Supplementary Material*

Schünemann HJ, Khabsa J, Solo K, et al. Ventilation techniques and risk for transmission of coronavirus disease, including COVID-19. A living systematic review of multiple streams of evidence. Ann Intern Med. 21 May 2020. [Epub ahead of print]. doi:10.7326/M20-2306

* This supplementary material was provided by the authors to give readers further details on their article. The material was reviewed but not copyedited.

Supplement 1

Systematic review

To edit the record click *Start an update* below. This will create a new version of the record - the existing version will remain unchanged.

1. * Review title.

Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

A rapid systematic review of non-invasive ventilation for the care of patients infected with COVID-19

2. Original language title.

For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

3. * Anticipated or actual start date.

Give the date when the systematic review commenced, or is expected to commence.

04/04/2020

4. * Anticipated completion date.

Give the date by which the review is expected to be completed.

04/05/2020

5. * Stage of review at time of this submission.

Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.

Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission come to light, the content of the PROSPERO record will be removed leaving only the title and named contact details and a statement that inaccuracies in the stage of the review date had been identified.

This field should be updated when any amendments are made to a published record and on completion and publication of the review. If this field was pre-populated from the initial screening questions then you are not able to edit it until the record is published.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	No	No
Formal screening of search results against eligibility criteria	No	No

Review stage	Started	Completed
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here (e.g. Funded proposal, protocol not yet finalised).

commissioned by WHO
commissioned by WHO

6. * Named contact.

The named contact acts as the guarantor for the accuracy of the information presented in the register record.

Holger Schunemann

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:
Professor Schunemann

7. * Named contact email.

Give the electronic mail address of the named contact.

schuneh@mcmaster.ca

8. Named contact address

PLEASE NOTE this information will be published in the PROSPERO record so please do not enter private information

Give the full postal address for the named contact.

Department of Health Research Methods, Evidence, and Impact\rMcMaster University Health Sciences Centre, Room 2C16\r1280 Main Street West\rHamilton, ON L8S 4K1, Canada

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

+19055259140

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

McMaster University

Organisation web address:
https://canada.cochrane.org/

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE: email and country are now mandatory fields for each person.**

Professor Holger Schunemann. McMaster University
Elie Akl. American University of Beirut
Waleed Alhazzani. McMaster University

Sally Yaacoub. American University of Beirut
Bram Rochwerg. McMaster University
Eddy Fan. University of Toronto
Derek Chu. McMaster University
Mark Loeb. McMaster University
Dan Perri. McMaster University
Andrea Darzi. McMaster University
Jan Brozek. McMaster University
Nancy Santesso. McMaster University
Paul Garner. Liverpool School of Tropical Medicine
Rebecca Thomas. Liverpool School of Tropical Medicine
Miriam Taegtmeyer. Liverpool School of Tropical Medicine
Layal Hneiny. American University of Beirut
Neera Bhatnagar. McMaster University
Aida Farha. American University of Beirut
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Ignacio Neumann. Pontificia Universidad Católica de Chile
Carlos Cuello Garcia. McMaster University
Finn Schünemann. None
Giovanna Muti. Vita-Salute San Raffaele University
Gian Paolo Morgano. McMaster University
Tamara Lotfi. McMaster University
Thomas Piggott. McMaster University
Ewa Borowiack. Evidence Prime
Anna Bak. Evidence Prime
Tejan Baldeh. McMaster University
Rosa Stalteri. McMaster University
Chen Chen. none
Anisa Hajizadeh. McMaster University
Wojciech Szczeklik. Krakow University
Leila Harrison. McMaster University
Martin Stanulla. Medical School of Hannover, Germany
Joanne Khabsa. American University of Beirut
Fatima Chamseddine. American University of Beirut
Rayane El-Khoury. American University of Beirut
Amena El-Harakeh. American University of Beirut
Zahra Saad. American University of Beirut
Assem Khamis. American University of Beirut
Pierre Abi Hanna. American University of Beirut
Antonio Bognanni. None
Marge Reinap. WHO Regional Office for Europe
Imad Bou Akl. American University of Beirut

12. * Funding sources/sponsors.

Give details of the individuals, organizations, groups or other legal entities who take responsibility for initiating, managing, sponsoring and/or financing the review. Include any unique identification numbers assigned to the review by the individuals or bodies listed.

World Health Organization, McMaster University, and American University of Beirut

Grant number(s)

13. * Conflicts of interest.

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review.

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country are now mandatory fields for each person.**

Karla Solo. McMaster University

15. * Review question.

State the question(s) to be addressed by the review, clearly and precisely. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS where relevant.

In patients with suspected or confirmed COVID-19, and hypoxemic respiratory failure what is the impact of using non-invasive ventilation (NIV), including bilevel positive airway pressure (BiPAP) or continuous positive airway pressure (CPAP) or high flow oxygen by nasal cannula (HFNC) as compared to no non-invasive mechanical ventilation?

16. * Searches.

State the sources that will be searched. Give the search dates, and any restrictions (e.g. language or publication period). Do NOT enter the full search strategy (it may be provided as a link or attachment.)

We will search the following electronic databases:
PubMed, MEDLINE, EMBASE, CINAHL, and the Cochrane Library from 2019 to current date.

We will search the following Chinese electronic databases:
• WHO Chinese database
• CNKI (http://new.oversea.cnki.net/index/)
• China Biomedical Literature Service (http://www.sinomed.ac.cn/login.do)

In addition, we will search the following COVID-19 specific databases (which include preprint repositories) from 2019 to current date
• Epistemonikos COVID-19 L·OVE platform (https://app.iloveevidence.com/loves/5e6fdb9669c00e4ac072701d);
• EPPI Centre living systematic map of the evidence (http://eppi.ioe.ac.uk/cms/Projects/DepartmentofHealthandSocialCare/Publishedreviews/COVID-19Livingsystematicmapoftheevidence/tabid/3765/Default.aspx);
• CORD-19 (https://www.kaggle.com/allen-institute-for-ai/CORD-19-research-challenge);
• COVID-19 Research Database maintained by the World Health Organization (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov)

We will conduct a search for ongoing trials using the U.S. National Library of Medicine Register of Clinical Trials (ClinicalTrials.gov) and the WHO International Clinical Trials Registry Platform (ICTRP). We will hand-search the reference lists of the included papers. We will also review the studies included in any identified relevant systematic reviews.

Search strategy combines relevant medical subject headings (MeSH) and keywords, which include “COVID-19”, and “corona virus”. PubMed search terms are informed by https://blocks.bmi-online.nl/catalog/397. The search strategy has been drafted by

Ms. Layal Hneiny and is being peer reviewed by two information specialists (Ms. Neera Bhatnagar and Ms. Aida Farha). Finalized search strategies will be available on April 3, 2020 but a final draft can be found in the Supplement.

Content experts will search websites of governmental and organizational websites for relevant grey literature documents.

Additional search strategies to identify indirect evidence on SARS and MERS will also be constructed and peer-reviewed by information specialists. This latter search will focus on systematic reviews.

Languages covered: English, German, Italian, Chinese, Spanish, Portuguese, Polish, Estonian, French, Arab

17. URL to search strategy.

Give a link to a published pdf/word document detailing either the search strategy or an example of a search strategy for a specific database if available (including the keywords that will be used in the search strategies), or upload your search strategy.

Do NOT provide links to your search results.

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to April 03, 2020>
Search Strategy:
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1 (pneumonia/ or pneumonia, viral/ or exp Viruses/) and (exp Disease Outbreaks/ or exp Epidemiology/ or Epidemiology.fs.) (104390)
2 coronaviridae/ or Coronaviridae Infections/ or exp coronavirus/ or Coronavirus Infections/ or Betacoronavirus/ (13402)
3 (Betacoronavirus or Beta-coronavirus or Coronavirus* or COVID).mp. (15546)
4 1 or 2 or 3 (119996)
5 limit 4 to ez="20020101-20200405" (85791)
6 SARS virus/ or severe acute respiratory syndrome/ or ((severe adj acute adj respiratory adj syndrome) or SARs or Sars-cov or ((sars-associated or sars-related) adj (cov or coronavirus))).mp. (11089)
7 Middle East Respiratory Syndrome Coronavirus/ or Middle East Respiratory Syndrome/ or (Mers or (middle adj east adj respiratory adj syndrome) or (middle adj east adj respiratory adj syndrome adj (associated or related) adj (coronavirus or Cov)) or Mers-Cov or ((Mers-related or mers-associated) adj (coronavirus or cov))).mp. (7985)
8 (("2019" adj (novel or new) adj corona*) or ("2019" adj (CoV or nCoV)) or (coronavirus adj (disease adj "2019")) or COVID19 or COVID-19 or ((Novel or New) adj Corona*) or SARS2 or SARS-CoV-2 or (SARS adj2 (coronaviridae or coronavirus)) or ((sars or Coronavirus) adj "2") or nCov or 2019ncov).mp. (6069)
9 5 or 6 or 7 or 8 (95981)
10 Respiration, Artificial/ or exp Positive Pressure Respiration/ or Ventilator Weaning/ or exp Noninvasive ventilation/ or VENTILATORS, MECHANICAL/ or Ventilators, Negative-Pressure/ (78994)
11 (((non-invasive or noninvasive or Mechanical or pulmonary or artificial or assisted or (proportion* adj assist*) or helmet or nasal or pressure or volume or cuirass) adj2 (ventilat* or respirat*)) or (respirator adj weaning) or ((positive or negative) adj airway*) or ((airway* or positive) adj3 pressure) or ((volume or pressure) adj control*) or BiPAP or ippb or ((inspiratory or intermittent) adj3 (ventilation or breathing)) or ippv or NIV or NIPPV or NPPV or NIAV or NIVM or SNIMV or NPSIMV or Aprv or cpap or ncpap or PAV or ((breath* or respiratory or pressure or volume) adj4 (support or ((face or nasal) adj mask) or helmet))).mp. (159984)
12 10 or 11 (160751)
13 9 and 12 (1393)

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.

COVID-19 infection and hypoxemic respiratory failure

19. * Participants/population.

Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.

Patients with confirmed or suspected COVID-19 infection and hypoxemic respiratory failure (despite oxygen therapy) in any setting that has capacity for NIV and invasive ventilation

20. * Intervention(s), exposure(s).

Give full and clear descriptions or definitions of the nature of the interventions or the exposures to be reviewed.

Non-invasive ventilation (NIV) including bilevel positive airway pressure (BiPAP) or continuous positive airway pressure (CPAP) or high flow oxygen by nasal canula (HFNC)

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

Invasive mechanical ventilation (via ETT or Tracheostomy), standard oxygen therapy or no mechanical ventilation

22. * Types of study to be included.

Give details of the types of study (study designs) eligible for inclusion in the review. If there are no restrictions on the types of study design eligible for inclusion, or certain study types are excluded, this should be stated. The preferred format includes details of both inclusion and exclusion criteria.

No restrictions will be placed on study design

23. Context.

Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.

individuals with suspected COVID-19 infection who are waiting to be tested (e.g., presenting to a lab, emergency department), or cannot be tested (because of lack of resources or time) are eligible for inclusion

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

• Death
• Transmission of COVID-19 to health care workers and other people
• Length of hospital stay
• Length of ICU stay
• Complications of therapy
• Secondary bacterial pneumonia
• Need for invasive ventilation
• Need for tracheostomy?
• (Time to) Recovery from COVID-19
• Aerosol generation and droplet dispersion of live virus at various distances and times)
• Contextual outcomes (acceptability, feasibility, resources use, impact on equity)

* Measures of effect
relative risks, odds ratios, risk difference, and/or 'number needed to treat.

25. * Additional outcome(s).

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state ‘None’ or ‘Not applicable’ as appropriate to the review

none

* Measures of effect

relative risks, odds ratios, risk difference

26. * Data extraction (selection and coding).

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

A single reviewer will extract data using a piloted form and a second reviewer will verify all extracted data. Minimal data will be extracted addressing the following domains: study identifier; study design; setting; population characteristics; intervention and comparator characteristics; outcomes (quantitative if possible); source of funding and reported conflicts of interests; ethical approval; study limitations or other important comments.

27. * Risk of bias (quality) assessment.

Describe the method of assessing risk of bias or quality assessment. State which characteristics of the studies will be assessed and any formal risk of bias tools that will be used.

One reviewer will perform risk of bias assessments and a second reviewer will verify all assessments. We will use the Cochrane risk of bias tool (version 2) for randomized controlled trials, and Newcastle Ottawa scale or ROBINS-I for non-randomized studies (depending on the number of studies found).

28. * Strategy for data synthesis.

Provide details of the planned synthesis including a rationale for the methods selected. This **must not be generic text** but should be **specific to your review** and describe how the proposed analysis will be applied to your data.

Our goal is to have two reviewers independently extract data using a piloted form and resolve disagreement by consensus. If the number of studies to extract data from is large, a single reviewer will extract data and a second reviewer will verify all extracted data. We will extract data addressing the following domains: study identifier; study design; setting; population characteristics; intervention and comparator characteristics; outcomes (quantitative if possible); source of funding and reported conflicts of interests; ethical approval; study limitations or other important comments.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

• Age: <18, 18 to 40, 50, 60, >60 years
• Interface (helmet compared to oronosal or full-face mask)
• Degree of hypoxia based on PF
• Comorbidities (diabetes, obesity, chronic kidney disease, congestive heart failure, COPD, asthma, chronic liver disease, hypertension, depression, actively treated malignancy, immunosuppression (due to illness or meds)
• Confirmed vs. suspected (see above) patients (testing pending, confirmation pending by public health)
• Prone positioning
• Type of healthcare setting (secondary or tertiary)
• Negative pressure vs. non-negative pressure
• Isolated vs. not.
• Radiographic pattern/finding

30. * Type and method of review.

Select the type of review and the review method from the lists below. Select the health area(s) of interest for your review.

Type of review

Cost effectiveness	No
Diagnostic	No
Epidemiologic	No

Individual patient data (IPD) meta-analysis	No
Intervention	Yes
Meta-analysis	No
Methodology	No
Narrative synthesis	No
Network meta-analysis	No
Pre-clinical	No
Prevention	No
Prognostic	No
Prospective meta-analysis (PMA)	No
Review of reviews	No
Service delivery	No
Synthesis of qualitative studies	No
Systematic review	Yes
Other	No

Health area of the review

Alcohol/substance misuse/abuse	No
Blood and immune system	No
Cancer	No
Cardiovascular	No
Care of the elderly	No
Child health	No
Complementary therapies	No
Crime and justice	No
Dental	No
Digestive system	No
Ear, nose and throat	No

Education	No
Endocrine and metabolic disorders	No
Eye disorders	No
General interest	No
Genetics	No
Health inequalities/health equity	No
Infections and infestations	Yes
International development	No
Mental health and behavioural conditions	No
Musculoskeletal	No
Neurological	No
Nursing	No
Obstetrics and gynaecology	No
Oral health	No
Palliative care	No
Perioperative care	No
Physiotherapy	No
Pregnancy and childbirth	No
Public health (including social determinants of health)	Yes
Rehabilitation	No
Respiratory disorders	Yes
Service delivery	No
Skin disorders	No
Social care	No
Surgery	No
Tropical Medicine	No
Urological	No

Wounds, injuries and accidents	No
Violence and abuse	No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is an English language summary.

32. * Country.

Select the country in which the review is being carried out from the drop down list. For multi-national collaborations select all the countries involved.

Canada
China
England
Italy
Lebanon
Poland

33. Other registration details.

Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. (N.B. Registration details for Cochrane protocols will be automatically entered). If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

Give the citation and link for the published protocol, if there is one

No I do not make this file publicly available until the review is complete

35. Dissemination plans.

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

In addition to preparing a report for WHO, we will disseminate the findings to the scientific community through publication, including in a peer-reviewed journal, and by making it available directly to core stakeholders as reports.

Do you intend to publish the review on completion?

Yes

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords will help users find the review in the Register (the words do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

37. Details of any existing review of the same topic by the same authors.

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

38. * Current review status.

Review status should be updated when the review is completed and when it is published. For newregistrations the review must be Ongoing.

Review_Ongoing

39. Any additional information.

Provide any other information the review team feel is relevant to the registration of the review.

40. Details of final report/publication(s).

This field should be left empty until details of the completed review are available.

