delays on the effectiveness of antiviral strategies in mitigating pandemic influenza A/H1N1 2009	Intervention out of scope;	Observational cohort (no control group)
Leung 2019	Giardiasis: An overview	Intervention out of scope;	Prevalence/Incidence study
Roberts 2000	Effect of infection control measures on the frequency of diarrheal episodes in child care: A randomized, controlled trial	Intervention out of scope;	Observational cohort (no control group); RCT

Study ID	Title	Exclusion Reasons	Reviewer Notes
Villasenor-Sierra 2007	Interpersonal relationships and group A streptococcus spread in a Mexican day-care center	Intervention out of scope;	Transmission study
Braga 2022	Children wearing face masks to prevent communicable diseases: scoping review	Intervention out of scope;	Wrong intervention
Chen 2015	Social contact patterns of school-age children in Taiwan: comparison of the term time and holiday periods	Intervention out of scope;	
Gilbert 2008	Screening policies for daycare attendees: lessons learned from an outbreak of E. coli O157:H7 in a daycare in Waterloo, Ontario	Intervention out of scope;	Prevalence/Incidence study
Glass 2008	Social contact networks for the spread of pandemic influenza in children and teenagers	Intervention out of scope;	Transmission study
UniversityofToronto 2021	mHealth Intervention for Increasing COVID-19 Prevention Practices With Urban Refugee and Displaced Youth in Uganda	Intervention out of scope;	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.)
Koutlakis-Barron 2016	Essentials of infection prevention in the pediatric population	Intervention out of scope;	Systematic review
Brooks 2020	The impact of unplanned school closure on children's social contact: Rapid evidence review	Intervention out of scope;	May provide secondary outcome discussion;
Neal 2004	Statistical inference and model selection for the 1861 Hagelloch measles epidemic	Intervention out of scope;	Model investigates impact of school closures on measles spread among other interventions
Kahan 2006	Pediatrician attitudes to exclusion of ill children from child-care centers in Israel: Pressure on ambulatory practices	Outcome out of scope	Wrong population but may be useful data
Copeland 2006	Compliance with American Academy of Pediatrics and American Public Health Association illness exclusion guidelines for child care centers in Maryland: Who follows them and when?	Outcome out of scope;	Case series
Landis 1988	Day-care center exclusion of sick children: Comparison of opinions of day-care staff, working mothers, and pediatricians	Outcome out of scope;	Has some information on sending children home based on fever temperatures but overall – study based on opinions of parents and staff;
Marchand 1994	Brazilian daycares: weighing the risks and benefits	Outcome out of scope;	
Ngan 2011	Public knowledge, attitude and practice on influenza pandemic (H1N1) 2009 prevention in Southern Vietnam	Outcome out of scope;	Case series
Shi 2014	Knowledge, attitudes, and practices of nonpharmaceutical interventions following school dismissals during the 2009 influenza A H1N1 pandemic in Michigan, United States	Outcome out of scope;	Observational cohort (no control group)

Study ID	Title	Exclusion Reasons	Reviewer Notes
Shope 2017	Pandemic influenza preparedness among child care center directors in 2008 and 2016	Outcome out of scope;	Case series
Song 2022	The indirect impact of control measures in COVID-19 pandemic on the incidence of other infectious diseases in China	Outcome out of scope;	Observational cohort (no control group)
Spyromitrou-Xioufi 2020	Risk factors for meningococcal disease in children and adolescents: a systematic review and META-analysis	Outcome out of scope;	Transmission study
Stebbins 2011	The effect of grade on compliance using nonpharmaceutical interventions to reduce influenza in an urban elementary school setting	Outcome out of scope;	Duplicate citation
Dramowski 2015	Utilization of paediatric isolation facilities in a TB-endemic setting	Population out of scope	Wrong setting; Could have potential information on transmissibility of TB
Hospices Civils de Lyon 2020	COVID-19 – SARS-CoV-2 Community Contamination in Children and Adults (Dyn3CEA_Nosocor)	Population out of scope;	Respiratory illness (COVID, SARS etc.); Transmission study
Moser 2018	Estimating age-specific reproductive numbers-A comparison of methods	Population out of scope;	Prevalence/Incidence study
Oh 2022	Lifting non-pharmaceutical interventions following the COVID-19 pandemic – the quiet before the storm?	Population out of scope;	
Principi 2004	Burden of influenza in healthy children and their households	Population out of scope;	Prevalence/Incidence study
SteelFisher 2012	Public response to the 2009 influenza A H1N1 pandemic: A polling study in five countries	Population out of scope;	Observational cohort (no control group); Prevalence/Incidence study May be useful – details the uptake of social distancing measures not the explicit isolation period etc
Wei 2020	Patient Delay in Hospital Visiting and the Weekend Effect of Surveillance Report on Hand-Foot-and-Mouth Disease and Epidemic Parotitis in Hanzhong City, China	Population out of scope;	Observational cohort (no control group)
Pickering 1981	Diarrhea caused by Shigella, rotavirus, and Giardia in day-care centers: prospective study	Published prior to 2000;	Observational cohort (no control group)
Robbins 1981	Low measles incidence: association with enforcement of school immunization laws	Published prior to 2000;	Published prior to 2000; RCT
Ahmed 2022	Feasibility, Acceptability, and Barriers to Implementing Select Non-Pharmaceutical Interventions to Reduce the Transmission of Pandemic Influenza – United States, 2019	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Amorim 1999	[Critical analysis of respiratory infectious disease investigations related to children attending day care centers]	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)

Study ID	Title	Exclusion Reasons	Reviewer Notes
Barschkett 2021	COVID-19 Associated Contact Restrictions in Germany: Marked Decline in Children’s Outpatient Visits for Infectious Diseases without Increasing Visits for Mental Health Disorders	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Budge 2014	Impact of home environment interventions on the risk of influenza-associated ARI in Andean Children: Observations from a prospective household-based cohort study	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Dietz 2020	2019 Novel Coronavirus (COVID-19) Pandemic: Built Environment Considerations To Reduce Transmission	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.); Transmission study
Drolet 2021	Time trends in social contacts before and during the COVID-19 pandemic: the CONNECT study	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Fan 2020	Needs and concerns of patients in isolation care units – learnings from COVID-19: A reflection	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Haapanen 2021	The impact of the lockdown and the re-opening of schools and day cares on the epidemiology of SARS-CoV-2 and other respiratory infections in children – A nationwide register study in Finland	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Hay 2002	The natural history of acute cough in children aged 0 to 4 years in primary care: a systematic review	Study included in Respiratory analysis;	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.); Systematic review
Huh 2021	Impact of Nonpharmaceutical Interventions on the Incidence of Respiratory Infections during the Coronavirus Disease 2019 (COVID-19) Outbreak in Korea: A Nationwide Surveillance Study	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Jefferson 2020	Physical interventions to interrupt or reduce the spread of respiratory viruses	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Karki 2021	Risk of infection and contribution to transmission of SARS-CoV-2 in school staff: A systematic review	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.); Systematic review
Kelloniemi 2021	COVID-19 restrictions probably brought the 2019-2020 Finnish influenza season to an early end and led to fewer respiratory viruses among infants	Study included in Respiratory analysis;	
Kuitunen 2020	Effect of Social Distancing Due to the COVID-19 Pandemic on the Incidence of Viral Respiratory Tract Infections in Children in Finland during Early 2020	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Lee 2021	Impact of Public Health Interventions on Seasonal Influenza Activity during the COVID-19 Outbreak in Korea	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Li 2020	Effects of indoor environment and lifestyle on respiratory health of children in Chongqing, China	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)

Study ID	Title	Exclusion Reasons	Reviewer Notes
Macfarlane Burnet Institute for Medical Research 2020	The Optimising Isolation, Quarantine and Distancing Study for COVID-19 (Optimise)	Study included in Respiratory analysis;	
Mathew 2011	Acute respiratory infection and pneumonia in India: A systematic review of literature for advocacy and action: UNICEF-PHFI series on newborn and child health, India	Study included in Respiratory analysis;	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.); Systematic review
Schneider 2021	[Social distancing as protection factor against COVID-19 in a non-metropolitan area in the State of Rio Grande do Sul, BrazilLas medidas de distanciamiento social como factor de protecci3n contra la COVID-19 en el interior de Rio Grande do Sul, Brasil]	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.); Transmission study
Stein 2021	The COVID-19 pandemic and its effect in Brazil	Study included in Respiratory analysis;	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.)
vanderHoek 2020	[The role of children in the transmission of SARS-CoV-2]	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.); Transmission study
Walger 2020	Children and adolescents in the CoVid-19 pandemic: Schools and daycare centers are to be opened again without restrictions. The protection of teachers, educators, carers and parents and the general hygiene rules do not conflict with this	Study included in Respiratory analysis;	Respiratory illness (COVID, SARS etc.)
Xu 2020	What is the evidence for transmission of COVID-19 by children in schools? A living systematic review	Study included in Respiratory analysis;	Transmission study
Zhao 2022	Nonpharmaceutical interventions to prevent viral respiratory infection in community settings: an umbrella review	Study included in Respiratory analysis;	May be useful - includes adherence to stay at home requirement;
Miller 2013	Use of Nonpharmaceutical Interventions to Reduce Transmission of 2009 Pandemic Influenza A (pH1N1) in Pennsylvania Public Schools	Study included in Respiratory analysis;	May be useful to show reduction of disease as a result of school closures but does not specify exact duration of isolation period
Yamamoto-Kataoka 2022	Influence of anti-coronavirus disease 2019 policies on 10 pediatric infectious diseases	Study included in Respiratory analysis;	Has small section on social distancing
Lee 2012	Prevention of influenza in healthy children	Study included in Respiratory analysis;	
Siraj 2020	The Infectious Diseases Act and Resource Allocation during the COVID-19 Pandemic in Bangladesh	Wrong publication type (not an intervention study);	Respiratory illness (COVID, SARS etc.)

Study ID	Title	Exclusion Reasons	Reviewer Notes
Bush 2012	How should we manage asthma in preschoolers-from guidelines to consensus	Wrong publication type (opinion piece, commentary etc.);	Respiratory illness (COVID, SARS etc.); Systematic review
Hojdak 2019	The time has come to invest more in the prevention of day care-associated infection in children	Wrong publication type (opinion piece, commentary etc.);	
Law 1992	Risk of acquiring cytomegalovirus infection while working in out-of-home child care centres	Wrong publication type (opinion piece, commentary etc.);	
Leung 2021	Paediatrics: How to manage viral gastroenteritis	Wrong publication type (opinion piece, commentary etc.);	Systematic review
Mumcuoglu 2006	Head louse infestations: The "no nit" policy and its consequences	Wrong publication type (opinion piece, commentary etc.);	Wrong study design (not a systematic review)
Bartlett 1991	Controlled trial of Giardia lamblia: Control strategies in day care centers	Duplicate data	Included in ECDC
Milne 2008	A small community model for the transmission of infectious diseases: comparison of school closure as an intervention in individual-based models of an influenza pandemic	Duplicate data	Included in Jackson 2014;
Williams 2001	Lice, nits, and school policy	Duplicate data	Included in Mumcuoglu 2006;

C2 Studies awaiting classification

This appendix documents the studies that potentially met the prespecified inclusion criteria for a systematic review on the effect exclusion measures for preventing infectious diseases in childcare settings, but they do not specifically measure the effect of exclusion measures (e.g., are incidence, transmission or prevalence related) (Table C.2), they were published in another language (Table C.3), or they were not able to be retrieved (Table C.4).

Table C.2 Characteristics of studies awaiting classification – indirect evidence

Study ID	Title	Exclusion Reasons	Reviewer Notes
ChoverLara 1999	[Outbreak of shigellosis in a lower-class district]	Case series; Prevalence/Incidence study	
Hayashi 2021	The statewide economic impact of child care-associated viral acute gastroenteritis infections	Economic analysis; Transmission study	Included for transmission model that may be relevant;
Enserink 2012	The KizSS network, a sentinel surveillance system for infectious diseases in day care centers: Study protocol	Observational cohort (no control group); Prevalence/Incidence study	Study protocol. Results?
Hu 2019	Manifestations of enterovirus D68 and high seroconversion among children attending a kindergarten	Observational cohort (no control group); Prevalence/Incidence study	Respiratory illness (COVID, SARS etc.)
Louhiala 1997	Day-care centers and diarrhea: A public health perspective	Observational cohort (no control group); Prevalence/Incidence study	
Thammasonthijarn 2021	Molecular epidemiological study of hand, foot, and mouth disease in a kindergarten-based setting in Bangkok, Thailand	Observational cohort (no control group); Prevalence/Incidence study; Transmission study	
Viboud 2004	Risk factors of influenza transmission in households	Observational cohort (no control group); Prevalence/Incidence study	
Turabelidze 2007	Communitywide outbreak of cryptosporidiosis in rural Missouri associated with attendance at child care centers	Observational cohort (no control group); RCT; Transmission study	
Cohen 2021	Asymptomatic transmission and high community burden of seasonal influenza in an urban and a rural community in South Africa, 2017-18 (PHIRST): a population cohort study	Observational cohort (no control group); Transmission study	

Study ID	Title	Exclusion Reasons	Reviewer Notes
AbdEl-Wahab 2016	Risky exposures and national estimate of HCV seroprevalence among school children in urban Egypt	Prevalence/Incidence study	
Amor 2015	A high prevalence of Strongyloides stercoralis found in a rural area of Amhara region, North-Western Ethiopia, by using a combination of three different diagnosis techniques	Prevalence/Incidence study	
Bravo 2003	Molluscum contagiosum: Diagnosis, pathogenesis and treatment	Prevalence/Incidence study	
Chen 2003	Helicobacter pylori and hepatitis a virus infection in school-aged children on two isolated neighborhood islands in Taiwan	Prevalence/Incidence study	
Chen 2011	Seroprevalence and severity of 2009 pandemic influenza a H1N1 in Taiwan	Prevalence/Incidence study	
Childers 2014	Prevalence of gastrointestinal parasites in children from Verã³n, a rural city of the Dominican Republic	Prevalence/Incidence study	
Cross 2009	Rates of common communicable illnesses in non-anaemic 12-24 month old South Island, New Zealand children	Prevalence/Incidence study	
Damtie 2021	Human Intestinal Parasitic Infections: Prevalence and Associated Risk Factors among Elementary School Children in Merawi Town, Northwest Ethiopia	Prevalence/Incidence study	
Eke 2016	Seroprevalence and Correlates of Hepatitis C Virus Infection in Secondary School Children in Enugu, Nigeria	Prevalence/Incidence study	
Ferguson 1995	Prospective study of diarrhoeal outbreaks in child long-daycare centres in western Sydney	Prevalence/Incidence study	
Fleming 1986	Prevention of Haemophilus influenzae type b infections in day care: a public health perspective	Prevalence/Incidence study	
Genobile 2004	An outbreak of shigellosis in a child care centre	Prevalence/Incidence study	
Horby 2012	The epidemiology of interpandemic and pandemic influenza in Vietnam, 2007-2010: the Ha Nam household cohort study I	Prevalence/Incidence study	
Kosar 2017	Prevalence and risk factors associated with intestinal parasitic infections among schoolchildren in Punjab, Pakistan	Prevalence/Incidence study	
Noyola 2005	Cytomegalovirus excretion in children attending day-care centers	Prevalence/Incidence study	
Peerbooms 2002	Nasopharyngeal carriage of potential bacterial pathogens related to day care attendance, with special reference to the molecular epidemiology of Haemophilus influenzae	Prevalence/Incidence study	
Puebla 2017	Prevalence of Giardia duodenalis among children from a central region of Cuba: molecular characterization and associated risk factors	Prevalence/Incidence study	
Qadri 1995	Asymptomatic salmonella, Shigella and intestinal parasites among primary school children in the eastern province	Prevalence/Incidence study	
Taheri 2011	Intestinal Parasitic Infection among School Children in South Khorasan Province, Iran	Prevalence/Incidence study	
Turki 2017	Prevalence of intestinal parasitic infection among primary school children in southern Iran	Prevalence/Incidence study	

Study ID	Title	Exclusion Reasons	Reviewer Notes
Voigt 2016	Cytomegalovirus Seroprevalence Among Children and Adolescents in Germany: Data From the German Health Interview and Examination Survey for Children and Adolescents (KiGGS), 2003-2006	Prevalence/Incidence study	
Yagupsky 1998	Acquisition, carriage, and transmission of pneumococci with decreased antibiotic susceptibility in young children attending a day care facility in southern Israel	Prevalence/Incidence study	
Yu 2019	Systematic review on the characteristics of acute gastroenteritis outbreaks caused by sapovirus	Prevalence/Incidence study	
Kaur 2021	COVID-19 Pandemic Impact on Respiratory Infectious Diseases in Primary Care Practice in Children	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.)	
Laursen 2018	Risks for upper respiratory infections in infants during their first months in day care included environmental and child-related factors	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.)	
Lessler 2009	Incubation periods of acute respiratory viral infections: a systematic review	Prevalence/Incidence study; Respiratory illness (COVID, SARS etc.)	
Cohen 2019	Burden and risk factors of Shigella sonnei shigellosis among children aged 0-59 months in hyperendemic communities in Israel	Prevalence/Incidence study; Risk Factor analysis	
Tegen 2021	Prevalence and Risk Factors Associated with Intestinal Parasitic Infection among Primary School Children in Dera District, Northwest Ethiopia	Prevalence/Incidence study; Risk Factor analysis	
Balegamire 2022	Prevalence, incidence, and risk factors associated with cytomegalovirus infection in healthcare and childcare worker: a systematic review and meta-analysis	Prevalence/Incidence study; Systematic review	
Bradley 2001	Child care and common communicable illnesses: Results from the national institute of child health and human development study of early child care	Prevalence/Incidence study; Transmission study	
Chu 2020	The Seattle Flu Study: A multiarm community-based prospective study protocol for assessing influenza prevalence, transmission and genomic epidemiology	Prevalence/Incidence study; Transmission study	
Davis 1986	Surveillance of communicable diseases in child day care settings	Prevalence/Incidence study; Transmission study	
Evans 1996	Outbreaks of infectious intestinal disease in schools and nurseries in England and Wales 1992 to 1994	Prevalence/Incidence study; Transmission study	
Farjo 2004	Diversity and sharing of Haemophilus influenzae strains colonizing healthy children attending day-care centers	Prevalence/Incidence study; Transmission study	
Huai 2010	A primary school outbreak of pandemic 2009 influenza A (H1N1) in China	Prevalence/Incidence study; Transmission study	
Joseph 2006	Cytomegalovirus as an occupational risk in daycare educators	Prevalence/Incidence study;	Population – Staff at childcare

Study ID	Title	Exclusion Reasons	Reviewer Notes
		Transmission study	centres;
Korona-Glowniak 2011	Upper respiratory colonization by Streptococcus pneumoniae in healthy pre-school children in south-east Poland	Prevalence/Incidence study; Transmission study	
Lin 2000	Current seroprevalence of hepatitis A virus infection among kindergarten children and teachers in Taiwan	Prevalence/Incidence study; Transmission study	
Peled 2002	Risk of exposure to hepatitis A virus among day-care workers in Israel: Implications for preventive measures	Prevalence/Incidence study; Transmission study	
Tourdjman 2012	Duration of Shedding and Secondary Household Transmission of Shiga Toxin-Producing Escherichia coli O26 During an Outbreak in a Childcare Center, Oregon, October-December 2010	Prevalence/Incidence study; Transmission study	
GrayDavis 1989	Horizontal transmission of hepatitis B virus	Published prior to 2000; Transmission study	
Ai 2021	Study of Risk Factors for Total Attack Rate and Transmission Dynamics of Norovirus Outbreaks, Jiangsu Province, China, From 2012 to 2018	Risk Factor analysis; Transmission study	
Mousa 2021	Social Contact Patterns and Implications for Infectious Disease Transmission: A Systematic Review and Meta-Analysis of Contact Surveys	Systematic review; Transmission study	
Silverberg 2019	Pediatric molluscum: an update	Systematic review; Transmission study	
Adler 1988	Molecular epidemiology of cytomegalovirus: Viral transmission among children attending a day care center, their parents, and caretakers	Transmission study	
Ali 2013	Transmission dynamics of the 2009 influenza A (H1N1) pandemic in India: the impact of holiday-related school closure	Transmission study	
Alves 2009	Prospective study of potential sources of Streptococcus mutans transmission in nursery school children	Transmission study	
BÃ©gin 1983	[Not Available]	Transmission study	
BaleJr 1999	Cytomegalovirus transmission in child care homes	Transmission study	
Boreham 1986	Giardiasis in Mount Isa, north-west Queensland	Transmission study	
CogoSimÃ£o 2020	53ongoli e disseminaÃ§Ã£o de micro-organismos no cuidar e educar	Transmission study	
Duong 2015	An outbreak of influenza A(H1N1)pdm09 virus in a primary school in Vietnam	Transmission study	
Ekanem 1983	Transmission dynamics of enteric bacteria in day-care centers	Transmission study	
Fukuda 1983	An epidemic of group A, type 4 streptococcal carriers among school children and their desk location at school	Transmission study	
Hutto 1985	Epidemiology of cytomegalovirus infections in young children: day care vs. home care	Transmission study	

Study ID	Title	Exclusion Reasons	Reviewer Notes
Ihekweazu 2010	Outbreaks of serious pneumococcal disease in closed settings in the post-antibiotic era: A systematic review	Transmission study	
Jackson 2016	The Relationship between School Holidays and Transmission of Influenza in England and Wales	Transmission study	Modelling analysis;
Johnstone-Robertson 2011	Social mixing patterns within a South African township community: Implications for respiratory disease transmission and control	Transmission study	
Kiti 2019	Study design and protocol for investigating social network patterns in rural and urban schools and households in a coastal setting in Kenya using wearable proximity sensors	Transmission study	
Kraay 2018	Fomite-mediated transmission as a sufficient pathway: A comparative analysis across three viral pathogens 11 Medical and Health Sciences 1117 Public Health and Health Services	Transmission study	
Kushwaha 2014	Outbreak of influenza (H1N1) amongst children in a residential school	Transmission study	
LeeFord-Jones 1996	Cytomegalovirus infections in Toronto child-care centers: A prospective study of viral excretion in children and seroconversion among day-care providers	Transmission study	
Leino 2008	Clustering of serotypes in a longitudinal study of Streptococcus pneumoniae carriage in three day care centres	Transmission study	
Lemp 1984	The relationship of staff to the incidence of diarrhea in day-care centers	Transmission study	
Lin 2021	An Increased Risk of School-Aged Children with Viral Infection among Diarrhea Clusters in Taiwan during 2011-2019	Transmission study	
Metcalf 2009	Seasonality and comparative dynamics of six childhood infections in pre-vaccination Copenhagen	Transmission study	
Nguyen 2009	Risk of latent tuberculosis infection in children living in households with tuberculosis patients: A cross sectional survey in remote northern Lao People’s Democratic Republic	Transmission study	
Nukiwa-Souma 2012	Influenza transmission in a community during a seasonal influenza a(H3N2) outbreak (2010-2011) in Mongolia: A community-based prospective cohort study	Transmission study	
Pessoa 2013	Comparative analysis of Streptococcus pneumoniae transmission in Portuguese and Finnish day-care centres	Transmission study	
Pickering 1986	Acute infectious diarrhea among children in day care: epidemiology and control	Transmission study	
Qian 2022	Association of pneumococcal carriage in infants with the risk of carriage among their contacts in Nha Trang, Vietnam: A nested cross-sectional survey	Transmission study	
Raymond 2002	Factors influencing Streptococcus pneumoniae carriage	Transmission study	
Reichler 1992	The spread of multiply resistant Streptococcus pneumoniae at a day care center in Ohio	Transmission study	
Salathe 2010	A high-resolution human contact network for infectious disease transmission	Transmission study	
Santermans 2015	The social contact hypothesis under the assumption of endemic equilibrium: Elucidating the transmission potential of VZV in Europe	Transmission study	

Study ID	Title	Exclusion Reasons	Reviewer Notes
Schlinkmann 2018	Transmission of respiratory and gastrointestinal infections in German households with children attending child care	Transmission study	
White 2008	Rotavirus within day care centres in Oxfordshire, UK: characterization of partial immunity	Transmission study	
Wood 2012	Indoor social networks in a South African township: Potential contribution of location to tuberculosis transmission	Transmission study	
Wu 2010	An Outbreak of Coxsackievirus A16 Infection: Comparison With Other Enteroviruses in a Preschool in Taipei	Transmission study	
Xiao 2016	Clustering of contacts relevant to the spread of infectious disease	Transmission study	
Yaari 2016	Model-based reconstruction of an epidemic using multiple datasets: Understanding influenza A/H1N1 pandemic dynamics in Israel	Transmission study	
Yu 2001	Varicella transmission in two samples of children with different social behaviour in the State of Sao Paulo, Brazil	Transmission study	
Saunders 2020	A household-level score to predict the risk of tuberculosis among contacts of patients with tuberculosis: a derivation and external validation prospective cohort study	Transmission study	Observational cohort (no control group)

Table C.3 Characteristics of studies awaiting classification – studies published in languages other than English

STUDY ID	Title	Exclusion reason	Notes
Britkova 2021	The influence of the self-isolation regime on the prevalence of infectious diseases in children living in urban and rural areas	Not available in English	Retrospective cohort study

Table C.4 Characteristics of studies awaiting classification – studies unable to be retrieved

STUDY ID	Title	Exclusion reason	Notes
Mayanskiy 2015	Rotavirus infection: epidemiology, pathology, vaccination	Full text not available	Observational study

C3 Ongoing studies

This appendix documents the studies that met the prespecified inclusion criteria for a systematic review on the effect of exclusion measures for preventing infectious diseases in childcare settings but outcome data from the study is not yet available.

Table C.5 Overview of ongoing studies

Study ID	Title	Exclusion Reasons	Reviewer Notes
Besnier 2019	Which public health interventions are effective in reducing morbidity, mortality and health inequalities from infectious diseases amongst children in low-income and middle-income countries (LMICs): Protocol for an umbrella review	Ongoing study	
Donaldson 2022	School Attendance Registers for the Syndromic Surveillance of Infectious Intestinal Disease in UK Children: Protocol for a Retrospective Analysis	Ongoing study	Observational cohort (no control group)

Appendix D Critical appraisal of included studies

This appendix documents the quality of systematic reviews and risk of bias of primary studies that met the prespecified inclusion criteria for a systematic review on the effect of exclusion measures for preventing the spread of infectious diseases in childhood education and care services.

D1 Gastrointestinal disease

The quality of systematic reviews is shown in Table D.1.

D1.1 Systematic reviews

Table D.1 AMSTAR quality of included systematic reviews: Gastrointestinal diseases

Review ID	Czumbel 2018
1. Did the research questions and inclusion criteria for the review include the components of the PICO?	YES
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	YES
3. Did the review authors explain their selection of the study designs for inclusion in the review?	YES
4. Did the review authors use a comprehensive literature search strategy?	PARTIAL YES
5. Did the review authors perform study selection in duplicate?	YES
6. Did the review authors perform data extraction in duplicate?	YES
7. Did the review authors provide a list of excluded studies and justify the exclusions?	NO
8. Did the review authors describe the included studies in adequate detail?	YES
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	NO
10. Did the review authors report on the sources of funding for the studies included in the review?	NO
11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?	No meta-analysis conducted
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No meta-analysis conducted
13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	YES
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	YES
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	No meta-analysis conducted
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	YES
Overall QUALITY of the review	Moderate

Source: AMSTAR-2 (4)

D1.2 Primary studies

The risk of bias for each item in the included studies for gastrointestinal diseases is shown in Table D.2.

Table D.2 Risk of bias of included primary studies: Gastrointestinal diseases

Domain	Chen 2016		Li 2021	
	Rating	Comments	Rating	Comments
Were the two groups similar and recruited from the same population?	Yes	Cohort from one school	Yes	Data collected from the same electronic healthcare records at the Children’s Hospital, Zhejiang in 2019 and 2020
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes	Modelling study – same group experienced each intervention	N/A	
Were confounding factors identified?	Unclear		Unclear	
Were strategies to deal with confounding factors stated?	Unclear		Unclear	
Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	N/A		N/A	
Were the outcomes measured in a valid and reliable way?	Yes	Total attack rate, cumulative cases of norovirus and duration outbreak recorded	Yes	Data collected in 2020 was compared with those acquired in 2019 during the same period
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Yes	School closure/isolation period 7-10 days	Yes	Annual data collection between 2019 and 2020
Was follow up complete, and if not, were the reasons loss to follow up described and explored?	Yes	N/A	Yes	No missing data
Were strategies to address incomplete follow up utilized?	N/A	N/A	N/A	
Was appropriate statistical analysis used?	Yes		Yes	The results were analysed using SPSS software. χ^2 test was used to determine statistical differences. Two-tailed P-values < 0.05 were statistically significant.
Overall appraisal	Include	Moderate risk	Include	Moderate risk

Source: JBI Manual (7)

D2 Influenza-like illnesses

D2.1 Systematic reviews

The quality of each included systematic review is summarised in Table D.3.