Supplement 2. Stream 1 search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <January 1, 2002 to May 1, 2020>
Search Strategy:
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1 (pneumonia/ or pneumonia, viral/ or exp Viruses/) and (exp Disease Outbreaks/ or exp Epidemiology/ or Epidemiology.fs.) (106155)
2 coronaviridae/ or Coronaviridae Infections/ or exp coronavirus/ or Coronavirus Infections/ or Betacoronavirus/ (14903)
3 (Betacoronavirus or Beta-coronavirus or Coronavirus* or COVID).mp. (20800)
4 1 or 2 or 3 (125624)
5 limit 4 to ez="20020101-20200501" (90532)
6 SARS virus/ or severe acute respiratory syndrome/ or ((severe adj acute adj respiratory adj (infection or syndrome)) or SARs or SARI or Sars-cov or ((sars-associated or sars-related) adj (cov or coronavirus))).mp. (14511)
7 Middle East Respiratory Syndrome Coronavirus/ or Middle East Respiratory Syndrome/ or (Mers or (middle adj east adj respiratory adj syndrome) or (middle adj east adj respiratory adj syndrome adj (associated or related) adj (coronavirus or Cov)) or Mers-Cov or ((Mers-related or mers-associated) adj (coronavirus or cov))).mp. (9622)
8 (("2019" adj (novel or new) adj corona*) or ("2019" adj (CoV or nCoV)) or (coronavirus adj (disease adj "2019")) or COVID19 or COVID-19 or ((Novel or New) adj Corona*) or SARS2 or SARS-CoV-2 or (SARS adj2 (coronaviridae or coronavirus)) or ((sars or Coronavirus) adj "2") or nCov or 2019ncov).mp. (11126)
9 5 or 6 or 7 or 8 (102564)
10 exp Respiration, Artificial/ or exp VENTILATORS, MECHANICAL/ or Cannula/ or exp Oxygen Inhalation Therapy/ or exp Intubation, Intratracheal/ (135597)
11 (((invasive or non-invasive or noninvasive or Mechanical or pulmonary or artificial or assisted or assistance or (proportion* adj assist*) or helmet or nasal or pressure or volume or cuirass or support or High-Frequency or interactive or liquid or liquid-assisted or fluorocarbon or One-Lung or manual or (inverse adj ratio)) adj2 (ventilat* or respirat*)) or (lung adj seperat* adj technique?) or (rapid adj sequenc* adj (intubate* or induct*)) or ((endotracheal or Intratracheal) adj intubat*) or (respirator adj weaning) or ((positive or negative) adj airway*) or ((airway* or positive) adj3 pressure) or ((respirat* or volume or pressure) adj control*) or BiPAP or ippb or ((inspiratory or intermittent) adj3 (ventilation or breathing)) or ippv or NIV or NIPPV or NPPV or NIAV or NIVM or SNIMV or NPSIMV or Aprv or cpap or BCAP or bCPAP or B-CPAP or ncpap or PAV or ((breath* or respiratory or pressure or volume) adj4 support) or ((face or nasal or oronosal or Laryngeal) adj (mask? or helmet?)) or (nasal adj3 (cannula? or oxygen or tube?)) or HFNC or optiflow* or (oxygen adj inhalat* adj therap*) or (therapeutic adj hyperventilation)).mp. (197195)
12 10 or 11 (230848)
13 9 and 12 (1835)

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Database: Embase <2002 January 1 to 2020 May 1>
Search Strategy:

No.	Query	Results
#23	#12 AND #22	8295
#22	#13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21	279905
#21	(((breath* OR respiratory OR pressure OR volume) NEAR/3 support):ti,ab,kw) OR (((face OR nasal OR oronosal OR laryngeal) NEXT/0 (mask$ OR helmet$)):ti,ab,kw) OR ((nasal NEAR/2 (cannula$ OR oxygen OR tube$)):ti,ab,kw) OR hfnc:ti,ab,kw OR optiflow*:ti,ab,kw OR ((oxygen NEXT/0 inhalat* NEXT/0 therap*):ti,ab,kw) OR 'therapeutic hyperventilation':ti,ab,kw	18181
#20	((inspiratory OR intermittent) NEAR/2 (ventilation OR breathing)):ti,ab,kw ((respirator NEXT/0 weaning):ti,ab,kw) OR (((positive OR negative) NEXT/0 airway*):ti,ab,kw) OR (((airway* OR positive) NEAR/2 pressure):ti,ab,kw) OR 'respiration-control':ti,ab,kw OR 'volume control':ti,ab,kw OR 'pressure	2167
#19	control*':ti,ab,kw pav:ti,ab,kw OR ippv:ti,ab,kw OR niv:ti,ab,kw OR nippv:ti,ab,kw OR nppv:ti,ab,kw OR niav:ti,ab,kw OR nivm:ti,ab,kw OR snimv:ti,ab,kw OR npsimv:ti,ab,kw OR aprv:ti,ab,kw OR cpap:ti,ab,kw OR ncpap:ti,ab,kw OR bipap:ti,ab,kw OR ippb:ti,ab,kw OR bcap:ti,ab,kw OR bcpap:ti,ab,kw OR 'b	58676
#18	cpap':ti,ab,kw	28993
#17	((invasive OR noninvasive) NEAR/1 (ventilat* OR respirat*)):ti,ab,kw (('non invasive' NEAR/1 respirat*):ti,ab,kw) OR ((mechanical NEAR/1 respirat*):ti,ab,kw) OR ((pulmonary NEAR/1 respirat*):ti,ab,kw) OR ((artificial NEAR/1 respirat*):ti,ab,kw) OR (((assisted OR assistance) NEAR/1 respirat*):ti,ab,kw) OR (('proportional assist*' NEAR/1 respirat*):ti,ab,kw) OR ((helmet NEAR/1 respirat*):ti,ab,kw) OR ((nasal NEAR/1 respirat*):ti,ab,kw) OR ((pressure NEAR/1 respirat*):ti,ab,kw) OR ((volume NEAR/1 respirat*):ti,ab,kw) OR ((cuirass NEAR/1 respirat*):ti,ab,kw) OR ((support NEAR/1	13392
#16	respirat*):ti,ab,kw) (((('high frequency' OR interactive OR liquid OR 'liquid assisted' OR fluorocarbon OR 'one lung' OR manual OR 'inverse ratio') NEAR/1 (ventilat* OR respirat*)):ti,ab,kw) OR ((lung NEXT/0 seperat* NEXT/0 technique$):ti,ab,kw) OR ((rapid NEXT/0 sequenc* NEXT/0 (intubate* OR induct*)):ti,ab,kw) OR	15827
#15	(((endotracheal OR intratracheal) NEXT/0 intubat*):ti,ab,kw) (('non invasive' NEAR/1 ventilat*):ti,ab,kw) OR ((mechanical NEAR/1 ventilat*):ti,ab,kw) OR ((pulmonary NEAR/1 ventilat*):ti,ab,kw) OR ((artificial NEAR/1 ventilat*):ti,ab,kw) OR (((assisted OR assistance) NEAR/1 ventilat*):ti,ab,kw) OR (('proportional assist*' NEAR/1 ventilat*):ti,ab,kw) OR ((helmet NEAR/1 ventilat*):ti,ab,kw) OR ((nasal NEAR/1 ventilat*):ti,ab,kw) OR ((pressure NEAR/1 ventilat*):ti,ab,kw) OR ((volume NEAR/1 ventilat*):ti,ab,kw) OR ((cuirass NEAR/1 ventilat*):ti,ab,kw) OR ((support NEAR/1	5384
#14	ventilat*):ti,ab,kw) 'artificial ventilation'/exp OR 'mechanical ventilator'/de OR 'negative pressure	102879
#13	ventilator'/exp	206448

#12	#5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11	225408
#11	'covid-19':ti,ab,kw OR covid19:ti,ab,kw OR ((2019 NEXT/0 (novel OR new) NEXT/0 corona*):ti,ab,kw)	4968
#10	((2019 NEXT/0 (cov OR ncov)):ti,ab,kw) OR ((coronavirus NEXT/0 'disease 2019'):ti,ab,kw) OR (((novel OR new) NEXT/0 corona*):ti,ab,kw) OR sars2:ti,ab,kw OR 'sars cov 2':ti,ab,kw OR ncov:ti,ab,kw OR 2019ncov:ti,ab,kw	1974
#9	mers:ti,ab,kw OR ((middle NEXT/0 east NEXT/0 respiratory NEXT/0 syndrome):ti,ab,kw) OR ((middle NEXT/0 east NEXT/0 respiratory NEXT/0 syndrome NEXT/0 (associated OR related) NEXT/0 (coronavirus OR cov)):ti,ab,kw) OR 'mers cov':ti,ab,kw OR ((('mers related' OR 'mers associated') NEXT/0 (coronavirus OR cov)):ti,ab,kw)	4675
#8	'middle east respiratory syndrome'/de OR 'middle east respiratory syndrome coronavirus'/de	2581
#7	((severe NEXT/0 acute NEXT/0 respiratory NEXT/0 (infection OR syndrome)):ti,ab,kw) OR sars:ti,ab,kw OR sari:ti,ab,kw OR 'sars cov':ti,ab,kw OR ((('sars associated' OR 'sars related') NEXT/0 (cov OR coronavirus)):ti,ab,kw)	12683
#6	'severe acute respiratory syndrome'/de OR 'sars-related coronavirus'/de	8730
#5	#4 AND [1-1-2002]/sd	213894
#4	#1 OR #2 OR #3	264340
#3	betacoronavirus:ti,ab,kw OR 'beta coronavirus':ti,ab,kw OR coronavirus*:ti,ab,kw OR covid:ti,ab,kw	17754
#2	'coronavirus infection'/de OR 'betacoronavirus'/de OR 'coronaviridae'/de OR 'coronaviridae infection'/de	4476
#1	('pneumonia'/de OR 'virus pneumonia'/de OR 'virus'/exp) AND ('epidemic'/de OR 'epidemiology'/exp OR epidemiology:lnk)	249476

PubMed (from January 1, 2002 to May 1, 2020)

((CORonaviridae[Mesh:noexp] OR " Coronaviridae Infections"[Mesh:noexp] OR conavirus[Mesh] OR "Coronavirus Infections"[Mesh:noexp] OR BetacORonavirus[Mesh:noexp] OR pneumonia[Mesh:noexp] OR pneumonia, viral[Mesh:noexp] OR Viruses[Mesh] and "Disease Outbreaks"[Mesh] OR Epidemiology[Mesh] OR Epidemiology [Mesh subject heading] OR BetacORonavirus[tw] OR Beta-cORonavirus[tw] OR corona[tw] OR corona'[tw] OR corona's[tw] OR OR coronaviral[tw] OR coronavirdae[tw] OR coronavirida[tw] OR coronaviridae[tw] OR coronaviridea[tw] OR coronaviridiae[tw] OR coronavirinae[tw] OR coronavirion[tw] OR coronavirions[tw] OR coronavirologists[tw] OR coronavirology[tw] OR coronaviroses[tw] OR coronavirous[tw] OR coronavirues[tw] OR coronavirus[tw] OR coronavirus'[tw] OR coronavirus's[tw] OR coronaviruscpe[tw] OR coronaviruse[tw] OR coronaviruses[tw] OR coronaviruses'[tw] OR coronaviruslike[tw] OR coronaviser[tw] OR coronaviurs[tw] OR coronaviuses[tw] OR coronavrius[tw] OR coronavvirus[tw] OR COVID[tw] AND 2002/01:2020/05 [crdt] OR "SARS virus"[Mesh:noexp] OR "severe acute respiratory syndrome"[Mesh:noexp] OR severe acute respiratory syndrome*[tw] OR SARS[tw] OR Sars-Cov[tw] OR Sars-related cov*[tw] OR Sars-associated cov*[tw] OR Sars-related coronavirus*[tw] OR Sars-associated corovavirus*[tw] OR Severe Acute Respiratory Infection*[tw] OR SARI[tw] OR "Middle East Respiratory Syndrome Coronavirus"[Mesh:noexp] OR "Middle East Respiratory Syndrome"[Mesh:noexp] OR Mers OR middle east respiratory syndrome*[tw] OR middle east respiratory syndrome-associated coronavirus*[tw] OR middle east respiratory syndrome-associated cov*[tw] OR middle east respiratory syndrome-related*[tw] OR middle east respiratory syndrome-related cov*[tw] OR middle east respiratory syndrome-related coronavirus*[tw] OR Mers-Cov[tw] OR Mers-related coronavirus*[tw] OR Mers-associated coronavirus*[tw] OR Mers-related Cov*[tw] OR Mers-associated Cov*[tw] OR 2019-novel-corona* OR 2019-new-corona* OR novel-corona* OR new-corona* OR 2019-Cov OR 2019-nCov OR nCov OR coronavirus disease-2019 OR SARS2 OR SARS-2 OR SARS-CoV-2 OR sars cORona* OR CORonavirus-2 OR 2019ncov)) AND (assistance in ventilat*[tw] OR Ventilation assistance*[tw] OR assistance in ventilation[tw] OR cuirass ventilat*[tw] OR cuirass respirat*[tw] OR non-invasive ventilat*[tw] OR noninvasive ventilat*[tw] OR non-invasive respirat*[tw] OR noninvasive respirat*[tw] OR Mechanical ventilat*[tw] OR Mechanical respirat*[tw] OR pulmonary ventilat*[tw] OR pulmonary respirat*[tw] OR artificial ventilat*[tw] OR artificial respirat*[tw] OR assisted ventilat*[tw] OR assisted respirat*[tw] OR proportional-assisted ventilat*[tw] OR proportional-assisted respirat*[tw] OR proportion-assisted ventilat*[tw] OR proportion-assisted respirat*[tw] OR helmet-based respirat*[tw] OR helmet-based ventilat*[tw] OR nasal ventilat*[tw] OR nasal respirat*[tw] OR pressure-based respirat*[tw] OR pressure-based ventilat*[tw] OR pressure respirat*[tw] OR pressure ventilat*[tw] OR volume ventilat*[tw] OR volume respirat*[tw] OR respirator weaning*[tw] OR respirators weaning*[tw] OR positive airway*[tw] OR negative airway*[tw] OR airway pressure*[tw] OR positive pressure*[tw] OR volume-control*[tw] OR pressure-control*[tw] OR BiPAP[tw] or ippb[tw] OR inspiratory breathing*[tw] OR inspiratory ventilation*[tw] OR

intermittent ventilation*[tw] OR intermittent breathing*[tw] ippv[tw] OR NIV[tw] OR NIPPV[tw] OR NPPV[tw] OR NIAV[tw] OR NIVM[tw] OR SNIMV[tw] OR NPSIMV[tw] OR Aprv[tw] OR cpap[tw] OR ncpap[tw] OR PAV[tw] OR breathing support*[tw] OR respiratory support*[tw] OR pressure support*[tw] OR BCAP[tw] OR bCPAP[tw] OR B-CPAP[tw] OR volume support*[tw] OR oxygen inhalation therap*[tw] OR Nasal cannula*[tw] OR Nasal tube*[tw] OR Oronosal mask*[tw] OR Optiflow*[tw] OR HFNC[tw] OR High Flow Nasal Oxygen Therap*[tw] OR Nasal high flow oxygen*[tw] OR high-frequency oscillation ventilat* [tw] OR high frequency ventilat*[tw] OR High-Frequency Jet Ventilat*[tw] OR Interactive Ventilatory Support*[tw] OR Liquid Ventilat*[tw] OR Liquid -assisted ventilat*[tw] OR fluorocarbon ventilat*[tw] OR One-Lung Ventilat*[tw] OR Lung separation technique*[tw] OR Laryngeal Mask*[tw] OR Rapid sequence induc*[tw] OR Rapid sequence intubat*[tw] OR Intratracheal intubat*[tw] OR endotracheal intubat*[tw] OR manual ventilat*[tw] OR inverse-ratio ventilat*[tw] OR respiration control*[w] OR therapeutic hyperventilate*[tw] OR "Respiration, Artificial"[Mesh] OR "Ventilators, Mechanical"[Mesh:NoExp] OR "Cannula"[Mesh:NoExp] OR "Oxygen Inhalation Therapy"[Mesh:NoExp] OR "Intubation, Intratracheal"[Mesh]) (983)

Cochrane Library (from January 1, 2002 to May 1, 2020)

ID	Search	Hits
#1	MeSH descriptor: [Pneumonia, Viral] this term only	65
#2	MeSH descriptor: [Pneumonia] this term only	2038
#3	MeSH descriptor: [Viruses] explode all trees	8821
#4	#1 OR #2 OR #3	10874
#5	MeSH descriptor: [Disease Outbreaks] explode all trees	269
#6	MeSH descriptor: [Epidemiology] explode all trees	39
#7	(Epidemiology):ti,ab,kw	49062
#8	#5 OR #6 OR #7	49162
#9	#4 AND #8	1336
#10	MeSH descriptor: [undefined] explode all trees	0
#11	MeSH descriptor: [Coronavirus] explode all trees	13
#12	MeSH descriptor: [Coronaviridae Infections] this term only	3
#13	MeSH descriptor: [Coronavirus Infections] this term only	137
#14	MeSH descriptor: [Betacoronavirus] explode all trees	12
#15	(Betacoronavirus or Beta-coronavirus or Coronavirus* or COVID):ti,ab,kw	397
#16	#9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 with Cochrane Library publication date Between Jan 2002 and May 2020	1448
#17	MeSH descriptor: [SARS Virus] this term only	9
#18	MeSH descriptor: [Severe Acute Respiratory Syndrome] this term only	107
#19	(((severe NEXT acute NEXT respiratory NEXT (infection OR syndrome)) or SARs or SARI or Sars-cov or ((sars-associated or sars-related) NEXT (cov or coronavirus)))):ti,ab,kw	455
#20	#17 OR #18 OR #19	455
#21	MeSH descriptor: [Middle East Respiratory Syndrome Coronavirus] this term only	1
#22	((middle NEXT east NEXT respiratory NEXT syndrome NEXT(associated OR related) NEXT (coronavirus or Cov))):ti,ab,kw	0
#23	(((Mers-related or mers-associated) NEXT (coronavirus or cov))):ti,ab,kw	0
#24	((middle NEXT east NEXT respiratory NEXT syndrome)):ti,ab,kw	20
#25	(Mers or Mers-Cov):ti,ab,kw	51
#26	#21 OR #22 OR #23 OR #24 OR #25	53
#27	((2019 NEXT (novel or new) NEXT corona*)):ti,ab,kw	17
#28	(("2019" NEXT (CoV or nCoV)) or (coronavirus NEXT (disease NEXT "2019")) or COVID19 or COVID-19 or ((Novel or New) NEXT Corona*) or SARS2 or SARS-CoV-2 or (SARS NEAR/1 (coronaviridae or coronavirus)) or ((sars or Coronavirus) NEXT "2") or nCov or 2019ncov):ti,ab,kw	414
#29	#27 OR #28	414
#30	#16 OR #20 OR #26 OR #29	1827
#31	MeSH descriptor: [Respiration, Artificial] explode all trees	6021

#32 MeSH descriptor: [Cannula] this term only 71
#33 MeSH descriptor: [Oxygen Inhalation Therapy] this term only 1123
#34 MeSH descriptor: [Intubation, Intratracheal] explode all trees 4308
#35 MeSH descriptor: [Ventilators, Mechanical] explode all trees 264
#36 ((((invasive or non-invasive or noninvasive or Mechanical or pulmonary or artificial or assisted or assistance or (proportion* NEXT assist*) or helmet or nasal or pressure or volume or cuirass or support or High-Frequency or interactive or liquid or liquid-assisted or fluorocarbon or One-Lung or manual or (inverse NEXT ratio)) NEAR/1 (ventilat* or respirat*)) or (lung NEXT seperat* NEXT technique?) or (rapid NEXT sequenc* NEXT (intubate* or induct*)) or ((endotracheal or Intratracheal) NEXT intubat*) or (respirator NEXT weaning) or ((positive or negative) NEXT airway*) or ((airway* or positive) NEAR/2 pressure) or ((respirat* or volume or pressure) NEXT control*) or BiPAP or ippb or ((inspiratory or intermittent) NEAR/2 (ventilation or breathing)) or ippv or NIV or NIPPV or NPPV or NIAV or NIVM or SNIMV or NPSIMV or Aprv or cpap or ncpap or PAV or BCAP or bCPAP or B-CPAP or ((breath* or respiratory or pressure or volume) NEAR/3 support) or ((face or nasal or oronosal or Laryngeal) NEXT (mask? or helmet?)) or (oxygen NEXT inhalat* NEXT therap*) or (nasal NEAR/2 (cannula? or oxygen or tube?)) or HFNC or optiflow* or (oxygen NEXT inhalat* NEXT therap*) or (therapeutic NEXT hyperventilation))):ti,ab,kw 38229
#37 #31 OR #32 OR #33 OR #34 OR #35 OR #36 39943
#38 #30 AND #37 130

CINAHL (inception to May 1, 2020)

#	Query	Limiters/Expanders	Last Run Via	Results
S12	S8 AND S11	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	1367
S11	S9 OR S10	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	76,695
S10	TI (((invasive OR non-invasive OR noninvasive OR invasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0 assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*)) OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	60,704

airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation))) OR AB (((invasive OR non-invasive OR noninvasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0 assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*))

OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0 airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation))) OR MW (((invasive OR non-invasive OR noninvasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0

assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*)) OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0 airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR

	optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation)))			
S9	(MH "Respiration, Artificial+") OR (MH "Ventilators, Mechanical") OR (MH "Mechanical Ventilation (Iowa NIC)") OR (MH "Ventilation Assistance (Iowa NIC)") OR (MH "Respiratory Therapy Equipment and Supplies+") OR (MH "Intubation, Intratracheal")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	54,850
S8	S4 OR S5 OR S6 OR S7	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	83,418
S7	TI ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019 ") OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) OR AB ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	1,953

S6	OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) OR MW ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019") OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) TI ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR cov)))) OR AB ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	1,224

S5	Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR cov)))) OR MW ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR cov)))) TI (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR ((severe W0 acute W0 respiratory W0 (infection or syndrome))) OR AB (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR ((severe W0 acute W0 respiratory W0 (infection or syndrome))) OR MW (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	4,181

	((severe W0 acute W0 respiratory W0 (infection or syndrome)))			
S4	S1 OR S2 OR S3	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	80,522
S3	TI (Betacoronavirus OR Beta-coronavirus or Coronavirus* OR COVID) OR AB (Betacoronavirus OR Beta-coronavirus or Coronavirus* OR COVID) OR MW (Betacoronavirus OR Beta-coronavirus or Coronavirus* OR COVID)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	2,315
S2	(MH "Coronaviridae+") OR (MH “Coronaviridae Infections+”)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	3,525
S1	((MH "Pneumonia") OR (MH "Pneumonia, Viral") OR (MH "Virus Diseases+") OR ("MH Viruses+")) AND ((MH "Disease Outbreaks") OR (MH "Epidemiology+") OR SU Epidemiology)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	78,443

Chinese databases

Database: CNKI **(inception to May 1, 2020)**

Search Strategy:

SU= (病毒性肺炎 + 疾病爆发 + 冠状病毒 + 新型病毒+CoV+COVID19+急性呼吸窘迫综合征+中东呼吸综合征+非典+非典型肺炎+非典冠状病毒+sars+mers)*(人工通气 + 辅助呼吸 + 机械通气 + 插管 + 氧气吸入治疗 + 氧气治疗 + 气管内插管 + 气管插管 + 无创 + 有创 + 呼吸机 + 通气 + NIV + 氧疗)

Result: 3832

Database: Sinomed **(inception to May 1, 2020)**

Search Strategy:

("冠状病毒"[常用字段:智能] OR "新冠肺炎"[常用字段:智能] OR "cov"[常用字段:智能] OR "急性呼吸窘迫综合征"[常用字段:智能] OR "中东呼吸综合征"[常用字段:智能] OR "mers"[常用字段:智能] OR "非典"[常用字段:智能] OR "非典型肺炎"[常用字段:智能] OR "sars"[常用字段:智能]) and ("人工呼吸"[常用字段:智能] OR "机械通气"[常用字段:智能] OR "插管"[常用字段:智能] OR "氧气治疗"[常用字段:智能] OR "无创"[常用字段:智能] OR "有创"[常用字段:智能] OR "呼吸机"[常用字段:智能] OR "氧疗"[常用字段:智能] OR "吸氧"[常用字段:智能])

Result: 6433

Database: Wanfang **(inception to May 1, 2020)**

Search Strategy:

（（病毒性肺炎 + 肺炎 + 病毒）*（疾病爆发 +流行病）+ 新冠肺炎 + 冠状病毒 + 非典 + sars + 中东综合征 + mers）*（人工通气 + 辅助呼吸 + 机械通气 + 插管 + 氧气吸入治疗 + 氧气治疗 + 气管内插管 + 气管插管 + 无创 + 有创 + 呼吸机 + NIV + 氧疗 + 通气 + NIPPV + NPPV + NIVM + SNIMV + NPSIMV + Aprv + cpap + ncpap + PAV + HFNC + 经鼻高流量氧疗）

Result: 4995

Database: VIP **(inception to May 1, 2020)**

Search Strategy:

M=（（病毒性肺炎 + 肺炎 + 病毒）*（疾病爆发 +流行病）+ 新冠肺炎 + 冠状病毒 + 非典 + sars + 中东综合征 + mers）*（人工通气 + 辅助呼吸 + 机械通气 + 插管 + 氧气吸入治疗 + 氧气治疗 + 气管内插管 + 气管插管 + 无创 + 有创 + 呼吸机 + NIV + 氧疗 + 通气 + NIPPV + NPPV + NIVM + SNIMV + NPSIMV + Aprv + cpap + ncpap + PAV + HFNC + 经鼻高流量氧疗）

Result: 278

WHO Chinese databases (Feb 2, 2020 to May 1, 2020)

Search Strategy:

#1 “2019冠状病毒”
#2 “新型冠状病毒”
#3 “新冠肺炎”
#4 “武汉2019”
#5 “武汉病毒“
#6 “武汉肺炎”

#7 “2019-nCoV”

#8 “SARS-CoV-2”

#9 “Novel coronavirus”

#10 “nCoV”

#11 “Emerging Coronavirus”

#12 “new coronavirus”

#13 “COVID-19”

#14 “coronavirus“

#15 OR/#1-#14

Result: 1800

Supplement. Stream 2 search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <January 1, 2017 to May 1, 2020>

Search Strategy:

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1 exp Respiration, Artificial/ or exp VENTILATORS, MECHANICAL/ or Cannula/ or exp Oxygen Inhalation Therapy/ or exp Intubation, Intratracheal/ (135597)

2 (((invasive or non-invasive or noninvasive or Mechanical or pulmonary or artificial or assisted or assistance or (proportion* adj assist*) or helmet or nasal or pressure or volume or cuirass or support or High-Frequency or interactive or liquid or liquid-assisted or fluorocarbon or One-Lung or manual or (inverse adj ratio)) adj2 (ventilat* or respirat*)) or (lung adj seperat* adj technique?) or (rapid adj sequenc* adj (intubate* or induct*)) or ((endotracheal or Intratracheal) adj intubat*) or (respirator adj weaning) or ((positive or negative) adj airway*) or ((airway* or positive) adj3 pressure) or ((respirat* or volume or pressure) adj control*) or BiPAP or ippb or ((inspiratory or intermittent) adj3 (ventilation or breathing)) or ippv or NIV or NIPPV or NPPV or NIAV or NIVM or SNIMV or NPSIMV or Aprv or cpap or BCAP or bCPAP or B-CPAP or ncpap or PAV or ((breath* or respiratory or pressure or volume) adj4 support) or ((face or nasal or oronosal or Laryngeal) adj (mask? or helmet?)) or (nasal adj3 (cannula? or oxygen or tube?)) or HFNC or optiflow* or (oxygen adj inhalat* adj therap*) or (therapeutic adj hyperventilation)).mp. (197195)

3 1 or 2 (230848)

4 (Meta-Analysis as Topic/ or meta analy$.tw. or metaanaly$.tw. or Meta-Analysis/ or (systematic adj (review$1 or overview$1)).tw. or exp Review Literature as Topic/ or cochrane.ab. or embase.ab. or (psychlit or psyclit).ab. or (psychinfo or psycinfo).ab. or (cinahl or cinhal).ab. or science citation index.ab. or bids.ab. or cancerlit.ab. or reference list$.ab. or bibliograph$.ab. or hand-search$.ab. or relevant journals.ab. or manual search$.ab. or ((selection criteria or data extraction).ab. and review/)) not (comment/ or letter/ or editorial/) (342183)

5 3 and 4 (4443)

6 limit 5 to ez="20170101-20200501" (1355)

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Database: Embase <January 1, 2017 to May 1 2020 >
Search Strategy:

No.	Query	Results
#13	#12 AND [1-1-2017]/sd	4667
#12	#10 AND #11	13713
#11	('meta analysis'/exp OR 'systematic review'/exp OR ((meta NEAR/3 analy*):ab,ti) OR metaanaly*:ab,ti OR review*:ti OR overview*:ti OR ((synthes* NEAR/3 (literature* OR research* OR studies OR data)):ab,ti) OR (pooled AND analys*:ab,ti) OR (((data NEAR/2 pool*):ab,ti) AND studies:ab,ti) OR medline:ab,ti OR medlars:ab,ti OR embase:ab,ti OR cinahl:ab,ti OR scisearch:ab,ti OR psychinfo:ab,ti OR psycinfo:ab,ti OR psychlit:ab,ti OR psyclit:ab,ti OR cinhal:ab,ti OR cancerlit:ab,ti OR cochrane:ab,ti OR bids:ab,ti OR pubmed:ab,ti OR ovid:ab,ti OR (((hand OR manual OR database* OR computer*) NEAR/2 search*):ab,ti) OR ((electronic NEAR/2 (database* OR 'data base' OR 'data bases')):ab,ti) OR bibliograph*:ab OR 'relevant journals':ab OR (((review* OR overview*) NEAR/10 (systematic* OR methodologic* OR quantitativ* OR research* OR literature* OR studies OR trial* OR effective*)):ab)) NOT ((((retrospective* OR record* OR case* OR patient*) NEAR/2 review*):ab,ti) OR (((patient* OR review*) NEAR/2 chart*):ab,ti) OR rat:ab,ti OR rats:ab,ti OR mouse:ab,ti OR mice:ab,ti OR hamster:ab,ti OR hamsters:ab,ti OR animal:ab,ti OR animals:ab,ti OR dog:ab,ti OR dogs:ab,ti OR cat:ab,ti OR cats:ab,ti OR bovine:ab,ti OR sheep:ab,ti) NOT ('editorial'/exp OR 'erratum'/de OR 'letter'/exp) NOT (('animal'/exp OR 'nonhuman'/exp) NOT (('animal'/exp OR 'nonhuman'/exp) AND 'human'/exp))	1189009
#10	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9	279905
#9	(((breath* OR respiratory OR pressure OR volume) NEAR/3 support):ti,ab,kw) OR (((face OR nasal OR oronosal OR laryngeal) NEXT/0 (mask$ OR helmet$)):ti,ab,kw) OR ((nasal NEAR/2 (cannula$ OR oxygen OR tube$)):ti,ab,kw) OR hfnc:ti,ab,kw OR optiflow*:ti,ab,kw OR ((oxygen NEXT/0 inhalat* NEXT/0 therap*):ti,ab,kw) OR 'therapeutic hyperventilation':ti,ab,kw OR bcap:ti,ab,kw OR bcpap:ti,ab,kw OR 'b cpap':ti,ab,kw	19009
#8	((inspiratory OR intermittent) NEAR/2 (ventilation OR breathing)):ti,ab,kw	2167
#7	((respirator NEXT/0 weaning):ti,ab,kw) OR (((positive OR negative) NEXT/0 airway*):ti,ab,kw) OR (((airway* OR positive) NEAR/2 pressure):ti,ab,kw) OR 'respiration-control':ti,ab,kw OR 'volume control':ti,ab,kw OR 'pressure control*':ti,ab,kw	58676
#6	pav:ti,ab,kw OR ippv:ti,ab,kw OR niv:ti,ab,kw OR nippv:ti,ab,kw OR nppv:ti,ab,kw OR niav:ti,ab,kw OR nivm:ti,ab,kw OR snimv:ti,ab,kw OR	28320

	npsimv:ti,ab,kw OR aprv:ti,ab,kw OR cpap:ti,ab,kw OR ncpap:ti,ab,kw OR bipap:ti,ab,kw OR ippb:ti,ab,kw	
#5	((invasive OR noninvasive) NEAR/1 (ventilat* OR respirat*)):ti,ab,kw	13392
#4	(('non invasive' NEAR/1 respirat*):ti,ab,kw) OR ((mechanical NEAR/1 respirat*):ti,ab,kw) OR ((pulmonary NEAR/1 respirat*):ti,ab,kw) OR ((artificial NEAR/1 respirat*):ti,ab,kw) OR (((assisted OR assistance) NEAR/1 respirat*):ti,ab,kw) OR (('proportional assist*' NEAR/1 respirat*):ti,ab,kw) OR ((helmet NEAR/1 respirat*):ti,ab,kw) OR ((nasal NEAR/1 respirat*):ti,ab,kw) OR ((pressure NEAR/1 respirat*):ti,ab,kw) OR ((volume NEAR/1 respirat*):ti,ab,kw) OR ((cuirass NEAR/1 respirat*):ti,ab,kw) OR ((support NEAR/1 respirat*):ti,ab,kw)	15827
#3	((('high frequency' OR interactive OR liquid OR 'liquid assisted' OR fluorocarbon OR 'one lung' OR manual OR 'inverse ratio') NEAR/1 (ventilat* OR respirat*)):ti,ab,kw) OR ((lung NEXT/0 seperat* NEXT/0 technique$):ti,ab,kw) OR ((rapid NEXT/0 sequenc* NEXT/0 (intubate* OR induct*)):ti,ab,kw) OR (((endotracheal OR intratracheal) NEXT/0 intubat*):ti,ab,kw)	5398
#2	(('non invasive' NEAR/1 ventilat*):ti,ab,kw) OR ((mechanical NEAR/1 ventilat*):ti,ab,kw) OR ((pulmonary NEAR/1 ventilat*):ti,ab,kw) OR ((artificial NEAR/1 ventilat*):ti,ab,kw) OR (((assisted OR assistance) NEAR/1 ventilat*):ti,ab,kw) OR (('proportional assist*' NEAR/1 ventilat*):ti,ab,kw) OR ((helmet NEAR/1 ventilat*):ti,ab,kw) OR ((nasal NEAR/1 ventilat*):ti,ab,kw) OR ((pressure NEAR/1 ventilat*):ti,ab,kw) OR ((volume NEAR/1 ventilat*):ti,ab,kw) OR ((cuirass NEAR/1 ventilat*):ti,ab,kw) OR ((support NEAR/1 ventilat*):ti,ab,kw)	102879
#1	'artificial ventilation'/exp OR 'mechanical ventilator'/de OR 'negative pressure ventilator'/exp	206448

PubMed (January 1, 2017 to May 1, 2020)

Search	Query	Items found
#3	Search (#1 AND #2) AND 2017/01:2020/05 [crdt]	1229
#2	Search (systematic[sb] OR meta-analysis[pt] OR meta-analysis as topic[mh] OR meta-analysis[mh] OR meta analy*[tw] OR metanaly*[tw] OR metaanaly*[tw] OR met analy*[tw] OR integrative research[tiab] OR integrative review*[tiab] OR integrative overview*[tiab] OR research integration*[tiab] OR research overview*[tiab] OR collaborative review*[tiab] OR collaborative overview*[tiab] OR systematic review*[tiab] OR technology assessment*[tiab] OR technology overview*[tiab] OR "Technology Assessment, Biomedical"[mh] OR HTA[tiab] OR HTAs[tiab] OR comparative efficacy[tiab] OR comparative effectiveness[tiab] OR outcomes research[tiab] OR indirect comparison*[tiab] OR ((indirect treatment[tiab] OR mixed-treatment[tiab]) AND comparison*[tiab]) OR Embase*[tiab] OR Cinahl*[tiab] OR systematic overview*[tiab] OR methodological overview*[tiab] OR methodologic overview*[tiab] OR methodological review*[tiab] OR methodologic review*[tiab] OR quantitative review*[tiab] OR quantitative overview*[tiab] OR quantitative synthes*[tiab] OR pooled analy*[tiab] OR Cochrane[tiab] OR Medline[tiab] OR Pubmed[tiab] OR Medlars[tiab] OR handsearch*[tiab] OR hand search*[tiab] OR meta-regression*[tiab] OR metaregression*[tiab] OR data synthes*[tiab] OR data extraction[tiab] OR data abstraction*[tiab] OR mantel haenszel[tiab] OR peto[tiab] OR der-simonian[tiab] OR dersimonian[tiab] OR fixed effect*[tiab] OR "Cochrane Database Syst Rev"[Journal:__jrid21711] OR "health technology assessment winchester, england"[Journal] OR "Evid Rep Technol Assess (Full Rep)"[Journal] OR "Evid Rep Technol Assess (Summ)"[Journal] OR "Int J Technol Assess Health Care"[Journal] OR "GMS Health Technol Assess"[Journal] OR "Health Technol Assess (Rockv)"[Journal] OR "Health Technol Assess Rep"[Journal])	427097
#1	Search (assistance in ventilat*[tw] OR Ventilation assistance*[tw] OR assistance in ventilation[tw] OR cuirass ventilat*[tw] OR cuirass respirat*[tw] OR non-invasive ventilat*[tw] OR invasive ventilation*[tw] OR noninvasive ventilat*[tw] OR non-invasive respirat*[tw] OR noninvasive respirat*[tw] OR Mechanical ventilat*[tw] OR Mechanical respirat*[tw] OR pulmonary ventilat*[tw] OR pulmonary respirat*[tw] OR artificial ventilat*[tw] OR artificial respirat*[tw] OR assisted ventilat*[tw] OR assisted respirat*[tw] OR proportional-assisted ventilat*[tw] OR proportional-assisted respirat*[tw] OR proportion-assisted ventilat*[tw] OR proportion-assisted respirat*[tw] OR helmet-based respirat*[tw] OR helmet-based ventilat*[tw] OR nasal ventilat*[tw] OR nasal respirat*[tw] OR pressure-based respirat*[tw] OR pressure-based ventilat*[tw] OR pressure respirat*[tw] OR pressure ventilat*[tw] OR volume ventilat*[tw] OR volume respirat*[tw] OR respirator weaning*[tw] OR respirators weaning*[tw] OR	212679

positive airway*[tw] OR negative airway*[tw] OR airway pressure*[tw] OR positive pressure*[tw] OR volume-control*[tw] OR pressure-control*[tw] OR BiPAP[tw] or ippb[tw] OR inspiratory breathing*[tw] OR inspiratory ventilation*[tw] OR intermittent ventilation*[tw] OR intermittent breathing*[tw] ippv[tw] OR NIV[tw] OR NIPPV[tw] OR NPPV[tw] OR NIAV[tw] OR NIVM[tw] OR SNIMV[tw] OR NPSIMV[tw] OR Aprv[tw] OR cpap[tw] OR ncpap[tw] OR PAV[tw] OR breathing support*[tw] OR respiratory support*[tw] OR pressure support*[tw] OR BCAP[tw] OR bCPAP[tw] OR B-CPAP[tw] OR volume support*[tw] OR oxygen inhalation therap*[tw] OR Nasal cannula*[tw] OR Nasal tube*[tw] OR Oronosal mask*[tw] OR Optiflow*[tw] OR HFNC[tw] OR High Flow Nasal Oxygen Therap*[tw] OR Nasal high flow oxygen*[tw] OR high-frequency oscillation ventilat* [tw] OR high frequency ventilat*[tw] OR High-Frequency Jet Ventilat*[tw] OR Interactive Ventilatory Support*[tw] OR Liquid Ventilat*[tw] OR Liquid -assisted ventilat*[tw] OR fluorocarbon ventilat*[tw] OR One-Lung Ventilat*[tw] OR Lung separation technique*[tw] OR Laryngeal Mask*[tw] OR Rapid sequence induc*[tw] OR Rapid sequence intubat*[tw] OR Intratracheal intubat*[tw] OR endotracheal intubat*[tw] OR manual ventilat*[tw] OR inverse-ratio ventilat*[tw] OR respiration control*[w] OR therapeutic hyperventilate*[tw] OR "Respiration, Artificial"[Mesh] OR "Ventilators, Mechanical"[Mesh:NoExp] OR "Cannula"[Mesh:NoExp] OR "Oxygen Inhalation Therapy"[Mesh:NoExp] OR "Intubation, Intratracheal"[Mesh])