Table D.3 AMSTAR Quality: Influenza-like illness

Review ID	Bin Nafisah 2018	Czumbel 2018	Fong 2020	Jackson 2013	Jackson 2014	Rashid 2015	Spielberger 2021	Talic 2021
1. Did the research questions and inclusion criteria for the review include the components of the PICO?	YES	YES	YES	NO	YES	NO	YES	YES
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	NO	YES	YES	PARTIAL YES	YES	NO	NO	NO
3. Did the review authors explain their selection of the study designs for inclusion in the review?	YES	YES	YES	YES	YES	YES	YES	YES
4. Did the review authors use a comprehensive literature search strategy?	#N/A	PARTIAL YES	YES	YES	PARTIAL YES	YES	PARTIAL YES	PARTIAL YES
5. Did the review authors perform study selection in duplicate?	YES	YES	YES	YES	YES	YES	YES	YES
6. Did the review authors perform data extraction in duplicate?	YES	YES	YES	YES	YES	YES	NO	YES
7. Did the review authors provide a list of excluded studies and justify the exclusions?	NO	NO	NO	NO	NO	NO	NO	NO
8. Did the review authors describe the included studies in adequate detail?	NO	YES	YES	PARTIAL YES	YES	PARTIAL YES	YES	YES
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	NO	NO	NO	#N/A	NO	#N/A	NO	NO

Review ID	Bin Nafisah 2018	Czumbel 2018	Fong 2020	Jackson 2013	Jackson 2014	Rashid 2015	Spielberger 2021	Talic 2021
10. Did the review authors report on the sources of funding for the studies included in the review?	NO	NO	NO	NO	NO	NO	YES	NO
11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?	YES	No meta-analysis conducted	YES	YES	No meta-analysis conducted	No meta-analysis conducted	No meta-analysis conducted	NO
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	#N/A	No meta-analysis conducted	YES	YES	No meta-analysis conducted	No meta-analysis conducted	No meta-analysis conducted	NO
13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	YES	YES	YES	YES	YES	#N/A	#N/A	NO
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	YES	YES	YES	YES	YES	YES	#N/A	YES
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	NO	No meta-analysis conducted	YES	YES	No meta-analysis conducted	No meta-analysis conducted	No meta-analysis conducted	YES
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	YES	YES	YES	YES	YES	YES	YES	YES
Overall QUALITY of the review	Low	Moderate	Moderate	Low	Moderate	Low	Moderate	Moderate

Source: AMSTAR-2 (4)

D2.2 Primary studies

The risk of bias for each item in the included studies for influenza-like illnesses is described in Table D.4 and Table D.5. The cluster-RCT (Stebbins 2010) was judged to have overall some concerns of bias arising due to the differences between groups at baseline and the use of subjective outcomes where participants were aware of their treatment allocation.

Table D.4 Risk of bias of included RCT

Study ID	Stebbins 2010		
	Signalling questions	Judgement	Comments
Bias arising from the randomisation process	1.1 Was the allocation sequence random?	Y	Cluster randomised
	1.2 Was the allocation sequence concealed until participants were enrolled and assigned to interventions?	Y	Random number generator
	1.3 Did baseline differences between intervention groups suggest a problem with the randomisation process?	N	The groups were not statistically significantly different at baseline
	<i>Risk-of-bias judgement</i>	<i>Some concerns</i>	
Bias due to deviations from intended interventions (effect of assignment to intervention [ITT])	2.1. Were participants aware of their assigned intervention during the trial?	Y	The nature of the intervention means participants were aware of their group assignment.
	2.2. Were carers and people delivering the interventions aware of participants' assigned intervention during the trial?	Y	The nature of the intervention means carers and people delivering the intervention were aware of the group assignment.
	2.3. If Y/PY/NI to 2.1 or 2.2: Were there deviations from the intended intervention that arose because of the trial context?	N	There were no deviations or changes to intervention groups reported.
	2.4 If Y/PY to 2.3: Were these deviations likely to have affected the outcome?	NA	
	2.5. If Y/PY/NI to 2.4: Were these deviations from intended intervention balanced between groups?	NA	
	2.6 Was an appropriate analysis used to estimate the effect of assignment to intervention?	Y	ITT used
	2.7 If N/PN/NI to 2.6: Was there potential for a substantial impact (on the result) of the failure to analyse participants in the group to which they were randomized?	NA	
	<i>Risk-of-bias judgement</i>	<i>Low</i>	
Bias due to missing outcome data	3.1 Were data for this outcome available for all, or nearly all, participants randomized?	PY	Data available for all, or nearly all, participants randomised.

Study ID	Stebbins 2010		
	Signalling questions	Judgement	Comments
	3.2 If N/PN/NI to 3.1: Is there evidence that the result was not biased by missing outcome data?	NA	
	3.3 If N/PN to 3.2: Could missingness in the outcome depend on its true value?	NA	
	3.4 If Y/PY/NI to 3.3: Is it likely that missingness in the outcome depended on its true value?	NA	
	<i>Risk-of-bias judgement</i>	<i>Low</i>	
Bias in measurement of the outcome	4.1 Was the method of measuring the outcome inappropriate?	N	There is no evidence to suggest the method of measuring the outcome was inappropriate
	4.2 Could measurement or ascertainment of the outcome have differed between intervention groups?	N	Outcomes were measured using the same instruments and time periods between the intervention and control groups.
	4.3 If N/PN/NI to 4.1 and 4.2: Were outcome assessors aware of the intervention received by study participants?	Y	Participants were not masked to treatment allocation
	4.4 If Y/PY/NI to 4.3: Could assessment of the outcome have been influenced by knowledge of intervention received?	PN	Participants and investigators were aware of the intervention they were receiving, this is unlikely to have effected outcomes due to binary nature of outcomes.
	4.5 If Y/PY/NI to 4.4: Is it likely that assessment of the outcome was influenced by knowledge of intervention received?	NA	
	<i>Risk-of-bias judgement</i>	<i>Some concerns</i>	
Bias in selection of the reported result	5.1 Were the data that produced this result analysed in accordance with a pre-specified analysis plan that was finalized before unblinded outcome data were available for analysis?	Y	Methods explain analysis plan
	Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.2 ... multiple eligible outcome measurements (e.g. scales, definitions, time points) within the outcome domain?	N	There is clear evidence through examination of the results that all eligible reported results for the outcome domain correspond to all intended outcome measurements.
	Is the numerical result being assessed likely to have been selected, on the basis of the results, from... 5.3 ... multiple eligible analyses of the data?	N	There is clear evidence through examination of the results that all eligible reported results for the outcome domain correspond to all intended outcome measurements.
	<i>Risk-of-bias judgement</i>	<i>Low</i>	
Overall risk of bias		Some concerns	The study has plausible bias that raises some doubt about the results.

Source: Cochrane RoB 2.0 (5, 6)

Table D.5 Risk of bias of including primary studies: Influenza-like illnesses

Domain	Burns 2021		Fumanelli 2016		Murillo- Zamora 2020		Uchida 2012	
	Rating	Comments	Rating	Comments	Rating	Comments	Rating	Comments
Were the two groups similar and recruited from the same population?	Yes	Cohort comprises student population	Yes	Cohort comprises student population	N/A	Single cohort monitored over time	Yes	Cohort comprises student population
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes	All groups exposed to model	Yes	All groups exposed to model	N/A		Yes	All groups exposed school or class closures
Were confounding factors identified?	Yes	Simulated the epidemic 500 times per scenario to account for possible difference between schools and seasons	Yes	Model assumptions stated in detail	Unclear		Yes	Continuous variables including grade, number of patients and closure duration stated
Were strategies to deal with confounding factors stated?	Yes	As above	Yes	In order to ensure stability of findings, all presented results were obtained by averaging over 50 stochastic realizations of the same experiment.	No		Yes	For categorical variables, the percentages of patients in each category were calculated and the proportions were compared using the Chi-squared test
Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	Unclear		Unclear		Yes	Retrospective cohort study	Unclear	

Domain	Burns 2021		Fumanelli 2016		Murillo- Zamora 2020		Uchida 2012	
	Rating	Comments	Rating	Comments	Rating	Comments	Rating	Comments
Were the outcomes measured in a valid and reliable way?	Yes	Outcomes measured using normally distributed values for parameters such as the start day in the year, contact rate between cohorts and others, and reported the median and the interquartile ranges	Yes	All results presented in the main text are evaluated right after the end of the period during which application of closure policies is possible	Yes	Assessed average % of change in overall daily influenza and age stratified incidence rates	Yes	A Poisson regression model was used to analyse the effects of several factors on H1N1 cases after the resumption of classes
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Unclear		Unclear		Yes	2019-2020	Yes	Data collected over four months
Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Unclear		Unclear		N/A		Yes	No missing data
Were strategies to address incomplete follow up utilized?	Unclear		Unclear		N/A		N/A	
Was appropriate statistical analysis used?	Yes	Statistical analysis used the RStudio Integrated Development	Yes	<i>P-values</i> were calculated using the Spearman correlation test	Yes	95% CI and average % change calculated – Poisson regression models employed	Yes	<i>P-values</i> were calculated using Poisson regression model
Overall risk of bias	Include	Moderate risk	Include	Moderate risk	Include	Moderate risk	Include	Low risk

Source: JBI Manual (7)

D3 Rash

D3.1 Systematic reviews

The quality of each included systematic review is summarised in Table D.6.

Table D.6 AMSTAR Quality: Rash

Review ID	Chan 2017	Czumbel 2018
1. Did the research questions and inclusion criteria for the review include the components of the PICO?	NO	YES
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	NO	YES
3. Did the review authors explain their selection of the study designs for inclusion in the review?	YES	YES
4. Did the review authors use a comprehensive literature search strategy?	YES	PARTIAL YES
5. Did the review authors perform study selection in duplicate?	YES	YES
6. Did the review authors perform data extraction in duplicate?	YES	YES
7. Did the review authors provide a list of excluded studies and justify the exclusions?	NO	NO
8. Did the review authors describe the included studies in adequate detail?	YES	YES
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	#N/A	NO
10. Did the review authors report on the sources of funding for the studies included in the review?	NO	NO
11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?	YES	No meta-analysis conducted
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	#N/A	No meta-analysis conducted
13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	#N/A	YES
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	YES	YES
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	NO	No meta-analysis conducted
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	YES	YES
Overall QUALITY of the review	Low	Moderate

Source: AMSTAR-2 (4)

D3.2 Primary studies

The risk of bias for each item in the included studies for rash is described in Table D.7.

Table D.7 Risk of bias of including primary studies: Rash

Domain	Getz 2016	
	Rating	Comments
Were the two groups similar and recruited from the same population?	Yes	Cohort comprises student population
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes	All groups exposed to model
Were confounding factors identified?	Yes	Model assumptions stated in detail
Were strategies to deal with confounding factors stated?	Yes	Spatial model was run a 100 times for two cases, the average and SD of this was reported
Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	Unclear	
Were the outcomes measured in a valid and reliable way?	Yes	Average and SD reported
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Not applicable	
Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Not applicable	
Were strategies to address incomplete follow up utilized?	Not applicable	
Was appropriate statistical analysis used?	Unclear	Only average and SD calculated
Overall appraisal	Include	Moderate risk

Source: JBI Manual(7)

D4 Other infectious diseases

D4.1 Systematic reviews

The quality of each included systematic review is summarised in Table D.8.

Table D.8 AMSTAR Quality: Other infectious diseases

Review ID	Czumbel 2018
1. Did the research questions and inclusion criteria for the review include the components of the PICO?	YES
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	YES
3. Did the review authors explain their selection of the study designs for inclusion in the review?	YES
4. Did the review authors use a comprehensive literature search strategy?	PARTIAL YES
5. Did the review authors perform study selection in duplicate?	YES
6. Did the review authors perform data extraction in duplicate?	YES
7. Did the review authors provide a list of excluded studies and justify the exclusions?	NO
8. Did the review authors describe the included studies in adequate detail?	YES
9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	NO
10. Did the review authors report on the sources of funding for the studies included in the review?	NO
11. If meta-analysis was performed, did the review authors use appropriate methods for statistical combination of results?	No meta-analysis conducted
12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	No meta-analysis conducted
13. Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	YES
14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	YES
15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	No meta-analysis conducted
16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	YES
Overall QUALITY of the review	Moderate

Source: AMSTAR-2 (4)

D4.2 Primary studies

The risk of bias for each item in the included studies for other infectious diseases is described in Table D.9.

Table D.9 Risk of bias of including primary studies: Other infectious diseases

Domain	Högberg 2004		McNeil 2021	
	Rating	Comments	Rating	Comments
Were the two groups similar and recruited from the same population?	Yes	Cohort comprises day care children	Unclear	Data from surveillance studies ongoing at Texas children’s hospital – 2017-2020 overtime, cohorts differ
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes	Children included based on epidemiological result	N/A	
Were confounding factors identified?	Yes	Baseline characteristics comparable	Unclear	
Were strategies to deal with confounding factors stated?	Unclear		No	
Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	Yes	At the baseline screen, additional PNSP cases were found in 14 DCC groups (11 in study area A and 3 in study area B). These 14 groups were included in the intervention study.	N/A	
Were the outcomes measured in a valid and reliable way?	Yes	The effect of the intervention was assessed both at individual level (RR for becoming a PNSP-carrier during the follow-up period in study area B compared to study area A), and at group level by calculating the attributable fraction among new carriers during the follow-up period.	Yes	incidence rates from 2017 to 2019 were examined using linear regression compared with incidence rates in 2020 using χ^2 for trend and reported as <i>P-values</i> and relative risk with 95% confidence intervals.
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Yes	Follow up time ranged from 1-10 weeks	Yes	2017-2020
Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Yes	No missing data	N/A	
Were strategies to address incomplete follow up utilized?	N/A		N/A	
Was appropriate statistical analysis used?	Unclear		Yes	Incidence over time
Overall risk of bias	Include	Moderate risk	Include	Moderate risk

Source: JBI Manual (7)

Appendix E Characteristics of included studies

This appendix documents the data extracted from studies that met the prespecified inclusion criteria for a systematic review on the effect of exclusion measures to preventing the transmission of infectious diseases in childcare settings. All extracted data is presented, including that which was not synthesised in the main report. The studies are divided by the publication type and disease category.

E1 Various

STUDY DETAILS: Czumbel 2018			
Citation			
Ida Czumbel, Chantal Quinten, Pierluigi Lopalco, Jan C. Semenza. Management and control of communicable diseases in schools and other childcare settings: systematic review on the incubation period and period of infectiousness. BMC Infectious Diseases (2018) 18:199			
Affiliation/Source of funds			
Author affiliated with the European Centre for Disease Control or the University of Pisa, Italy Details on funding or potential conflicts of interest not provided. The study was funded by ECDC under the procurement The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Systematic review and meta-analysis of observational studies	I	United States, United Kingdom, Finland, Spain, Japan, China, Guinea-Bissau, Sweden, Republic of Guatemala, Australia, the Netherlands, Peru, Chile, Italy, Germany, India, Republic of the Union of Myanmar, Denmark, People's Republic of Bangladesh, Thailand, Norway, Taiwan, Canada, France, Malaysia, Trinidad, Kenya, Hong Kong	Households, children's homes, hospital, schools, nurseries, day care centres, community parks
Prognostic factor		Comparator	
Incubation period Period of infectiousness Duration of shedding Setting specific exclusion period		NA	
Population characteristics			
Children aged from 1 month to 18 years			
Length of follow-up		Outcomes measured	
PubMed and Medline databases were searched for citations between 1980 and June 2015. CDC, WHO and the American Academy of Paediatricians Red Book were used to search for reference and relevant cited articles in October 2014.		Definition of the incubation, infectiousness, duration of shedding and exclusion periods as the number of days from a defined point in time until another defined point in time	
INTERNAL VALIDITY			
Overall quality			
Rating: High No or one non-critical weakness – the systematic review has one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review. The overall risk of bias for included studies was not assessed by the review authors but study limitations are listed and discussed in the extraction tables.			
RESULTS:			

STUDY DETAILS: Czumbel 2018			
Exclusion measures			
Measles Grey literature: CDC, RB	Information on exclusion was available mainly in the grey literature. It states an exclusion of 4–5 days from onset of rash.		
Mumps Grey literature: CDC	Information on exclusion was found until 5 days of onset of parotitis.		
Rubella Grey literature: CDC, WHO	Data sources suggest an exclusion period of 5–6 days after onset of rash		
Varicella N = 2536 (2 studies) Ma 2004 Moore 1991	Two studies reporting on exclusion were conducted in school outbreaks where children were excluded from school for 7 days after the onset of symptoms or until all lesions were crusted. The exclusion seemed not to have been effective since most transmission already occurred after exposure to prodromal cases.		
Meningococcal disease Grey literature: CDC	The literature revealed that the exclusion should start as soon as the disease is suspected and for at least 48 h from the start of treatment		
Pertussis N = 2321 (1 study) Kwantes 1983 Grey literature: R2001, RB, CDC	The authors of the outbreak investigation study suggest that due to the long duration of shedding, exclusion from school for 3 weeks will not be effective. In other data sources, exclusion for pertussis for 5 days was described for patients receiving a full course of antimicrobial treatment		
Hepatitis A N = NR (1 study) Reid 1986 Grey literature: RB	Exclusion from school until severe symptoms persist combined with application of hygienic measure was found useful, while the Red Book recommends one week of exclusion after onset of jaundice.		
Seasonal influenza N = NR (1 citation) Aronson 2013	No studies reporting on the exclusion period were identified. According to one source, there is no need for exclusion unless the child is unable to participate in lessons.		
Transmission measures	Incubation period	Period of infectiousness	Duration of shedding
Measles N = NR (7 studies) Gahr 2014 Lempriere 1931 Parker 2006 Paunio 1997 Perucha 2006 Shiraishi 1990 Stillerman 1944	Range of between 9 and 20 days, with a median value of around 13 days. Approx. 2 days shorter if vaccinated	4 days before and 4 days after the onset of rash.	Ranged from between 2 days before to 6 days after the onset of rash

STUDY DETAILS: Czumbel 2018

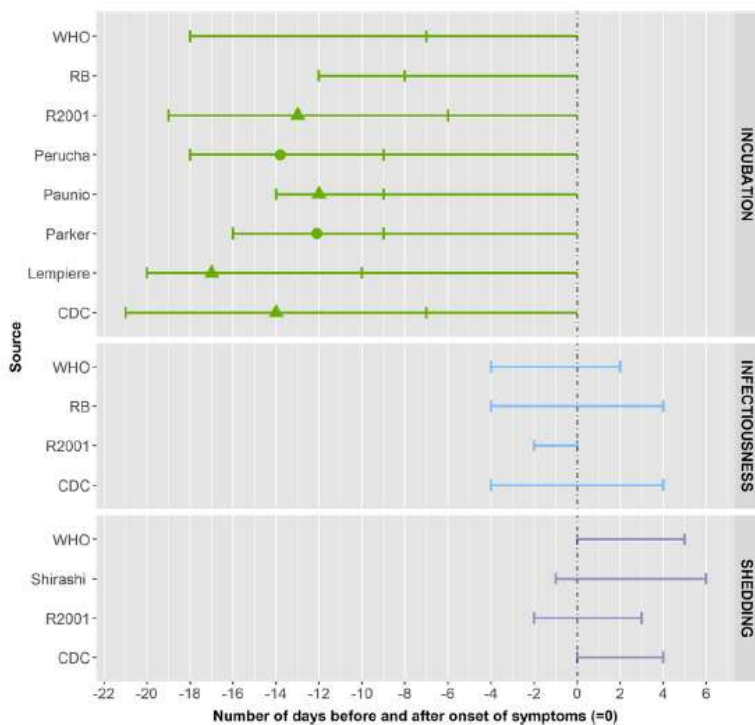


Fig. 2 Summary measures for the incubation period, infectiousness and shedding period for measles by source. Legend: ▲: mean, ●: median, —|— minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001)

Mumps N = NR (2 studies) Brunell 1968 Henle 1948	16–18 days	Range from between 7 days before to 11–14 days after parotitis onset.	Ranged from 2–6 days prior to the onset of symptoms and up to 4 days after the onset of parotitis
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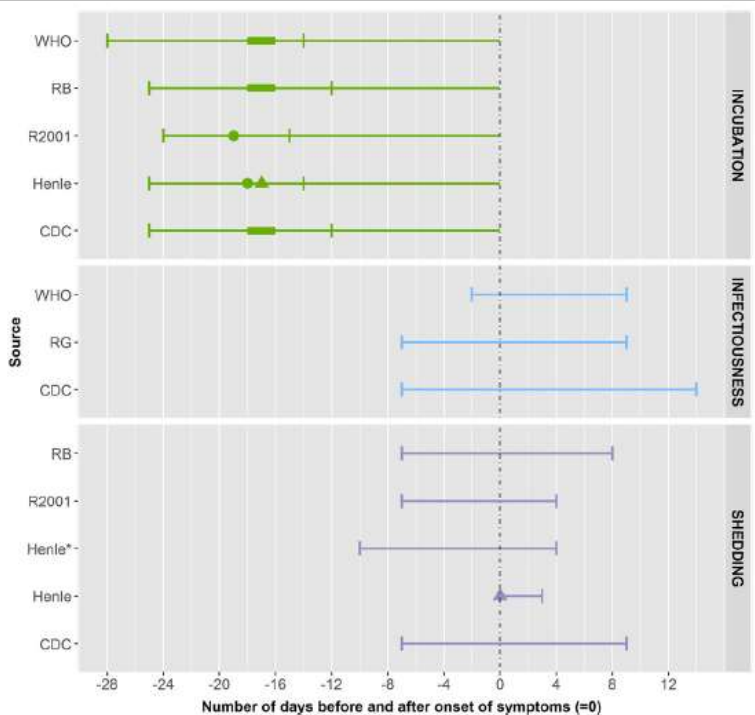


Fig. 3 Summary measures for the incubation period, infectiousness and shedding period for mumps by source. Legend: ▲: mean, ●: median, interval [quantitative measure around the central tendency (mean or medium) or qualitative (usually) measure as provided by the authors], —|— minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001), RG: The 2009 'Managing infectious diseases in child care and school. A quick reference guide'

STUDY DETAILS: Czumbel 2018

Rubella N = NR (2 studies) Sever 1965 Zhao 1992	Ranged between 13 and 24 days	NR	13 days before the onset of rash and persisted for up to 6 days after onset 7 days before up to 14 days after onset of rash
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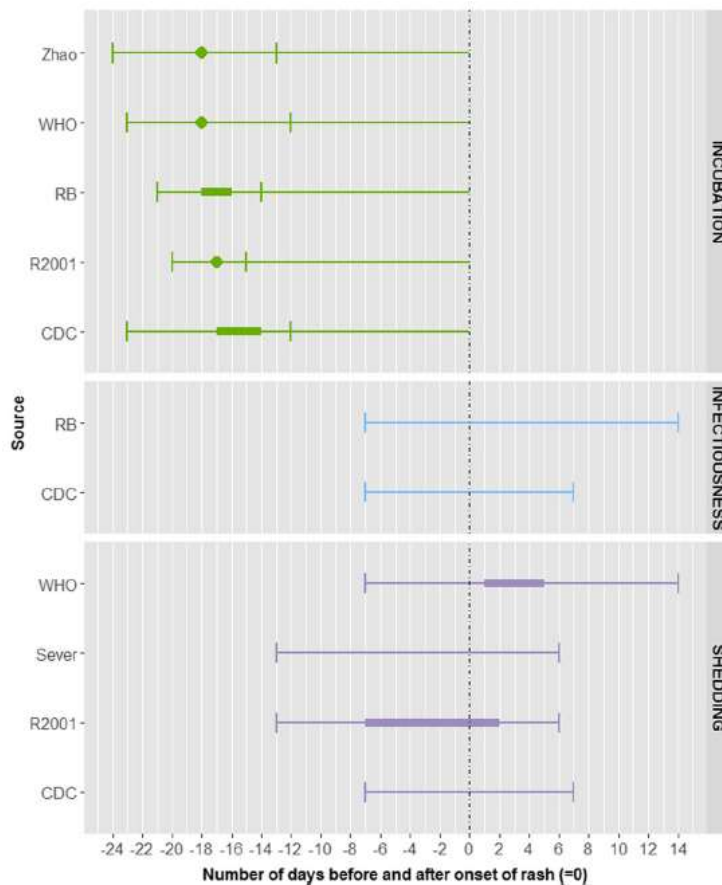


Fig. 4 Summary measures for the incubation period, infectiousness and shedding period for rubella by source. Legend: ●: median, interval [quantitative measure around the central tendency (mean or median) or qualitative (usually) measure as provided by the authors], — minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001)

Varicella N = NR (6 studies) Asano 1985 Gordon 1929 Ma 2006 Moore 1991 Ozaki 1996 Poulsen 2005	Between 10 and 21 days with a mean/median of around 14–16 days depending on the contacts	Up to 5 days after the onset of symptoms	NR
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STUDY DETAILS: Czumbel 2018

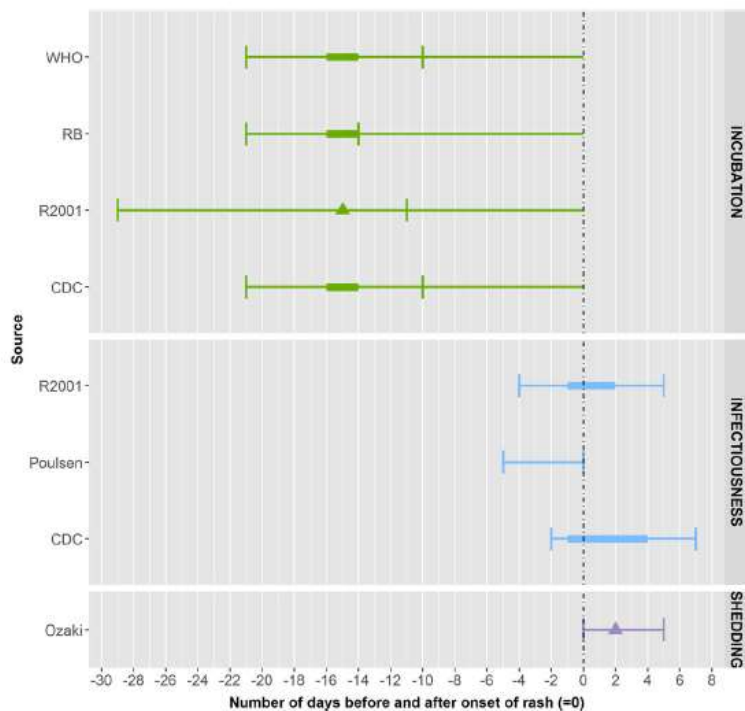


Fig. 5 Summary measures for the incubation period, infectiousness and shedding period for varicella by source. Legend: ▲: mean, interval [quantitative measure around the central tendency (mean or medium) or qualitative (usually) measure as provided by the authors], —: minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001)

<p>Meningococcal disease N = NR (0 studies) Grey literature: CDC</p>	<p>Between 1 and 10 days, most often between 1 and 4 days.</p>	<p>1–2 days after the start of treatment</p>	<p>1–2 days after the start of treatment and in untreated patients the median duration of shedding was 9 months</p>
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STUDY DETAILS: Czumbel 2018

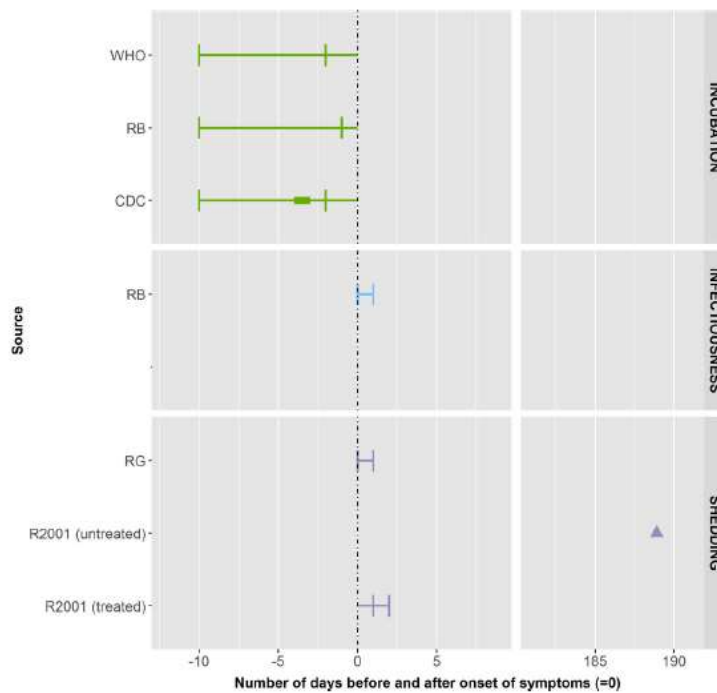


Fig. 6 Summary measures for the incubation period, infectiousness and shedding period for meningitis by source. Legend: ▲: mean, ●: median, interval [quantitative measure around the central tendency (mean or median) or qualitative (usually) measure as provided by the authors], —: minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001), RG: The 2009 'Managing infectious diseases in childcare and school. A quick reference guide'

<p>Pertussis N = NR (2 studies) Kwantes 1983 Stocks 1993</p>	<p>3 to 7 days with an unknown upper limit 4 and 21 days, usually 7–10 days</p>	<p>Most contagious in the first two weeks after cough onset</p>	<p>Up to 4 to 7 weeks after illness onset Less than 7 days after onset of symptoms in those who were treated and 2–6 weeks in those who were untreated.</p>
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STUDY DETAILS: Czumbel 2018