Cochrane Library (January 1, 2017 to May 1, 2020)

ID	Search	Hits
#1	MeSH descriptor: [Respiration, Artificial] explode all trees	6021
#2	MeSH descriptor: [Cannula] this term only	71
#3	MeSH descriptor: [Oxygen Inhalation Therapy] this term only	1123
#4	MeSH descriptor: [Intubation, Intratracheal] explode all trees	4308
#5	MeSH descriptor: [Ventilators, Mechanical] explode all trees	264
#6	((((invasive or non-invasive or noninvasive or Mechanical or pulmonary or artificial or assisted or assistance or (proportion* NEXT assist*) or helmet or nasal or pressure or volume or cuirass or support or High-Frequency or interactive or liquid or liquid-assisted or fluorocarbon or One-Lung or manual or (inverse NEXT ratio)) NEAR/1 (ventilat* or respirat*)) or (lung NEXT seperat* NEXT technique?) or (rapid NEXT sequenc* NEXT (intubate* or induct*)) or ((endotracheal or Intratracheal) NEXT intubat*) or (respirator NEXT weaning) or ((positive or negative) NEXT airway*) or ((airway* or positive) NEAR/2 pressure) or ((respirat* or volume or pressure) NEXT control*) or BiPAP or ippb or ((inspiratory or intermittent) NEAR/2 (ventilation or breathing)) or ippv or NIV or NIPPV or NPPV or NIAV or NIVM or SNIMV or NPSIMV or Aprv or cpap or ncpap or PAV or BCAP or bCPAP or B-CPAP or ((breath* or respiratory or pressure or volume) NEAR/3 support) or ((face or nasal or oronosal or Laryngeal) NEXT (mask? or helmet?)) or (oxygen NEXT inhalat* NEXT therap*) or (nasal NEAR/2 (cannula? or oxygen or tube?)) or HFNC or optiflow* or (oxygen NEXT inhalat* NEXT therap*) or (therapeutic NEXT hyperventilation))):ti,ab,kw	38229
#7	#1 OR #2 OR #3 OR #4 OR #5 OR #6 with Cochrane Library publication date Between Jan 2017 and May 2020, in Cochrane Reviews	117

CINAHL (January 1, 2017 to May 1, 2020)

S3	S1 AND S2	Limiters - Published Date: 20170101-20200531 Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	772
S2	(MH "Meta Analysis") OR TI meta analys* OR AB meta analys* OR TI Metaanaly* OR AB metaanalys* OR (MH "Literature Review+") OR TI systematic review* OR AB systematic review* OR TI systematic overview* OR AB systematic overview* NOT (PT commentary OR PT letter OR PT editorial OR MH animals+)	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Basic Search Database - CINAHL Complete	187,909
S1	TI (((invasive OR non-invasive OR noninvasive OR invasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0 assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*)) OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0 airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or	Expanders - Apply equivalent subjects Se		76,695

	pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation))) OR AB (((invasive OR non-invasive OR noninvasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0 assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*)) OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0 airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation))) OR MW (((invasive OR non-invasive OR noninvasive OR Mechanical OR pulmonary OR artificial OR assisted OR assistance OR (proportion* W0 assist*) OR helmet OR nasal OR pressure OR volume or cuirass OR support OR High-Frequency OR interactive OR liquid OR liquid-assisted OR fluorocarbon OR One-Lung OR manual OR (inverse W0 ratio)) N1 (ventilat* or respirat*)) OR (lung W0 seperat* W0 technique#) OR (rapid W0 sequenc* W0 (intubate* OR induct*)) or ((endotracheal OR		

	Intratracheal) W0 intubat*) OR (respirator W0 weaning) OR ((positive OR negative) W0 airway*) OR ((airway* OR positive) N2 pressure) OR ((respirat* or volume or pressure) W0 control*) OR BiPAP OR ippb OR ((inspiratory OR intermittent) N2 (ventilation OR breathing)) OR ippv OR NIV OR NIPPV OR NPPV OR NIAV OR NIVM OR SNIMV OR NPSIMV OR Aprv OR cpap OR bCPAP OR B-CPAP OR BCAP OR ncpap OR PAV OR ((breath* OR respiratory OR pressure OR volume) N3 support) OR ((face OR nasal OR oronosal OR Laryngeal) W0 (mask# or helmet#)) OR (oxygen W0 inhalat* W0 therap*) OR (nasal N2 (cannula# OR oxygen OR tube#)) OR HFNC OR optiflow* OR (oxygen W0 inhalat* W0 therap*) OR (therapeutic W0 hyperventilation))) OR (MH "Respiration, Artificial+") OR (MH "Ventilators, Mechanical") OR (MH "Mechanical Ventilation (Iowa NIC)") OR (MH "Ventilation Assistance (Iowa NIC)") OR (MH "Respiratory Therapy Equipment and Supplies+") OR (MH "Intubation, Intratracheal")		

Supplement. Stream 3 search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to May 1, 2020>
Search Strategy:
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1 SARS virus/ or severe acute respiratory syndrome/ or ((severe adj acute adj respiratory adj (infection or syndrome)) or SARs or SARI or Sars-cov or ((sars-associated or sars-related) adj (cov or coronavirus))).mp. (14511)
2 Middle East Respiratory Syndrome Coronavirus/ or Middle East Respiratory Syndrome/ or (Mers or (middle adj east adj respiratory adj syndrome) or (middle adj east adj respiratory adj syndrome adj (associated or related) adj (coronavirus or Cov)) or Mers-Cov or ((Mers-related or mers-associated) adj (coronavirus or cov))).mp. (9622)
3 (("2019" adj (novel or new) adj corona*) or ("2019" adj (CoV or nCoV)) or (coronavirus adj (disease adj "2019")) or COVID19 or COVID-19 or ((Novel or New) adj Corona*) or SARS2 or SARS-CoV-2 or (SARS adj2 (coronaviridae or coronavirus)) or ((sars or Coronavirus) adj "2") or nCov or 2019ncov).mp. (11126)
4 1 or 2 or 3 (26211)
5 (fomite? or ((cross or health* or nosocomial or hospital? or lab or labs or laborator*) adj3 (infection? or pneumonia?)) or (infection* adj control) or ((destr* or preven*) adj4 (pathogen? or germ?))).mp. (116629)
6 Fomites/ or Infectious Disease Transmission, Patient-to-Professional/ or Disease Transmission, Infectious/ or Equipment Contamination/ or Equipment Contamination/ or Laboratory Infection/ or Infection Control/ or (Laboratories/ and (exp Occupational exposure/ or occupational diseases/)) or exp Aerosols/ (77007)
7 ((equipment* or utensil? or clothing or pipet* or droplet* or Aerosol* or cough* or communicable or autochthonous or horizontal or pathogen* or disease* or virus* or air-borne or air-microbiology) adj4 (spread* or transmi* or induc* or stimulat* or genrat* or contamina* or (infect* adj5 (ventilat* or respirat*)) or dispers*)).mp. (261400)
8 5 or 6 or 7 (394437)
9 4 and 8 (3949)

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Database: Embase <1974 to 2020 May 01>
Search Strategy:

No.	Query	Results
#13	#5 AND #12	5379
#12	#6 OR #7 OR #10 OR #11	504508
#11	fomite$:ti,ab,kw OR (((cross OR health* OR nosocomial OR hospital$ OR lab OR labs OR laborator*) NEAR/2 (infection$ OR pneumonia$)):ti,ab,kw) OR ((infection* NEXT/0 control):ti,ab,kw) OR (((destr* OR preven*) NEAR/3 (pathogen$ OR germ$)):ti,ab,kw)	63041
#10	#8 AND #9	1304
#9	equipment*:ti,ab,kw OR utensil$:ti,ab,kw OR clothing:ti,ab,kw OR pipet*:ti,ab,kw OR droplet*:ti,ab,kw OR aerosol*:ti,ab,kw OR cough*:ti,ab,kw OR communicable:ti,ab,kw OR autochthonous:ti,ab,kw OR horizontal:ti,ab,kw OR pathogen*:ti,ab,kw OR disease*:ti,ab,kw OR virus*:ti,ab,kw OR 'air borne':ti,ab,kw OR 'air microbiology':ti,ab,kw	688334
#8	(infect* NEAR/4 (respirat* OR ventilat*)):ti,ab,kw	83988
#7	((equipment* OR utensil$ OR clothing OR pipet* OR droplet* OR aerosol* OR cough* OR communicable OR autochthonous OR horizontal OR pathogen* OR disease* OR virus* OR 'air borne' OR 'air microbiology') NEAR/3 (spread* OR transmi* OR induc* OR stimulat* OR genrat* OR contamina* OR dispers*)):ti,ab,kw	191893
#6	'fomite'/de OR 'disease transmission'/de OR 'medical device contamination'/de OR 'laboratory infection'/de OR 'infection control'/de OR ('laboratory'/exp AND ('occupational exposure'/exp OR 'occupational disease'/de)) OR 'aerosol'/de	236821
#5	#1 OR #2 OR #3 OR #4	24228
#4	'covid-19':ti,ab,kw OR covid19:ti,ab,kw OR ((2019 NEXT/0 (novel OR new) NEXT/0 corona*):ti,ab,kw)	4968
#3	((2019 NEXT/0 (cov OR ncov)):ti,ab,kw) OR ((coronavirus NEXT/0 'disease 2019'):ti,ab,kw) OR (((novel OR new) NEXT/0 corona*):ti,ab,kw) OR sars2:ti,ab,kw OR 'sars cov 2':ti,ab,kw OR ncov:ti,ab,kw OR 2019ncov:ti,ab,kw	1974
#2	'middle east respiratory syndrome'/de OR 'middle east respiratory syndrome coronavirus'/de OR mers:ti,ab,kw OR ((middle NEXT/0 east NEXT/0 respiratory NEXT/0 syndrome):ti,ab,kw) OR ((middle NEXT/0 east NEXT/0 respiratory NEXT/0 syndrome NEXT/0 (associated OR related) NEXT/0 (coronavirus OR cov)):ti,ab,kw) OR 'mers cov':ti,ab,kw OR ((('mers related' OR 'mers associated') NEXT/0 (coronavirus OR cov)):ti,ab,kw)	5417
#1	'severe acute respiratory syndrome'/de OR 'sars-related coronavirus'/de OR ((severe NEXT/0 acute NEXT/0 respiratory NEXT/0 (infection OR syndrome)):ti,ab,kw) OR sars:ti,ab,kw OR sari:ti,ab,kw OR 'sars cov':ti,ab,kw OR ((('sars associated' OR 'sars related') NEXT/0 (cov OR coronavirus)):ti,ab,kw)	16184

PubMed (inception to May 1, 2020**)**

Search	Query	Items found
#7	Search (#1 OR #2 OR #3) AND (#4 OR #5 OR #6)	4724
#6	Search equipment contaminat*[tw] OR contaminated equipment*[tw] OR utensil contaminat*[tw] OR utensils contaminat*[tw] OR contaminated utensil*[tw] OR clothing contaminat*[tw] OR contaminated cloth*[tw] OR Droplet spread*[tw] OR Droplets spread*[tw] OR Aerosol spread*[tw] OR Aerosols spread*[tw] OR Droplet generat*[tw] OR Droplets generat*[tw] OR Aerosol generat*[tw] OR Aerosols generat*[tw] OR Droplet dispers*[tw] OR Droplets dispers*[tw] OR Aerosol dispers*[tw] OR Aerosols dispers*[tw] OR Communicable contamina*[tw] OR autochthonous contamina*[tw] OR horizontal contamina*[tw] OR pathogen contamina*[tw] OR disease contamina*[tw] OR air-borne contamina*[tw] OR virus contamina*[tw] OR air-microbiology contamina*[tw] OR Communicable transmi*[tw] OR autochthonous transmi*[tw] OR horizontal transmi*[tw] OR pathogen transmi*[tw] OR disease transmi*[tw] OR air-borne transmi*[tw] OR virus transmi*[tw] OR air-microbiology transmi*[tw] OR pathogen induc*[tw] OR disease induc*[tw] OR air-borne induc*[tw] OR virus induc*[tw] OR air-microbiology induc*[tw] OR pathogen generat*[tw] OR disease generat*[tw] OR air-borne generat*[tw] OR virus generat*[tw] OR air-microbiology generat*[tw] OR pathogen spread*[tw] OR disease spread*[tw] OR air-borne spread*[tw] OR virus spread*[tw] OR air-microbiology spread*[tw]	101850
#5	Search fomite*[tw] OR cross infection*[tw] OR health infection*[tw] OR healthcare infection*[tw] OR nosocomial infection*[tw] OR hospital infection*[tw] OR lab infection*[tw] OR labs infection*[tw] OR labORatORy infection*[tw] OR labORatORies infection*[tw] OR cross pneumonia*[tw] OR health pneumonia*[tw] OR healthcare pneumonia*[tw] OR nosocomial pneumonia*[tw] OR hospital pneumonia*[tw] OR lab pneumonia*[tw] OR labs pneumonia*[tw] OR labORatORy pneumonia*[tw] OR labORatORies pneumonia*[tw] OR infection control*[tw] OR destroying pathogen*[tw] OR preventing pathogen*[tw] OR destruction of pathogen*[tw] OR prevention from pathogen*[tw] OR destroying germ*[tw] OR preventing germ*[tw] OR destruction of germ*[tw] OR prevention from germ*[tw]	245974
#4	Search "Fomites"[Mesh:noexp] or "Infectious Disease Transmission, Patient-to-Professional"[Mesh:noexp] or "Disease Transmission, Infectious"[Mesh:noexp] or "Equipment Contamination"[Mesh:noexp] or "Equipment Contamination"[Mesh:noexp] or "Laboratory Infection"[Mesh:noexp] or "Infection Control"[Mesh:noexp] or ("Laboratories"[Mesh:noexp] AND ("Occupational exposure"[Mesh:noexp] OR "Occupational diseases"[Mesh:noexp])) OR "Aerosols"[Mesh]	76984
#3	Search (((2019-novel-corona*[tw] OR 2019-new-corona*[tw] OR novel-corona*[tw] OR new-corona*[tw] OR 2019-Cov[tw] OR 2019-nCov[tw] OR	9410

	nCov[tw] OR coronavirus disease-2019[tw] OR SARS2[tw] OR SARS-2[tw] OR SARS-CoV-2[tw] OR sars cORona*[tw] OR CORonavirus-2[tw] OR 2019ncov[tw])))) OR ((cORonaviridae[Mesh:noexp] OR "CORonaviridae Infections"[Mesh:noexp] OR cORonavirus[Mesh] OR “CORonavirus Infections"[Mesh:noexp] OR BetacORonavirus[Mesh:noexp] OR ((pneumonia[Mesh:noexp] OR “pneumonia, viral"[Mesh:noexp] OR exp Viruses[Mesh]) AND ("Disease Outbreaks"[Mesh] OR Epidemiology[Mesh] OR Epidemiology [Mesh subject heading])) OR BetacORonavirus[tw] OR Beta-cORonavirus[tw] OR CORonavirus*[tw] OR COVID[tw]) AND 2019/11:2020/05[crdt])	
#2	Search "Middle East Respiratory Syndrome Coronavirus"[Mesh:noexp] OR "Middle East Respiratory Syndrome"[Mesh:noexp] OR Mers[tw] OR middle east respiratORy syndrome*[tw] OR Mers-Cov[tw] OR Mers-related coronavirus[tw] OR Mers-related cov[tw] OR Mers-associated coronavirus[tw] OR Mers-associated cov[tw]	4704
#1	Search "sars virus"[MeSH:noexp] OR severe acute respiratory syndrome*[tw] OR severe acute respirator*[TW] OR SARs[TW] OR SARI[TW] OR Sars-cov[TW] OR sars-associated cov*[TW] OR sars-associated coronavirus*[TW] OR sars-related cov*[TW] OR sars-related coronavirus*[TW]	15733

Cochrane Library (inception to May 1, 2020)

ID Search Hits
#1 MeSH descriptor: [SARS Virus] this term only 9
#2 MeSH descriptor: [Severe Acute Respiratory Syndrome] this term only 107
#3 (((severe NEXT acute NEXT respiratory NEXT (infection or syndrome)) or SARs or SARI or Sars-cov or ((sars-associated or sars-related) NEXT (cov or coronavirus)))):ti,ab,kw 455
#4 MeSH descriptor: [Middle East Respiratory Syndrome Coronavirus] this term only 1
#5 MeSH descriptor: [Coronavirus Infections] this term only 137
#6 ((Mers or (middle NEXT east NEXT respiratory NEXT syndrome) or (middle NEXT east NEXT respiratory NEXT syndrome NEXT (associated or related) NEXT (coronavirus or Cov)) or Mers-Cov or ((Mers-related or mers-associated) NEXT (coronavirus or cov)))):ti,ab,kw 53
#7 (2019 NEXT (novel or new) NEXT corona*) 21
#8 (("2019" NEXT (CoV or nCoV))):ti,ab,kw 3
#9 ((coronavirus NEXT disease NEXT 2019)):ti,ab,kw 21
#10 (COVID19 or COVID-19 or ((Novel or New) NEXT Corona*) or SARS2 or SARS-CoV-2):ti,ab,kw 401
#11 ((SARS NEAR/1 (coronaviridae or coronavirus)) or ((sars or Coronavirus) NEXT 2)):ti,ab,kw 44
#12 nCov:ti,ab,kw or 2019ncov:ti,ab,kw 34
#13 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 729
#14 MeSH descriptor: [Fomites] this term only 9
#15 MeSH descriptor: [Infectious Disease Transmission, Patient-to-Professional] this term only 59
#16 MeSH descriptor: [Disease Transmission, Infectious] this term only 107
#17 MeSH descriptor: [Equipment Contamination] this term only 372
#18 MeSH descriptor: [Laboratory Infection] this term only 2
#19 MeSH descriptor: [Infection Control] this term only 528
#20 #14 OR #15 OR #16 OR #17 OR #18 OR #19 1004
#21 MeSH descriptor: [Laboratories, Dental] this term only 16
#22 MeSH descriptor: [Occupational Exposure] explode all trees 550
#23 MeSH descriptor: [Occupational Diseases] this term only 854
#24 #22 OR #23 1317
#25 #21 AND #24 2
#26 MeSH descriptor: [Aerosols] explode all trees 2348
#27 #20 OR #25 OR #26 3347
#28 ((fomite? or ((cross or health* or nosocomial or hospital? or lab or labs or laborator*) NEAR/2 (infection? or pneumonia?)) or (infection* NEXT control) or ((destr* or preven*) NEAR/3 (pathogen? or germ?)))):ti,ab,kw 5411
#29 (((equipment* or utensil? or clothing or pipet* or droplet* or Aerosol* or cough* or communicable or autochthonous or horizontal or pathogen* or disease* or virus* or air-borne

or air-microbiology) NEAR/3 (spread* or transmi* or induc* or stimulat* or genrat* or contamina* or (infect* NEAR/4 (ventilat* or respirat*)) or dispers*))):ti,ab,kw 13202
#30 #27 OR #28 OR #29 20396
#31 #13 AND #30 65