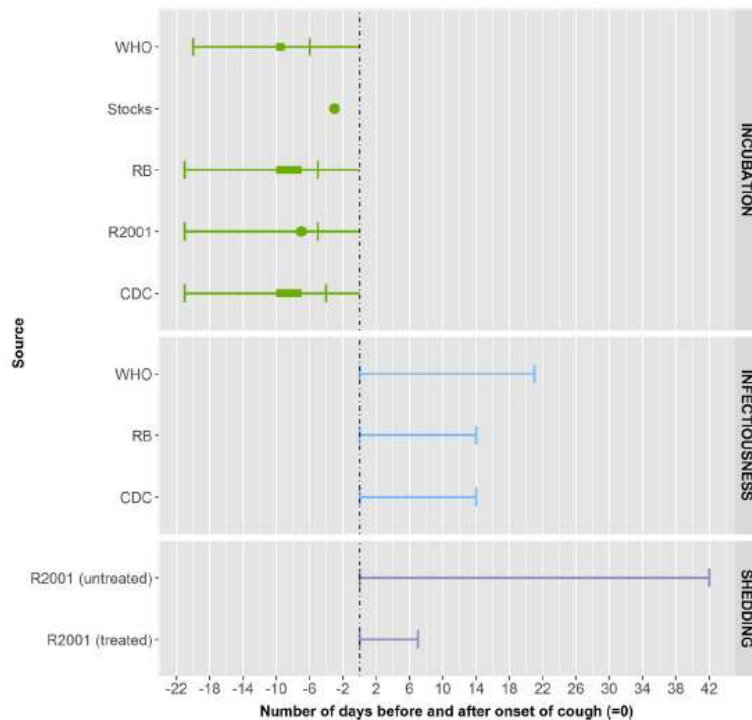


Fig. 7 Summary measures for the incubation period, infectiousness and shedding period for pertussis by source. Legend: ●: median, — interval [quantitative measure around the central tendency (mean or medium) or qualitative (usually) measure as provided by the authors], — minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001)

Hepatitis A
N = NR (3 studies)
Krugman 1987
Brodribb 1952
Reid 1986

Between 30 and 125 days,
with a median of 37 days
20– 32 days

NR

NR

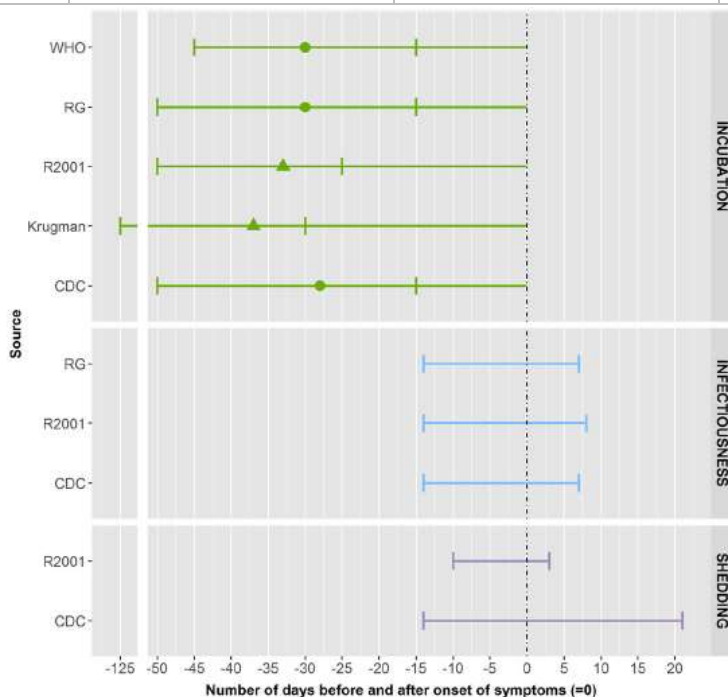
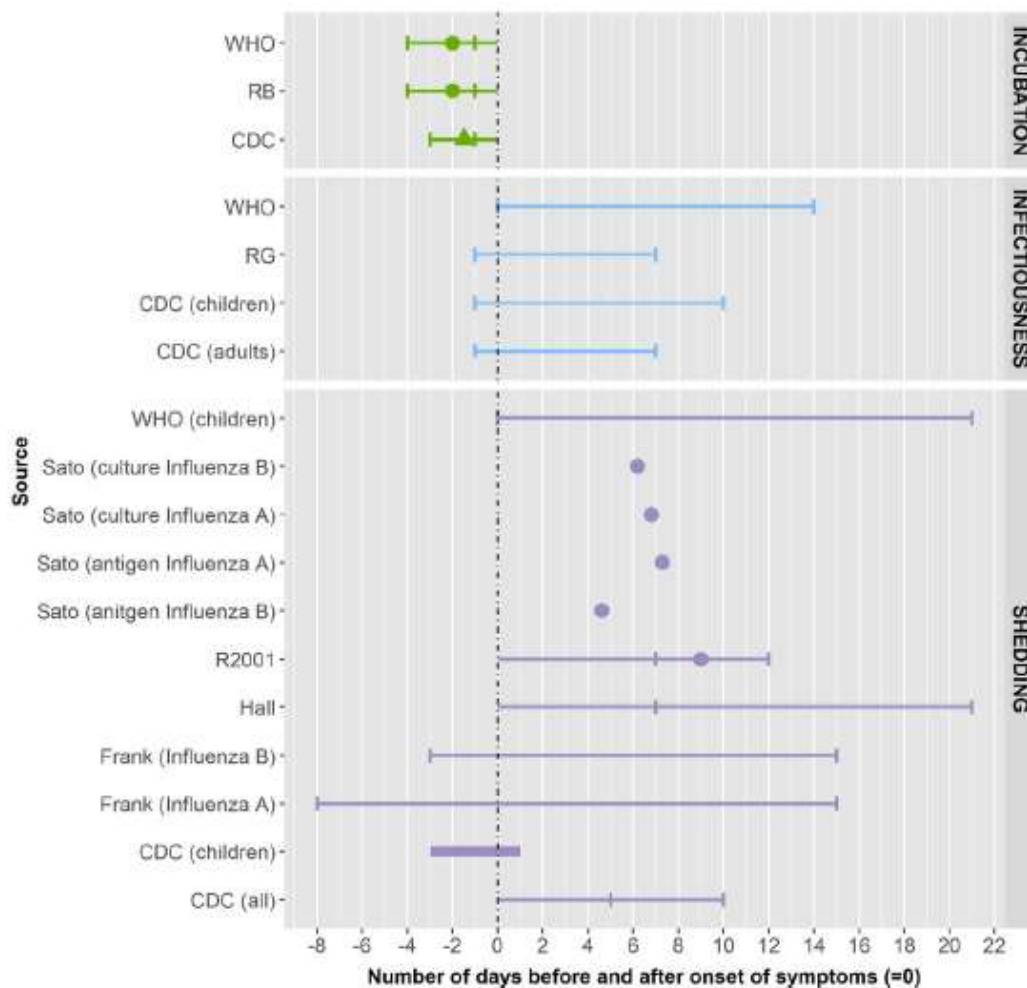


Fig. 8 Summary measures for the incubation period, infectiousness and shedding period for hepatitis A by source. Legend: ▲: mean, ●: median, — minimum and maximum range, RB: Red Book, R2001: Richardson et al. (2001), RG: The 2009 'Managing infectious diseases in child care and school. A quick reference guide'

STUDY DETAILS: Czumbel 2018			
Seasonal influenza N = NR (8 citations) Brocklebank 1972 Frank 1981 Hall 1975 Hall 1978 Hall 1979 Jackson 2013 Sato 2005 Sugisaki 2013	1–4 days is described, on average 2 days	1 day before to 10 days after onset of symptoms in children	A mean of around 7 days of shedding from onset of illness was reported for influenza A. Mean of around 6 days measured by viral culture and 4.6 days measured by antigen detection was reported for influenza B Shedding reported to persist for up to 21 days in young children from the onset of illness



Additional comments

Authors conclusions:

This review summarizes the current knowledge of the best available evidence from the scientific literature regarding the incubation period, shedding, and infectiousness of specific communicable diseases. Presenting conclusive data on exclusion is difficult because measures may be influenced by a range of factors, such as the age of the affected child. The decision to exclude a child largely depends on the perceived severity of the condition and its potential impact on the health of the affected child and cannot therefore be completely evidence-based. Decisions about the length of the exclusion period should be based on data on infectiousness if they exist or, if not, on data on shedding.

Included studies:

STUDY DETAILS: Czumbel 2018				
Stillerman 1944	Kwantes 1983	Asano 1985	Reid 1986	Gahr 2014
Aronson 2013	Sato 2005	Gordon 1929	Jackson 2013	Lempriere 19
Moore 1991	Brunell 1968	Ma 2006	Henle 2012	Parker 2006
Sever 1965	Poulsen 2004	Reid 1986	Ozaki 1996	Paunio 1997
Poulsen 2005	Krugman 1987	Sato 2005	Brodribb 1952	Perucha 200
Stocks 1993	Zhao 1992	Sugisaki 2013	Shiraishi 1990	
Included grey literature and handbooks: CDC; RN; R2001; WHO				
CDC: Centre for Disease Control and Prevention; CI, confidence interval; R2001: Richardson 2001; RB: American Academy of Paediatrics Committee on Infectious Diseases: Red Book; RCT, randomised controlled trial; RG: Quick reference guide; RR, relative risk; SD, standard deviation; WHO: World Health Organisation				

STUDY DETAILS: ECDC 2016			
Citation			
European Centre for Disease Prevention and Control. Systematic review on the incubation and infectiousness/shedding period of communicable diseases in children. Stockholm: ECDC; 2016.			
Affiliation/Source of funds			
The study was commissioned by the European Centre for Disease Prevention and Control Author affiliations: the European Centre for Disease Prevention and Control in collaboration with external experts The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Systematic review of observational studies, case series, prospective studies and clinical trials	I	Not available	Schools, daycare centres, households, institutions and hospitals
Prognostic factor		Comparator	
Incubation period Period of infectiousness and/or duration of shedding Exclusion period		NA	
Population characteristics			
Healthy individuals of at least one month to 18 years, infected with a transmittable disease For objective 3 (exclusion period): attending a school or other childcare setting			
Length of follow-up		Outcomes measured	
PubMed and Medline databases were searched for citations between 1980 and June 2015. CDC and WHO were used to search for reference and relevant cited articles in October 2014.		For the most common transmittable childhood infectious diseases or those with a particular concern: - Incubation period - Period of infectiousness or duration of shedding - Exclusion period	
INTERNAL VALIDITY			
Overall quality (AMSTAR 2)			
Rating: Critically Low More than one critical flaw with or without non-critical weaknesses – the review has more than one critical flaw and <i>should not be relied on</i> to provide an accurate and comprehensive summary of the available studies. The overall risk of bias for included studies was not assessed by the review authors.			
RESULTS:			
Outcome No. patients (No. trials)	Narrative summary	Relevant outcomes from grey literature	
<i>Exclusion period</i>			
Measles N =	Exclusion of known susceptible contacts from a boarding school for 10 d (from 6–16 d)	RB: Until 24 hours after treatment has been initiated	

STUDY DETAILS: ECDC 2016			
1 study Lempriere 1931	after exposure) did not prevent spread of infection	<p>RG: At least 2 weeks after a rash in the last case for unimmunised people who have been exempted from measles immunised within 72 hr of exposure</p> <p>CDC: 4 days after a rash for cases; 21 days after a rash in the last case for persons who have been exempted from measles vaccination within the appropriate time</p> <p>R2001: 5 days from onset of a rash</p>	
Meningococcal disease	NA	<p>RG: Should be excluded as soon as it is suspected</p> <p>CDC: Closing schools or universities is not recommended for outbreak control</p> <p>R2001: 48 h from start of treatment</p>	
Mumps	NA	<p>RB: Until 5 days after onset of parotid gland swelling</p> <p>RG: Until 5 days after onset of parotid gland swelling; Exclude exposed children who have not been immunised until they become immunised or, if they are not immunised because of an accepted exemption, continue to exclude them until the health department determines it is safe. This may be as long as a month after the last case</p> <p>CDC: 5 days after onset of parotitis; Students who have been exempted from mumps vaccination should be excluded until the 26th day after the onset of parotitis in the last person</p> <p>R2001: 5 days from onset of parotitis</p>	
Pertussis NR 2 studies Stocks 1933 Kwanten 1983	<p>Expected by authors, not directly tested: Exclusion for 3 weeks from school from onset of paroxysmal cough is not likely to have any significant effect as for a large group shedding is longer</p> <p>Expected by authors, not directly tested: Keep infected children at school until the first sign of catarrh or cough, to protect younger children</p>	<p>RB: Until 5 days of appropriate antimicrobial therapy course completed</p> <p>CDC: Until 5 days of a full course of antimicrobial treatment; Untreated: 21 days from onset of cough</p> <p>R2001: Treated: 5 days from starting antibiotics; Untreated: at least 3 weeks</p>	
Rubella	NA	<p>RB: Until 6 days after onset of a rash</p> <p>RG: Until 6 days after the rash; For outbreaks, exclude exposed children who have not been immunised (or, if older than 4–6 years, received < 2 doses of vaccine) until they become immunised or, if they are not immunised because of an accepted exemption, continue to exclude them until the health department determines it is safe. This may be more than 3 weeks; CDC: Outbreak setting: 23 days after the onset of a rash of the last reported case; Cases: infectious period (i.e., 5–7 days after a rash onset)</p> <p>R2001: 5 days from onset of a rash</p>	
Varicella N = NR (2 studies) Moore Ma 2006	Exclusion from school for 7 d from onset of a rash or until all lesions were crusted (mean and median duration were 7 d) seemed not to have been effective: most transmission already occurred after exposure to prodromal cases; Classes in which ill students remained in school >2 d while ill with a rash had higher attack rates (40%–80%) compared to classes in which ill	<p>RB: Until all lesions have dried and crusted (usually 6 days after onset of a rash)</p> <p>CDC: Until lesions have crusted over</p> <p>R2001: 5 days from start of skin eruption</p>	Secondary attack rates: RR = 10 (CI; 3/7 – 29.0)

STUDY DETAILS: ECDC 2016		
	students were isolated immediately (< 15%).	
Gastroenteritis by adenovirus, astrovirus and rotavirus	NA	R2001: 24 h from last episode of diarrhea
Gastroenteritis by calicivirus/ norovirus N = NR (2 studies) Marks 2003 Grohmann 1991	Calicivirus: Ill children excluded from daycare centre until 24 hours after last episode of gastroenteritis and closure of daycare centre for 11 ds (and additional hygiene measures). The outbreak subsided after 11 weeks, apparently independently of all the public health measures that had been taken. Norwalk-like virus: School closure for 4 ds, from d 18 – 21 of outbreak (including cleaning using chlorine-based agents). Outbreak stopped	RG: Exclude under conditions* CDC: Acute phase of illness, and a period following recovery while the person is still shedding virus at high levels (usually 24– 72 hours) R2001: 24 h from last episode of diarrhea
Hepatitis A N = NR (1 study) Reid 1986	Exclusion from school until clinical recovery (and hygiene measures). These measures were apparently successful because no further cases occurred in either school after the lapse of one incubation period from the date the measures were instituted	RB: Until 1 week after onset of jaundice R2001: < 5 y: 5 days, ≥5 y: none
Campylobacteriosis	NA	RG: Exclude under conditions* R2001: 24 h from last episode of diarrhea
<i>E. coli</i> O157 N = NR (3 studies) Dabke 2014 Belongia 1993 Al-Jader 1999	All children excluded from nursery until 2 negative faecal stools; effective in ending outbreak All children excluded from childcare centre until 2 negative consecutive stools (≥48 hours apart) no evidence of continued transmission Median duration of exclusion from childcare facilities 39.5 d (IQR 28–52d); exclusion period ≥2 weeks longer than the duration of shedding in 34/150 cases (23% (95%CI 16–30) where both duration of shedding and exclusion were known	RB: Until diarrhoea resolves and results of 2 stool cultures are negative
Other enterohaemorrhagic <i>E. coli</i> (EHEC) or STEC/VTEC N = NR (1 study) McDonald 2014	School closed and reopened 5 d later for children with 5 consecutive negative results (diagnosed with stx2-positive STEC or an STEC serogroup; uncomplicated diarrhea with only stx1-positive STEC but serotype previously associated with HUS; or STEC infection with severe clinical presentation, such as bloody diarrhoea or HUS) or 3 consecutive negative results (uncomplicated diarrhea with only stx1-positive STEC). Duration of exclusion for confirmed cases (n=6, including one asymptomatic case) (range 37 – 109 d; median: 71 d). The outbreak was interrupted	R2001: EHEC (O157): 2 negative stools, Others: 24 h from last episode of diarrhoea
Salmonellosis (non-typhoid)	NA	RB: Until diarrhoea resolves R2001: < 5 y: at least one negative stool ≥ 5 y: 24 h from last episode of diarrhoea
Typhoid fever or Paratyphoid fever	NA	R2001: < 5 y: at least one negative stool ≥ 5 y: 24 h from last episode of diarrhoea
Shigellosis N = NR (1 study)	Daycare centre 1: allowed to return on Daycare centre 2: closed until family	RB: Until diarrhoea resolves and results of 2 stool cultures are negative

STUDY DETAILS: ECDC 2016			
Tauxe 1986	appropriate antimicrobial therapy after diarrhea had ceased and were isolated in separate room until 2 negative successive stool cultures.	running the centre had 2 negative successive negative stool culture after antimicrobial therapy. Transmission ceased within 2 d after interventions.	RG: Exclude under conditions* R2001: < 5 y: at least one negative stool ≥ 5 y: 24 h from last episode of diarrhoea
Giardiasis N = NR (1 study) Bartlett 1991	Group 1: Re-admission to daycare centre after completion of treatment, and two Giardia- negative stool examinations by the health department. Group 2: Re-admission when asymptomatic, with continued treatment and follow-up testing in the centre. Group 3: Re-admission when asymptomatic, with continued treatment and follow-up testing in the centre. At the end of the 6month follow-up period, no control strategy was associated with significantly lower prevalence of Giardia, although the 6-month prevalence in all 3 groups were significantly lower than the prevalence at the time of intervention		RG: Exclude under conditions* R2001: 24 h from last episode of diarrhea
Seasonal influenza N = NR (2 studies) Jackson 2013 Sugisaki 2013	School closure can reduce transmission of seasonal influenza among schoolchildren. Standard class closure (2 d class closure, carried out the day following student absentee rates due to influenza or influenza-like illness reaching 10%) is effective for mitigating outbreaks in elementary schools. Non-standard class closure (different approaches (e.g. 1 d class closure carried out after 10% absentee rate, or class closures carried out ≥2 d after a 10% student absentee rate) relatively ineffective at mitigating an influenza outbreak with a class, but subgroup analyses revealed that "1 d class closure" effectively interrupted outbreaks within 1 week and resulted in outbreaks of shorter duration than those controlled by "standard class closures"		RG: No need to exclude, unless the child is unable to participate, meets other exclusion criteria such as fever with behaviour change
Scarlet fever N = NR (2 studies) Lamden 2010 Hoek 2006	Minimum exclusion of cases from school was 24 hours (though in practice usually 48 hours; with penicillin treatment), but not effective. Excluded from nursery for 5 d after the start of treatment with penicillin. Closure (once on advice, once for holidays). Symptoms of the last reported case began on 1 d after school closure.		RG: No need for exclusion, unless child exhibits rapid or laboured breathing or cyanotic (blue) episodes; the child is unable to participate; the child meets other exclusion criteria such as fever with behavioural change R2001: 5 days from start of antibiotic treatment
Streptococcal pharyngitis N = NR (1 study) Snellman 1993	Children with positive throat cultures for group A streptococcal pharyngitis should complete a full 24 hours of antibiotic therapy before returning to school		RB: Until 24 hours after treatment has been initiated and the child is able to participate in activities
Impetigo, streptococcal	NA		RB: Exclusion until 24 hours after treatment has been initiate RG: Temporarily exclude until exclusion criteria

STUDY DETAILS: ECDC 2016			
			are resolved. Wash the affected area and cover the sores and then exclude the child at the end of the day until child is treated. Readmit to group setting when topical, oral or other systemic antibiotics are started if the sores can be covered and kept dry R2001: As long as open lesions persist
Roseola infantum	NA		RG: No need, unless the child is unable to participate, or the child meets other exclusion criteria such as fever with behavioural change
Fifth disease (erythema infectiosum, parvovirus infection)	NA		RG: No need, unless the child has an underlying blood disorder, such as sickle cell disease, or a compromised immune system, unable to participate; the child meets other exclusion criteria such as fever with behavioural change CDC: The greatest risk of transmitting the virus occurs before symptoms of EI develop; therefore, transmission cannot be prevented by identifying and excluding persons with EI. A policy to routinely exclude members of high-risk groups is not recommended.
Impetigo, Staphylococcal	NA		RB: Exclusion only if skin lesions are draining and cannot be covered with a watertight dressing RG: Wash the affected area and cover the sores and then exclude the child at the end of the day until child is treated R2001: As long as open lesions exist
MRSA infection	NA		WHO: Isolate infected or colonized patients RG: No need for exclusion, unless the child is unable to participate or other exclusion criteria are met, such as fever with behavioural change CDC: In most cases, not necessary. Exclusion from school and sports activities should be reserved drainage ('pus' for those with wound) that cannot be covered and contained with a clean, dry bandage and for those who cannot maintain good personal hygiene
Additional comments			
<i>Authors conclusions:</i> The author notes this review specifically addressed incubation period, period of infectiousness/shedding and exclusion period, and may serve as a basic document for producing a guidance with the best available relevant scientific information based on the period of incubation, period of infectiousness and shedding.			
Included studies:			
Stillerman 1944	Kwantes 1983	Asano 1985	Reid 1986
Aronson 2013	Sato 2005	Gordon 1929	Jackson 2013
Moore 1991	Brunell 1968	Ma 2006	Henle 2012
Sever 1965	Poulsen 2004	Reid 1986	Ozaki 1996
Poulsen 2005	Krugman 1987	Sato 2005	Brodribb 1952
Stocks 1993	Zhao 1992	Sugisaki 2013	Shiraishi 1990
Included grey literature and handbooks: CDC; RN; R2001; WHO			

STUDY DETAILS: ECDC 2016

CDC: Centre for Disease Control and Prevention; CI, confidence interval; R2001: Richardson 2001; RB: Red Book; RCT, randomised controlled trial; RG: Quick reference guide; RR, relative risk; SD, standard deviation; WHO: World Health Organisation

* Conditions: stool is not contained in the diaper, diarrhoea is causing 'accidents', stool frequency exceeds 2 or more stools above normal, blood or mucus in stool, stool is all black or very pale, dry month, no tears, or no urine output in 8 h, jaundice, the child is unable to participate or other symptoms such as fever with behaviour change

E2 Gastrointestinal diseases

STUDY DETAILS: Chen 2016			
Citation			
Chen, T., Gu, H., Leung, R.KK. et al. Evidence-Based interventions of Norovirus outbreaks in China. BMC Public Health 16, 1072 (2016). https://doi.org/10.1186/s12889-016-3716-3			
Affiliation/Source of funds			
No funding provided. All authors affiliated with Office for Disease Control and Emergency Response, hospitals or tertiary institutions in China The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Modelling study	III-2	Changsha, China	Schools
Intervention		Comparator	
Isolation School closure (7, 8, 9, 10 days) Isolation plus school closure (7, 8, 9, 10 days) none		Reported data (actual)	
Population characteristics			
High school students and teachers in Changsha. The school comprised 25 classes with 1400 students and 153 teaching and supporting staff			
Length of follow-up		Outcomes measured	
December 24 to NR		Total attack rate Cumulative cases Duration of outbreak	
Method of analysis			
The significance of mode of transmission was estimated by permutation tests on the basis of Monte Carlo simulations. Random walk was used to sample the probability distribution of interpersonal transmission. Two states “interpersonal” and “non-interpersonal” were modelled. In the first incident, random walk modeling was used to assess the proportion between interpersonal and waterborne transmissions. In the second incident, the visit frequency to the potential source of infection was estimated. A Susceptible–Exposed–Infectious/asymptomatic–Removed–Water (SEIARW) model was used to characterize NoV transmission epidemics.			
INTERNAL VALIDITY			
Overall risk of bias (descriptive)			
Rating: Moderate The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial due to lack of information relating to missing data.			
RESULTS			
School closure for 7, 8 and 9 days were not predicted to be able to contain an outbreak yielding a similar result to that of no intervention (Table 1), with Total Attack Rate (TAR) over 67 % and Duration of Outbreak (DO) more than 39 days. School closures only became effective when extended to 10 days (TAR 2.26%). Simulated results reveal that isolation was more effective in containing the outbreak and did not change when combined with school closure.			

STUDY DETAILS: Chen 2016

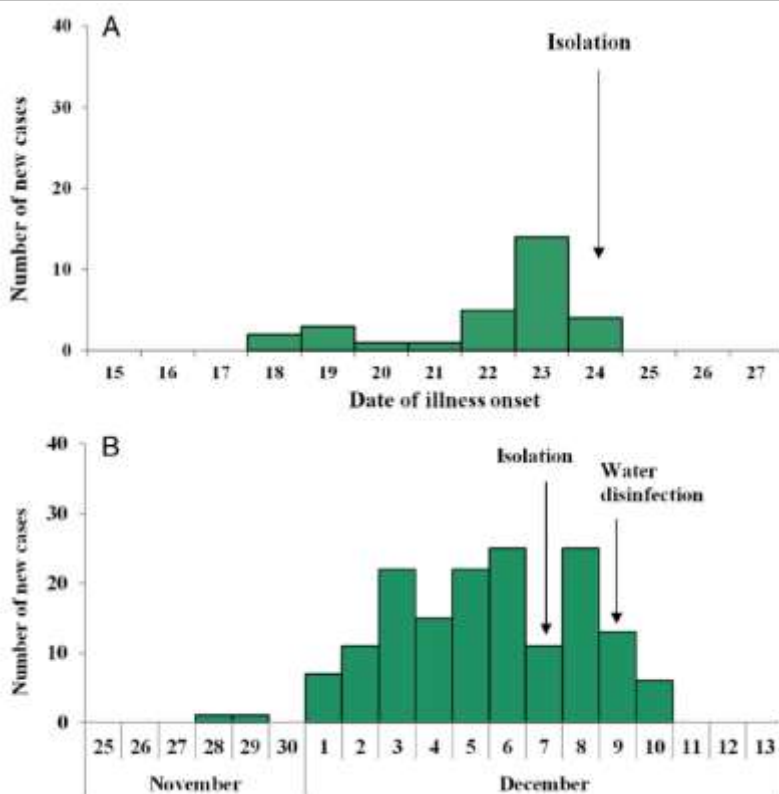
Table 1 Comparison between reported data and simulated results by different interventions implemented in two outbreaks in Changsha, 2014

Intervention	TAR ^a (%)		Cumulative cases	DO ^c (day)
	%	95% CI ^b		

Outbreak 2

Reported data	2.14	2.06-2.22	30	16
Isolation	2.26	2.18-2.34	32	15
School closure (7 days)	67.23	66.80-67.66	941	50
School closure (8 days)	67.22	66.79-67.65	941	52
School closure (9 days)	67.21	66.78-67.64	941	54
School closure (10 days)	2.26	2.18-2.34	32	15
Isolation + School closure (7 days)	2.26	2.18-2.34	32	15
Isolation + School closure (8 days)	2.26	2.18-2.34	32	15
Isolation + School closure (9 days)	2.26	2.18-2.34	32	15
Isolation + School closure (10 days)	2.26	2.18-2.34	32	15
None	67.45	67.02-67.88	944	39

^aTotal attack rate; ^bconfidence interval; ^cduration of outbreak



Additional comments

Authors conclusions:

Simulation results indicated that contaminated water was 14 to 500 fold more infectious than infected individuals. Asymptomatic individuals were not effective transmitters. School closure for up to a week still could not contain the outbreak unless the duration was extended to 10 or more days

School closure alone could not contain Norovirus outbreaks. Overlooked personal hygiene may serve as a hotbed for infectious disease transmission.

CI, confidence interval; ITT, intention-to-treat; PP, per-protocol; RCT, randomised controlled trial; SD, standard deviation

STUDY DETAILS: Li 2021				
Citation				
Li W, Zhu Y, Lou J, Chen J, Xie X, Mao J. Rotavirus and adenovirus infections in children during COVID–19 outbreak in Hangzhou, China. <i>Transl Pediatr.</i> 2021 Sep;10(9):2281–2286. doi: 10.21037/tp–21–150. PMID: 34733668; PMCID: PMC8506064.				
Affiliation/Source of funds				
This study was funded by the science and technology projects in Zhejiang Province (LGC21H200004 and 2019C03037) and the Medical Scientific Projects from Health Department of Zhejiang Province (2018KY455). <i>All authors affiliated with The Children's Hospital, Zhejiang University</i> The authors declared no conflicts of interest.				
Study design	Level of evidence	Location	Setting	
Retrospective cohort	III–3	Hangzhou, China	Children's Hospital of Zhejiang	
Intervention		Comparator		
Impact of protective measures and isolation on intestinal infection in children before and after COVID-19		Historical cohort (2019)		
Population characteristics				
Children that reported to the Children's Hospital at Zhejiang University School of Medicine, China				
Length of follow-up		Outcomes measured		
Healthcare records were extracted from the Children's Hospital during the COVID–19 outbreak (January–December 2020)		Incidence of paediatric intestinal infection Incidence of rotavirus Incidence of adenovirus Outpatient visits		
Method of analysis				
Data on outpatient visits and intestinal infections, number of completed tests for rotavirus and adenovirus antigen assays, and the confirmed positive cases from January–December 2020 were collected from the electronic healthcare records at the Children's Hospital, Zhejiang University School of Medicine. The data were compared with those acquired in 2019 during the same period. Intestinal infections included primary diagnosis of enteritis, diarrhea, indigestion, gastroenteritis, and vomiting. The results were analysed using SPSS software (version 20.0). χ^2 test was used to determine statistical differences. Two-tailed P-values < 0.05 were considered to be statistically significant				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Moderate The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial with important problems relating to the uncertainty of data used.				
RESULTS				
Outcome	Intervention n/N (%)	Comparator n/N (%)	Risk estimate (95% CI)	Statistical significance p value
<i>2019 vs 2020</i>				
Outpatient visits	40 690 to 269 465 per month	255 932 to 425 234 per month	NR	$p < 0.05$
Paediatric intestinal infections incidence	1602 to 10 818 (2.92–4.01%)	18 065 to 28 014 (4.17% to 7.09%)	NR	$p < 0.05$
Positive rate of Adenovirus	233/14 097 (1.58%)	815/30 285 (2.69%)	NR	$p < 0.05$
Positive rate of Rotavirus	1008 (7.15%)	4365/30 285 (14.41%)	NR	$p < 0.05$

STUDY DETAILS: Li 2021

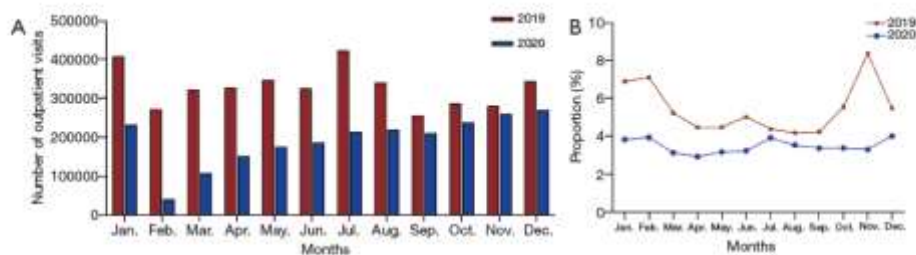


Figure 1 Distribution of patients with intestinal infection and outpatient visits from January–June in 2019 and 2020. (A) Monthly number of outpatient visits; (B) proportion of patients with intestinal infection in outpatient visits.

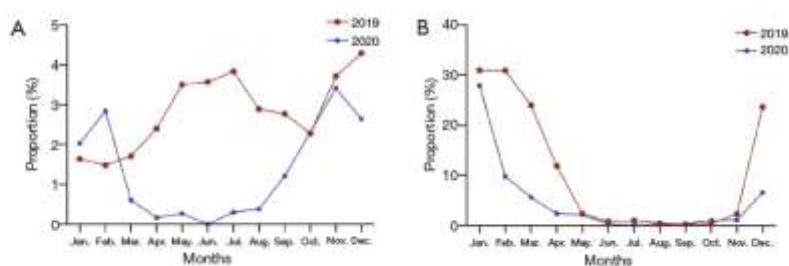


Figure 2 Distribution of positive rate for adenovirus and rotavirus from January to December in 2019 and 2020. (A) Positive rate of adenovirus; (B) positive rate of rotavirus.

Additional comments

Authors conclusions:

In summary, in the early phase of COVID-19 outbreak, the outpatients, the cases of intestinal infection, and positive cases of rotavirus or adenovirus slightly decreased under COVID-19 measures in Hangzhou. With the lift of control measures, the outpatients, the cases of intestinal infection were slowly increasing. The prevention and control of new coronavirus pandemic can also limit the infection and transmission of rotavirus and adenovirus.

NR, not reported

STUDY DETAILS: CDNA SoNGS 2010

Citation

Communicable Diseases Network Australia (CDNA) Norovirus Working Group. Guidelines for the public health management of gastroenteritis outbreaks due to norovirus or suspected viral agents in Australia. Australian Government: Department of Health and Ageing. 2010 April

Affiliation/Source of funds

No information on the source of funds or conflicts of interest was provided. All authors affiliated with Hospitals, Pathology Services of the Department of Health in Australia.

Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention	Comparator		
Public health management of gastroenteritis outbreaks due to norovirus or suspected viral agents in Australia	NA		
Population characteristics			
NA			
Length of follow-up	Outcomes measured		
NA	Incubation period Period of infectiousness Exclusion Isolation and cohorting		

STUDY DETAILS: CDNA SoNGS 2010	
Method of analysis	
<p>These Guidelines are provided to assist public health units investigating outbreaks of norovirus and suspected viral gastroenteritis.</p> <p>These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.</p>	
INTERNAL VALIDITY	
Overall quality (author’s opinion)	
<p>Rating: High</p> <p>No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.</p>	
RESULTS	
Outcome	Narrative summary
Incubation period	Viral shedding in stools coincided with onset of illness and did not extend more than 72 hours after the onset of the first symptom.
Period of infectiousness	Maximum viral shedding probably occurs 24–48 hours after exposure
Exclusion	Ill people should be sent home immediately and excluded from childcare, preschool, school or work for 48 hours after all symptoms have stopped. It is a reasonable and accepted recommendation that workers be excluded for 48 hours after symptoms have stopped.
Isolation and cohorting	<p>An attempt should be made to separate ill people from well people ('cohorting'), especially if the outbreak setting is in a semi-closed environment and people are required to live in a household-like situation sharing the same facilities. However, there should be limited moving around of norovirus-infected people.</p> <p>In such settings, common areas should be closed off in an outbreak situation. If this is not possible, unwell people should not use common areas. If possible, ill people should be restricted to their room and for 48 hours after resolution of symptoms. This measure is intended to prevent susceptible individuals from becoming infected as norovirus immunity is known to be strain specific and short-lived.</p>
Additional comments	
<p><i>Authors conclusions:</i></p> <p>Following standard infection control precautions can minimise the risk of norovirus outbreaks caused by person-to-person transmission in any institution or group setting or by an infected food handler. This requires a basic level of hygiene measures that can be implemented in any setting, regardless of whether a person is infectious or not. Although standard infection control precautions are intended for use in healthcare settings, the principles can be applied to other institutional and group settings. Person-to-person outbreaks in semi-closed environments are usually difficult to control because the infectious dose of norovirus is small, infected people excrete large numbers of viable virus particles and widespread environmental contamination occurs.</p>	

E3 Influenza/COVID

STUDY DETAILS: Burns 2021			
Citation			
Burns AAC, Gutfraind A. 2021. "Effectiveness of isolation policies in schools: evidence from a mathematical model of influenza and COVID-19." PeerJ9: e11211 DOI 10.7717/peerj.11211			
Affiliation/Source of funds			
This research is supported by the US National Institutes of Health (NIH) grant R01GM121600 All authors affiliated with tertiary institutions in Chicago, USA The authors declared no competing interests			
Study design	Level of evidence	Location	Setting
Modelling study	I	United States	School settings
Intervention		Comparator	
Symptom-based isolation policies, and a four day school week		No isolation	
Population characteristics			
School children			
Length of follow-up		Outcomes measured	
NR – modelling study		The attack rate: the proportion of the population infected during the outbreak The outbreak duration: the number of days with more than one infected student The peak number of simultaneously infected: a measure of the burden on the caregivers and the healthcare system	
Method of analysis			
<p>The study used a deterministic compartmental dynamical model known as the Susceptible, Exposed, Infectious, Recovered (SEIR) model that tracks the number of individuals of various cohorts immunological states, and degree of isolation for each day during an outbreak. The model further stratifies the population by both the day of their infection, location, and school grade. In the model, the day of infection determines the rate of virus shedding and the probability of symptoms, which then influences the likelihood of either isolating at home or returning to school. The probability of isolating was also based on the stage of the illness, as well as the isolation policy.</p> <p>The model was validated on outbreaks of influenza and COVID-19 in schools and shown to match the peak and duration of the outbreak curves, and the overall attack rates of the student population. To ensure that the results were robust to uncertainty in parameter values, the epidemic was simulated 500 times per scenario to account for possible difference between schools and seasons, with normally distributed values for parameters such as the start day in the year, contact rate between cohorts and others, and reported the median and the interquartile ranges. Using the model, the authors considered the effect of two key control policies, fever-based isolation and a shortened school week. They also considered the effect of increasing the monitoring of symptoms, which could be attained through training of the parents and distribution of free thermometers. They also considered supplemental policies: subdividing students into cohorts of half the normal size, reducing contacts between cohorts, and enforcing strict quarantines on weekends.</p>			
INTERNAL VALIDITY			
Overall risk of bias (descriptive) as per JBI Manual			
Rating: Moderate The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial with important problems relating to the uncertainty of data used.			
RESULTS			

STUDY DETAILS: Burns 2021

Table 2 Relative effectiveness of isolation policies. Median effect (interquartile range).

Outbreak	Policy option	Attack rate		Outbreak duration	
		Baseline (%)	% decrease	Baseline (days)	% decrease
Flu	One day isolation (CDC guideline)	25	29 (13–59)%	82	1 (–2 to 16)%
	Two day post-fever isolation		70 (55–85)%		18 (6–66)%
	Four day school week		73 (64–88)%		20 (11–55)%
	Three day school week		93 (91–97)%		99 (82–100)%
COVID-19	One day isolation	11.3	7 (5–14)%	138	1 (1–4)%
	Two day post-fever isolation		10 (5–17)%		1 (1–4)%
	14 day post-fever isolation		14 (5–26)%		4 (3–7)%
	Four day school week		57 (52–64)%		22 (12–26)%
	Three day school week		81 (79–83)%		46 (33–52)%

Outcome	Intervention Attack rate % (interquartile range)	Comparator Attack rate % (interquartile range)
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Isolation policy (1 and 2 days) vs No isolation policy

Influenza

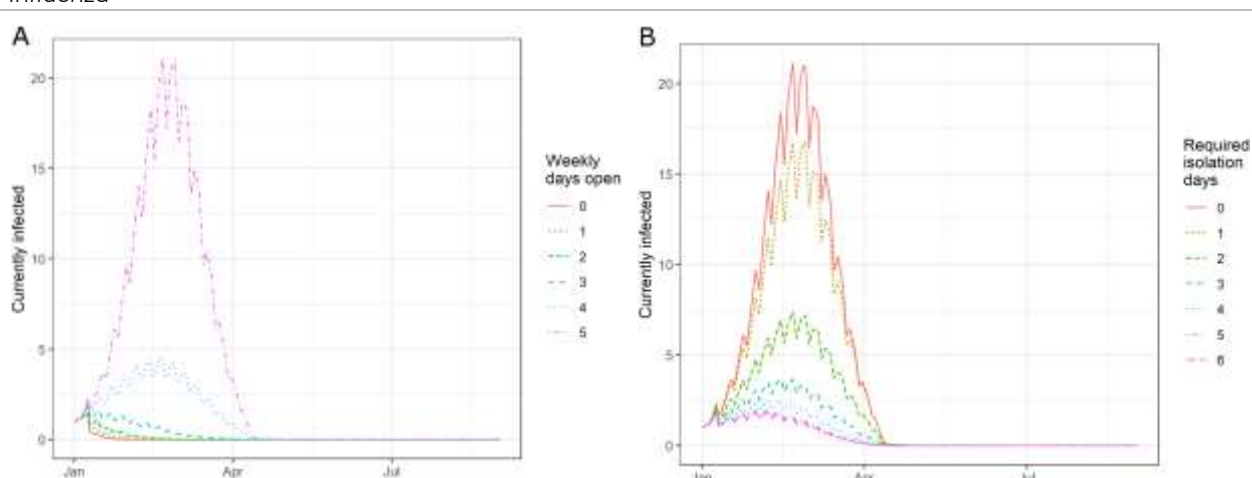
Median attack rate simulation	1 day isolation policy: 17.2 (range 9.9 to 21.4%) 2-day isolation policy: 7.4 (range 3.7 to 11.1%)	No isolation policy 24.5 (range 16.6 to 28.1%)
Peak prevalence simulation	2-day isolation policy: 5-day peak prevalence (range: 2 to 8)	No isolation policy: 30-day peak prevalence (range 13 to 25)
Outbreak duration simulation	2-day isolation policy: 67 days (range 28 to 77)	No isolation policy: 82 days (range 78 to 84)

COVID-19

Median attack rate simulation	1 day of isolation: 9.4 (range 8.3 to 10.6) 2 days of isolation: 9.2 (range 8.0 to 10.6) 14 days of isolation: 8.5 (range 7.4 to 9.7)	No days of isolation 10.0 (range 8.3 to 11.3)
Outbreak duration simulation	1 day of isolation: 137 days (range 133 to 139) 2 days of isolation: 136 days (range 132 to 139) 14 days of isolation: 132 days (range 128 to 134)	No days of isolation: 138 days (range 135 to 140)

Shortened school week vs 5-day school week

Influenza



The effect of requiring isolation after the last fever event in a median US school experiencing an outbreak of influenza. (A) Fever isolation and (B) shortened in-person school week. Vertical axis indicates daily prevalence and ripples are due to weekends and closures. Summer holiday starts June 17 and reduces transmission. Increasing the required days of isolation or shortening the in-person school week reduces the peak infected and the number concurrently infected. Only shortening the in-person school week reduces the duration of the outbreak.

Attack rate simulation	4-days school week: 6.8 (range 3.3 to 8.8%)	73% reduction from baseline
	3-day school week: 1.8 (range 0.9 to 2.3%)	93% reduction from baseline

STUDY DETAILS: Burns 2021				
COVID-19				
<p>The effect of requiring isolation after the last fever event in a median US school experiencing an outbreak of COVID-19. (A) Post-fever isolation and (B) in-person school-week reduction policies on a median US school experiencing an outbreak of COVID-19. Vertical axis indicates daily prevalence as in Fig. 2. Increasing the number of post-fever isolation days has little effect on the outbreak. Reducing the number of school days that students physically go to school each week reduces the peak number of infected, the number concurrently infected, and the duration of the outbreak.</p>				
Median attack rate simulation	4-day school week: 4.4% (range 3.7 – 4.9%)	57% reduction from baseline (range 52-64%)		
	3-day school week: 2.0% (range 1.7 – 2.2%)	46% reduction from baseline (range 33-52%)		
2-day isolation policy and 3-day school week vs. 2-day isolation policy				
Influenza				
Attack rate simulation	2.1(1.0 to 3.3) %	0.9 (0.5 to 1.2) %	NR	NR
Additional comments				
<p><i>Authors conclusions:</i> Confirmed that symptom-based policies would be effective in controlling influenza in a variety of scenarios. For influenza outbreaks it is recommended that isolation is maintained for at least 2 days following the last day of fever. For both influenza and COVID-19 they found that using a shortened school-week of 4 days instead of 5 days could be effective in reducing the attack rate, and additional days would increase the effect. For COVID-19, application of post-fever isolation policy was found to be less effective and reduced the attack rate by 10 (5-17)% for a 2-day isolation policy and by 14 (5-26)% for 14 days.</p>				
IQR; interquartile range; NR, not reported				

STUDY DETAILS: Fong 2020				
Citation				
Fong, M.W., Gao, H., Wong, J.Y., Xiao, J., Shiu, E.Y.C., Ryu, S., Cowling, B.J., 2020. "Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Social Distancing Measures. Emerging Infectious Diseases," 26, 976–984.. doi:10.3201/eid2605.190995				
Affiliation/Source of funds				
This study was conducted in preparation for the development of guidelines by the World Health Organization on the use of nonpharmaceutical interventions for pandemic influenza in nonmedical settings. This study was supported by the World Health Organization. M.W.F. and J.X. were supported by the Collaborative Research Fund from the University Grants Committee of Hong Kong (project no. C7025-16G). All authors affiliated with the University of Hong Kong, Hong Kong, China No information provided on any conflicts of interest				

STUDY DETAILS: Fong 2020			
Study design	Level of evidence	Location	Setting
Systematic review	I	Asia, Europe, America, Africa, and Australia	School, Workplace, General community
Prognostic factor		Comparator	
Reduction of impact of influenza outbreak		N/A	
Population characteristics			
Community – non-healthcare setting			
Length of follow-up		Outcomes measures	
<p>Separate systematic reviews to gather available evidence on the effectiveness of 6 outcome measures in reducing influenza transmission in the community. Literature search of Cochrane Library, Embase, Medline and PubMed.</p> <p>Found no RCT's, included observational and simulation studies. Studies from 1946 to August 4th 2018. Except for: School closures (updated the latest SR by Jackson 2013) and searched from January 1st 2011 to September 3rd 2018. Workplace measures (updated the latest SR by Ahmed 2018) and searched the literature from January 1st 2017 to September 27, 2018.</p>		<p>Isolating ill persons</p> <p>Contact tracing</p> <p>Quarantining exposed persons</p> <p>School dismissals or closures</p> <p>Workplace measures, including workplace closures</p> <p>Avoiding crowding</p>	
INTERNAL VALIDITY			
Overall quality			
<p>Rating: Low</p> <p>One critical flaw with or without non-critical weaknesses – the review has a critical flaw and <i>may not</i> provide an accurate and comprehensive summary of the available studies that address the question of interest.</p>			
RESULTS:			
Outcome (No. trials)	Narrative summary	Main findings/Authors conclusions	
<i>Isolating ill persons</i>			
4 observational studies 11 simulation studies	<p>Reduction of impact: 8 studies suggested a decrease in attack rate brought by implementation of case isolation 4 studies suggest intervention is more impactful in combination with other interventions. Increase in isolation rate is quasi-linearly correlated with a decrease in attack rate of influenza.</p> <p>Delay of the epidemic peak: 3 studies showed evidence isolating ill persons will delay the spread and peak of influenza epidemics</p> <p>Reduction in transmissibility: 4 studies showed evidence isolating ill persons will reduce transmissibility of influenza and reduce reproduction numbers for influenza.</p>	Isolation has moderate impact in reducing influenza transmission and impact	
<i>Quarantine of exposed persons</i>			
1 intervention study, 5 observational studies and 10 simulation studies	<p>Reduction of impact: 5 studies suggested reduction in attack rate with implementation of household quarantine measures</p> <p>Delay of epidemic peak: 4 studies found quarantine is effective at reducing peak and number of cases in a pandemic if compliance is high. One study found border quarantine causes minimal reduction in the number of cases.</p> <p>Transmissibility: 3 studies found household and border quarantine reduce transmission of influenza.</p> <p>Increased risk for household contacts:</p>	Quarantine has in general a moderate impact in reducing influenza transmission and impact	

STUDY DETAILS: Fong 2020		
	2 studies reported increased risk of secondary cases of influenzas in households where people a concurrently quarantined with an isolated individual.	
<i>Contact tracing</i>		
4 simulation studies	<p>None of the 4 studies examined contact tracing as a single intervention, this measure was studied in combination with other interventions e.g., quarantine.</p> <p>Reduction of impact: 1 study suggested contact tracing (in combination with other interventions) will reduce the impact of influenza outbreak. Another study found it provides only modest benefit. And a third study found no effect.</p> <p>Delay of epidemic peak: 1 study found contact tracing (in combination with other interventions) will delay epidemic peaks for up to 6 weeks.</p> <p>Reduction in transmissibility: 1 study showed evidence for contact tracing and quarantine was more effective than symptom monitoring and quarantine to reduce influenza transmissibility.</p>	Combination of contact tracing with other measures (e.g., isolation and quarantine) can reduce influenza, transmission and impact; the addition of contact tracing to existing measures might provide only modest benefit but will need substantial resources
<i>School closure (planned holiday, reactive closures or pre-emptive closures)</i>		
<p>22 studies (since Jackson et al 2013)</p> <p>13 pre-emptive school closure</p> <p>16 reactive school closures</p> <p>28 planned holidays</p>	<p>16 studies demonstrated that reactive school closure could be a useful control measure during influenza epidemics or pandemics, with impacts that included reducing the incidence and reducing the peak size</p> <p>7 studies reported a reduction in number of confirmed or influenza like illness cases</p> <p>2 studies reported a reduction in total infected cases/peak of epidemic curve</p> <p>2 studies reported no significant difference b/w the attack rate in closed and not closed schools</p> <p>2 studies showed absenteeism was lower after school reopening compared with before school closure</p> <p>3 studies found school closure reduced transmission rate of influenza. 1 study found a reactive closure after 27% of students had symptoms was not effective.</p> <p>13 studies found pre-emptive school closure could delay epidemic peak and reduce transmission</p> <p>8 showed that planned holidays could reduce influenza transmission</p> <p>17 observation studies also reported a reduction in incidence of influenza associated with planned school holidays</p>	The transmission of influenza decreases during routine school holidays but might increase after schools reopen. The effectiveness of reactive school closure varies. Pre-emptive school closures has moderate impact in reducing influenza transmission
<i>Workplace measures and workplace closures</i>		
<p>Update to Ahmed et al 2018 systematic review</p> <p>Workplace measures: 18 intervention, observational or simulation studies</p> <p>Workplace closures: 10 simulation studies</p>	<p>6 studies showed working from home/ smaller work units/ staying home while sick (paid sick leave) reduces influenza transmission</p> <p>12 simulation studies on workplace measures reviewed by Ahmed et al 2018 suggested that workplace measure alone reduced the cumulative attack rate by 23%, as well as delaying and reducing the peak influenza attack rate.</p> <p>Workplace closures: 10 simulation studies suggested the reduction in attack rate, duration of infection or maximum case number.</p>	Workplace measures are effective; combination with other interventions will further strengthen the effect Workplace closures might have a modest impact in reducing influenza transmission

STUDY DETAILS: Fong 2020		
<i>Avoiding crowding</i>		
3 observational studies	Avoiding crowding refers to the measures to reduce influenza transmission in crowded areas (e.g., large meetings, conferences, and religious pilgrimages, national and international events). Studies suggested early intervention of measures to avoid crowding will reduce the impact of the epidemic.	Timely and sustained application of measures to avoid crowding might reduce influenza transmission
Additional comments		
The review found some evidence from observational and simulation studies to support the effectiveness of social distancing measures during influenza pandemics. Timely implementation and high compliance in the community would be useful factors for the success of these interventions. Additional research on transmission dynamics, and research on the optimal timing and duration of school and workplace closures would be useful.		

STUDY DETAILS: Bin Nafisah 2018			
Citation			
Bin Nafisah S, Alamery AH, Al Nafesa A, Aleid B, Brazanji NA. "School closure during novel influenza: A systematic review. <i>Journal of Infection and Public Health</i> ." 2018;11(5):657–61.			
Affiliation/Source of funds			
Details on funding not provided. Author affiliations: All authors affiliated with Medical or Research centres or the Ministry of Health in Saudi Arabia The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Systematic review and meta analysis of observational or modelling studies	I–III	Japan, Mexico, USA, China, UK, Australia, France, Greece, Singapore, India, the Netherlands, Argentina	Community, schools, households
Prognostic factor		Comparator	
School closure before or after the epidemic reaches its peak to reduce overall influenza pandemic		NA	
Population characteristics			
Authors do not explicitly report the population, but results are provided for school children and wider community			
Length of follow-up		Outcomes measured	
PubMed, ProQuest and Cochrane databases were searched for citations between 1957 and 2017 using keywords: School Closure and Infection; School Closure and Influenza. Studies from 1957 to 2015 were included		The timing of closure The delay of the epidemic peak Duration of closure The effect of school closure on the attack rate The relationship between the duration of the infectiveness and school closure	
INTERNAL VALIDITY			
Overall quality			
Rating: Low More than one critical flaw with or without non-critical weaknesses – the review has more than one critical flaw and <i>should not be relied on</i> to provide an accurate and comprehensive summary of the available studies. Included studies: The overall risk of bias for included studies was not assessed by review authors. This raises serious concerns in quality of the included studies and the basis for the results.			

STUDY DETAILS: Bin Nafisah 2018			
RESULTS:			
Outcome No. patients (No. trials)	Narrative description	Correlation coefficient	Statistical significance p-value
Overview of studies	<ul style="list-style-type: none"> - Median period of school closure for all studies was 14 days (range 1-140 days) - Mean attack rate was 31% (SD 21.30) (mean attack rate of 32.79% in community and 18.19% in school children) - Median duration of infectiveness of various influenza pathogens was 4 days - Mean reduction of the peak of the epidemic was 29.65% (SD = 23.63) 		
<i>School Closure vs no School Closure</i>			
Timing of closure 31 studies	Timing of school closure in relation to the state of an epidemic is inversely correlated with reduction in the peak of the epidemic	$r = -0.57$	$p < 0.05$
	Early closure of school in relation to start of an epidemic significantly predicted more reduction in the epidemic peak The faster the epidemic reaches its peak; the more likely early school closure would have an effect on the reduction of its peak	$\beta = -0.501$	$p < 0.05$
Delay of the epidemic peak 31 studies	The median time for school closure to delay the epidemic peak was 11 days. Yet, delaying the epidemic peak did not correlate with the reduction of its peak.		$p > 0.05$
	A reduction in the overall infection: mean (SD) 1.33 (0.49) to 0.97 (0.50)	$t(82) = -0.250$	$p < 0.05$
	The timing of school closures in relation to the start of the epidemic reveals no correlation with a peak delay. Hence, closure at any time during the epidemic will delay the peak		$p > 0.05$
Duration of closure 31 studies	The effect of school closure on delaying an epidemic peak positively correlated with the period of school closure. That is the longer the period of closure; the more likely the peak to be delayed	$r = 0.51$	$p < 0.05$
	The longer the duration of the school closure the later the epidemic peak will be	$\beta = 0.230$	$p < 0.05$
	The effect on the duration of school closure showed only correlation with delaying the peak and did not correlate with reduction of its peak		$p > 0.05$
Closure after the epidemic reaches its peak 31 studies	There is a significant relationship $\chi^2 (2, N = 83) = 7.89$, on the effect of school closure on the overall infection after the epidemic peak More reduction in the overall infection was noted if schools were closed after the epidemic reaches its peak.		$p < 0.05$
Effect of school closure on the attack rate 31 studies	The reduction of the epidemic peak from school closure is positively correlated with the attack rate when implemented before the peak The higher the attack rate, the more likely a reduction in the original epidemic peak will result from school closure.	$r = 0.423$	$p < 0.05$
	The effect of school closure on delaying an epidemic peak negatively correlated with the attack rate. That is, the more school closure delayed the peak, the less attack rate would result.	$r = -0.479$	$p < 0.05$
	The attack rate was lowered to a further extent when the closure implemented after the epidemic reaches its peak	$t(73) = -3.48$	$p < 0.05$.