CINAHL (inception to May 1, 2020)

#	Query	Limiters/Expanders	Last Run Via	Results
S10	S5 AND S9	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	2,710
S9	S6 OR S7 OR S8	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	371,341
S8	((equipment* OR utensil# OR clothing OR pipet* OR droplet* OR Aerosol* OR cough* OR communicable OR autochthonous OR horizontal OR pathogen* OR disease* OR virus* OR air-borne OR air-microbiology) N3 (spread* OR transmi* OR induc* OR stimulat* OR genrat* OR contamina* OR (infect* N4 (ventilat* OR respirat*)) OR dispers*))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	216,030
S7	(MH "Disease Transmission, Horizontal+") OR (MH "Equipment Contamination") OR (MH "Laboratory Infection") OR (MH "Infection Control") OR ((MH "Laboratories")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	36,836

	AND (MH "Occupational Exposure")) OR (MH "Aerosols")			
S6	(fomite# OR ((cross OR health* OR nosocomial OR hospital? OR lab OR labs OR laborator*) N2 (infection# or pneumonia#)) OR (infection* W0 control) OR ((destr* or preven*) N3 (pathogen# OR germ#)))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	192,850
S5	S1 OR S2 OR S3 OR S4	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	6,792
S4	TI ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019 ") OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) OR AB ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019") OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	1953

S3	SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) OR MW ((("2019" W0 (novel OR new) W0 corona*) OR ("2019" W0 (CoV OR nCoV)) OR (coronavirus W0 disease W0 "2019") OR COVID19 OR COVID-19 OR ((Novel OR New) W0 Corona*) OR SARS2 OR SARS-CoV-2 OR (SARS N1 (coronaviridae OR coronavirus)) OR ((sars OR Coronavirus) W0 "2") OR nCov OR 2019ncov)) TI ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR cov)))) OR AB ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	1224

S2	cov)))) OR MW ((Mers OR (middle W0 east W0 respiratory W0 syndrome) OR (middle W0 east W0 respiratory W0 syndrome W0 (associated OR related) W0 (coronavirus OR Cov)) OR Mers-Cov OR ((Mers-related OR mers-associated) W0 (coronavirus OR cov)))) TI (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR ((severe W0 acute W0 respiratory W0 (infection or syndrome))) OR AB (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR ((severe W0 acute W0 respiratory W0 (infection or syndrome))) OR MW (((severe W0 acute W0 respiratory W0 syndrome) OR SARs OR Sars-cov OR ((sars-associated OR sars-related) W0 (cov OR coronavirus))) OR SARI OR ((severe W0 acute W0 respiratory W0 (infection or syndrome)))	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	4181

S1	(MH "SARS Virus") OR (MH "Severe Acute Respiratory Syndrome") OR (MH "Middle East Respiratory Syndrome Coronavirus") OR (MH "Middle East Respiratory Syndrome")	Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Complete	2601

Chinese databases

CNKI **(inception to May 1, 2020)**

SU=(‘2019?新？冠状’ + ‘2019？cov’ + ‘冠状病毒？病？2019’ + ‘covid19’ + ‘covid-19’ + ‘新？冠状’ + ‘sars2’ + ‘sars-cov-2’ + ‘ncov’)*((‘污染’ +(‘交叉’ + ‘健康’ + ‘医院’ + ‘实验’ + ‘感染’)*(‘感染’ + ‘肺炎’) + (‘感染’)* (‘控制’) + (‘销毁’ + ‘预防’)*(‘病原’ + ‘菌’)) + (‘污染’ + ‘传染病传播’ + ‘患者到医学专业人员’ + ‘传染病传播’ + ‘用品污染’ + ‘设备污染’ + ‘实验室感染’ + ‘感染控制’ + ‘气溶胶’ + (‘实验室’)*(‘职业暴露’ + ‘职业病’)) + ((‘设备’ + ‘用品’ +‘用具’ + ‘衣’+ ‘移液器’+ ‘滴’+ ‘气溶胶’+ ‘咳嗽’+ ‘传染’+ ‘自发性’+ ‘水平’+ ‘病原’+ ‘病’+ ‘病毒’+ ‘空气传播’+ ‘空气微生物’)*(‘传播’+ ‘传’+ ‘诱导’+ ‘诱发’+ ‘刺激’+ ‘生产’+ ‘产生’+ ‘污染’+ ‘散’+ ((‘感染’)*(‘通气’ + ‘呼吸’)))))

Search hits: 781 references

Wanfang **(inception to May 1, 2020)**

主题:(‘2019?新？冠状’ + ‘2019？cov’ + ‘冠状病毒？病？2019’ + ‘covid19’ + ‘covid-19’ + ‘新？冠状’ + ‘sars2’ + ‘sars-cov-2’ + ‘ncov’)*((‘污染’ +(‘交叉’ + ‘健康’ + ‘医院’ + ‘实验’ + ‘感染’)*(‘感染’ + ‘肺炎’) + (‘感染’)* (‘控制’) + (‘销毁’ + ‘预防’)*(‘病原’ + ‘菌’)) + (‘污染’ + ‘传染病传播’ + ‘患者到医学专业人员’ + ‘传染病传播’ + ‘用品污染’ + ‘设备污染’ + ‘实验室感染’ + ‘感染控制’ + ‘气溶胶’ + (‘实验室’)*(‘职业暴露’ + ‘职业病’)) + ((‘设备’ + ‘用品’ +‘用具’ + ‘衣’+ ‘移液器’+ ‘滴’+ ‘气溶胶’+ ‘咳嗽’+ ‘传染’+ ‘自发性’+ ‘水平’+ ‘病原’+ ‘病’+ ‘病毒’+ ‘空气传播’+ ‘空气微生物’)*(‘传播’+ ‘传’+ ‘诱导’+ ‘诱发’+ ‘刺激’+ ‘生产’+ ‘产生’+ ‘污染’+ ‘散’+ ((‘感染’)*(‘通气’ + ‘呼吸’)))))

Search hits: 5 references

VIP **(inception to May 1, 2020)**

M=(‘2019?新？冠状’ + ‘2019？cov’ + ‘冠状病毒？病？2019’ + ‘covid19’ + ‘covid-19’ + ‘新？冠状’ + ‘sars2’ + ‘sars-cov-2’ + ‘ncov’)*((‘污染’ +(‘交叉’ + ‘健康’ + ‘医院’ + ‘实验’ + ‘感染’)*(‘感染’ + ‘肺炎’) + (‘感染’)* (‘控制’) + (‘销毁’ + ‘预防’)*(‘病原’ + ‘菌’)) + (‘污染’ + ‘传染病传播’ + ‘患者到医学专业人员’ + ‘传染病传播’ + ‘用品污染’ + ‘设备污染’ + ‘实验室感染’ + ‘感染控制’ + ‘气溶胶’ + (‘实验室’)*(‘职业暴露’ + ‘职业病’)) + ((‘设备’ + ‘用品’ +‘用具’ + ‘衣’+ ‘移液器’+ ‘滴’+ ‘气溶胶’+ ‘咳嗽’+ ‘传染’+ ‘自发性’+ ‘水平’+ ‘病原’+ ‘病’+ ‘病毒’+ ‘空气传播’+ ‘空气微生物’)*(‘传播’+ ‘传’+ ‘诱导’+ ‘诱发’+ ‘刺激’+ ‘生产’+ ‘产生’+ ‘污染’+ ‘散’+ ((‘感染’)*(‘通气’ + ‘呼吸’)))))

Search hits: 1656 references

Sinomed **(inception to May 1, 2020)**

("2019?新？冠状"[常用字段:智能] OR "2019？cov"[常用字段:智能] OR "冠状病毒？病？2019"[常用字段:智能] OR "covid19"[常用字段:智能] OR "covid-19"[常用字段:智能] OR "新？冠状"[常用字段:智能] OR "sars2"[常用字段:智能] OR "sars-cov-2"[常用字段:智能] OR "ncov"[常用字段:智能]) AND (("污染"[常用字段:智能] OR (("感染"[常用字段:智能]) AND ("控制" [常用字段:智能])) OR (("交叉"[常用字段:智能] OR "健康"[常用字段:智能] OR "医院"[常用字段:智能] OR "实验"[常用字段:智能] OR "感染"[常用字段:智能]) AND ("感染"[常用字段:智能] OR "肺炎"[常用字段:智能])) OR (("销毁"[常用字段:智能] OR "预防"[常用字段:智能]) AND ("病原"[常用字段:智能] OR "菌"[常用字段:智能]))) OR ("污染"[常用字段:智能] OR "传染病传播"[常用字段:智能] OR "患者到医学专业人员"[常用字段:智能] OR "传染病传播"[常用字段:智能] OR "用品污染"[常用字段:智能] OR "设备污染"[常用字段:智能] OR "实验室感染"[常用字段:智能] OR "感染控制"[常用字段:智能] OR "气溶胶"[常用字段:智能] OR (("实验室"[常用字段:智能]) AND ("职业暴露"[常用字段:智能] OR "职业病"[常用字段:智能]))) OR (("设备"[常用字段:智能] OR "用品"[常用字段:智能] OR "用具"[常用字段:智能] OR "衣"[常用字段:智能] OR "移液器"[常用字段:智能] OR "滴"[常用字段:智能] OR "气溶胶"[常用字段:智能] OR "咳嗽"[常用字段:智能] OR "传染"[常用字段:智能] OR "自发性"[常用字段:智能] OR "水平"[常用字段:智能] OR "病原"[常用字段:智能] OR "病"[常用字段:智能] OR "病毒"[常用字段:智能] OR "空气传播"[常用字段:智能] OR "空气微生物"[常用字段:智能]) AND ("传播"[常用字段:智能] OR "传"[常用字段:智能] OR "诱导"[常用字段:智能] OR "诱发"[常用字段:智能] OR "刺激"[常用字段:智能] OR "生产"[常用字段:智能] OR "产生"[常用字段:智能] OR "污染"[常用字段:智能] OR "散"[常用字段:智能] OR (("感染"[常用字段:智能]) AND ("通气"[常用字段:智能] OR "呼吸"[常用字段:智能]))))

Search hits: 2795 references

WHO Chinese databases (Feb 2, 2020 to May 1, 2020)

Search Strategy:

#1 “2019**冠状病毒**”

#2 “新型冠状病毒”

#3 “新冠肺炎”

#4 “武汉2019”

#5 “武汉病毒“

#6 “武汉肺炎”

#7 “2019-nCoV”

#8 “SARS-CoV-2”

#9 “Novel coronavirus”

#10 “nCoV”

#11 “Emerging Coronavirus”

#12 “new coronavirus”

#13 “COVID-19”

#14 “coronavirus“

#15 OR/#1-#14

Search hits: 1800 references

Supplement. Stream 4 search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <January 1, 2010 to May 1, 2020>
Search Strategy:
---

1 exp Positive-Pressure Respiration/ (25632)
2 exp High-Frequency Ventilation/ (2823)
3 exp ventilators, mechanical/ (9001)
4 Ventilation/ (5651)
5 exp Intubation, Intratracheal/ (38466)
6 suction/ (12378)
7 Tracheostomy/ (7302)
8 Bronchoscopy/ (24972)
9 Thoracostomy/ (1439)
10 exp "Nebulizers and Vaporizers"/ (11233)
11 Sputum/ (21208)
12 Oxygen Inhalation Therapy/ (14246)
13 Autopsy/ (41856)
14 exp Respiratory Function Tests/ (232861)
15 exp Spirometry/ (21722)
16 exp cardiopulmonary resuscitation/ (17736)
17 respiration, artificial/ (48154)
18 Breathing exercises/ (3379)
19 or/1-18 (462703)
20 Physical Therapy Modalities/ (36399)
21 thorax/ (21273)
22 20 and 21 (131)
23 19 or 22 (462778)
24 (ventilation or ventilator or ventilating or ventilatory).ti,ab. (145885)
25 (respirator or respirators or respirat* support or respirat* care).ti,ab. (10569)
26 (intubation or intubated or extubation or extubated).ti,ab. (62256)
27 ((respiratory or airway or air way or open) adj3 suction*).ti,ab. (399)
28 (nebulize* or nebulise* or aerosolize* or aerosolise*).ti,ab. (14483)
29 heat moisture exchange*.ti,ab. (58)
30 (bronchoscopy or tracheostomy or thoracostomy).ti,ab. (32540)
31 (chest adj3 physiotherapy).ti,ab. (846)
32 (sputum adj3 (induction or inducing)).ti,ab. (774)
33 oxygen therap*.ti,ab. (10630)
34 (lung function test* or pulmonary function test*).ti,ab. (15291)
35 ((continuous or bilevel) adj2 (positive airway or positive pressure)).ti,ab. (9898)
36 (cardiopulmonary resuscitation or artificial resuscitation or artificial respiration).ti,ab. (15879)
37 (autopsy adj3 lung tissue*).ti,ab. (119)

38 or/24-37 (277913)
39 23 or 38 (601932)
40 exp Health personnel/ (508238)
41 (health care worker* or healthcare worker* or health care provider* or healthcare provider* or physiotherapist* or dentist* or nurse* or doctor* or physician* or health personnel or medical personnel or hospital personnel or hospital worker* or staff or healthcare professional* or health care professional* or care giver* or caregiver* or paramedic* or therapist*).ti,ab. (1070764)
42 40 or 41 (1330082)
43 Infectious Disease Transmission, Patient-to-Professional/ (3885)
44 occupational exposure/ (54047)
45 air microbiology/ (7579)
46 infectious disease transmission/ (9106)
47 infection control/ (23575)
48 infection control, dental/ (1127)
49 exp cross infection/ (58807)
50 Disease Outbreaks/ (78859)
51 Aerosols/ (30094)
52 ((aerosol* or cough* or droplet* or infection* or infectious or disease*) adj3 (generat* or induc* or stimulat* or produc* or creat* or respirable range* or dispers* or transmission or transmitted or transmit or spread* or disseminat* or count* or precaution* or control* or inhibit* or prevent* or reduc*)).ti,ab. (464017)
53 cross infection.ti,ab. (2247)
54 or/44-53 (670356)
55 39 and 43 (306)
56 39 and 41 and 54 (2558)
57 55 or 56 (2704)
58 (aerosol* adj2 generat* adj2 procedure*).ti,ab. (99)
59 57 or 58 (2761)
60 exp *Health personnel/ (371456)
61 (health care worker* or healthcare worker* or health care provider* or healthcare provider* or physiotherapist* or dentist* or nurse* or doctor* or physician* or hospital personnel or health personnel or medical personnel or hospital worker* or staff or healthcare professional* or health care professional* or care giver* or caregiver* or paramedic* or therapist*).ti. (354397)
62 60 or 61 (584444)
63 Infectious Disease Transmission, Patient-to-Professional/ (3885)
64 occupational exposure/ (54047)
65 air microbiology/ (7579)
66 infectious disease transmission/ (9106)
67 infection control/ (23575)
68 infection control, dental/ (1127)
69 exp cross infection/ (58807)
70 Disease Outbreaks/ (78859)

71 Aerosols/ (30094)
72 ((aerosol* or cough* or droplet* or infection* or infectious or disease*) adj3 (generat* or induc* or stimulat* or produc* or creat* or respirable range* or dispers* or transmission or transmitted or transmit or spread* or disseminat* or count* or precaution* or control* or inhibit* or prevent* or reduc*)).ti,ab. (464017)
73 cross infection.ti,ab. (2247)
74 or/63-73 (671851)
75 human influenza/ (48539)
76 exp Influenza A virus/ (43199)
77 SARS virus/ (3009)
78 Severe Acute Respiratory Syndrome/ (4563)
79 exp tuberculosis/ (190872)
80 exp pneumonia/ (92607)
81 or/75-80 (352437)
82 (influenza* or H1N1 or tuberculosis or pneumonia or pneumococcus or severe acute respiratory syndrome or SARS or acute respiratory infection*).ti,ab. (416304)
83 81 or 82 (522435)
84 62 and 74 and 83 (2291)
85 59 or 84 (4785)
86 meta-analysis.pt. (114083)
87 meta-analysis/ or systematic review/ or meta-analysis as topic/ or exp technology assessment, biomedical/ (214672)
88 ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab. (184744)
89 ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab. (10701)
90 ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab. (26108)
91 (data synthes* or data extraction* or data abstraction*).ti,ab. (26398)
92 (handsearch* or hand search*).ti,ab. (9166)
93 (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab. (25844)
94 (met analy* or metanaly* or health technology assessment* or HTA or HTAs).ti,ab. (6397)
95 (meta regression* or metaregression* or mega regression*).ti,ab. (8588)
96 (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw. (300324)
97 (medline or Cochrane or pubmed or medlars).ti,ab,hw. (215824)
98 (cochrane or health technology assessment or evidence report).jw. (16941)
99 (meta-analysis or systematic review).mp. (279561)
100 or/86-99 (438774)
101 (Randomized Controlled Trial or Controlled Clinical Trial).pt. (593647)
102 Randomized Controlled Trial/ (504846)
103 Randomized Controlled Trials as Topic/ (132435)
104 Controlled Clinical Trial/ (93651)