STUDY DETAILS: Bin Nafisah 2018			
	(M = 27.59, SD = 18.42) as compared to closure before the epidemic peak (M = 44.94, SD = 22.41)		
Relationship between the duration of the infectiveness and school closure 31 studies	The effect of school closure on delaying an epidemic peak positively correlated with the duration of the infectiveness	r = 0.54	p < 0.05
	The longer the duration of infectiveness the more likely school closure will delay the epidemic peak	β = 0.461	p < 0.05
Additional comments			
<p><i>Authors conclusions:</i></p> <p>The authors conclude that school closure is an efficient strategy that influences epidemic based on studies from several past epidemics. Hence, it is a measure by its own to control the epidemic. Yet, closure require efforts invested in early detection and efficient implementation.</p> <p>Included studies:</p> <p>NR – Bin Nafisah did not provide a list of 31 included studies</p>			
<p>β, the slope of the line between the predictor variable and the dependent variable; CI, confidence interval; M, mean; Mdn, median score; NR, not reported; RR, relative risk; SD, standard deviation; t, calculated difference represented in units of standard error</p>			

STUDY DETAILS: Fumanelli 2016			
Citation			
Fumanelli L, Ajelli M, Merler S, Ferguson NM, Cauchemez S (2016) Model-Based Comprehensive Analysis of School Closure Policies for Mitigating Influenza Epidemics and Pandemics. PLoS Comput Biol 12(1): e1004681. doi:10.1371/journal.pcbi.1004681			
Affiliation/Source of funds			
<p>LF, MA, SM received funding from the European Commission Horizon2020 CIMPLEX project. NMF and SC received funding from NIGMS MIDAS.</p> <p>All authors affiliated with the Bruno Kessler Foundation, Imperial College London or the Institut Pasteur, Paris</p> <p>The authors declared no conflicts of interest.</p>			
Study design	Level of evidence	Location	Setting
Prospective cohort modelling study	III-3	United Kingdom	Schools, households, and community
Intervention		Comparator	
School closure strategies: (i) national closure, (ii) county closure, (iii) reactive closure, and (iv) gradual closure		No intervention	
Population characteristics			
School children and staff			
Length of follow-up		Outcomes measured	
Data taken from the 2009 A/H1N1 influenza pandemic. A basic reproductive number of R ₀ = 1.5 and probability of developing symptoms given infection was set to 30%. Adults were assumed to be half as susceptible to infection as chi		Attack rate reduction Peak incidence reduction Peak delay	
Method of analysis			
The analysis is performed by making use of an individual based model, structurally similar to that employed in previous studies and refined to account for a detailed school structure.			
INTERNAL VALIDITY			
Overall risk of bias (descriptive)			
Rating: Moderate The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial due to the lack of information regarding follow up data.			
RESULTS			

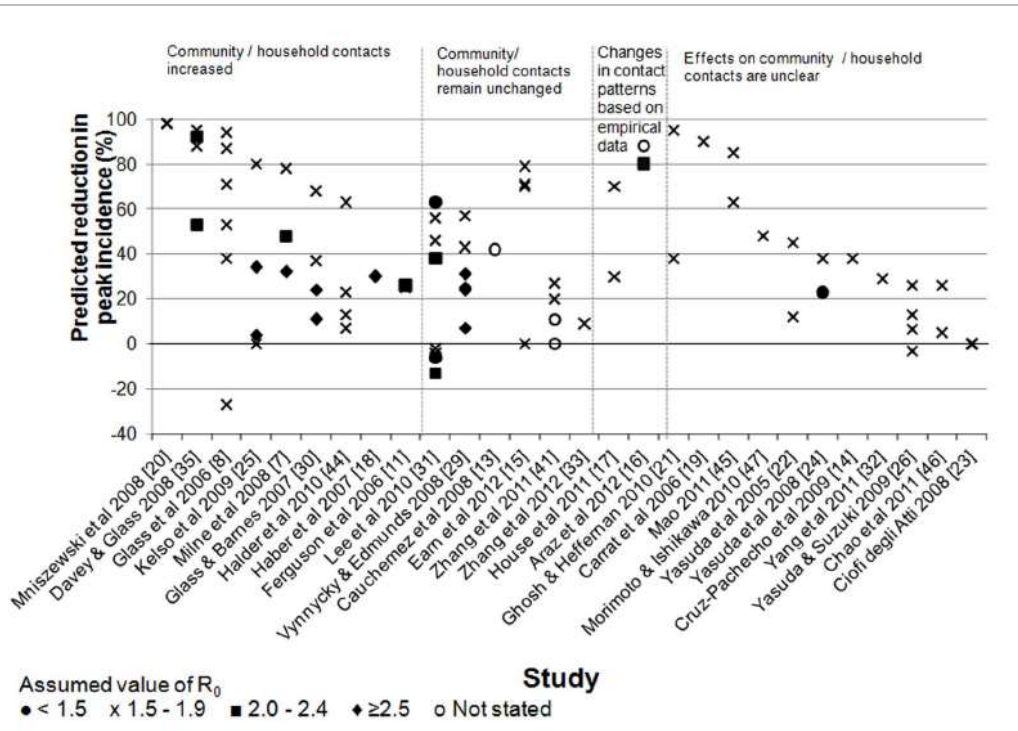
STUDY DETAILS: Fumanelli 2016				
Outcome	Intervention Reduction range (%)	Comparator Mean	Risk estimate (95% CI)	Statistical significance p-value
<i>National closure vs no intervention</i>				
Infection attack rate 50 stochastic realisations	5–10 %	19.5%	95% CI: 19.4, 19.5	No significant difference
Peak incidence 50 stochastic realisations	0–20 %	6.8 cases per 1000 individuals	95% CI: 5.8, 7.1	No significant difference
Peak delay 50 stochastic realisations	0–5 weeks	13.8 weeks	95% CI: 12.1, 17.2	No significant difference
<i>County closure vs no intervention</i>				
Infection attack rate 50 stochastic realisations	5–20 %	19.5%	95% CI: 19.4, 19.5	Favours intervention $p < 0.0001$
Peak incidence 50 stochastic realisations	20–70 %	6.8	95% CI: 5.8, 7.1	Favours intervention $p < 0.0001$
Peak delay 50 stochastic realisations	–1 to 7 weeks	13.8 weeks	95% CI: 12.1, 17.2	Favours intervention $p < 0.0001$
Reactive closure vs no intervention				
Infection attack rate 50 stochastic realisations	5–30 %	19.5%	95% CI: 19.4, 19.5	Favours intervention $p < 0.0001$
Peak incidence 50 stochastic realisations	17–80 %	6.8	95% CI: 5.8, 7.1	Favours intervention $p < 0.0001$
Peak delay 50 stochastic realisations	0–4 weeks	13.8 weeks	95% CI: 12.1, 17.2	Favours intervention $p < 0.0001$
Gradual closure vs no intervention				
Infection attack rate 50 stochastic realisations	8–20 %	19.5%	95% CI: 19.4, 19.5	Favours intervention $p < 0.0001$
Peak incidence 50 stochastic realisations	25–60%	6.8	95% CI: 5.8, 7.1	Favours intervention $p < 0.0001$
Peak delay 50 stochastic realisations	–1 to 6 weeks	13.8 weeks	95% CI: 12.1, 17.2	Favours intervention $p < 0.0001$
Additional comments				
<i>Authors conclusions:</i> The authors findings suggest that gradual closure (originating from classes where an excess absenteeism is observed), as well as closure of all schools within the same county of a school where excess absenteeism occurs, may be considered more diffusely by policy makers responding to influenza pandemics, along with reactive and proactive closures that are more typically discussed in pandemic plans				
CI, confidence interval; NR, not reported				

STUDY DETAILS: Jackson 2014			
Citation			
Jackson C, Mangtani P, Hawker J, Olowokure B, Vynnycky E (2014) The Effects of School Closures on Influenza Outbreaks and Pandemics: Systematic Review of Simulation Studies. PLoSONE 9(5): e97297			
Affiliation/Source of funds			
The study was partially funded by the Health Protection Agency (now known as Public Health England). C Jackson was supported by an NIHR Research Training Fellowship Author affiliations: London School of Hygiene and Tropical Medicine and Public Health England The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Systematic review and meta-analysis of modelling studies	I	United States, Thailand, Japan, United Kingdom, France, Italy, Australia, Sweden, Greece, Canada, the Netherlands, Singapore, Mexico, Mongolia,	Community, schools, workplaces, pre-schools, playgroups, household, day care
Prognostic factor		Comparator	
Average number of secondary infectious individuals generated by a typical infectious individual in a totally susceptible population (R_0)		N/A	
Population characteristics			
No limitations on population were reported, however search strategy was limited to schools, day care, nurseries and households with children.			
Length of follow-up		Outcomes measured	
Embase and Medline databases were searched for citations between 1980 and December 2012. PubMed was also used to allow for delays in papers being listed in these databases covering publication dates from 1 August to 31 October 2012. Relevant papers from the reference lists of the retrieved articles were also identified and three modelling publications were hand searched.		Type of model Population structure and contact rates Infection parameter values Threshold for closing schools and duration of closure Assumed effects of school closure on contact patterns Predicted percentage reduction in the peak incidence of infection Predicted percentage reduction in the cumulative attack rate Predicted effect on time to the peak of the epidemic Predicted effect on duration of the epidemic	
INTERNAL VALIDITY			
Overall quality			
Rating: Moderate More than one non-critical weakness – the systematic review has more than one weakness but no critical flaws. It <i>may</i> provide an accurate summary of the results of the available studies that were included in the review. Included studies: The overall quality for included studies was not judged by the review authors. As such, there were concerns with risk of bias in included studies. The review also did not list the excluded studies; however a description was provided for the reasons for exclusion.			
RESULTS:			
School closure vs. No school closure			
<i>Predicted percentage reduction in the peak incidence of infection (28 studies)</i>			
Yasuda 2005	Reduced by ~45% (permanent closure) or ~12% (13-day closure)		
Ferguson 2006	Decreased by 25–33%, depending on R_0 . Duration of closure has little effect.		
Haber 2007	Decreased by ~30% if schools are closed for 14 days when prevalence reaches 10%		
Cauchemez 2008	Decreased by 39–45% (47–52% in children). Reductions were smaller than this if schools closed at a higher threshold, e.g., 21% if threshold was 100 / 100,000 / day		
Yasuda 2008	Decreased by ~23% if schools closed after 1–3 weeks, or by ~38% if schools closed after 4 weeks		
Mniszewsk 2008	First wave peak AR decreased by ~98%; second wave peak AR 50–100% smaller than the unmitigated single peak, depending on vaccine properties.		

STUDY DETAILS: Jackson 2014	
Milne 2008	Reduced by 32–78%, depending on R_0 (greater reduction for lower R_0)
Kelso 2009	If $R_0=1.5$, decreased by ~80% if delay is up to 4 weeks. If $R_0=2.5$, decreased by ~33% for delays of 3 weeks or less
Yasuda & Suzuki 2009	Effects ranged from a decrease of 26% to an increase of 3%, depending on timing and duration of closure
Lee 2009	Ranged from a reduction of 63.2% (if R_0 was 1.4) to an increase of 9.2% (if R_0 was 2.4)
Chao 2010	Peak prevalence reduced by ~67% if schools closed permanently; if schools reopened after 60 days, epidemic was bimodal, with the first and second peaks in prevalence ~33% and 50%
Chao 2011	Peak prevalence reduced by ~5% by county-wide closures or ~26% by local closures
Halder 2010	Reduced by ~13% (school case isolation), ~23% (individual school closure) or ~7% (all school closure) if closed for 1 week; individual school closure resulted in greater reductions with longer periods of closure (e.g. ~63% with 4 week closure)
Kelso 2010	For each antiviral strategy, adding school closure reduced the peak incidence by up to 50% compared to using antivirals alone (assuming no delay in diagnosis; effects decreased as delay increased)
Halder 2010	Maximum reduction of 73% ($R_0 = 1.5$) or 38% ($R_0 = 2.5$), depending on timing and duration of closure
Barrett 2011	Peak prevalence in children reduced by ~78% compared to the scenario with preventive behaviours only. No clear effect for adults or elderly.
Yang 2011	Reduced by 28.9%
Zhang 2011	Reduced by ~0–27% depending on threshold and duration of closure. Increasing duration of closure has little effect if it is 4 weeks or longer
Morimoto & Ishikawa 2010	Reduced by 48%
Zhang 2012	Decreased by up to 28% by school closure alone
Carrat 2006	Decreased by ~90% if only schools closed, or by ~97% if schools and workplaces closed
Glass 2006	Reduction of 94% if children and teenagers were kept at home and compliance was 90%
Cruz-Pacheco 2009	Peak prevalence reduced by 38% if control measures relaxed or 67% if control measures not relaxed
Vynnycky & Edmunds 2008	Decreased by ~0 to 60%, depending on R_0 , baseline mixing patterns, reduction in contacts and closure threshold
House 2011	Reduced by 30 to 70%; size of reduction increased with increasing duration of closure and increasing R_0
Araz 2012	Peak prevalence reduced by ~80% (low transmission scenario) or ~88% (high transmission scenario)
Ghosh & Hefferman 2010	First wave: reduced by ~38%. Second wave: reduced by ~95%
Earn 2012	First wave, school aged children: reduced by ~70% in Alberta and Calgary, very little effect in Edmonton
Glass & Barnes 2007	Decreased by ~10 to 70% depending on age-specific attack rates and R_0

STUDY DETAILS: Jackson 2014

Graphical summary of results



Summary of the estimated effects of school closures on peak incidence of pandemic influenza (all ages) predicted by the modelling studies. Different symbols are used to reflect the assumed value for R_0 . The findings are grouped according to whether they assumed that the community/household contacts increased, remained unchanged, the assumptions about contact were based on empirical data or were unclear. Some studies assumed that workplaces and/or other public places also closed. All studies that stated their assumptions regarding the effects of school closure on contact patterns assumed that contacts between school-aged children were reduced or eliminated.

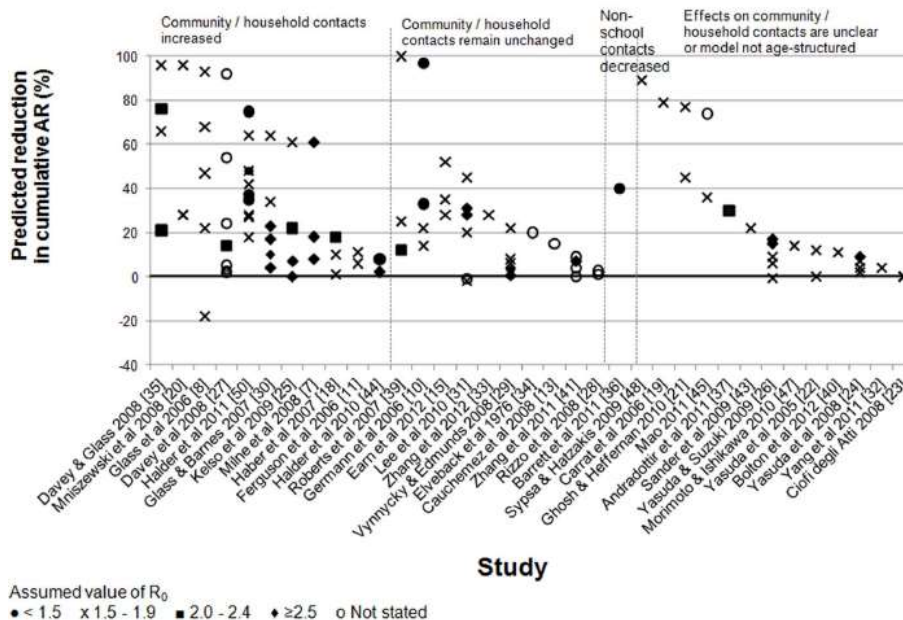
Predicted percentage reduction in the cumulative attack rate (28 studies)

Elyeback 1976	Reduced by 90% if schools never opened, or by 20% with one week closure
Ferguson 2005	>90% chance of eliminating epidemic if $R_0 \leq 1.7$
Yasuda 2005	Reduced by 12% (10% in adults, 17% in children, permanent closure) or essentially unchanged (13 day closure)
Ferguson 2006	If $R_0=2.0$, decreased by 6 to 9%. If $R_0=1.7$, decreased by 11 to 15%. Longer closures were associated with slightly increased reductions.
Germann 2006	Predicted reduction ranged from 14% (if $R_0=2.4$) to 97% (if $R_0=1.6$)
Haber 2007	Decreased by ~1 to 18%, depending on threshold and duration of closure: greater effect at lower thresholds; effect of duration of closure less clear
Cauchemez 2008	Decreased by 13 to 17% (18 to 23% in children); greater reduction if schools closed at lower threshold. Reductions were smaller than this if schools closed at a higher threshold, e.g., 10% if threshold was 100 / 100,000 / day
Yasuda 2008	Changed by < 10% for all closure thresholds
Mniszewsk 2008	Total AR (first and second waves) reduced by 28–96%, depending on vaccine properties
Milne 2008	Decreased by 8 to 61%, depending on R_0 (greater reduction for lower R_0)
Kelso 2009	If $R_0=1.5$, reduced by ~60% if delay is up to 3 weeks. For $R_0 = 1.5$ and pre-emptive closure, reductions in cumulative AR were ~57% (0–5 years), 64% (6–12 years) 66% (13–17 years)
Sander 2009	Decreased by 22% (from 50% to 39%)
Sypsa & Hatzakis 2009	Reduced by 89%

STUDY DETAILS: Jackson 2014	
Yasuda & Suzuki 2009	Ranged from an increase of 0.7% to a decrease of 17%, depending on timing and duration of closure
Lee 2009	Ranged from a reduction of 44.7% (if R ₀ was 1.4) to an increase of 1.7% (if R ₀ was 1.7)
Chao 2011	Both strategies “did not elicit any substantive decrease” (this is not quantified further).
Halder 2010	Reduced by ~8% (school case isolation or individual school closure) or ~2% (all school closure) if closed for 1 week; individual school closure resulted in greater reductions with longer periods of closure (e.g. ~23% with 4 week closure)
Kelso 2010	For each antiviral strategy, adding school closure reduced the cumulative AR by ~20–30% compared to using antivirals alone (assuming no delay in diagnosis; effects decreased as delay increased)
Halder 2010	Maximum reduction of 42% (R ₀ = 1.5), 18% (R ₀ = 2.0), 8% (R ₀ = 2.5) depending on timing and duration of closure. Optimal threshold depended non to linearly on duration of closure.
Barrett 2011	Reduced by 40% compared to the scenario with preventive behaviours only
Andradittir 2011	Reduced by 30% overall. Effect largest in adults (40% reduction) and smallest in schoolchildren (22% reduction)
Yang 2011	Reduced by 4.2%
Zhang 2011	Reduced by < 10% for all combinations of closure threshold and duration
Morimoto & Ishikawa 2011	Reduced by 14%
Halder 2011	Reduced by 35–75% if R _n = 1.2, ~28–64% if R _n = 1.5, or ~18–42% if R _n = 1.8. Larger reductions with longer duration of closure
Zhang 2012	Decreased by up to 9% by school closure alone
Carrat 2006	Decreased by 79% if only schools closed, or by 98% if schools and workplaces closed
Glass 2006	Reduction of 93% if children and teenagers were kept at home and compliance was 90%
PerIroth 2010	Reduced by 66% (if R ₀ = 1.6) or 12% (R ₀ = 2.1)
Roberts 2007	If R ₀ = 1.1, cumulative AR is close to zero (and R < 1) if transmission in schools is reduced by 37%
Rizzo 2008	Decreased by < 1% if intervention implemented 2 or 4 weeks after start of pandemic, or by 2.6% if after 8 weeks
Vynnycky & Edmunds 2008	Decreased by < 1% to ~24%, depending on R ₀ , baseline mixing patterns, reduction in contacts and closure threshold
Araz 2012	For low transmission scenario, reduction in cumulative AR was 5 to 94% in children aged 5 to 18 years. For high transmission scenario, reduction in cumulative AR was –3 to 86% for children aged 5 to 18 years
Ghosh & Hefferman 2010	First wave: reduced by ~45%. Second wave: reduced by ~77%
Earn 2012	Calgary: reduced by ~28%; Edmonton: reduced by ~35%; Alberta: reduced by ~52%
Bolton 2012	Maximum reduction of ~11% (if schools closed for 4 weeks starting from week 5 and attack rate in children was 3 times that in adults)
Glass & Barnes 2007	If schools are closed when prevalence in schoolchildren is 2%, decreased ~4 to 64% depending on age-specific attack rates and R ₀

STUDY DETAILS: Jackson 2014

Graphical summary of results



Summary of the estimated effects of school closures on cumulative incidence of pandemic influenza (all ages) predicted by the modelling studies. Different symbols are used to reflect the assumed value for R_0 . The findings are grouped according to whether they assumed that the community/household contacts increased, remained unchanged, the assumptions about contact were based on empirical data or were unclear. Some studies assumed that workplaces and/or other public places also closed [11,23,28]. All studies that stated their assumptions regarding the effects of school closure on contact patterns assumed that contacts between school-aged children were reduced or eliminated.

Predicted effect on time to the peak of the epidemic (28 studies)

Yasuda 2005	Increased by ~25% from 20 to 25 days (permanent closure) or ~35% from 20 to 27 days (13 day closure)
Ferguson 2006	Delayed by 9–16 days, depending on R_0 and the proportion of workplaces closing
Haber 2007	Peak occurs 1 week earlier if schools are closed for 14 days when prevalence reaches 10%, compared to the no intervention scenario; no results presented for longer durations of closure.
Ciofi degli Atti 2008	Increased by 5–8 days (2.5–8.8%) depending on transmissibility (greater delay for higher R_0)
Yasuda 2008	If schools were closed 1–2 weeks after the start of the epidemic, peak delayed by 2–3 weeks; otherwise the epidemic curve became bimodal, with the larger peak occurring 3 weeks after (if schools closed after 3 weeks) or 1 week before (if closed after 4 weeks) the peak for the unmitigated epidemic
Mniszewski 2008	Reduced by ~1 week (for peak of first wave)
Kelso 2009	If $R_0 = 1.5$, delayed by ~17 days for delays up to 4 weeks. If $R_0 = 2.5$, peak is delayed 5 to 12 days if closure is pre-emptive or within 2 weeks, otherwise little effect.
Yasuda & Suzuki 2009	Delayed by 1 to 2 weeks, depending on timing and duration of closure (compared to scenario with self-isolation alone)
Lee 2009	Could be delayed by up to 28 days if $R_0 = 1.4$ and whole school system is closed for 8 weeks at a threshold prevalence of 1% or less
Chao 2010	Peak prevalence delayed by ~24 days; the second peak occurs ~10 days later (when schools are closed for 60 days)
Chao 2011	County-wide closures delayed the peak by ~1 week; local closures by ~4 to 5 weeks
Halder 2010	No apparent effect of school case isolation; individual or all school closure delayed peak by ~10 days
Kelso 2010	Delayed by ~40 days for each antiviral strategy
Halder 2010	Maximum delay ~45 days (if $R_0 = 1.5$, schools closed for 8 weeks and closure was optimally timed). Smaller delays were possible with higher values of R_0

STUDY DETAILS: Jackson 2014	
Barrett 2011	Epidemic becomes bimodal. For children, peaks with school closure occur ~14 days before and ~3 days after the peak in the scenario with preventive behaviours only
Yang 2011	Delayed by 8 days
Zhang 2011	Delayed by up to 5 days
Morimoto & Ishikawa 2010	Delayed by 45 days
Zhang 2012	Peak delayed by 5 days by school closure alone
Carrat 2006	No appreciable effect if only schools closed; peak is ~25 days earlier if schools and workplaces are closed
Glass 2006	Reduction of 19 days if children and teenagers were kept at home and compliance was 90%
Cruz-Pacheco 2009	Delayed by ~1 week
Vynnycky & Edmunds 2008	Delayed by 1 to 2 weeks if $R_0 = 1.8$ or 2.5
Araz 2012	Peak brought forward by ~60 days (low transmission scenario) or ~35 days (high transmission scenario)
Ghosh & Hefferman 2010	First wave: no effect. Second wave: delayed by ~50 to 60 days
Earn 2012	Delayed by ~1 month
Bolton 2012	Delayed by up to two weeks
Glass & Barnes 2007	Delayed by 1 to 15 weeks, depending on age-specific attack rates and R_0
<i>Predicted effect on duration of the epidemic (28 studies)</i>	
Yasuda 2005	Increased by ~40% from 50 to 70 days (permanent closure) or ~20% from 50 to 60 days (13 day closure)
Haber 2007	Slight increase (~1 week) if schools are closed for 14 days when prevalence reaches 10%
Yasuda 2008	Increased by ~4% weeks for all closure thresholds
Mniszewski 2008	First wave duration increased by ~40 days; second wave may begin ~6 months after the end of the first and last for ~90 days
Kelso 2009	If $R_0 = 1.5$, increased by up to ~30 days; if $R_0 = 2.5$, increased by up to ~10 days
Sypsa & Hatzakis 2009	Shortened by 11 days
Lee 2009	Difficult to assess precisely from graphs presented, but suggests an increase is likely (~10 to 20 days)
Chao 2011	County-wide closures had little effect on duration; local closures increased the duration of the epidemic, but it is not clear by how much.
Halder 2010	Possible slight increase of ~10 days for all strategies.
Kelso 2010	Increased by up to 40 days, depending on antiviral strategy
Halder 2010	Markedly increased, particularly for low values of R_0
Barrett 2011	Shortened by ~20 days in children
Yang 2011	Increased by 2 weeks
Morimoto & Ishikawa 2010	Increased by ~70 days
Carrat 2006	Increased by ~30% if only schools are closed, or reduced by ~60% if schools and workplaces are closed
Glass 2006	Reduction of 20 days if children and teenagers were kept at home and compliance was 90
Cruz-Pacheco 2009	Increased by 2-3 weeks if contact rate recovers instantaneously when controls are lifted
Vynnycky & Edmunds 2008	Little or no effect for high R_0 or if reduction in contact is $\leq 50\%$. If $R_0 \sim 1.8$, increased by up to 70% and 40% if schools are closed early or late, respectively
Araz 2012	Reduced by ≥ 75 days (low transmission scenario) or increased by ≥ 25 days (high transmission scenario)
Ghosh & Hefferman 2010	First wave: no effect. Second wave: effect unclear
Earn 2012	Duration of first wave increased by up to ~1 month

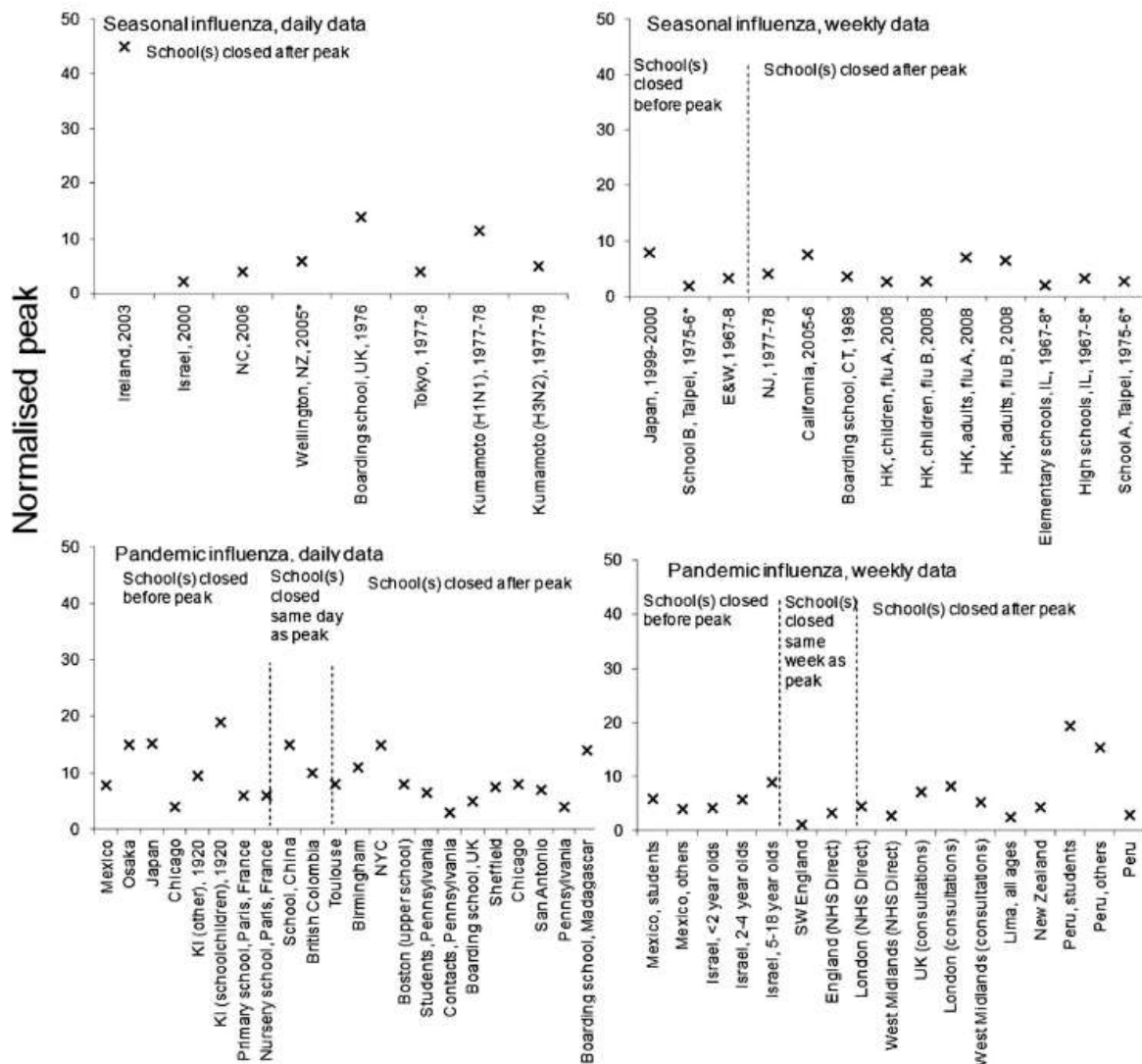
STUDY DETAILS: Jackson 2014			
Glass & Barnes 2007	Increased by 20 to 75% (1 to 3 weeks) depending on age-specific attack rates and R_0		
<i>Overall summary of key findings</i>			
Table 1. Summary of the key findings of factors influencing the impact of school closures, as reflected by the predicted reduction in the peak incidence and the cumulative attack rate.			
Parameter/scenario	Predicted influence on impact of school closures (assuming that factors other than those specified remain unchanged)		
R_0	Over the range of values of R_0 investigated in the studies (up to approximately $R_0 = 3.5$), the higher the value of R_0 , the smaller the effect of school closure		
Age-specific attack rates	School closure is more effective if baseline attack rates are higher amongst children than amongst adults, than if baseline attack rates among children equal or are smaller than those among adults		
Effect of school closures on contact patterns	The greater the reduction in contact resulting from school closure, the greater the effect of the intervention *		
Timing and duration of closure			
Individual versus area school closures	Results differed between models		
Age-specific effects	The effect of school closures is greater on incidence amongst children than that amongst adults		
Effect on peak compared to cumulative attack rate	School closures have a greater effect on the peak attack rate than on the cumulative attack rate		
Additional comments			
<i>Authors conclusions:</i>			
Overall, modelling work suggests that school closures may be beneficial in reducing peak and cumulative attack rates during an influenza pandemic. Results from models which have used a variety of different assumptions and approaches suggest that this intervention can lead to reductions of 20–60% in the peak incidence of an epidemic and smaller (0–40%) reductions in the size of the epidemic. The size of the reductions are expected to be greater if the transmissibility of the virus is relatively low (e.g. $R_0 < 2$) and if attack rates are higher in children than in adults.			
Included studies:			
Elyeback 1976	Ferguson 2005	Yasuda 2005	Halder 2011
Ferguson 2006	Germann 2006	Haber 2007	Glass 2006
Cauchemez 2008	Yasuda 2008	Mniszewsk 2008	Rizzo 2008
Milne 2008	Kelso 2009	Sander 2009	Ghosh & Hefferman 2010
Sypsa & Hatzakis 2009	Yasuda & Suzuki 2009	Lee 2009	Glass & Barnes 2007
Chao 2011	Halder 2010	Kelso 2010	Yang 2011
Halder 2010	Barrett 2011	Andradittir 2011	
CI, confidence interval; ITT, intention-to-treat; MD, mean difference; PP, per-protocol; RCT, randomised controlled trial; RR, relative risk; SD, standard deviation			

STUDY DETAILS: Jackson 2013			
Citation:			
Jackson C, Vynnycky E, Hawker J, <i>et al</i> School closures and influenza: systematic review of epidemiological studies <i>BMJ Open</i> 2013;3:e002149. doi: 10.1136/bmjopen-2012-002149			
Affiliation/Source of funds			
The study was partially funded by the Health Protection Agency; CJ was supported by a Research Training Fellowship from the National Institute for Health Research. Author affiliations: <ul style="list-style-type: none"> - Department of Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine, London, UK - Health Protection Agency, London, UK - Health Protection Agency, Birmingham, UK The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Systematic review of epidemiological studies	I	Europe – 22 North America –22	School

STUDY DETAILS: Jackson 2013	
	Central America–22 South America – 3 Asia – 20 Africa – 1 Australasia – 6
Intervention	Comparator
School closure – schools initially open then subsequently closed, with or without other interventions.	N/A
Population characteristics	
N = number of studies with that population Children only 25 General population 29 School pupils and staff 5 Children and other specified separately 22	
Length of follow-up	Outcomes measured
Medline and Embase were searched in January 2012, without language restriction for papers published by the end of 2011. Eurosurveillance (23 April 2009 to 15 December 2011), Morbidity and Mortality Weekly Report (24 April 2009 to 23 December 2011) and Emerging Infectious Diseases (April 2009 to December 2011) were hand-searched.	Age specific effects of school closure Reversibility of the effects Changes in transmission patterns from modelling analyses of epidemic data Different school closure strategies Use of multiple interventions
INTERNAL VALIDITY	
Overall risk of bias (descriptive)	
Rating: Critically low More than one critical flaw with or without non-critical weaknesses – the review has more than one critical flaw and <i>should not be relied on</i> to provide an accurate and comprehensive summary of the available studies. Included studies: Study did not address risk of bias of included studies	
RESULTS:	
Outcome	Narrative summary
Age specific effects of school closure	The available age-specific data suggested that any benefits associated with school closure were greatest among school-aged children
Reversibility of the effect	Incidence sometimes rebounded when schools reopened, suggesting that school closure contributed to reducing incidence in some settings.
Changes in transmission patterns from modelling analyses of epidemic data	School holidays/closure reduced transmission of seasonal influenza amongst children (unless school closure occurs after peak of outbreak)
Different school closure strategies	The effects of these different strategies could not be compared, due to both late implementation and differences between the studies in other factors (such as the duration of closure).
Use of multiple interventions	In most of the pandemic influenza studies, other interventions were implemented alongside school closure and may have contributed to any reduction in incidence

STUDY DETAILS: Jackson 2013

Normalised peak attack rates (estimated as peak attack rate/median attack rate) recorded in the identified studies



Additional comments

Authors conclusions:

The results suggest that school closure can reduce transmission of pandemic and seasonal influenza among schoolchildren. Many datasets, however, show no clear effect of school closure. As noted by some authors, this may sometimes have been because schools shut late in the outbreak (often close to or after the peak).