105 Controlled Clinical Trials as Topic/ (5501)
106 Randomization/ (102644)
107 Random Allocation/ (102644)
108 Double-Blind Method/ (157371)
109 Double-Blind Studies/ (157371)
110 Single-Blind Method/ (28441)
111 Single-Blind Studies/ (28441)
112 Placebos/ (34842)
113 Control Groups/ (1666)
114 (random* or sham or placebo*).ti,ab,hw. (1479970)
115 ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw. (234799)
116 ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw. (992)
117 (control* adj3 (study or studies or trial*)).ti,ab. (521560)
118 (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw. (43416)
119 (allocated adj1 to).ti,ab,hw. (0)
120 ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw. (34087)
121 or/101-120 (1774789)
122 epidemiologic methods.sh. (31315)
123 epidemiologic studies.sh. (8294)
124 cohort studies/ (259990)
125 cohort analysis/ (259990)
126 longitudinal studies/ (133461)
127 prospective studies/ (536462)
128 follow-up studies/ (639145)
129 retrospective studies/ (815010)
130 case-control studies/ (282009)
131 exp case control study/ (1074288)
132 cross-sectional study/ (325582)
133 observational study/ (78330)
134 quasi experimental study/ (662)
135 (observational adj3 (study or studies or design or analysis or analyses)).ti,ab. (141660)
136 (cohort adj7 (study or studies or design or analysis or analyses)).ti,ab. (274444)
137 (prospective adj7 (study or studies or design or analysis or analyses or cohort)).ti,ab. (427568)
138 ((follow up or followup) adj7 (study or studies or design or analysis or analyses)).ti,ab. (133765)
139 ((longitudinal or longterm or (long adj term)) adj7 (study or studies or design or analysis or analyses or data or cohort)).ti,ab. (264279)
140 (retrospective adj7 (study or studies or design or analysis or analyses or cohort or data or review)).ti,ab. (475775)
141 ((case adj control) or (case adj comparison) or (case adj controlled)).ti,ab. (127301)
142 (case-referent adj3 (study or studies or design or analysis or analyses)).ti,ab. (616)
143 (population adj3 (study or studies or analysis or analyses)).ti,ab. (178734)

144 (descriptive adj3 (study or studies or design or analysis or analyses)).ti,ab. (74903)
145 ((multidimensional or (multi adj dimensional)) adj3 (study or studies or design or analysis or analyses)).ti,ab. (3602)
146 (cross adj sectional adj7 (study or studies or design or research or analysis or analyses or survey or findings)).ti,ab. (284716)
147 ((natural adj experiment) or (natural adj experiments)).ti,ab. (2054)
148 (quasi adj (experiment or experiments or experimental)).ti,ab. (13300)
149 ((non experiment or nonexperiment or non experimental or nonexperimental) adj3 (study or studies or design or analysis or analyses)).ti,ab. (1302)
150 (prevalence adj3 (study or studies or analysis or analyses)).ti,ab. (37071)
151 case series.ti,ab. (72539)
152 case reports.pt. (2094108)
153 case report/ (2094108)
154 case study/ (2094108)
155 (case adj3 (report or reports or study or studies or histories)).ti,ab. (757977)
156 organizational case studies.sh. (12269)
157 or/122-156 (5423588)
158 exp clinical pathway/ (6657)
159 exp clinical protocol/ (166131)
160 exp consensus/ (12616)
161 exp consensus development conference/ (11901)
162 exp consensus development conferences as topic/ (2819)
163 critical pathways/ (6657)
164 exp guideline/ (33762)
165 guidelines as topic/ (39479)
166 exp practice guideline/ (26832)
167 practice guidelines as topic/ (116539)
168 health planning guidelines/ (4080)
169 (guideline or practice guideline or consensus development conference or consensus development conference, NIH).pt. (43076)
170 (position statement* or policy statement* or practice parameter* or best practice*).ti,ab. (32170)
171 (standards or guideline or guidelines).ti. (98565)
172 ((practice or treatment*) adj guideline*).ab. (29083)
173 (CPG or CPGs).ti. (5687)
174 consensus*.ti. (24332)
175 consensus*.ab. /freq=2 (24897)
176 ((critical or clinical or practice) adj2 (path or paths or pathway or pathways or protocol*)).ti,ab. (19553)
177 recommendat*.ti. (37843)
178 (care adj2 (standard or path or paths or pathway or pathways or map or maps or plan or plans)).ti,ab. (57424)
179 (algorithm* adj2 (screening or examination or test or tested or testing or assessment* or diagnosis or diagnoses or diagnosed or diagnosing)).ti,ab. (7385)

180 (algorithm* adj2 (pharmacotherap* or chemotherap* or chemotreatment* or therap* or treatment* or intervention*)).ti,ab. (9511)
181 or/158-180 (591624)
182 100 or 121 or 157 or 181 (7245526)
183 85 and 182 (2221)
184 limit 183 to yr="2010 -Current" (1147)
185 conference abstract.pt. (0)
186 184 not 185 (1147)

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Database: Embase <January 1, 2010 to May 1, 2020>

Search Strategy:

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1 positive end expiratory pressure/ (47993)
2 high frequency ventilation/ (2661)
3 intermittent positive pressure ventilation/ (1955)
4 endotracheal intubation/ (39023)
5 suction/ (8576)
6 Tracheostomy/ (22342)
7 tracheobronchial toilet/ (2642)
8 exp bronchoscopy/ (48799)
9 thorax drainage/ (8659)
10 nebulization/ (6480)
11 exp nebulizer/ (9233)
12 Sputum/ (19322)
13 sputum analysis/ (8762)
14 sputum examination/ (1781)
15 oxygen therapy/ (25715)
16 Autopsy/ (82456)
17 exp lung function test/ (148155)
18 resuscitation/ (95279)
19 artificial ventilation/ (115211)
20 breathing exercise/ (6308)
21 or/1-20 (606093)
22 (ventilation or ventilator or ventilating or ventilatory).ti,ab,kw. (175485)
23 (respirator or respirators or respirat* support or respirat* care).ti,ab,kw. (11096)
24 (intubation or intubated or extubation or extubated).ti,ab,kw. (83855)
25 ((respiratory or airway or air way or open) adj3 suction*).ti,ab,kw. (508)
26 (nebulize* or nebulise* or aerosolize* or aerosolise*).ti,ab,kw. (16759)
27 heat moisture exchange*.ti,ab,kw. (63)
28 (bronchoscopy or tracheostomy or thoracostomy).ti,ab,kw. (46789)
29 (chest adj3 physiotherapy).ti,ab,kw. (1207)
30 (sputum adj3 (induction or inducing)).ti,ab,kw. (1235)
31 oxygen therap*.ti,ab,kw. (12657)
32 (lung function test* or pulmonary function test*).ti,ab,kw. (24516)
33 ((continuous or bilevel) adj2 (positive airway or positive pressure)).ti,ab,kw. (13529)
34 (cardiopulmonary resuscitation or artificial resuscitation or artificial respiration).ti,ab,kw. (20231)
35 (autopsy adj3 lung tissue*).ti,ab,kw. (122)
36 or/22-35 (342620)
37 21 or 36 (733828)
38 exp health care personnel/ (1356570)

39 (health care worker* or healthcare worker* or health care provider* or healthcare provider* or physiotherapist* or dentist* or nurse* or doctor* or physician* or health personnel or medical personnel or hospital personnel or hospital worker* or staff or healthcare professional* or health care professional* or care giver* or caregiver* or paramedic* or therapist*).ti,ab,kw. (1180442)
40 38 or 39 (1982207)
41 occupational exposure/ (60471)
42 airborne infection/ (1435)
43 infection control/ (72146)
44 exp cross infection/ (11794)
45 hospital infection/ (34728)
46 virus transmission/ (52585)
47 bacterial transmission/ (13233)
48 disease transmission/ (73389)
49 aerosol/ (39296)
50 ((aerosol* or cough* or droplet* or infection* or infectious or disease*) adj3 (generat* or induc* or stimulat* or produc*or creat* or respirable range* or dispers* or transmission or transmitted or transmit or spread* or disseminat* or count* or precaution* or control* or inhibit* or prevent* or reduc*)).ti,ab,kw. (503823)
51 cross infection.ti,ab,kw. (2379)
52 or/41-51 (762573)
53 37 and 40 and 52 (5044)
54 (aerosol* adj2 generat* adj2 procedure*).ti,ab,kw. (104)
55 53 or 54 (5089)
56 exp *health care personnel/ (384938)
57 (health care worker* or healthcare worker* or health care provider* or healthcare provider* or physiotherapist* or dentist* or nurse* or doctor* or physician* or hospital personnel or health personnel or medical personnel or hospital worker* or staff or healthcare professional* or health care professional* or care giver* or caregiver* or paramedic* or therapist*).ti,kw. (289059)
58 56 or 57 (568656)
59 occupational exposure/ (60471)
60 airborne infection/ (1435)
61 infection control/ (72146)
62 exp cross infection/ (11794)
63 hospital infection/ (34728)
64 virus transmission/ (52585)
65 bacterial transmission/ (13233)
66 disease transmission/ (73389)
67 aerosol/ (39296)
68 ((aerosol* or cough* or droplet* or infection* or infectious or disease*) adj3 (generat* or induc* or stimulat* or produc* or creat* or respirable range* or dispers* or transmission or transmitted or transmit or spread* or disseminat* or count* or precaution* or control* or inhibit* or prevent* or reduc*)).ti,ab,kw. (537332)

69 cross infection.ti,ab,kw. (2379)
70 or/59-69 (793814)
71 exp coronavirus infection/ (12644)
72 exp influenza virus/ (25969)
73 exp influenza/ (77766)
74 Parainfluenza virus infection/ (1279)
75 tuberculosis/ (84625)
76 lung tuberculosis/ (33366)
77 drug resistant tuberculosis/ (2301)
78 streptococcus pneumoniae/ (34103)
79 pneumonia/ (140141)
80 Respiratory syncytial pneumovirus/ (11357)
81 or/71-80 (379652)
82 (influenza* or H1N1 or tuberculosis or pneumonia or pneumococcus or severe acute respiratory syndrome or SARS or acute respiratory infection*).ti,ab,kw. (388392)
83 81 or 82 (535750)
84 58 and 70 and 83 (2920)
85 55 or 84 (7636)
86 meta-analysis.pt. (0)
87 meta-analysis/ or systematic review/ or meta-analysis as topic/ or exp technology assessment, biomedical/ (368479)
88 ((systematic* adj3 (review* or overview*)) or (methodologic* adj3 (review* or overview*))).ti,ab,kw. (232653)
89 ((quantitative adj3 (review* or overview* or synthes*)) or (research adj3 (integrati* or overview*))).ti,ab,kw. (11866)
90 ((integrative adj3 (review* or overview*)) or (collaborative adj3 (review* or overview*)) or (pool* adj3 analy*)).ti,ab,kw. (36577)
91 (data synthes* or data extraction* or data abstraction*).ti,ab,kw. (31641)
92 (handsearch* or hand search*).ti,ab,kw. (10999)
93 (mantel haenszel or peto or der simonian or dersimonian or fixed effect* or latin square*).ti,ab,kw. (31961)
94 (met analy* or metanaly* or health technology assessment* or HTA or HTAs).ti,ab,kw. (11347)
95 (meta regression* or metaregression* or mega regression*).ti,ab,kw. (10888)
96 (meta-analy* or metaanaly* or systematic review* or biomedical technology assessment* or bio-medical technology assessment*).mp,hw. (472474)
97 (medline or Cochrane or pubmed or medlars).ti,ab,hw. (282770)
98 (cochrane or health technology assessment or evidence report).jw. (23296)
99 (meta-analysis or systematic review).mp. (443556)
100 or/86-99 (627846)
101 (Randomized Controlled Trial or Controlled Clinical Trial).pt. (0)
102 Randomized Controlled Trial/ (556184)
103 Randomized Controlled Trials as Topic/ (113758)
104 Controlled Clinical Trial/ (418885)

105 Controlled Clinical Trials as Topic/ (9363)
106 Randomization/ (78481)
107 Random Allocation/ (74702)
108 Double-Blind Method/ (121233)
109 Double Blind Procedure/ (145615)
110 Double-Blind Studies/ (129475)
111 Single-Blind Method/ (35378)
112 Single Blind Procedure/ (37372)
113 Single-Blind Studies/ (37372)
114 Placebos/ (240672)
115 Placebo/ (296915)
116 Control Groups/ (110201)
117 Control Group/ (110201)
118 (random* or sham or placebo*).ti,ab,hw,kw. (1812375)
119 ((singl* or doubl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kw. (245326)
120 ((tripl* or trebl*) adj (blind* or dumm* or mask*)).ti,ab,hw,kw. (1257)
121 (control* adj3 (study or studies or trial*)).ti,ab,kw. (650422)
122 (Nonrandom* or non random* or non-random* or quasi-random* or quasirandom*).ti,ab,hw,kw. (49354)
123 (allocated adj1 to).ti,ab,hw,kw. (0)
124 ((open label or open-label) adj5 (study or studies or trial*)).ti,ab,hw,kw. (61468)
125 or/101-124 (2280104)
126 epidemiologic methods.sh. (4)
127 epidemiologic studies.sh. (0)
128 cohort studies/ (433474)
129 cohort analysis/ (567281)
130 longitudinal studies/ (111773)
131 longitudinal study/ (131804)
132 prospective studies/ (472166)
133 prospective study/ (577076)
134 follow-up studies/ (1004968)
135 follow up/ (1462619)
136 followup studies/ (0)
137 retrospective studies/ (606368)
138 retrospective study/ (881525)
139 case-control studies/ (116348)
140 exp case control study/ (168250)
141 cross-sectional study/ (339621)
142 observational study/ (195219)
143 quasi experimental methods/ (0)
144 quasi experimental study/ (6735)
145 (observational adj3 (study or studies or design or analysis or analyses)).ti,ab,kw. (222297)
146 (cohort adj7 (study or studies or design or analysis or analyses)).ti,ab,kw. (422484)

147 (prospective adj7 (study or studies or design or analysis or analyses or cohort)).ti,ab,kw. (597902)
148 ((follow up or followup) adj7 (study or studies or design or analysis or analyses)).ti,ab,kw. (187882)
149 ((longitudinal or longterm or (long adj term)) adj7 (study or studies or design or analysis or analyses or data or cohort)).ti,ab,kw. (349022)
150 (retrospective adj7 (study or studies or design or analysis or analyses or cohort or data or review)).ti,ab,kw. (762045)
151 ((case adj control) or (case adj comparison) or (case adj controlled)).ti,ab,kw. (157471)
152 (case-referent adj3 (study or studies or design or analysis or analyses)).ti,ab,kw. (397)
153 (population adj3 (study or studies or analysis or analyses)).ti,ab,kw. (252970)
154 (descriptive adj3 (study or studies or design or analysis or analyses)).ti,ab,kw. (108780)
155 ((multidimensional or (multi adj dimensional)) adj3 (study or studies or design or analysis or analyses)).ti,ab,kw. (3679)
156 (cross adj sectional adj7 (study or studies or design or research or analysis or analyses or survey or findings)).ti,ab,kw. (367096)
157 ((natural adj experiment) or (natural adj experiments)).ti,ab,kw. (2184)
158 (quasi adj (experiment or experiments or experimental)).ti,ab,kw. (15806)
159 ((non experiment or nonexperiment or non experimental or nonexperimental) adj3 (study or studies or design or analysis or analyses)).ti,ab,kw. (1651)
160 (prevalence adj3 (study or studies or analysis or analyses)).ti,ab,kw. (50081)
161 case series.ti,ab,kw. (100520)
162 case reports.pt. (0)
163 case report/ (1696605)
164 case study/ (65906)
165 (case adj3 (report or reports or study or studies or histories)).ti,ab,kw. (830892)
166 organizational case studies.sh. (2)
167 or/126-166 (5824424)
168 exp clinical pathway/ (8274)
169 exp clinical protocol/ (94159)
170 exp consensus/ (68743)
171 exp consensus development conference/ (23376)
172 exp consensus development conferences as topic/ (23376)
173 critical pathways/ (8274)
174 guidelines as topic/ (366913)
175 exp practice guideline/ (530982)
176 practice guidelines as topic/ (301084)
177 health planning guidelines/ (70637)
178 (guideline or practice guideline or consensus development conference or consensus development conference, NIH).pt. (0)
179 (position statement* or policy statement* or practice parameter* or best practice*).ti,ab,kw. (46014)
180 (standards or guideline or guidelines).ti,kw. (132217)
181 ((practice or treatment*) adj guideline*).ab. (42973)

182 (CPG or CPGs).ti,kw. (9105)
183 consensus*.ti,kw. (29176)
184 consensus*.ab. /freq=2 (30657)
185 ((critical or clinical or practice) adj2 (path or paths or pathway or pathways or protocol*)).ti,ab,kw. (29627)
186 recommendat*.ti,kw. (44881)
187 (care adj2 (standard or path or paths or pathway or pathways or map or maps or plan or plans)).ti,ab,kw. (98721)
188 (algorithm* adj2 (screening or examination or test or tested or testing or assessment* or diagnosis or diagnoses or diagnosed or diagnosing)).ti,ab,kw. (10093)
189 (algorithm* adj2 (pharmacotherap* or chemotherap* or chemotreatment* or therap* or treatment* or intervention*)).ti,ab,kw. (14392)
190 or/168-189 (923657)
191 100 or 125 or 167 or 190 (8171928)
192 85 and 191 (3985)
193 limit 192 to yr="2010 -Current" (2830)
194 (2010* or 2011* or 2012* or 2013* or 2014* or 2015* or 2016* or 2017* or 2018* or 2019* or 2020*).dc. (15668448)
195 192 and 194 (2956)
196 193 or 195 (2956)
197 conference abstract.pt. (3767678)
198 196 not 197 (1801)