CI, confidence interval; ITT, intention-to-treat; MD, mean difference; PP, per-protocol; RCT, randomised controlled trial; RR, relative risk; SD, standard deviation

STUDY DETAILS: Rashid 2015

Citation

Harunor Rashid, Iman Ridda, Catherine King, Matthew Begun, Hatice Tekin, James G. Wood, Robert Booy. "Evidence compendium and advice on social distancing and other related measures for response to an influenza pandemic," Paediatric Respiratory Reviews 16 (2015) 119–126

Affiliation/Source of funds

This study was funded by the Australian Department of Health obtained through a tender process. All authors affiliated with hospitals or tertiary institutions in Sydney, Australia

STUDY DETAILS: Rashid 2015			
The authors declared Iman Ridda holds an NHMRC Early Career Fellowship (630739) and James Wood has received partial salary support from NHMRC CRE			
Study design	Level of evidence	Location	Setting
Systematic review of modelling and observational studies	I-III	Canada, United States, Thailand, United Kingdom, Australia	Schools, households and community
Intervention		Comparator	
School closure Voluntary home isolation and quarantine Work place interventions – work closure and home working Internal mobility restriction		N/A	
Population characteristics			
No restriction			
Length of follow-up		Outcomes measured	
Medline, Embase, Cochrane Library, SCOPUS and Web of Science were searched from 1946 to December 2012. Emphasis was given to studies published in, or after, 2008. This landmark year was chosen as: a) most of the major national or international guidelines (e.g., ECDC menu, Australian Health Management Plan for Pandemic Influenza [AHMPPI]) were published in or after 2008, and b) this allowed the evidence compendium to be updated in light of the studies published on the 2009 pandemic. The ECDC technical report on pandemic influenza (ECDC menu) has been used as a basic template for this review, allowing for quick comparison to identify the differences and latest updates		Evidence of effectiveness - An arbitrary scale was used for effectiveness: - 'high' to mean an overall risk reduction of >50%, - 'moderate' to mean a reduction between 10% and 50% and - 'mild' to mean a reduction of < 10%. Similarly, an arbitrary scale was also employed for economic impact: - 'massive' meant an impact of hundreds of millions or billions of dollars, - 'major' meant an impact in the range of millions of dollars, - 'considerable' meant an impact of hundred thousands of dollars, and - 'moderate' meant a smaller impact.	
INTERNAL VALIDITY			
Overall quality			
Rating: Moderate More than one non-critical weakness – the systematic review has more than one weakness but no critical flaws. It <i>may</i> provide an accurate summary of the results of the available studies that were included in the review. Included studies: Quality from individual studies were not explicitly stated. However, authors reported that overall the quality of the evidence was quite weak, drawing primarily on observational or simulated data.			
RESULTS:			
Summary of school and work based interventions			
Intervention	Narrative summary of evidence		
Proactive school closure	Reduction in influenza transmission from 1% to 50%. Delays the peak of the epidemic by a week or two		
Reactive school closure	Reactive school closures may reduce the transmission of influenza by about 7 to 15%, rarely up to 90 to 100%		
Workplace closure	Modelling study suggests that 10% workplace closure has only modest impact while 33% workplace closure lessens the attack rate to less than 5% and delays the peak by 1 week.		
Home working	It is moderately effective in reducing transmission of influenza by about 20% to 30%.		
Self-isolation of cases	There are limited data, overall effectiveness of the measure is moderate; may delay the peak of influenza when combined with other measures.		
Quarantine of contacts	Modelling studies show that quarantine decreases peak case load, attack rate, and delays the peak.		
Mobility restrictions	Modelling studies suggest that a high travel restriction (50%) delays the peak of influenza. A minimal travel restriction is not helpful.		
Cancellation of mass events	Effectiveness is not proven but may be of theoretical benefit if cancelled around the peak of the epidemic.		

STUDY DETAILS: Rashid 2015
Additional comments
<p>Authors conclusions: Studies suggest that school closure, whether proactive or reactive, reduces transmission of influenza and delays the epidemic peak. The majority of modelling and observational studies suggest a reduction in influenza occurrence or transmission following school closure but with wide variance (range 1 to 50%). Other studies, in which transmission between children is assumed to be very influential, have predicted effectiveness as high as 90 to 100%</p>
<p>Abbreviations: NR, not reported</p>

STUDY DETAILS: Spielberger 2021			
Citation			
Spielberger BD, Goerne T, Geweniger A, Henneke P, Elling R. Intra-Household and Close-Contact SARS-CoV-2 Transmission Among Children - a Systematic Review. <i>Front Pediatr.</i> 2021 Apr 9;9:613292. doi: 10.3389/fped.2021.613292. PMID: 33898355; PMCID: PMC8062727.			
Affiliation/Source of funds			
Details on funding not provided. Author affiliations: Centre for Paediatrics and Adolescent Medicine, Medical Centre-University of Freiburg, Freiburg, Germany, Institute for Immunodeficiency, Centre for Chronic Immunodeficiency, Medical Centre – University of Freiburg, Freiburg, Germany The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest			
Study design	Level of evidence	Location	Setting
Systematic review	I	China (n=31 studies) France (n=4 studies) Switzerland (n=4 studies) USA (n=4 studies) Germany (n=3 studies) Israel (n=3 studies) South Korea (n=3 studies) Brazil (n=2 studies) Brunei Darussalam (n=1 studies) Chile (n=1 studies) Spain (n=1 studies) Italy (n=1 studies) Greece (n=1 studies) Iceland (n=1 studies) Finland (n=1 studies) India (n=1 studies) Japan (n=1 studies) Singapore (n=1 studies) Taiwan (n=1 studies) Australia (n=1 studies) Vietnam (n=1 studies)	Household and community, schools, kindergarten
Population characteristics			
Any child or adult, with COVID-19 infection proven by serology or by RT-PCR			
Length of follow-up		Key questions addressed by SR	
Search of PubMed and on medRxiv on August 11th 2020 evaluating all studies for inclusion that were presenting data on SARS-CoV-2 transmission on or by children and adolescents. Infection or transmission had to be confirmed by SARS-CoV-2 PCR or serology. Publication type: observational studies (cross-sectional,		What is the susceptibility to a SARS-CoV-2 infection of children compared to adults? To what extent do children and adolescents spread SARS-CoV2 in a household or close-contact setting compared to adults? Have differences between different age groups like	

STUDY DETAILS: Spielberg 2021	
case-control, retrospective, prospective, mixed-cohort designs), intervention studies, guidelines, commentaries, conference abstracts. Only articles written in English were included	toddlers, teens, and adolescents been observed regarding virus transmission?

INTERNAL VALIDITY

Overall risk of bias (descriptive)

Rating: Low,
 One critical flaw with or without non-critical weaknesses – the review has a critical flaw and *may not* provide an accurate and comprehensive summary of the available studies that address the question of interest.
 Included studies: the authors did not assess risk of bias for included studies

RESULTS:

Transmission of COVID-19 by children vs adults

Pooled secondary attack rate for children	13.40% (95%CI 5.7, 21.1)
Pooled secondary attack rate for adults	12.32% (95% CI 8.3, 16.4)

Authors identified 11 contact tracing studies with an adult or paediatric COVID-19 index patient.
 Authors identified 7 studies where a child was the most likely COVID-19 index patient.

The transmission risk of infected children vs. adults can only be estimated in settings where a definite and unique index patient simultaneously exposes a comparable cluster of adults and children e.g., in a household setting. However, these settings are difficult to define.

Authors still performed meta-analysis of best studies, since data was highly heterogeneous, a random-effects model was chosen. Data were separately evaluated for adult and child index persons (see figure 7 below). On the basis of limited data and high heterogeneity, the analysis did not reveal evidence for significant differences regarding the contagiousness of children and adults with SARS-CoV2 infections

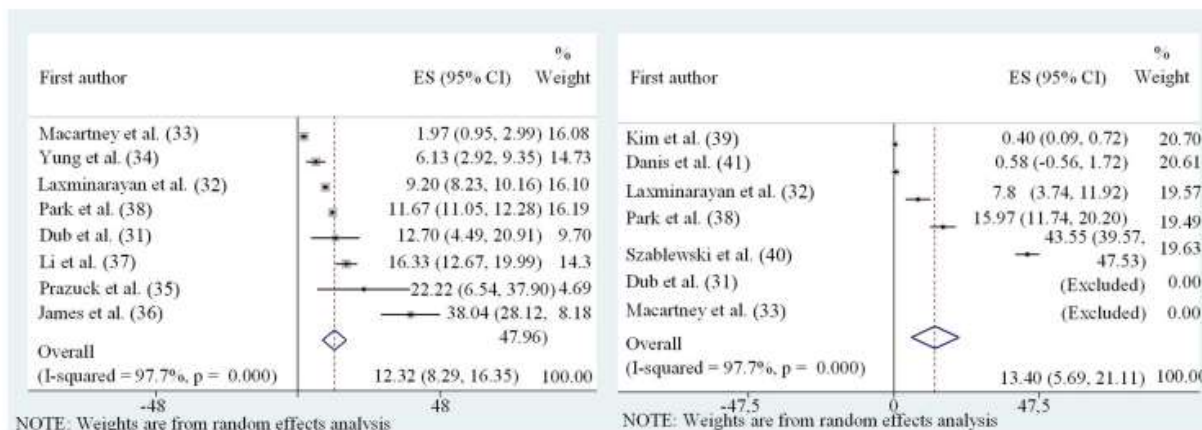


FIGURE 7 | Forest plot of meta-analysis of secondary attack rates of child (Left) and adult (Right) index persons.

The study also identified 12 reports on SARS-CoV-2 transmission, which only described one family or a very small sample of patients and therefore were not included in the meta-analysis

The study also identified 28 studies with data on transmission of SARS-CoV-2 in settings of close contacts and households, without description of transmission chains.

These studies were included in quantitative analysis

Authors identified 7 seroprevalence studies and 4 PCR prevalence studies.

The authors qualitatively summarised these studies.

Overall there is preliminary evidence from the seroprevalence studies and population-based PCR studies that children have a lower susceptibility to SARS-CoV-2 than adults. As all of the studies were conducted when contact restrictions for children such as school closures were active, the lower seroprevalence is likely influenced by a reduction in exposure MD

Additional comments

Authors note: data on transmission of SAR-CoV-2 on or by children in scarce. Several studies show a lower seropositivity of children compared to adults, suggesting a lower susceptibility of especially younger children. Most

STUDY DETAILS: Spielberg 2021
insight currently comes from household studies suggesting, that children are predominantly infected by their household contacts. The contagiousness seems to be comparable between children and adults, based on the meta-analysis of included studies

STUDY DETAILS: Talic 2021				
Citation				
Stella Talic, Shivangi Shah, Holly Wild, Danijela Gasevic, Ashika Maharaj, Zanfina Ademi, Xue Li, Wei Xu, Ines Mesa-Eguiagaray, Jasmin Rostron, Evropi Theodoratou, Xiaomeng Zhang, Ashmika Motee, Danny Liew, Dragan Ilic. "Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and covid-19 mortality: systematic review and meta-analysis," <i>BMJ</i> 2021;375: e068302 doi: 10.1136/bmj-2021-068302				
Affiliation/Source of funds				
No funding was available for this research. ET is supported by a Cancer Research UK Career Development Fellowship and XZ is supported by The Darwin Trust of Edinburgh. Author affiliations: Monash University, Australia; Torrens University, Australia; University of Edinburgh, UK; Zhejiang University School of Medicine, China The authors declared no conflicts of interest.				
Study design	Level of evidence	Location	Setting	
Systematic review and meta-analysis of empirical studies	I-II/III	Global	Community	
Prognostic factor		Comparator		
Effectiveness of public health measures in reducing the incidence of covid-19 including social measures such as contact tracing, isolation, quarantine, school closures, workplace closures, social distance of a particular distance (e.g., 1.5m), lockdown		No intervention		
Population characteristics				
Population at risk and affected by COVID-19				
Length of follow-up		Outcomes measured		
Embase, CINAHL, Global Health, Biosis, Joanna Briggs and the WHO COVID-19 database was last performed on 7 June 2021.		Primary: Incidence of Covid-19 Secondary outcomes: SARS-CoV-2 transmission and covid-19 mortality		
INTERNAL VALIDITY				
Overall quality				
Rating: High No or one non-critical weakness – the systematic review provides an accurate and comprehensive summary of the results of the available studies that address the question of interest. Included studies: The overall risk of bias for included studies was judged by the review authors to be rated as low in three studies, moderate in 24 studies, and high to serious in seven studies. There were concerns with major confounding, which was difficult to control for because of the novel nature of the pandemic.				
RESULTS:				
Outcome No. patients (No. trials)	[intervention] n/N (%) Mean ± SD	[comparator] n/N (%) Mean ± SD	Risk Estimate (95% CI)	Statistical significance p-value
<i>Physical distancing</i>				
Covid-19 incidence N = 108933 (5 studies)	25% reduction in incidence of covid-19		RR 0.75 (0.59, 0.95)	I ² = 87%

STUDY DETAILS: Talic 2021			
Voko 2020 Van den Berg 2021 Xu 2020 Doung-Ngern 2020 Wang 2020			Heterogeneity among studies was substantial, and risk of bias ranged from moderate to serious or critical
Transmission of SARS-CoV-2 N = 108933 23 studies) Guo 2021 Quaife 2020	12% decrease in SARS-CoV-2 transmission and 62% reduction in overall physical contacts	RR 0.88, (0.86, 0.89)	Both studies were rated at moderate risk of bias
Covid-19 mortality N = 108933 (1 study) Alimohamad 2020	Reduction in covid-19 related mortality	β -0.07 (-0.05, -0.10)	$p < 0.001$ Study rated at serious or critical risk of bias

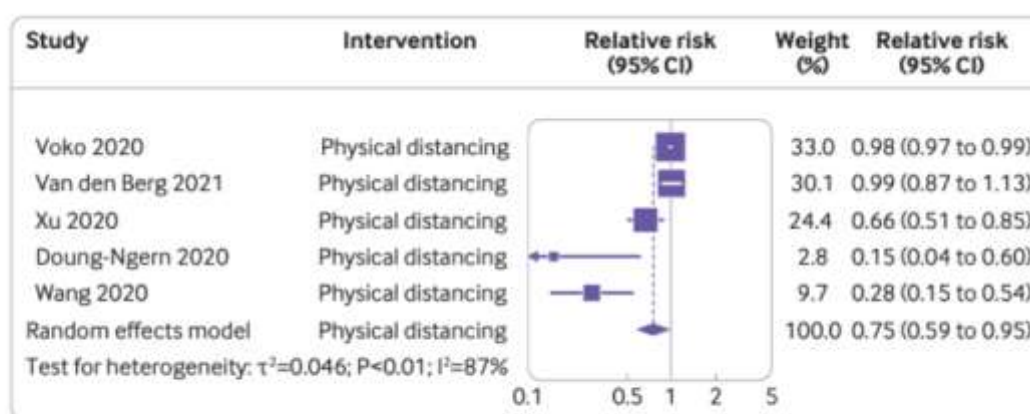


Fig 6 | Meta-analysis of evidence on association between physical distancing and incidence of covid-19 using unadjusted random effect model

Stay at home or isolation			
Covid-19 incidence N = 108933 (4 studies) Khosravi 2020 Dreher 2021 Liu 2020 Jarvis 2020	74% reduction in the average daily number of contacts observed for each participant and estimated a decrease in reproductive number: the reproductive number pre-intervention was 3.6 and post-intervention was 0.60	RR 0.26 (0.37, 0.89)	All the studies that assessed stay at home or isolation measures reported reductions in transmission of SARS-CoV-2.
Quarantine			
Transmission of SARS-CoV-2 N = 108933 (2 studies) Al-Tawfiq 2020	4.9% decrease in the incidence of Covid-19 at eight weeks after the implementation of quarantine		Both studies rated low to moderate risk of bias
Vanman 2021	14 times higher risk of SARS-CoV-2 transmission associated with no quarantine compared with strict quarantine	OR 14.44 (2.42, 86.17)	
School closures			
Covid-19 incidence N = 108933			Both studies were rated at moderate risk of bias

STUDY DETAILS: Talic 2021																							
(2 studies) Iwata 2020 Auger 2020	62% decrease No effect of school closures on incidence of covid-19	RR 0.38 (-49, -71) α coefficient 0.08 (-0.36, 0.65)																					
Covid-19 mortality NR (1 study) Iwata 2020	58% decrease	RR 0.42 (-46, -68)	Moderate risk of bias																				
Transmission of SARS-CoV-2 N = 10 Liu 2020 Guo 2021	Reduction of 13% Reduction of 10%	RR 0.87 (0.86, 0.89) RR 0.9 (0.86, 0.93)	All studies were rated at moderate risk of bias																				
Additional comments																							
<p><i>Authors conclusions:</i> Current evidence from quantitative analyses indicates a benefit associated with physical distancing in reducing the incidence of Covid-19.</p> <p>The effectiveness of measures such as school closures for the containment of covid-19 have largely been effective but depended on early implementation when incidence rates of covid-19 were still low. Only Japan reported no decrease in covid-19 incidence after school closures, and other studies found that different public health measures were sometimes implemented simultaneously or soon after one another, thus the results should be interpreted with caution. Isolation or stay at home was an effective measure in reducing the transmission of SARS-CoV-2, but the included studies used results for mobility to assess stay at home or isolation and therefore could have been limited by potential flaws in publicly available phone data. Quarantine was found to be as effective in reducing the incidence of covid-19 and transmission of SARS-CoV-2. Another study reported that quarantine was effective in reducing the transmission of SARS-CoV-2 in a cohort with a low prevalence of the virus, yet it is unknown if the same effect would be observed with higher prevalence.</p> <p><i>Included studies:</i></p> <table border="1"> <tbody> <tr> <td>Voko 2020</td> <td>Guo 2021</td> <td>Liu 2020</td> <td>Guo 2021</td> </tr> <tr> <td>Van den Berg 2021</td> <td>Quaife 2020</td> <td>Jarvis 2020</td> <td>Al-Tawfiq 2020</td> </tr> <tr> <td>Xu 2020</td> <td>Alimohamad 2020</td> <td>Iwata 2020</td> <td>Vanman 2021</td> </tr> <tr> <td>Doung-Ngern 2020</td> <td>Khosravi 2020</td> <td>Auger 2020</td> <td>Liu 2020</td> </tr> <tr> <td>Wang 2020</td> <td>Dreher 2021</td> <td></td> <td></td> </tr> </tbody> </table> <p>CI, confidence interval</p>				Voko 2020	Guo 2021	Liu 2020	Guo 2021	Van den Berg 2021	Quaife 2020	Jarvis 2020	Al-Tawfiq 2020	Xu 2020	Alimohamad 2020	Iwata 2020	Vanman 2021	Doung-Ngern 2020	Khosravi 2020	Auger 2020	Liu 2020	Wang 2020	Dreher 2021		
Voko 2020	Guo 2021	Liu 2020	Guo 2021																				
Van den Berg 2021	Quaife 2020	Jarvis 2020	Al-Tawfiq 2020																				
Xu 2020	Alimohamad 2020	Iwata 2020	Vanman 2021																				
Doung-Ngern 2020	Khosravi 2020	Auger 2020	Liu 2020																				
Wang 2020	Dreher 2021																						

STUDY DETAILS: Viner 2020			
Citation			
Viner, R.M., Russell, S.J., Croker, H., Packer, J., Ward, J., Stansfield, C., Mytton, O., Bonell, C., Booy, R., 2020. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. <i>The Lancet Child & Adolescent Health</i> 4, 397–404. doi:10.1016/s2352-4642(20)30095-x			
Affiliation/Source of funds			
Details on funding not provided. Author affiliations: UCL Great Ormond Street Institute of Child Health(Prof R M Viner PhD, S J Russell PhD, H Croker PhD, J Packer MEpi, J Ward MBBS), UCL Institute of Education(C Stansfield PhD), University College London, London, UK; MRC Epidemiology Unit, University of Cambridge, Cambridge, UK (O Mytton PhD); Public Health and Policy, London School of Hygiene & Tropical Medicine, London, UK(C Bonell PhD); and National Centre for Immunisation Research and Surveillance, University of Sydney, Sydney, NSW, Australia(Prof R Booy MD) The Authors declare no competing interests			
Study design	Level of evidence	Location	Setting
Systematic review of quantitative studies using	I	China Hongkong	Schools or nurseries

STUDY DETAILS: Viner 2020			
diverse designs		Singapore	
Intervention		Comparator	
School closures		NA	
Population characteristics			
No restriction			
Length of follow-up		Outcomes measured	
Electronic databases (PubMed, WHO global research data base) March 9,2020 and again on March 19, 2020. No language restrictions.		Effectiveness of school social distancing measures	
INTERNAL VALIDITY			
Overall risk of bias (descriptive)			
Rating: Moderate			
More than one critical flaw with or without non-critical weaknesses – the review has more than one critical flaw and <i>should not be relied on</i> to provide an accurate and comprehensive summary of the available studies.			
Included studies: The authors did not consider the risk of bias for the studies included in the review.			
RESULTS:			
Outcome (No. trials)		Narrative summary	
<i>Effectiveness of school social distancing measures</i>			
9 published studies, 7 non-peer reviewed studies	Data from the SARS outbreak in mainland China, Hong Kong, and Singapore suggest that school transmission played no substantial role in the outbreak, and that school closures and other activities such as school temperature monitoring did not contribute to control of infection transmission.	Study found a remarkable dearth of policy-relevant data on the implementation of school social distancing during corona virus outbreaks.	
<i>Modelling studies</i>	One study concluded that the package of social distancing measures was effectiveness in reducing the final size and peak incidence of the outbreak while also delaying the peak. Another modelling study (not peer reviewed) concluded school closure is insufficient to mitigate the COVID-19 pandemic in isolation.		
Additional comments			
<i>Authors conclusions:</i>			
CI, confidence interval; ITT, intention-to-treat; MD, mean difference; PP, per-protocol; RCT, randomised controlled trial; RR, relative risk; SD, standard deviation			

STUDY DETAILS: Stebbins 2010			
Citation			
Samuel Stebbins, James H. Stark, and Charles J. Vukotich Jr. "Compliance With a Multilayered Nonpharmaceutical Intervention in an Urban Elementary School Setting," J Public Health Management Practice, 2010, 16(4), 316-324			
Affiliation/Source of funds			
This research was supported by Cooperative Agreement number 5UCI00043502 from the Centres for Disease Control and Prevention (CDC)			
All authors affiliated with the University of Pittsburgh, Pennsylvania, USA			
Details on potential conflicts of interest not provided.			
Study design	Level of evidence	Location	Setting
Randomised controlled trial (cluster)	II	Pennsylvania, USA	Elementary schools
Intervention		Comparator	
Hygiene-based non-pharmaceutical interventions including an education program: "WHACKtheFlu" campaign where the H in WHACK is		No intervention	

STUDY DETAILS: Stebbins 2010				
"Home is where you stay when you are sick"				
Population characteristics				
School-aged children, their parents, and the school staff in 10 K–5 elementary schools				
Length of follow-up		Outcomes measured		
Intervention commenced in October 2007 (baseline) with results reported at February 2008 (during flu season) and May 2008 (post-flu season)		Knowledge and behaviour regarding four of the five letters in WHACK (not the K) <ul style="list-style-type: none"> • Wash or sanitize your hands often • Home is where you stay when you are sick • Avoid touching your eyes, nose, and mouth • Cover your coughs and sneezes • Keep your distance from sick people 		
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Some concerns The study has plausible bias due to the nature of subjective outcomes that raises some doubt about the results favouring the intervention.				
RESULTS:				
Population analysed	Intervention		Comparator	
Randomised	82		85	
Efficacy analysis (ITT)	74		77	
Outcome	Intervention Mean	Comparator Mean	Risk estimate (95% CI)	Statistical significance p-value
<i>Non-pharmaceutical Intervention vs. No intervention</i>				
Parents keep sick children home from school N = 151	3.26	3.23	NR	p = 0.8282
Ill student reports to class N = 151	3.29	2.78	NR	p = 0.0007
Send an ill student to nurse N = 151	3.53	3.10	NR	p = 0.0018
Additional comments				
The PIPP study provides evidence that children can learn about, implement, and persist in performing a suite of hygiene-based NPIs in an urban school setting during influenza season. Children not only improved hygiene behaviour but with rare exceptions also retained it for more than 4 months after the final educational intervention. Teachers reported that parents were more likely to keep their sick children at home during flu season, and this behaviour persisted overtime. Ill students were less likely to report to class, but only during the later part of the flu season. The necessity of sending an ill student to the school nurse was unchanged. All responses were significantly higher in intervention than control schools, except for responses to question 3, which were not different.				
ITT, intent to treat; NR, not reported; PP, per-protocol				

STUDY DETAILS: Murillo-Zamora 2020
Citation
Murillo-Zamora E, Guzmán-Esquivel J, Sánchez-Piña RA, Cedeño-Laurent G, Delgado-Enciso I, Mendoza-Cano O. "Physical distancing reduced the incidence of influenza and supports a favorable impact on SARS-CoV-2 spread in Mexico." J Infect Dev Ctries. 2020 Sep 30;14(9):953–956. doi: 10.3855/jidc.13250. PMID: 33031079.
Affiliation/Source of funds
Details on funding not provided. All authors affiliated with tertiary institutions in Mexico or the United States

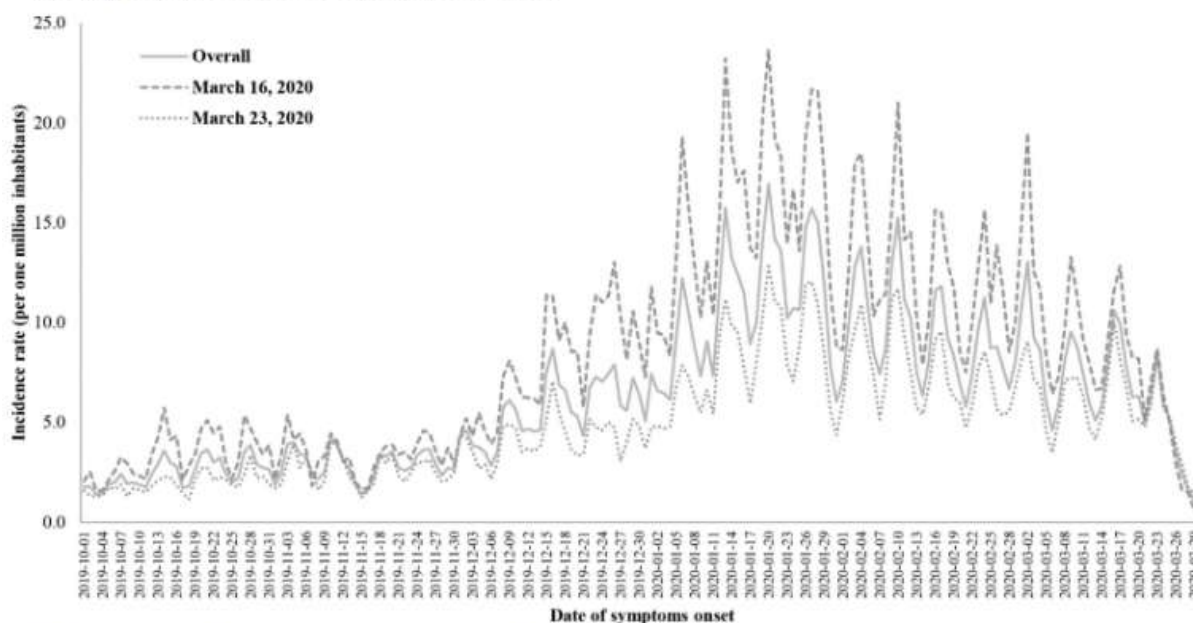
The authors declared no conflicts of interest.				
Study design	Level of evidence	Location	Setting	
Retrospective cohort – cross sectional analysis	III-2	Mexico	Community	
Intervention		Comparator		
Physical distancing interventions including school closures		N/A		
Population characteristics				
Subjects from all ages registered with influenza like illness (ILI) or severe acute respiratory infection (SARI) in epidemiological surveillance system				
Length of follow-up		Outcomes measured		
Cases were collected from October 21 2019 to March 20 2020		Incidence of influenza like illness and severe acute respiratory infection determined by the average percent change in overall daily influenza		
Method of analysis				
Cross-sectional analysis of cases registered as ILI/SARI (October 21, 2019 – March 30, 2020) in a prospective epidemiologic surveillance system belonging to the Instituto Mexicano del Seguro Social (Mexican Institute of Social Security). The ILI/SARI diagnoses were clustered and daily-incidence rates (per one million inhabitants) were computed. Average percent changes (APCs), and 95% confidence intervals, and the date of in-person class suspension (March 16 vs. March 23) were used to compare trends in influenza incidence. Poisson regression models were employed. Given that publicly available and de-identified data were used, the approval of an ethics committee was waived.				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Moderate, Description: The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial due to the lack of information regarding follow up data.				
RESULTS				
Outcome	Intervention Daily average percentage of change	Comparator Daily average percentage of change	Risk estimate (95% CI)	Statistical significance p-value
<i>2019 vs 2020</i>				
Average percentage of change in overall daily influenza for children aged 5 to 14 (school closures implemented on March 16 th)	Oct 1 to Jan 20: -11.7 (-15.7, -7.6)	Jan 21 to Mar 15: 1.8 (1.5, 2.1) Mar 16 to Mar 30: -1.3 (-1.8, -0.9)	NR	NR

Table 1. Average percentage of change in overall daily influenza and age-stratified incidence rates, Mexico 2019 – 2020.