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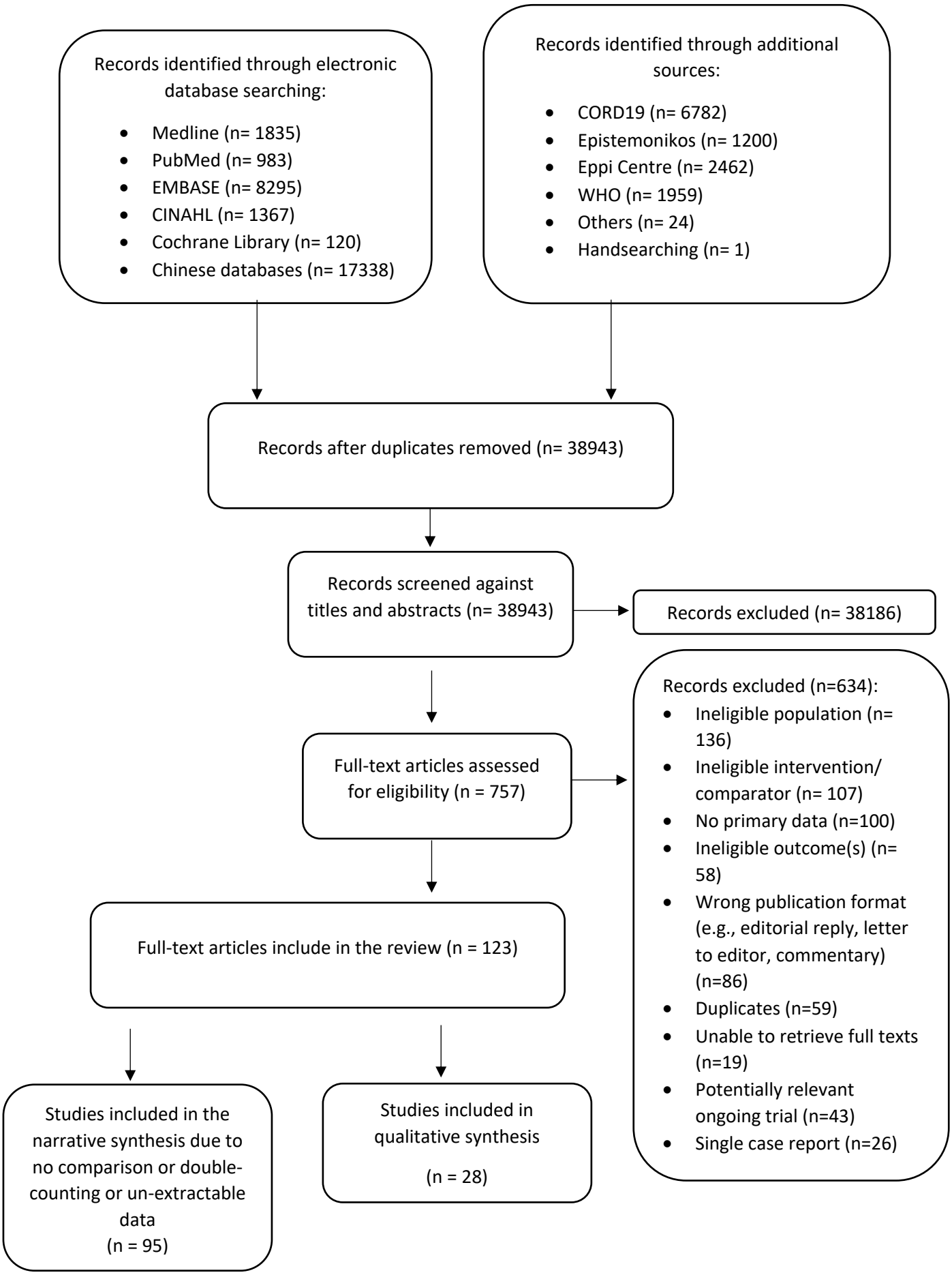
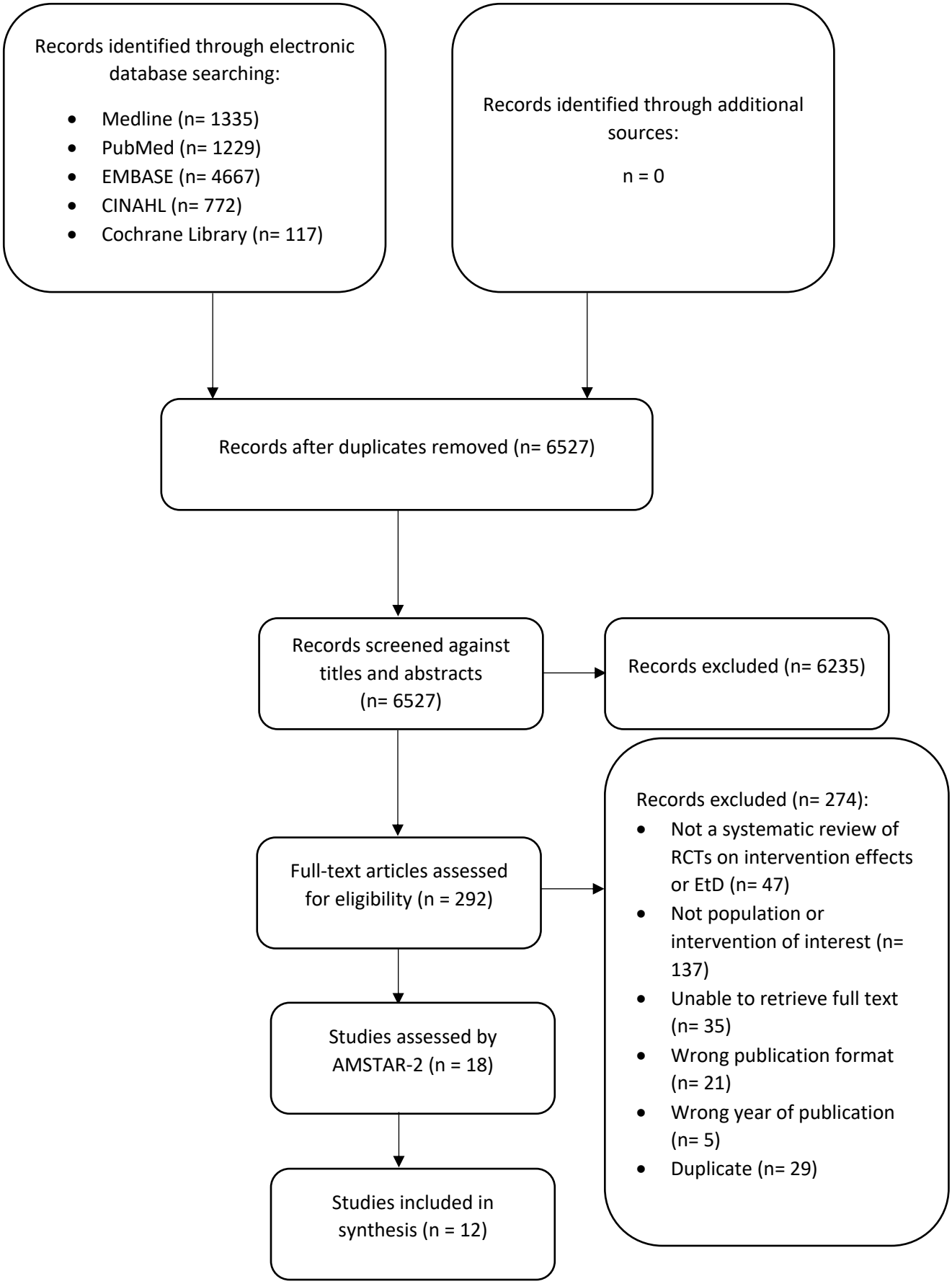
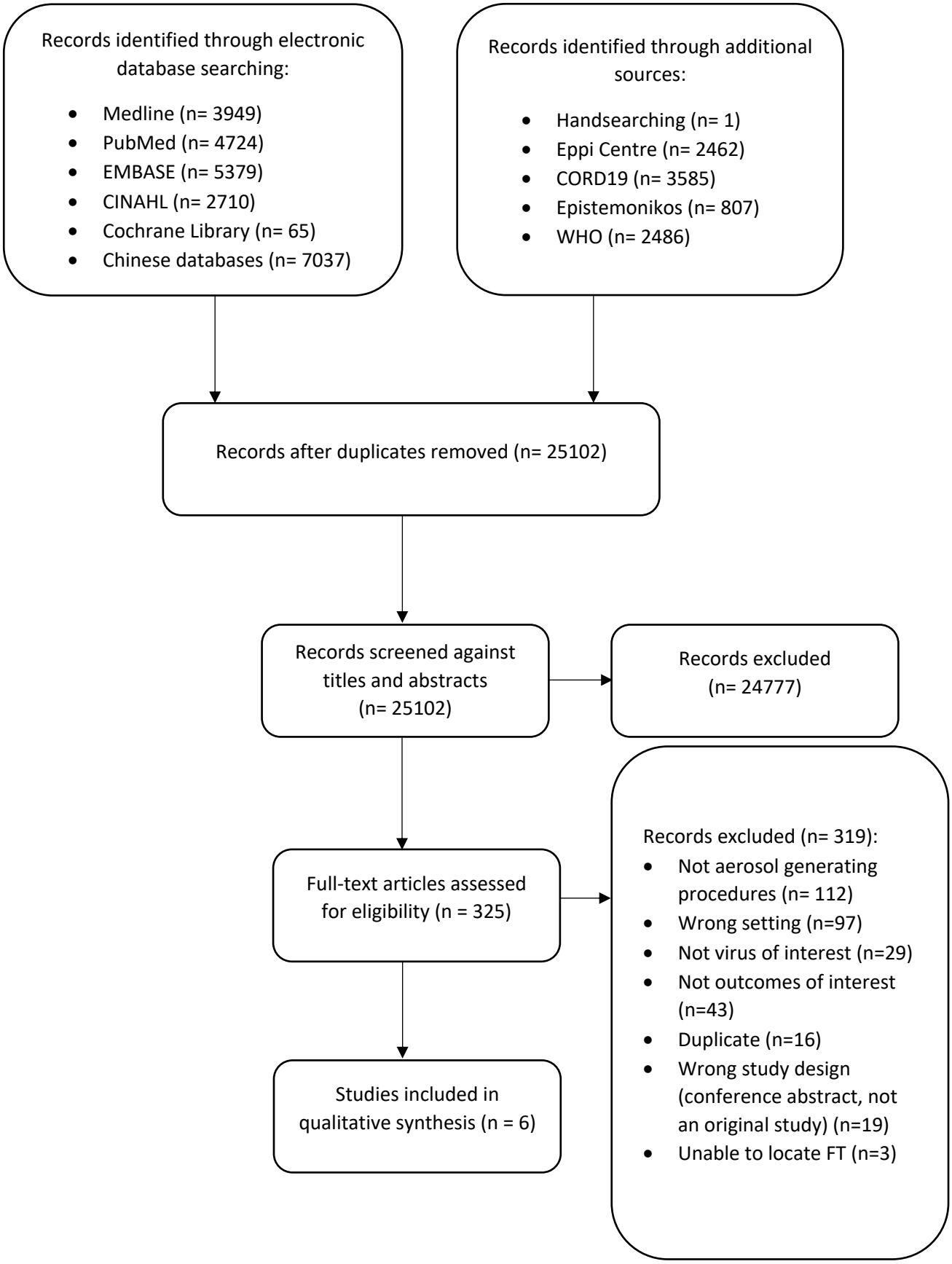
Supplement 3. Stream 1 PRISMA Flow Chart



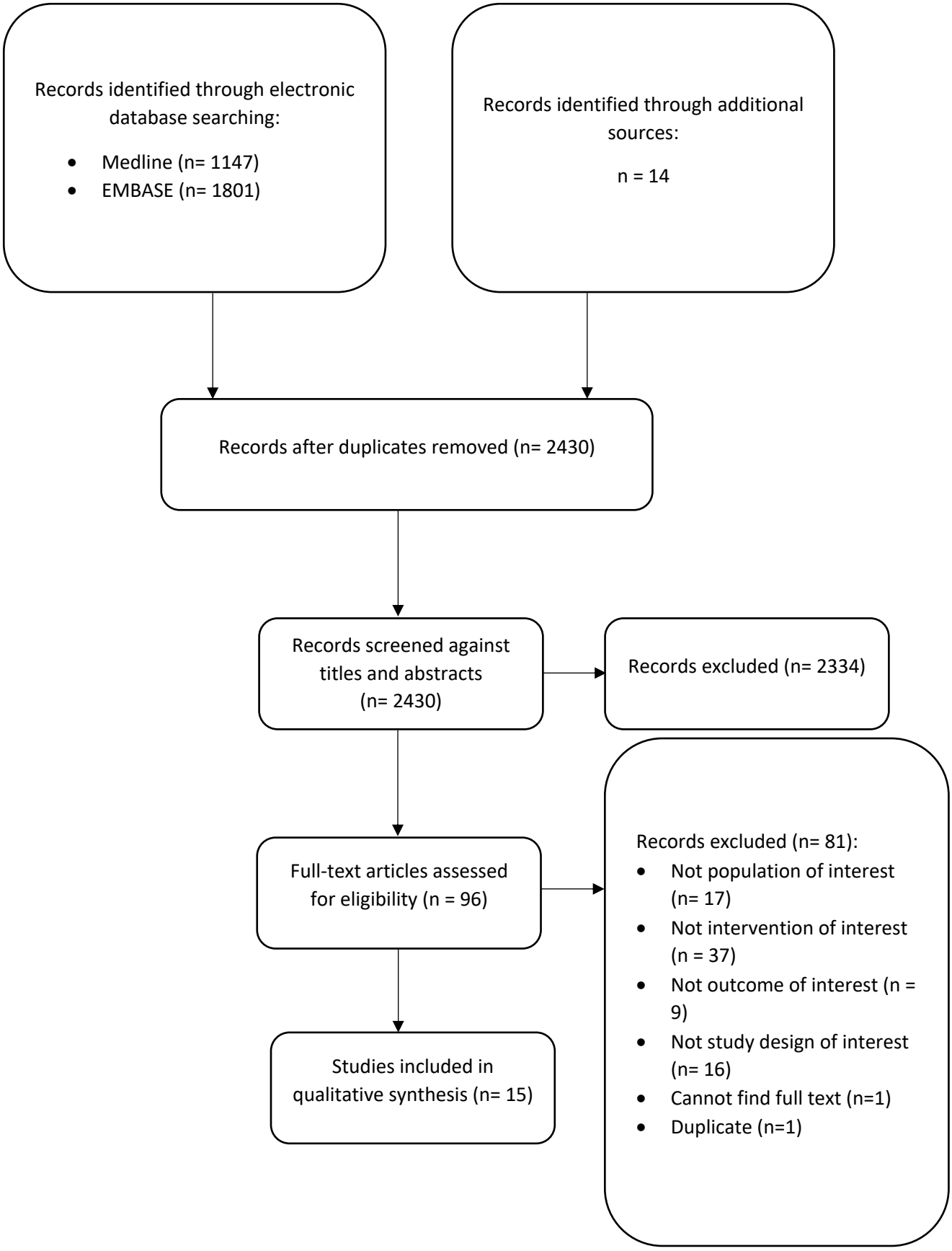
Supplement 3. Stream 2 PRISMA Flow Chart



Supplement 3. Stream 3 PRISMA Flow Chart



Supplement 3. Stream 4 PRISMA Flow Chart



Supplement 4. Baseline characteristics of eligible studies excluded from the analysis (n=95)

Study ID	Study design for interventions	Country	Virus	Interventions	Risk of bias
Zhang 2020(1)	Retrospective cases	China	COVID-19	MV (NIV, IMV)	5/9; concern related to comparability and outcome
Yang 2020(2)	Retrospective cases	China	COVID-19	IMV	7/9; concern related to comparability
Wong 2003(3)	Case study	China	SARS	IMV	6/9; concern related to selection and comparability
Zhong 2004(4)	Case study	China	SARS	NIV	Insufficient information to make an assessment
Zheng 2020(5)	Retrospective cases	China	COVID-19	IMV	5/9; concern related to comparability and outcome
Zhao 2003(6)	Cohort	China	SARS	NIV, IMV	5/9; concern related to comparability and outcome
Liu 2020(7)	Case control	China	COVID-19	NIV, Standard oxygen therapy	5/9; concern related to comparability and selection
Liu 2005(8)	Cohort	Taiwan	SARS	IMV, Standard oxygen therapy	6/9; concern related to selection and comparability
Lien 2008(9)	Case series	Taiwan	SARS	IMV	6/9; concern related to selection and comparability
Khalid 2016(10)	Single arm study	Saudi Arabia	MERS	NIV	6/9; concern related to selection and comparability
Han 2004(11)	Single arm study	China	SARS	NIV	6/9; concern related to selection and comparability
Halim 2016(12)	Cohort	Saudia Arabia	MERS	IMV	6/9; concern related to selection and comparability
Guan 2020(13)	Cohort	China	COVID-19	NIV, IVM	6/9; concern related to selection and comparability
Gomersall 2004(14)	Cohort	China	SARS	MV, no MV	6/9; concern related to selection and comparability
Fowler 2003(15)	Cohort	Canada	SARS	IMV	6/9; concern related to selection and comparability
Cheung 2004(16)	single arm cohort	China	SARS	NIV	6/9; concern related to selection and comparability

Bhatraju 2020(17)	Case Series	USA	SARS	IMV	5/9; concern related to selection, comparability and outcome
Arabi 2014(18)	Case Series	Saudia Arabia	MERS	IMV	6/9; concern related to selection and comparability
AlAhmadi 2017(19)	Cohort	Saudia Arabia	MERS	NIV, IMV	5/9; concern related to selection, comparability and outcome
Almekhlafi 2016(20)	Cohort	Saudia Arabia	MERS	NIV, IMV	7/9; concern related to selection and comparability
Xu 2020(21)	Cohort	China	COVID-19	NIV, IMV	6/9; concern related to selection and comparability
Shi 2020(22)	Cohort	China	COVID-19	Oxygen therapy, MV	7/9; concern related to comparability
Qi 2020(23)	Cohort	China	COVID-19	NIV, IMV, standard oxygen therapy	6/9; concern related to selection and comparability
Peiris 2003(24)	Cohort	China	SARS	IMV	6/9; concern related to selection and comparability
Liu 2020(25)	Cohort	China	COVID-19	NIV	6/9; concern related to selection and comparability
Fan H 2020(26)	Cohort	China	COVID-19	NIV, IMV, standard oxygen therapy	6/9; concern related to selection and comparability
Chen 2005(27)	Cohort	China	SARS	IMV	6/9; concern related to selection and comparability
Al-Dorzi 2016(28)	Cohort	Saudi Arabia	MERS	NIV, IMV	6/9; concern related to selection and comparability
Pan 2020(29)	Case Series	China	COVID-19	IMV	5/9; concern related to comparability and outcome
Chen 2020(30)	Case-control	China	COVID-19	NIV, IMV, Standard oxygen therapy	6/9; concern related to selection and comparability
Mo 2020(31)	retrospective study	China	COVID-19	IMV, standard oxygen therapy	5/9; concern related to comparability and selection

Chen 2020(32)	Retrospective study	China	COVID-19	NIV, IMV	5/9; concern related to comparability and outcome
Arentz 2020(33)	Retrospective study	USA	COVID-19	MV	6/9; concern related to selection and comparability
Chen 2003(34)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Han 2004(35)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Zhao 2003(36)	Cohort	China	SARS	NIV	6/9; concern related to selection and comparability
Yang 2003(37)	Cohort	China	SARS	NIV, no MV	6/9; concern related to selection and comparability
Li 2003(38)	Retrospective study	China	SARS	NIV	6/9; concern related to selection and comparability
Liu 2007(39)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Gong 2003(40)	Case series	China	SARS	NIV, IMV	6/9; concern related to selection and comparability
Xu 2003(41)	Retrospective study	China	SARS	NIV	6/9; concern related to selection and comparability
Chan 2003(42)	Retrospective study	China	SARS	IMV	6/9; concern related to selection and comparability
Lu 2003(43)	Case Series	China	SARS	NIV	2/9; concern related to comparability, selection, and exposure
Zhao W 2003(44)	Case Series	China	SARS	NIV, no NIV	5/9; concern related to comparability, selection
Xiao F 2004(45)	EtD (cost)	China	SARS	NIV, no MV	N/A
Bai YH 2003(46)	Case series	China	SARS	IMV	6/9; concern related to selection and comparability
Yu 2005(47)	Case Series	China	SARS	IMV	5/9; concern related to comparability, selection