Age group	Period, APC (95% CI)		
	Oct. 1 - Jan. 20	Jan. 21 - Mar. 15	Mar. 16 - Mar. 30
All the states			
Overall	1.8 (1.6, 2.0)	-1.0 (-1.4, -0.6)	-7.2 (-11.1, -3.1)
5/overall	1.0 (0.8, 1.2)	-1.1 (-1.6, -0.7)	-10.0 (-13.3, -6.4)
5 - 14	1.8 (1.5, 2.1)	-1.3 (-1.8, -0.9)	-11.7 (-15.7, -7.6)
15 - 29	2.0 (1.8, 2.3)	-0.5 (-0.9, 0.003)	-8.0 (-12.2, -3.6)
30 - 49	2.3 (2.0, 2.5)	-1.2 (-1.7, -0.7)	-5.5 (-9.8, -1.1)
50 - 64	1.9 (1.7, 2.1)	-1.6 (-2.1, -1.2)	-6.2 (-10.4, -1.8)
65/higher	1.1 (0.9, 1.3)	-1.0 (-1.5, -0.6)	-7.4 (-10.2, -4.4)
From March 16, 2020 (10 states)^a			
Overall	2.0 (1.8, 2.2)	-1.1 (-1.5, -0.6)	-8.8 (-12.5, -4.5)
5/overall	1.7 (1.5, 2.0)	-1.0 (-1.5, -0.5)	-12.0 (-15.4, -8.5)
5 - 14	2.0 (1.7, 2.3)	-1.1 (-1.6, -0.5)	-13.7 (-18.4, -8.7)
15 - 29	2.1 (1.8, 2.4)	-0.6 (-1.0, -0.1)	-9.2 (-13.5, -4.5)
30 - 49	2.2 (1.9, 2.5)	-1.3 (-1.8, -0.8)	-7.1 (-11.6, -2.3)
50 - 64	1.9 (1.7, 2.2)	-2.0 (-2.6, -1.4)	-7.4 (-11.7, -3.0)
65/higher	1.5 (1.2, 1.8)	-1.3 (-1.9, -0.6)	-9.3 (-13.2, -5.1)
From March 23, 2020 (22 states)			
Overall	1.6 (1.4, 1.8)	-1.0 (-1.4, -0.6)	-6.0 (-9.9, -2.0)
5/overall	0.3 (0.1, 0.5)	-1.3 (-1.9, -0.8)	-7.8 (-11.7, -3.7)
5 - 14	1.6 (1.3, 2.0)	-1.7 (-2.1, -1.2)	-9.7 (-14.0, -5.2)
15 - 29	1.9 (1.7, 2.2)	-0.3 (-0.9, -0.2)	-7.0 (-11.2, -2.7)
30 - 49	2.3 (2.1, 2.5)	-1.1 (-1.6, -0.6)	-4.6 (-8.7, -0.2)
50 - 64	1.8 (1.6, 2.0)	-1.3 (-1.8, -0.8)	-5.4 (-9.9, -0.6)
65/higher	0.8 (0.6, 1.1)	-0.9 (-1.4, -0.3)	-6.3 (-9.3, -3.2)

APC: average percent change (computed through Poisson regression models); CI: confidence interval. Daily incidence rates of influenza-like illness per million inhabitants were computed, according to the date of symptom onset. ^a 10 out of 32 Mexican States suspended in-person academic classes starting from March 16, 2020: Colima, Guanajuato, Jalisco, Michoacán, Nuevo León, Tamaulipas, Tlaxcala, Sonora, Veracruz, and Yucatán. Source: the Online Notification System for the Epidemiologic Surveillance of Influenza; *SINOLAVE*, the Spanish acronym) belonging to the *Instituto Mexicano del Seguro Social*.

Figure 1. Unadjusted incidence rates (per one million inhabitants) of influenza virus infection at the Instituto Mexicano del Seguro Social, according to the date of school closures, Mexico 2019 – 2020.



Influenza-like illness (ILI) and severe acute respiratory infection (SARI) were clustered for the aim of the present study. Source: Self-elaborated by authors by using data from the Online Notification System for the Epidemiologic Surveillance of Influenza (*SINOLAVE*) of the Instituto Mexicano del Seguro Social

Additional comments

Authors conclusions:

The author's findings suggest that physical distancing policies implemented in Mexico were effective in diminishing

the community spread of the influenza virus, implying their positive impact on SARS-CoV-2 spread. Significant decreasing trends (average percentile changes) were documented in the two groups of states and in most age groups since late January. In addition, the decrease was significantly greater ($p = 0.026$) in states that has an earlier preventive measure implementation date.

CI, confidence interval; NR, not reported

STUDY DETAILS: Uchida 2012				
Citation				
M. Uchida, T. Tsukahara, M. Kaneko, S. Washizuka, S. Kawa. "Effect of short-term school closures on the H1N1 pandemic in Japan: a comparative case study," <i>Infection</i> (2012) 40:549–556 DOI 10.1007/s15010-012-0304-z				
Affiliation/Source of funds				
Details on funding not provided. Author affiliations: Shinju University, Japan The authors declared no conflicts of interest.				
Study design	Level of evidence	Location	Setting	
Prospective cohort	III-2	Japan	Multicentre: 57 classes across two elementary schools and two junior high schools	
Intervention		Comparator		
School closure		Class closure		
Population characteristics				
School children two elementary schools and two junior high schools affiliated with Shinshu University in Nagano. Students attending the elementary schools are 7 to 12 years old and those attending the junior high school are 13 to 15 years old.				
Length of follow-up		Outcomes measured		
Prospective monitoring occurred between August 2009 to March 2010		Transmission of H1N1 infection		
Method of analysis				
For categorical variables, the percentages of patients in each category were calculated and the proportions were compared using the Chi-squared test. A Poisson regression model was used to analyse the effects of several factors on H1N1 cases after the resumption of classes				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Low The study is comparable to a well-performed RCT and is judged to be a low risk of bias for ALL domains.				
RESULTS				
Population analysed		Intervention	Comparator	
Available		886	1255	
Analysed		886	1255	
Outcome	Intervention Incidence rate	Comparator Incidence rate	Risk estimate (95% CI)	Statistical significance p-value
<i>School closure vs Class closure</i>				
Cumulative rate of infection	876/2141 (40.9%)			
Median duration of absence from school	5 days (range 2 to 16)			
Duration of closures	40 class closures a total of 53 times median duration of 4 days (range 1 to 10 days)			
<i>School closure vs Class closure</i>				
<i>Elementary schools</i>				
Number of patients N = 886	School closures in district A and the class closures in district B had similar effects on subsequent peaks throughout the study period.	NR	No significant difference	

STUDY DETAILS: Uchida 2012				
<i>Junior schools</i>				
Number of patients N = 1255	Few subsequent infection peaks following school closure	Infection peak in November followed by another large peak in December 2009	NR	<i>Favours intervention</i>
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>(a)</p> </div> <div style="width: 48%;"> <p>(b)</p> </div> </div>				
<p>Time-course of the number of patients and closure in the elementary schools, where a grey box indicates a class closure for 1 day (a) District A – school closure and (b) District B – class closure</p>				
Additional comments				
<p><i>Authors conclusions:</i> Considering forty classes were closed a total of 53 times for a median duration of 4 days over the course of the H1N1 pandemic, school closure more effectively inhibits subsequent epidemic outbreaks than class closure. Longer school closures are effective in reducing the spread of infection, and school closure should be implemented as early as possible</p>				
<p>CI, confidence interval; NR, not reported</p>				

STUDY DETAILS: CDNA SoNGS 2017a			
Citation			
Communicable Diseases Network Australia (CDNA) Influenza Infection working group. Seasonal Influenza Infection: CDNA National Guidelines for Public Health Units. Australian Health Protection Principal Committee (AHPPC) and the Australian Government: Department of Health. 2017 December			
Affiliation/Source of funds			
No information on the source of funds or conflicts of interest was provided. All authors apart of the Influenza Infection working group.			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of seasonal influenza infection in Australia		NA	

STUDY DETAILS: CDNA SoNGS 2017a	
Population characteristics	
NA	
Length of follow-up	Outcomes measured
NA	Incubation period Period of infectiousness Case management: Isolation and restriction
Method of analysis	
These Guidelines are provided to assist public health units investigating outbreaks of seasonal influenza infection. These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.	
INTERNAL VALIDITY	
Overall quality (author's opinion)	
Rating: High No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.	
RESULTS	
Outcome	Narrative summary
Incubation period	The incubation period for infection with influenza is most commonly 2-3 days with a range from 1-7 days.
Period of infectiousness	Patients may shed influenza virus and therefore be infectious for up to 24 hours prior to onset of symptoms and up to seven days after onset of symptoms. Children may shed virus for ten days or more, and adult influenza patients are considered no longer infectious 24 hours after the resolution of fever without anti-pyretic medication.
Isolation and restriction	Isolation and restriction is not routinely required for single notifications. In general, health care providers should counsel patients who have influenza or ILI to stay at home and keep away from work, school and crowded areas or public gatherings until the symptoms have resolved.
Additional comments	
<i>Authors conclusions:</i> Schools and childcare settings are prone to rapid transmission of influenza. Vaccination should be strongly encouraged for children and staff of schools and childcare centres, especially for those at risk of severe disease. Children or staff with ILI or confirmed influenza should not attend school or childcare while infectious. If a child or staff member becomes ill with an ILI they should be sent home as soon as possible. If an outbreak of ILI is reported in school or childcare settings, the PHU should assess the extent of the outbreak and may: <ul style="list-style-type: none"> - Issue a generic letter for the school/childcare setting to use for parents – informing of the outbreak, reinforcing control measures (stay away if symptomatic, increase hygiene, consider vaccination, etc.), and urging children and staff at high risk of complications to see their doctor promptly, if ill with ILI - Provide fact sheets and information to staff and students, including website links advising of practical control measures (cough and sneezing etiquette, hand hygiene, stay home if sick). 	
ILI; influenza-like illness	

STUDY DETAILS: CDNA SoNGS 2015			
Citation			
Communicable Diseases Network Australia (CDNA); Pertussis SoNG working group. Pertussis: CDNA National Guidelines for Public Health Units. Australian Health Protection Principal Committee (AHPPC) and the Australian Government: Department of Health. 2015 April			
Affiliation/Source of funds			
No information on the source of funds or conflicts of interest was provided. All authors apart of the Pertussis working group.			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of pertussis in Australia		NA	

Population characteristics		
NA		
Length of follow-up	Outcomes measured	
NA	Incubation period Period of infectiousness Case management: Isolation and restriction	
Method of analysis		
<p>These Guidelines are provided to assist public health units investigating outbreaks of pertussis.</p> <p>These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.</p>		
INTERNAL VALIDITY		
Overall quality (author's opinion)		
<p>Rating: High</p> <p>No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.</p>		
RESULTS		
Outcome	Narrative summary	
Incubation period	The incubation period ranges from 4-21 days, usually 7 to 10 days.	
Period of infectiousness	<p>Cases are infectious from the onset of catarrhal symptoms. Communicability gradually decreases and is negligible 3 weeks after onset of cough. Secondary attack rates of 80% among susceptible household contacts have been reported. For public health purposes, a case is considered non-infectious (even if the PCR result is still positive) at whichever time is the earlier of:</p> <ul style="list-style-type: none"> - 21 days after the onset of any cough, or - 14 days after onset of paroxysmal cough (if the onset is known), or - when they have completed 5 days of a course of an appropriate antibiotic. 	
Isolation and restriction	<p>Exclusion from work, school, preschool, and childcare, and restricted attendance from other settings, especially where there are infants, should be recommended for cases until they are no longer infectious, i.e. until:</p> <ul style="list-style-type: none"> - 21 days after the onset of any cough, or - 14 days after the onset of paroxysmal cough (if the onset is known), or - they have completed 5 days of a course of an appropriate antibiotic. 	
Childcare setting: Sporadic case	Where there is an incompletely vaccinated child < 6 months in room (who is not the case)	<p>Children: exclude for 5 days while on antibiotics or 14 days (from first exposure to infectious case) if they do not take antibiotics</p> <p>Staff: not excluded while taking 5 days of antibiotics or recommend exclusion for 14 days (from first exposure to infectious case) if they do not take antibiotics</p>
	Where all children are ≥6 months	<p>Children: not excluded if they remain well</p> <p>Staff: not excluded if they remain well</p>
Childcare setting: 2 or more cases in the same room within a single incubation period (21 days)	<p>Children: exclude for 5 days while on antibiotics or 14 days (from first exposure to infectious case) if they do not take antibiotics</p> <p>Staff: not excluded while taking 5 days of antibiotics or recommend exclusion for 14 days (from first exposure to infectious case) if they do not take antibiotics</p>	
Additional comments		
<p><i>Authors conclusions:</i></p> <p>For childcare and healthcare settings, the general principles are to recommend exclusion of unvaccinated or incompletely vaccinated contacts until:</p> <ul style="list-style-type: none"> - the expiry of 14 days from their first exposure to the infectious case, or - they have completed 5 days of a course of an appropriate antibiotic. <p>The period of exclusion for 14 days from first exposure considers the highly (but waning) infectious nature of pertussis and covers the usual length of an incubation period (7-10 days). The benefit of exclusion is to a) protect the child contact who has not received 3 effective doses of vaccine and therefore is not protected against disease and b) reduce the risk of transmission from the child contact to any other person in the setting who is at increased risk of severe and/or complicated disease. If parents do not follow an exclusion request despite public health personnel attempting to convince them of the need to do so, then specific jurisdictional public health legislative provisions, where they exist, may need to be applied.</p>		

STUDY DETAILS: CDNA SoNGS 2022			
Citation			
Communicable Diseases Network Australia (CDNA): COVID-19 working group. Coronavirus Disease 2019 (COVID-19): CDNA National Guidelines for Public Health Units. Version 7.4 Australian Health Principal Protection Principal Committee (AHPPC) , and the Australian Government: Department of Health. 14 October 2022			
Affiliation/Source of funds			
No information on the source of funds or conflicts of interest was provided. All authors apart of the COVID-19 working group.			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of pertussis in Australia		NA	
Population characteristics			
NA			
Length of follow-up		Outcomes measured	
NA		Incubation period Period of infectiousness Case management: Isolation and restriction	
Method of analysis			
These Guidelines are provided to assist public health units investigating outbreaks of COVID-19. These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.			
INTERNAL VALIDITY			
Overall quality (author's opinion)			
Rating: High No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.			
RESULTS			
Outcome	Narrative summary		
Incubation period	The median incubation period of ancestral strains of SARS-CoV-2 is 5 to 6 days, with a range of 1 to 14 days (9-11). Studies have shown shorter incubation periods for both Delta and Omicron VOCs than ancestral SARS-CoV-2		
Period of infectiousness	Transmission of SARS-CoV-2 can occur from pre-symptomatic and asymptomatic people and can continue as long as they shed whole live viruses. For the ancestral strains of SARS-CoV-2, people with mild-to-moderate illness were highly unlikely to be infectious more than 10 days after symptom onset. The infectious period, however, can vary based on individual factors and the VOC. The commencement of the infectious period for COVID-19 is generally taken from 48 hours prior to symptom onset (or positive test if asymptomatic).		
Isolation and restriction	Although not mandatory, isolation of COVID-19 cases is recommended as an effective way to reduce the spread of infection. PHUs should recommend cases stay at home until their symptoms have resolved. Cases should be educated about their potential to infect others for up to 10 days after onset of symptoms. PHUs should strongly recommend cases avoid entering high-risk settings (such as residential aged care facilities, disability care facilities and hospitals) until at least 7 days following their positive test result and they are well.		
Quarantine	A quarantine period of 7 days reduces transmission, with the majority of cases developing COVID-19 within 7 days from exposure.		
Additional comments			
<i>Authors conclusions:</i> For childcare and healthcare settings, the general principles are to recommend exclusion of unvaccinated or incompletely vaccinated contacts until:			

- the expiry of 14 days from their first exposure to the infectious case, or
- they have completed 5 days of a course of an appropriate antibiotic.

The period of exclusion for 14 days from first exposure considers the highly (but waning) infectious nature of pertussis and covers the usual length of an incubation period (7-10 days). The benefit of exclusion is to a) protect the child contact who has not received 3 effective doses of vaccine and therefore is not protected against disease and b) reduce the risk of transmission from the child contact to any other person in the setting who is at increased risk of severe and/or complicated disease. If parents do not follow an exclusion request despite public health personnel attempting to convince them of the need to do so, then specific jurisdictional public health legislative provisions, where they exist, may need to be applied.

COVID-19. Coronavirus Disease 2019; VOC, variants of concern

E4 Rash

STUDY DETAILS: Chan 2017				
Citation				
Joyce HY Chan, CK Law, Esther Hamblion, H Fung, James Rudge, “Best practices to prevent transmission and control outbreaks of hand, foot, and mouth disease in childcare facilities: a systematic review”. Hong Kong Med J 2017; 23:177–90				
Affiliation/Source of funds				
Details on funding not provided. All authors affiliated with tertiary institutions in Hong Kong, Thailand, or the United Kingdom The authors declared no conflicts of interest.				
Study design	Level of evidence	Location	Setting	
Systematic review and meta-analysis of case-series studies	I	China	Childcare facilities	
Intervention		Comparator		
Impact and effectiveness of detection tools and public health preventive measures to interrupt transmission of hand, food, and mouth disease		N/A		
Population characteristics				
Children aged 0–6 years in childcare facilities The study population for the individual outbreaks ranged from 102 to 889 children, and for the clustered outbreaks in 7 to 61 kindergartens, the study sizes were 830 and 16 780 children, respectively. <i>Across studies:</i> Mean attack rate of 8.4% (range 0.97% to 28.18%), Mean severe case rate of 5.3% (range 0% to 50%) Mean hospitalisation rate of 2.8% (range 0% to 33.86%) Length of outbreak ranged from 4 to 46 days (mean/median 15 days).				
Studies implemented a range of health control measures including environmental disinfection (all 16 studies) and facility closure (14 studies). Closure usually lasted 2 weeks (range 6 to 30 days)				
Length of follow-up		Outcomes measured		
MEDLINE, EMBASE, Global Health, WHO Western Pacific Region Index Medicus database, China National Knowledge Infrastructure Databases, and Chinese Scientific Journals Database were searched from 1980 to 2012.		Outbreak characteristics Methods for detection and diagnosis of EV71 Interventions applied Recommendations for dealing with future outbreaks		
INTERNAL VALIDITY				
Overall quality				
Rating: Moderate More than one non-critical weakness – the systematic review has more than one weakness but no critical flaws. It <i>may</i> provide an accurate summary of the results of the available studies that were included in the review. The overall quality for included studies was satisfactory – good. There were some concerns due to lack of or missing data across almost all included studies.				
RESULTS:				
Study ID	Number of cases (n/N) (Attack rate, %)	Facility closure duration	Isolation of HFMD cases until symptoms resolved	Other measures
<i>Environmental disinfection and isolation measures</i>				
Li 2011	6/157 (3.82)	6 days		
<i>Personal hygiene, environmental disinfection, and isolation measure</i>				
Tao 2009	54/620 (8.88)	2 weeks	Yes	
Li 2008	16/382 (4.19)	No	Yes (14 days after symptoms relieved)	Body checks (AM)
<i>All measures except hand hygiene (i.e. facility closure, environmental disinfection, isolation, morning body check)</i>				
Duan 2010	372/16780 (2.22)	Full, partial and no closure	Yes	Body checks (AM/PM) and active case

STUDY DETAILS: Chan 2017																						
				searching																		
Jiang 2011	13/685 (14.31)	10 days	Yes	Active case searching																		
Chen 2007	26/689 (3.77)	2 Weeks	Yes	Body checks (AM/PM) and active case searching																		
Wang 2010	40/608 (8.88)	2 Weeks	Yes (for symptomatic and asymptomatic children)	Yes (test asymptomatic cases and recommend isolation)																		
Wu 2011	19/369 (5.15)	2 Weeks	Yes (1 week after symptoms resolved)	Body checks (AM/PM)																		
<i>All measures: facility closure, environmental disinfection, hygiene, isolation, morning body check</i>																						
Qu 2010	91/830 (10.95%)	2 weeks	Yes (1 week after symptoms resolved)	Body checks (AM), good ventilation and forbid class sleeping in same room at same time																		
Li 2010	15/167 (8.82)	30 days	Yes (2 weeks after symptoms resolved)	Body checks (AM)																		
Lu 2008	34/889 (3.82)	15 days	Yes	Body checks (AM), good ventilation																		
Ge and Lu 2010	26/390 (6.67)	Yes (days not stated)	Yes	Body checks (AM/PM)																		
Yu 2009	16/102 (15.69)	2 weeks	Yes																			
Zhang and Qin 2007	23/750 (3.10)	2 weeks	Yes (for symptomatic and asymptomatic children)	Body checks (AM)																		
Zhang and Ren 2010	30/213 (14.10)	2 weeks	Yes	Body checks (AM/PM)																		
Zhang 2001	31/110 (28.18)	No	Yes	Body checks (AM), stop admission and active case searching																		
Additional comments																						
<i>Authors conclusions:</i>																						
<p>The review summarises that a timely notification of a clustered outbreak within 24 hours and implementation of isolation measures according to the CDC guidelines are crucial to minimise attack rate of HFMD within childcare facilities. To achieve this, communication between stakeholders (childcare facilities, CHP, parents, and health care providers) about outbreak confirmation, risk assessment, and sentinel surveillance in the form of regular body checks should be enhanced by the provision of clear guidelines and an interactive platform</p>																						
<p>Included studies:</p> <table border="0"> <tr> <td>Li 2011</td> <td>Tao 2009</td> <td>Li 2008</td> </tr> <tr> <td>Duan 2010</td> <td>Jiang 2011</td> <td>Chen 2007</td> </tr> <tr> <td>Wang 2010</td> <td>Wu 2011</td> <td>Qu 2010</td> </tr> <tr> <td>Li 2010</td> <td>Lu 2009</td> <td>Ge and Lu 2010</td> </tr> <tr> <td>Un 2009</td> <td>Zhang and Qin 2007</td> <td>Zhang and Ren 2010</td> </tr> <tr> <td>Zhang 2001</td> <td></td> <td></td> </tr> </table>					Li 2011	Tao 2009	Li 2008	Duan 2010	Jiang 2011	Chen 2007	Wang 2010	Wu 2011	Qu 2010	Li 2010	Lu 2009	Ge and Lu 2010	Un 2009	Zhang and Qin 2007	Zhang and Ren 2010	Zhang 2001		
Li 2011	Tao 2009	Li 2008																				
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Un 2009	Zhang and Qin 2007	Zhang and Ren 2010																				
Zhang 2001																						
<p>CDC = Chinese Center for Disease Control and Prevention; HFMD = hand, foot, and mouth disease</p>																						

STUDY DETAILS: Getz 2016				
Citation				
Getz WM, Carlson C, Dougherty E, Porco Francis TC 1st, Salter R. “An Agent–Based Model of School Closing in Under–Vaccinated Communities During Measles Outbreaks.” Agent Dir Simul Symp. 2016 Apr; 2016:10. PMID: 27668297; PMCID: PMC5032840.				
Affiliation/Source of funds				
TCP was supported by a Models of Infectious Disease Agent Study (MIDAS) grant from the US NIH/NIGMS to the University of California, San Francisco, USA (U01GM087728). WMG was supported by funds from the University of California, Berkeley, USA. All authors affiliated with Medical or Tertiary institutions in the USA or South Africa				
Study design	Level of evidence	Location	Setting	
Modelling study	III–2	California, USA	Schools where a measles outbreak has occurred	
Intervention		Comparator		
Stay at home regulations for children who are not vaccinated		Inactive control		
Population characteristics				
Model based off data from 533 680 school children (aged 5 to 18 years) across 7864 schools and was condensed to two different scenarios: - 400 student school with 85% vaccination coverage - 400 student school with 95% vaccination coverage				
Length of follow–up		Outcomes measured		
NA		Number of cases		
Method of analysis				
This study used the NOVA modelling platform to build a stochastic, spatially–structured, individual–based SEIR model of measles outbreaks, under the assumption that the R_0 for measles is approximately 7. Used two versions of the model – one with 85% vaccine coverage, and one with 95% vaccine coverage, at 400 student schools. The model also included students occasionally visiting super spreading sites (high density sites e.g. Cinemas). The analysis was based on a Markov chain approach – model of measles in the US barring unvaccinated school–aged individuals from attending schools when one or more individuals in the school have come down with the measles				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Moderate The study appears to provide sound evidence for a non–randomised study but cannot be considered comparable to a well–performed randomised trial due to the lack of information regarding follow up data.				
RESULTS				
Outcome	Intervention: Send home Mean ± SD	Comparator: No action Mean ± SD	Risk estimate (95% CI)	Statistical significance p–value
<i>Send home vs No action</i>				
Number of cases				
Scenario 1: 85% vaccination coverage	2.4 ± 305	348 ± 403	MD –345.60 [–415.64, –275.56] ^	$p < 0.00001$ ^
Scenario 2: 95% vaccination coverage	1.6 ± 1.5	42 ± 50	MD –40.40 [–47.33, –33.47] ^	$p < 0.00001$ ^
(a)		(b)		

STUDY DETAILS: Getz 2016
Probability density plots of log number of cases from 100 runs of the model for each of the with and without implementation of the 'send unvaccinated students home' policy cases: (a) low vaccination rate community (85%); (b) high vaccination rate community (95%) (note: the abscissa scale is different from case (a)).
Additional comments
Authors conclusions: The model provides evidence for the considerable efficacy of a 'send unvaccinated students home' policy during outbreaks of measles in communities that are 'close to' vs 'well above' the heard immunity vaccination threshold
CI, confidence interval; ITT, intention-to-treat; PP, per-protocol; RCT, randomised controlled trial; SD, standard deviation ^ calculated post-hoc

STUDY DETAILS: CDNA SoNGS 2017b			
Citation			
Communicable Diseases Network Australia (CDNA) Influenza Infection working group. Invasive Meningococcal Disease: CDNA National Guidelines for Public Health Units. Australian Health Protection Principal Committee (AHPPC) and the Australian Government: Department of Health. 2017 March			
Affiliation/Source of funds			
No information on the source of funds or conflicts of interest was provided. All authors apart of the JEG working group.			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of invasive meningococcal disease in Australia		NA	
Population characteristics			
NA			
Length of follow-up		Outcomes measured	
NA		Incubation period Period of infectiousness Case management: Isolation and restriction	
Method of analysis			
These Guidelines are provided to assist public health units investigating outbreaks of invasive meningococcal disease. These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.			
INTERNAL VALIDITY			
Overall quality (author's opinion)			
Rating: High No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.			
RESULTS			
Outcome	Narrative summary		
Incubation period	Usually from 1 to 7 days (rarely up to 10 days). Individuals who become asymptomatic carriers of meningococci are very unlikely to develop IMD 1.		
Period of infectiousness	Until the organisms are no longer present in discharges from the nose and throat. With effective antibiotic therapy meningococci usually disappear from the nasopharynx within 24 hours.		
Isolation and restriction	Droplets and nasopharyngeal secretions are considered to be infectious from the onset of the acute illness until completion of 24 hours treatment with effective systemic antibiotics. ⁹ Hence, during this period both standard and droplet precautions should be practised for suspected, probable or confirmed cases, especially while undertaking airway management during resuscitation.		

Additional comments
<p><i>Authors conclusions:</i> To be considered a higher-risk contact, children and staff in childcare should have an equivalent degree of contact with the case as a household contact. An exposure assessment should be conducted to assess the degree of contact at the childcare centre. As a guide, two full days (where one full day is approximately 6-8 hours) of attendance in the same care group as the case or a cumulative of around 20 hours in the same care group as the case in the 7 days prior to onset of case symptoms should be considered a higher-risk contact.</p>
<p>IMD, invasive meningococcal disease</p>

STUDY DETAILS: CDNA SoNGS 2019			
Citation			
Communicable Diseases Network Australia (CDNA) Measles working group. Measles: CDNA National Guidelines for Public Health Units. Australian Health Protection Principal Committee (AHPPC) and the Australian Government: Department of Health. 2019 August			
Affiliation/Source of funds			
No information on the source of funds or conflicts of interest was provided. All authors affiliated apart of the Measles working group.			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of measles in Australia		NA	
Population characteristics			
NA			
Length of follow-up		Outcomes measured	
NA		Incubation period Period of infectiousness Case management: Isolation and restriction	
Method of analysis			
These Guidelines are provided to assist public health units investigating outbreaks of measles. These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.			
INTERNAL VALIDITY			
Overall quality (author's opinion)			
Rating: High No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.			
RESULTS			
Outcome	Narrative summary		
Incubation period	The incubation period is variable, averaging about 10 days (range from 7 to 18 days, occasionally longer) to the onset of fever and about 14 days to the onset of the rash. This period can be longer if immunoglobulin is given early in the incubation period.		
Period of infectiousness	Cases are considered to be infectious from 24 hours prior to onset of prodromal symptoms until 4 days after the onset of rash. Where the prodrome is undefined, the onset of the infectious period should be considered to be 4 days before the onset of the rash.		
Isolation and restriction	Susceptible contacts in early childhood education and care services and primary schools ¹ should be excluded until 14 days after the onset of the rash in the last case occurring at the facility or 18 days after the last contact with an infectious case to whom they were exposed outside the facility. However they may return if vaccinated within 3 days (72 hours) of first exposure to an infectious case or if they receive NHIG within 6 days (144 hours) following exposure.		

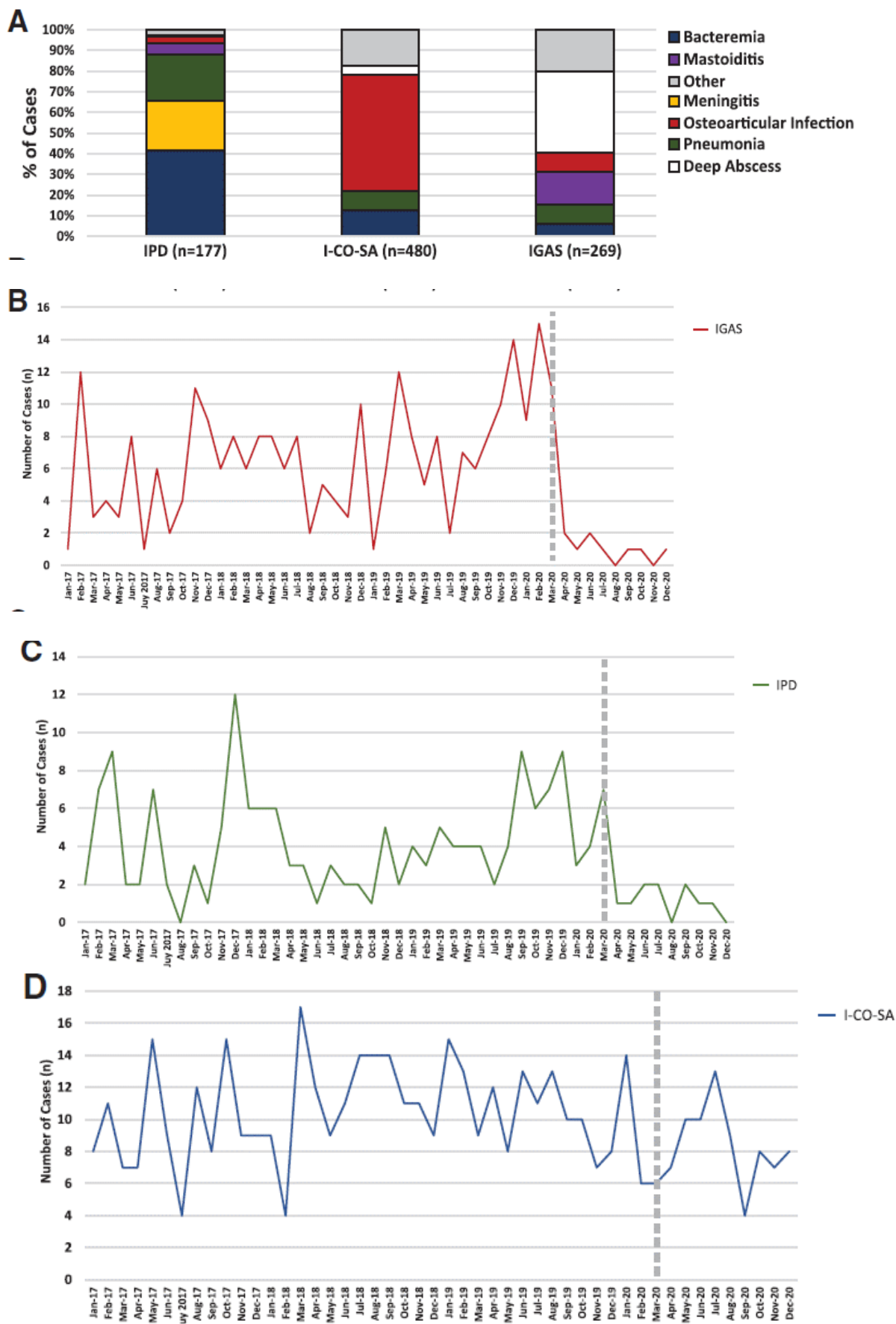
STUDY DETAILS: CDNA SoNGS 2019	
	<ul style="list-style-type: none"> - If a child or staff member receives MMR more than 72 hours after exposure and hence requires exclusion, if the outbreak is ongoing they may return to the facility if they remain well and more than 18 days have elapsed since their last contact with a case. - Immunocompromised children or staff should be excluded (regardless of their measles vaccination status) until 14 days after the onset of the rash in the last case occurring at the facility. Exclusion is advised for their own safety, even if they receive NHIG. <p>Adults in normal work situations or tertiary education facilities who are susceptible contacts do not always need to be excluded from work, education or social settings, depending on an assessment of their likelihood of developing measles and the likely consequences of infecting others. However, in these instances, they should be advised to isolate themselves from the time of onset of any prodromal symptoms consistent with measles, and to advise the PHU and seek medical assessment.</p>
Additional comments	
<i>Authors conclusions:</i>	
<ul style="list-style-type: none"> - Exclude suspected, probable, and confirmed cases from work, school, early childhood education and care services. - Advise them to stay in isolation, and specifically advise against interaction with susceptible people, until 4 days after the onset of the rash. When a case is isolated at home, visitors should be discouraged while the case is infectious. - Consider making a daily phone call to monitor compliance with isolation, and to encourage seeking medical attention, at home, if clinically indicated. - Suspected cases should be managed as though they are probable or confirmed cases whilst awaiting laboratory results. 	
ILI; influenza-like illness; MMR, measles, mumps rubella vaccine; PHU, public health unit	

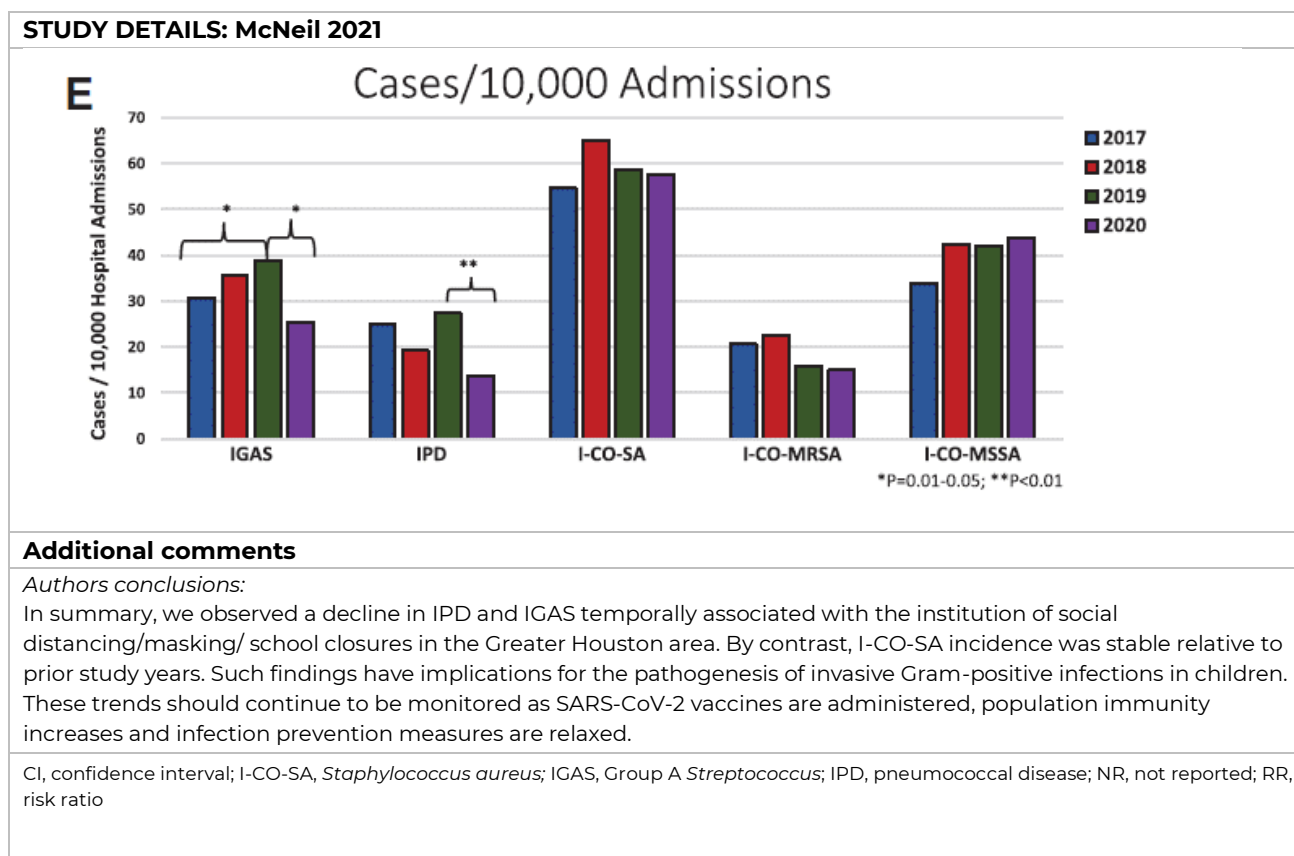
E5 Other infectious diseases

STUDY DETAILS: McNeil 2021			
Citation			
McNeil JC, Flores AR, Kaplan SL, Hulten KG. The Indirect Impact of the SARS-CoV-2 Pandemic on Invasive Group A Streptococcus, Streptococcus Pneumoniae and Staphylococcus Aureus Infections in Houston Area Children. <i>Pediatr Infect Dis J.</i> 2021 Aug 1;40(8):e313–e316. doi: 10.1097/INF.0000000000003195. PMID: 34250979; PMCID: PMC8279221.			
Affiliation/Source of funds			
J. C.McN. receives grant funding from the Agency for Healthcare Research and Quality (AHRQ R01HS026896). J.C.McN. has also received a donation of laboratory materials from Allergan for work unrelated to this manuscript. S.L.K. and K.G.H. receive research support through Pfizer. A.R.F. receives grant funding through NIAID R01AI25216, R21AI153663, R21AI142126, R21AI159059.			
Author affiliations: Baylor College of Medicine and Texas Children's Hospital, Houston, Texas; and University of Texas Health Science Center, Houston, Texas			
The authors declared no conflicts of interest.			
Study design	Level of evidence	Location	Setting
Prospective cohort study	III-3	Houston, Texas, USA	Community Texas Children's Hospital (TCH) campuses
Intervention		Comparator	
Indirect impact of Coronavirus 2 prevention strategies on invasive Staphylococcus aureus, Streptococcus pneumoniae (pneumococcus) and Group A Streptococcus		Historical cohort	
Population characteristics			
Paediatric admissions (< 18 yrs)			
Length of follow-up		Outcomes measured	
Cultures were examined from 1 January 2017 to 31 December 2020 COVID-19 Prevention strategies commenced from		Invasive <i>Staphylococcus aureus</i> incidence - rate/10,000 admissions <i>Streptococcus pneumoniae</i> (pneumococcus) incidence-	

STUDY DETAILS: McNeil 2021				
15 March 2020.		rate/10,000 admissions <i>Group A Streptococcus incidence - rate/10,000 admissions</i>		
Method of analysis				
<p>The annual and monthly number of hospital admissions across all TCH campuses was obtained from TCH administrative data. The number of non–neonatal paediatric admissions (patients < 18 years old) was employed as the denominator in calculations of frequency and presented as rate/10,000 admissions which was used as a surrogate for incidence.</p> <p>The primary comparison of interest was the rate/10 000 admissions of IGAS, IPD or I–CO–SA infection in the period subsequent to social distancing/school closure/ masking mandates in the Houston area compared with the prior 3 years. To adjust for potential trends unrelated to the SARS–CoV–2 pandemic, incidence rates from 2017 to 2019 were examined using linear regression which was then compared with incidence rates in 2020 using χ^2 for trend and reported as P-values and relative risk (RR) with 95% confidence intervals (95% CI).</p>				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Moderate				
The study appears to provide sound evidence for a non–randomised study but cannot be considered comparable to a well–performed randomised trial with important problems relating to the uncertainty of data used.				
RESULTS				
Outcome	Intervention n/N (%) Mean \pm SD	Comparator n/N (%) Mean \pm SD	Risk estimate (95% CI)	Statistical significance p–value
<i>COVID-19 prevention strategies vs Historical cohort</i>				
Total hospital admissions for <i>S. aureus</i> (I–CO–SA), Group A streptococcus (IGAS), and pneumococcal disease (IPD)	2020 = 17 348 admissions	2017 = 20 840 admissions 2018 = 20 760 admissions 2019 = 22 304 admissions	N/A	N/A
Pneumococcal disease (IPD) incidence	Declined to 13.83/10 000 admissions	Incidence stable from 2017 to 2019 (range from 19.26 to 23.39 cases/10 000 admissions)	RR 0.51 (0.32, 0.81)	<i>Favours intervention</i> $p = 0.02$
Invasive community onset <i>S. aureus</i> (I–CO–SA)	Stable from 2018 to 2020 57.6/10 000 admissions	Increased from 2017 to 2018 (54.7/10 000 vs 65.03/10 000)	RR 0.9 (0.78, 1.32)	No significant difference in I–CO–SA between 2019 and 2020 $p = 0.47$
<i>Streptococcus pyogenes</i> [Group A <i>Streptococcus</i> (GAS)]	Declined in 2020 25.36/10000 admissions	Increased incidence 2019 – 2019 30.71/10 000 to 39.01/10 000 admissions	RR 0.65 (0.45, 93)	<i>Favours intervention</i> $p = 0.02$
Specific diagnosis of IPD				
Bacteraemia:	5.19/10 000 in 2020	11.21/10 000 in 2019	RR 0.46 (0.21, 0.99)	$p = 0.02$
Meningitis:	2.88/10 000 in 2020	7.62/10 000 in 2019	RR 0.37 (0.12, 0.98)	$p = 0.03$
Pneumonia:	2.88/10 000 in 2020	6.72/10 000 in 2019	RR 0.43 (0.15, 1.17)	$p = 0.06$

STUDY DETAILS: McNeil 2021





STUDY DETAILS: Högberg 2004

Citation
 Liselotte Högberg, Birgitta Henriques Normark, Håkan Ringberg, Karin Stenqvist, Hans Fredlund, Patricia Geli, Katarzyna Grabowska, Eva Melander, Martin Laurell, Christina Åhrén, Eva Törnqvist, Rosmarie Fält, Dag Höglund, Gunnel Möllerberg & Karl Ekdahl (2004) The Impact of Active Intervention on the Spread of Penicillin-resistant *Streptococcus pneumoniae* in Swedish Day-care Centres, *Scandinavian Journal of Infectious Diseases*, 36:9, 629–635, DOI: 10.1080/00365540410022594

Affiliation/Source of funds
 Details on potential conflicts of interest not provided.
 This study was supported by grant QLK2-CT-2000-01020 (EURIS) from the European Commission.
 All authors affiliates with Medical or Tertiary institutions in Sweden

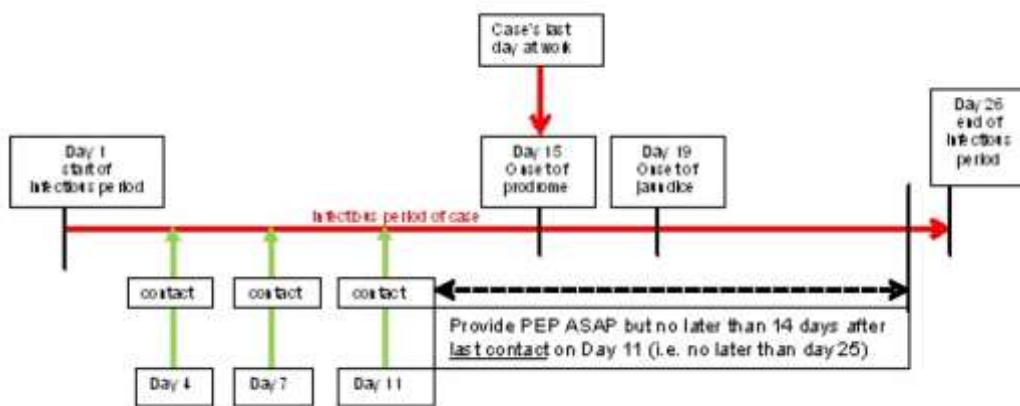
Study design	Level of evidence	Location	Setting
Prospective/retrospective cohort	III-2	Skane and Greater Goteborg City, Sweden	Day care centres
Intervention	Comparator		
Exclusion of penicillin-non-susceptible <i>Streptococcus pneumoniae</i> (PNSP) carriers from day care centres	No intervention		
Population characteristics			
Children from 14 day care centres across counties in Sweden. The children were defined as those who had extensive daily contact, i.e. spent the majority of the day in the same rooms, sharing the same staff etc.			
Length of follow-up	Outcomes measured		
The follow-up cultures during the intervention period were made within 11 days in all DCCs in study area A. In study area B they were completed after a mean time of 29 days (range 27/ 31d) Study conducted from August 2001 to September 2002	Prevalence of PNSP		
Method of analysis			
A case was defined as a child who had <i>Streptococcus pneumoniae</i> with a PcG MIC ≥ 0.5 mg/l isolated through			

STUDY DETAILS: Högberg 2004				
nasopharyngeal culture. The effect of the intervention was assessed both at individual level (relative risk for becoming a PNSP-carrier during the follow-up period in study area B compared to study area A), and at group level by calculating the attributable fraction among new carriers during the follow-up period.				
INTERNAL VALIDITY				
Overall risk of bias (descriptive)				
Rating: Moderate				
The study appears to provide sound evidence for a non-randomised study but cannot be considered comparable to a well-performed randomised trial due to lack of statistical analysis and uncertainty in how compounding effects were handled.				
RESULTS				
Day Care Centre no.	Baseline prevalence (%) n/N	Follow up cumulative incidence (%) n/N	No follow up cultures	Follow up time (weeks)
<i>Prevalence of PNSP</i>				
1	25% (3/12)	0(0/9)	1	1
2	45% (5/21)	9 (0/16)	1	1
3	21% (3/14)	0 (0/11)	1	1
4	29% (2/7)	0 (0.5)	1	1
5	13% (1/8)	14% (1/7)	2	2
6	13% (3/24)	5% (1/21)	2	2
7	11% (2/18)	13% (2/16)	2	2
8	6% (1/17)	0 (0/16)	1	1
9	14% (2/14)	0 (0/12)	1	3
10	20% (3/15)	0 (0/12)	1	2
11	7% (1/15)	0 (0/14)	1	1
12	8% (1/12)	27% (3/11)	3	9
13	54% (7/12)	33% (2/5)	2	6
14	8% (2/24)	9% (2/22)	3	10
TOTAL Incidence of PNSP	Study Area A: 2.9% (4/139)	Study Area B: 18.4% (7/38)		
<i>Proportional estimates</i>				
Proportion new carriers estimated to be attributed to the lack of intervention	NR	84%	95% CI, 49 - 95	
Additional comments				
<i>Authors conclusions:</i>				
The relative risk for children in day care centres without an exclusion intervention was 6.4 (95% CI: 2.0/20.7). Each prevented case in area A can be estimated to have demanded the exclusion of 2 other children from day care for approximately 4 weeks each.				
CI, confidence interval; NR, not reported; PNSP, penicillin-non-susceptible Streptococcus pneumonia				

STUDY DETAILS: CDNA SoNGS 2018
Citation
Communicable Diseases Network Australia (CDNA); Hepatitis A working group. Hepatitis A: CDNA National Guidelines for Public Health Units. Australian Health Protection Principal Committee (AHPPC) and the Australian Government: Department of Health. 2018 July
Affiliation/Source of funds
No information on the source of funds or conflicts of interest was provided. All authors affiliated apart of the Hepatitis A working group.

STUDY DETAILS: CDNA SoNGS 2018			
Study design	Level of evidence	Location	Setting
National Guidelines	NA	Australia	Community
Intervention		Comparator	
Public health management of Hepatitis A in Australia		NA	
Population characteristics			
NA			
Length of follow-up		Outcomes measured	
NA		Incubation period Period of infectiousness Case management: Isolation and restriction	
Method of analysis			
These Guidelines are provided to assist public health units investigating outbreaks of Hepatitis A in Australia. These <i>Guidelines</i> capture the knowledge of experienced professionals, build on past research efforts, and provide advice on best practice based upon the best available evidence at the time of completion.			
INTERNAL VALIDITY			
Overall quality (author’s opinion)			
Rating: High No or one non-critical weakness – the guidelines have one non-critical weakness but no critical flaws. It provides an accurate summary of the results of the available studies that were included in the review.			
RESULTS			
Outcome	Narrative summary		
Incubation period	The incubation period averages 28 to 30 days, with a range of 15 to 50 days.		
Period of infectiousness	Cases are considered infectious from two weeks before the onset of prodromal symptoms to either one week after the onset of jaundice (if it occurs), OR two weeks after the onset of prodromal symptoms (if jaundice does not occur).		
Isolation and restriction	<p>While in the infectious period which can be defined as:</p> <ul style="list-style-type: none"> - from two weeks before the onset of the prodrome to at least seven days after the onset of jaundice; OR - from two weeks before the onset of the prodrome to 2 weeks after the onset of symptoms if there is no jaundice; OR - for asymptomatic cases, estimated using the timing of contact with the source if known (such as contact with an index case or consumption of contaminated food) and with consideration of the laboratory test results. If infectious period cannot be estimated, consider convening an expert panel to decide. <p>Cases should:</p> <ul style="list-style-type: none"> - Not donate blood - Not prepare or handle ready-to-eat food or drink for consumption by other people - Not have sex - Not provide personal care to others - Not attend childcare, preschool, primary school or work that could put others at risk - Be isolated as much as is practicable if living in a residential or aged care facility, or correctional facility, and ideally be placed in a single room with ensuite, or have a dedicated bathroom - Not share drugs or drug paraphernalia, and - Not share utensils, towels or personal items with others. 		

STUDY DETAILS: CDNA SoNGS 2018



Additional comments

Authors conclusions:

Because most HAV infections in young children are asymptomatic, illness among staff members or household contacts is often the first (and only) indication of child care centre outbreaks.¹² The exclusion period for a diagnosed case should be considered. Asymptomatic cases with HAV undetectable by PCR on stool can safely return to child care. Others that may remain PCR positive in stool should be assessed on a case by case basis.

The critical role of good personal hygiene (especially hand washing) should be reviewed with childcare centre staff. Staff involved in food handling, should not be involved in changing nappies during the same shift or day. Affected centres should be discouraged from accepting new children for 50 days after onset of the last case, unless hepatitis A vaccine or NHIG is given before admission. Transferring children to other centres should be discouraged during this period. All surfaces and toys in affected classrooms should be cleaned and sanitised daily. Toys that can't be washed should be temporarily removed.

HAV; Hepatitis A Virus; NHIG, normal human immunoglobulin; PCR, polymerase chain reaction; PEP, post-exposure prophylaxis

Appendix F Differences between protocol & review

F1 Methods not implemented

In the absence of quantifiable data, there were some methods that were not implemented in the review relating to the following sections:

Measures of effect

For all measures of effects, it was intended that we will report 95% confidence intervals and p -values with dichotomous data presented as risk ratios (RR) and continuous data reported as mean difference (MD). A standardised mean difference (SMD) was to be used when different scales are used to measure the same conceptual outcome (e.g. behaviour or practice change) and time-to-event data was to be presented as hazard ratios (HR) and, if analyses of covariance have been used to adjust for baseline measures, the adjusted effect estimates will also be recorded. Count data was to be presented as a rate ratio, and, to reduce effects of confounding, adjusted effect estimates from nonrandomised studies were to be reported (if available).

Quantitative synthesis

It was intended that, synthesis (meta-analysis) will be undertaken for studies that compare exclusion periods with 'no intervention, or alternative infection control interventions'. For RCTs and nonrandomised studies, data synthesis was to be performed using RevMan 5.4 (8). Within each comparison (PICO) it was intended that we combined effect estimates across studies for each outcome using a random effects model to take into account expected differences between studies. Due to the qualitative nature of the results for the included studies, a quantitative synthesis could not be conducted.

Risk of bias

It was intended that, for any included study, a second reviewer will check the risk of bias assessment when conducting the evidence synthesis (i.e. when examining the outcome results of the study for inclusion in a meta-analysis and when developing GRADE summary of findings tables), with the focus of the assessment being on the outcome of interest. That is, the second reviewer will check that the 'study level' assessment was appropriate for the outcome, with any additional notes added to the RoB comments. Due to the qualitative nature of the results for included studies, an evidence synthesis was not feasible and thus the risk of bias or quality of each study was conducted by one reviewer only.

In addition, it was intended that for each outcome we will report our judgement of risk of bias (e.g. low, moderate, high, critical) by domain and provide a rationale for the judgement with supporting information. Due to the low quality evidence provided, this was not applicable.

Subgroup analyses and investigations of heterogeneity

We did not plan to undertake any subgroup analyses of subsets of participants within or across studies, unless there was substantial inconsistency between effect estimates. Any subgroup analysis was intended to explore possible sources of heterogeneity relating to delivery of the intervention. Studies were to be grouped according to intervention characteristics and a standard test for heterogeneity across the subgroups was to be reported.

F2 Changes from protocol

There were some differences between the protocol and review relating to the following sections:

Studies identified in the literature search

It was intended that an update of the literature search was to be conducted to identify any studies published since the search date of the key evidence from systematic reviews. Due to time constraints, this was not performed, with the most recent literature search date from the included systematic reviews being up to June 2015.

Study selection criteria

Studies set in aged care; tertiary hospitals and other acute health care settings were not eligible for inclusion; however, modelling studies that used data taken from other settings (e.g. tertiary hospitals) were included.

Subgroup analyses and investigations of heterogeneity

We had specified that studies were to be stratified based on symptoms experienced (such as fever, diarrhoea, vomiting, rash), and from when the exclusion period commenced (i.e. from the first observed, first notified, or first confirmed symptom). However, given the small number of studies for each comparison, we did not stratify studies on the basis on commencement of exclusion period.

Summary of findings and certainty of the evidence

We had specified that the certainty of evidence across each population was assessed using the GRADE approach (3) with evidence from RCTs and nonrandomised studies evaluated separately, as well as evidence comparing exclusion measures with 'control' and 'other intervention'. It was intended that for each condition, findings for the critical and important outcomes were to be reported in summary of findings tables that were prepared using the GRADEpro GDT software (www.grade.pro.org). The estimates of treatment effects for each outcome were to be reported as absolute and relative risks (or SMD). As mentioned, data from the included studies was primarily non-quantitative and thus a narrative synthesis was prioritised.

Contributions of authors

The evidence evaluation and technical report was written and developed by **HTANALYSTS**, with evidence synthesis conducted by Sinead McCraith and Kate Nolan. Dr Margaret Jorgensen provided strategic advice and oversight. Expert advice was provided by SHAC, especially in relation to evidence synthesis.

Declarations of interest

All named authors declare they have no financial, personal or professional interests that could be construed to have influenced the conduct or results of this systematic review.

In line with the process to establish any ONHMRC committee, each committee member was asked to disclose their interests. Potential conflicts of interest among SHAC members are lodged with the NHMRC and are available online.

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