Zeng QL 2003(48)	Cohort	China	SARS	NIV	6/9; concern related to selection and comparability
Zhang K 2003(49)	Case Series	China	SARS	NIV	5/9; concern related to comparability, selection
Ye H 2003(50)	case series	China	SARS	NIV, IMV	6/9; concern related to selection and comparability
Wu X 2003(51)	Case Series	China	SARS	NIV	4/9; concern related to comparability, selection, and outcome
Liu JL 2003(52)	Case series	China	SARS	NIV	1/9; concern related to selection, comparability, and exposure
Zhao S(53)	Case series	China	SARS	NIV	3/9; concern related to selection, comparability, and exposure
Ou XY 2004(54)	Cohort	China	SARS	NIV, IMV	6/9; concern related to selection and comparability
Zhang JH 2003(55)	Case series	China	SARS	NIV	4/9; concern related to selection and comparability
Yang Q 2003(56)	Case series	China	SARS	IMV	4/9; concern related to selection and comparability
Chen SB 2003(57)	Cohort	China	SARS	NIV, IMV	7/9; concern related to comparability
He WQ 2003(58)	Case series	China	SARS	MV, NIV → IMV	6/9; concern related to selection and comparability
Cao CY 2003(59)	Case series	China	SARS	Standard oxygen therapy	4/9; concern related to selection, comparability, and outcome
Han CH 2007(60)	Case series	China	SARS	NIV	3/9; concern related to selection, comparability, and exposure
Zhang AZ 2004(61)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Zhang J 2003(62)	Case series	China	SARS	NIV	5/9; concern related to selection, comparability, and exposure

Zhang ZY 2005(63)	Case series	China	SARS	NIV, NIV → IMV	6/9; concern related to selection and comparability
Zhang ZC 2003(64)	Case series	China	SARS	IMV	5/9; concern related to selection, comparability, and exposure
Ma JY 2003(65)	Case series	China	SARS	NIV	2/9; concern related to selection, comparability, and exposure
Liu 2003(66)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Liu YF 2004(67)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Wan SI 2003(68)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Liu QG 2003(69)	Case series	China	SARS	IMV	5/9; concern related to selection and comparability
Wei HG 2013(70)	Case series	China	SARS	NIV	2/9; concern related to selection, comparability, and exposure
Chen HW 2003(71)	Case series	China	SARS	NIV	4/9; concern related to selection, comparability, and exposure
Xu YD 2003(72)	Case series	China	SARS	NIV, NIV → IMV	4/9; concern related to selection, comparability, and exposure
Yu XC 2003(73)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Meng Y 2004(74)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Yang ZP 2004(75)	Case series	China	SARS	NIV	6/9; concern related to selection and comparability
Gritti 2020(76)	Case series	China	COVID-19	NIV	6/9; concern related to selection and comparability
Barrasa 2020(77)	Case series	Spain	COVID-19	MV	6/9; concern related to selection and comparability

Geng 2020(78)	Case series	China	COVID-19	HFNC	6/9; concern related to selection and comparability
Liang 2020(79)	Case series	China	COVID-19	IMV	6/9; concern related to selection and comparability
Ling 2020(80)	Case series	China	COVID-19	IMV	6/9; concern related to selection and comparability
Pedersen 2020(81)	Case series	Denmark	COVID-19	IMV	6/9; concern related to selection and comparability
Yao 2020(82)	Case series	China	COVID-19	NIV, HFNC	3/9; concern related to selection, comparability, and outcome
Piva 2020(83)	Case series	Italy	COVID-19	NIV, IMV	5/9; concern related to selection, comparability, and outcome
Xie 2020(84)	Case series	China	COVID-19	NIV, IMV, HFNO, standard oxygen therapy	1/9; concern related to selection, comparability, and outcome
Chen 2020(85)	Case series	China	COVID-19	IMV, HFNC	5/9; concern related to comparability and outcome
Wang 2020(86)	Case series	China	COVID-19	IMV, NIV	5/9; concern related to selection and comparability
Argenziano 2020(87)	Case series	USA	COVID-19	MV	4/9; concern related to comparability and outcome
Grasselli 2020(88)	Case series	Italy	COVID-19	IMV, NIV, standard oxygen therapy	2/9; concern related to selection, comparability, and outcome
Wang 2020(89)	Case series	China	COVID-19	HFNC, NIV, IMV	7/9; concern related to comparability
Docherty 2020(90)	Case series	England	COVID-19	IMV	6/9; concern related to selection and comparability
He GJ 2020(91)	Case series	China	COVID-19	NIV	5/9; concern related to selection, comparability and outcome
Chen XL 2003(92)	Case series	China	SARS	NIV	4/9; concern related to selection, comparability and outcome

Zhao YY 2020(93)	Case series	China	COVID-19	NIV, IMV	4/9; concern related to selection, comparability and outcome
Lin Y 2020(94)	Case series	China	COVID-19	NIV, IMV	3/9; concern related to selection, comparability and outcome
Yang Y 2020(95)	Case series	China	COVID-19	HFNC	5/9 concern related to selection, comparability and outcome

HFNO: high flow oxygenation. HFNC: high flow nasal cannula. IMV: invasive mechanical ventilation. NIV: noninvasive ventilation. *Risk of bias per outcome for randomized studies was assessed using the Cochrane Risk of Bias tool 2.0 (overall risk of bias rating is presented here); risk of bias for non-randomized studies was assessed using the Newcastle-Ottawa scale (overall rating is presented here; with indication of domains of concern), risk of bias for studies addressing Evidence to Decision (EtD) outcomes (i.e., acceptability, feasibility, equity, resources and cost, value and preferences) was not assessed (reported as N/A).

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Supplement 5. Stream 1: Characteristics of included studies comparing different modalities of invasive and non-invasive ventilation

Study, analyzed design, Number of patients, Virus (preprint if indicated)	Ventilation	Age (mean & SD or median & IQR/range)	Eligibility criteria if reported	Degree of hypoxia based on PaO2/FiO2 ratio	Comorbidities	Radiographic pattern/findings	Risk of bias score (higher scores indicate lower risk of bias)*
Alraddadi 2019(21), Cohort (n = 302), Kingdom of Saudi Arabia, MERS	NIV	Median age 60 (50, 73)	Patients with AHRF who required mechanical ventilation support in the ICU, whether invasively or noninvasively.	Median: PaO2/FiO2 ratio 110 (62, 160), PaO2 mmHg 63 (56, 74); PaCO2 mmHg 39 (32, 47.4); HCO3 mEq/L 23 (20, 24.7).	83.8% Any comorbidity; 59% Diabetes with chronic complications; 18.1% Chronic pulmonary disease (including asthma); 7.6% Chronic liver disease; 29.5% Chronic renal disease; 47.6% Chronic cardiac disease; 15.2% Chronic neurological disease; 1.9% Rheumatological disease; 9.5% Any malignancy; 4.8% Immunosuppressant use.	Number of quadrants with infiltrates on chest radiograph 2 (1, 4)	8/9 No major concern
	IMV	Median age 58 (45, 69)	Patients with AHRF who required mechanical ventilation support in the ICU, whether invasively or noninvasively.	Median: PaO2/FiO2 ratio 106 (68, 166), PaO2 mmHg 71 (60, 87); PaCO2 mmHg 43.5 (36, 51.1); HCO3 mEq/L 21.7 (18.1, 24.9)	83.2% Any comorbidity; 48.2% Diabetes with chronic complications; 10.7% Chronic pulmonary disease (including asthma); 5.6% Chronic liver disease; 34.5% Chronic renal disease; 39.6% Chronic cardiac disease; 8.6% Chronic neurological	Number of quadrants with infiltrates on chest radiograph 3 (2, 4)	

					disease; 2.5% Rheumatological disease; 10.7% Any malignancy; 7.6% Immunosuppressant use.		
Auld 2020(84), Cohort (n= 217), USA, COVID-19 (preprint)	Any IMV vs no IMV	Median (IQR) age 64 (54 – 73) in entire cohort	Not reported	Not reported	Baseline data available only for initial cohort with 217 pts: Comorbidities n (%): Hypertension 134 (62), Congestive heart failure 41 (19), coronary artery disease 31 (14), diabetes mellitus 99 (46), renal diseases 58 (27), asthma 19 (9), COPD 21 (10)	Not reported	6/9 Concern related to selection and comparability of the groups
Booth 2003(23), Cohort (n = 144), Canada, SARS	IMV & No MV (not separately reported)	Median (IQR) age 45 (34-57) in entire cohort	Fever, a known exposure to SARS, and respiratory symptoms or infiltrates observed on chest radiograph. Patients were excluded if an alternative diagnosis was determined.	NR	Baseline data available only for initial cohort with 114 pts: Comorbidities n (%): Diabetes 16 (11), Cardiac disease 12 (8) , Cancer 9 (6), COPD 2 (1), Chronic renal failure 2 (1)	Chest radiography on admission was normal in 36 (25%) individuals, while unilateral and bilateral infiltrates were observed in 66 (46%) and 42 (29%) patients, respectively. (XR abnormalities distribution among the total study population)	6/9 Concern related to selection and comparability of the groups
Chiang 2004(24), Cohort (14 patients), Taiwan, SARS	IMV	Age not reported	Absolute indication for tracheal intubation and mechanical ventilation, all patients requiring	PaO2/FIO2 ratio lower than 200 mmHg.	not reported	100%	6/9 Concern related to selection and comparability of the groups

			intubation had severe SARS which defined as PaO2/FIO2 ratio less than 100 mm Hg, and a relative indication, PaO2/FIO2 ratio of 100 to 200 mm Hg.				
	Standard Oxygen Therapy	SARS, age not reported	Did not have severe SARS	Pa02/FiO2 > 200 mmHg	not reported	100%	
Choi 2016(25), Cohort (n = 186), South Korea, MERS	IMV & Standard Oxygen Therapy	Not reported	not reported	not reported	not reported	not reported	6/9 Concern related to selection and comparability of the groups
Duca 2020(26), Cohort (n = 320), Italy, COVID-19 (preprint)	CPAP (Helmet)	Mean age 69 (+/- 11.5)	Hypoxic and/or dyspneic on 15 L/min nonrebreather mask	Not reported	Not reported	Not reported	6/9 Concern reated to the comparability of the groups and outcome follow-up
	NIV	Mean age 71 (+/- 12)	Hypoxic and/or dyspneic on 15 L/min nonrebreather mask	Not reported	Not reported	Not reported	
	IMV	Mean age 69 (+/- 12)	Hypoxic and/or dyspneic on 15 L/min nonrebreather mask	Not reported	Not reported	Not reported	

Fowler 2004(27), Cohort (n = 71), Canada, SARS	NIV, HFO, IMV	Mean age 35.1 (+/- 6.5)	HCW performing/assisting intubation: Nurses, Physicians	not reported	not reported	not reported	7/9 Concern related to selection of participants
Guo 2003 (85), Cohort (n= 46), China, SARS	MV vs No MV	Mean age (SD) 48.2 (15.1)	Severe SARS with hypoxia	Not reported	Not reported	Not reported	4/9 Concern related to selection and comparability of the groups
He 2020 (86), Cohort (n= 37), China, COVID-19	SOT vs HFNC vs NIV	Not reported	Not reported	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of the groups
Hua 2020 (87), Cohort (n= 45), China, COVID-19	HFNC	Mean age (SD) 38.1 (0.7)	Not reported	Not reported	Not reported	Not reported	5/9 Concern related to selection, comparability of the groups and outcome follow-up
	SOT	Mean age (SD) 37.8 (0.8)	Not reported	Not reported	Not reported	Not reported	
Li 2003 (88), Cohort (n= 102), China, SARS	MV vs no MV	Not reported	Severe SARS with hypoxia	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of groups
Li 2007(28), Cohort (n =59), Hong	IMV	Mean age (SD) 55.1 (15.0)	Severe SARS infection	PaO2/FiO2 mmHg (probably median IQR	Chronic disease or immunosuppression 26%;	Non reported	7/9 Concern related to the

Kong (China), SARS				altough not described) 140 (79–175)			comparability of the groups
	No IMV	Mean age (SD) 39.2 (10.9)	Severe SARS infection	On admission PaO2/FiO2 median (range): 142 (107–199)	Chronic disease or immunosuppression 10%	Not reported	
Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	HFNC, NIV, SOT (nasal catheter & mask)	Median (IQR) age 50 (39-65)	Dyspnea with respiratory rate ≥ 30; pulse oxygenation < 93%; PaO2:FiO2 < 300; lung infiltrates >50% within 24 to 48 hours; respiratory failure, septic shock, and/or multi-organ failure	PaO2:FiO2 ratio (<300 mmHg)	Hypertension (18.5%), Diabetes (22.2%), chronic pulmonary disease (13.6%), chronic heart failure (4.9%),	Lung infiltrates > 50% in 4.9%	5/9 Concern related to selection, comparability of the groups and outcome follow-up
Liu 2003(89), Cohort (n= 44), China, SARS	NIV vs IMV	Not reported	SARS with symptom, abnormal lab test and lung CT	Not reported	Not reported	Not reported	4/9 Concern related to selection and comparability of groups
Liu 2004(33), RCT (n =60), China, SARS	NIV	Age range:18-54	PaCO2:45-70	not reported	not reported	not reported	Some concerns due to imbalances in baseline characteristics
	No MV	Age range:17-55	PaCO2:45-70	not reported	not reported	not reported	
Liu 2020 (90), Cohort (n= 47), China, COVID-19	NIV vs IMV	Age >60 years: 89%	Not reported	Not reported	Heart failure (51.1%), renal failure (31.2%)	Not reported	4/9 Concern related to selection, comparability

							, and outcome follow up
Liu 2020 (91), Cohort (n= 32), China, COVID-19	NIV vs HFNC	Not reported	Not reported	Not reported	Not reported	Not reported	5/9 Concern related to selection, comparability , and outcome follow up
Mo 2020 (92), Cohort (n= 38), China, COVID-19	HFNC	Mean age (SD) 59.8 (10.6)	Not reported	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of groups
	SOT	Mean age (SD) 60.3 (16.3)	Not reported	Not reported	Not reported	Not reported	
Wang 2004 (93), Cohort (n= 220), China, SARS	NIV vs IMV	Age range 20 - 76	Severe SARS with hypoxia	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of groups
Wang 2020(30), Cohort (n = 27), China, COVID-19	HFNC	Median (IQR) 65 (56–75)	Patients with pneumonia secondary to COVID-19 who required HFNC, NIV or invasive ventilation (severe respiratory failure)..	At baseline, the number of patients with PaO2/ FiO2 > 200 and ≤ 200 mmHg was 6 and 11, respectively	Hypertension (18%), Diabetes (18%), Chronic heart failure (18%)	Pulmonary infiltrates 100%	6/9 Concern related to selection and comparability of the groups and outcome follow-up

	NIV	not reported	not reported	not reported	not reported	not reported	
Wang 2020 (94), Cohort (n= 548), China, COVID-19	NIV vs IMV vs HFNC	Not reported	Not reported	Not reported	Baseline data available only for initial cohort with 548 pts: Comorbidities n (%): Hypertension 166 (30), coronary heart disease 34 (6), diabetes mellitus 83 (15), chronic kidney disease 10 (2), asthma 5 (1), COPD 17 (3)	Not reported	6/9 Concern related to seletion and comparability of the groups
Wu 2020(31), Cohort (n = 201), China, COVID-19	Standard oxygen therapy, NIV, IMV, IMV with ECMO	Median (IQR) 51 (43 – 60) for entire cohort	not reported	not reported	not reported	not reported	6/9 Concern related to selection and comparability of the groups
Xu 2010(12), Cohort (n = 127), China, SARS	No MV, NIV, IMV	Mean age (40.5 ± 15.6)	Confirmed SARS patients and oxygenation index < 300 mmHg (, the data is more complete A total of 127 patients.	not reported	not reported	not reported	8/9 No major concern
Yam 2005(32), Cohort (n = 493), Hong Kong (China), SARS	NIV	median:47 years	**Inclusion criteria:** ever developed ARF during hospitalization for SARS	FiO2>0.21: 19% pts, FiO2>0.50: 0% pts, **Respiratory status %**: non ARF:76.2%, ARF (ALI+ARDS): 23.8%, ARDS:2.4%	% with comorbidities: 23.8%, not specified	median radiographic score= 6	8/9 No major concern

	IMV	median: 44 years		FiO2>0.21: 10.7% pts, FiO2>0.50: 1.6% pts, Respiratory status %: non ARF:87%, ARF (ALI+ARDS): 13%, ARDS:5.4%	% with comorbidities: 17.7%, not specified	median radiographic score= 2	
Yang 2003 (95), Cohort (n= 63), China, SARS	MV vs no MV	Not reported	Severe SARS with hypoxia	Not reported	Not reported	Not reported	4/9 Concern related to selection, comparability and outcome
Yang 2004 (96), Cohort (n= 216), China, SARS	MV(NIV) vs no MV	Not reported	Not reported	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of groups
Yu 2003 (97), Cohort (n= 167), China, SARS	NIV vs IMV	Baseline mean age of the initial cohort: 36.6	Not reported	Not reported	Not reported	Not reported	7/9 Concern related to comparability of groups
Zheng 2004 (98), Cohort (n= 21), China, SARS	NIV	Mean age (SD) 39.2 (5.2)	Not reported	Not reported	Not reported	Not reported	6/9 Concern related to selection and comparability of groups
	IMV	Mean age (SD) 49.3 (17.0)	Not reported	Not reported	Not reported	Not reported	

NIV: noninvasive mechanical ventilation; IMV: invasive mechanical ventilation; MV: mechanical ventilation; ECMO; Extracorporeal membrane oxygenation; SOT: standard oxygen therapy; HFNC; High flow oxygen by nasal canula; ETT: endotracheal tube; HFO: high flow oxygen; SARS: Severe acute respiratory syndrome; MERS: Middle East respiratory syndrome; HCW: healthcare worker: ICU: intensive care unit; NIPPV: noninvasive positive pressure ventilation: ARF: acute respiratory failure; COPD = chronic obstructive pulmonary disease

*Risk of bias per outcome for randomized studies was assessed using the Cochrane Risk of Bias tool 2.0 (overall risk of bias rating is presented here); risk of bias for non-randomized studies was assessed using the Newcastle-Ottawa scale (overall start rating is presented here; zero stars are represented as a dash (-), indicating high risk of bias).

Supplement 6. Results of randomized, adjusted and unadjusted studies of SARS, MERS and COVID-19 patients comparing no ventilation, invasive mechanical ventilation and non-invasive mechanical ventilation by outcome and subgroups (stream 1).

Comparison	**Name of study**	**Outcome (duration follow-up)**	**Intervention**	**Comparator**	**Effect estimate [OR (95%CI)] with subgroups or narrative for adjusted studies**
NIV (intervention) versus IMV (comparator)	Alraddadi 2019(21) Cohort (n = 302) Kingdom of Saudi Arabia, MERS	Mortality (90 days)	69/105	150/197	0.61 (0.23 – 1.60) PaO2/FiO2 ratio ≤ 100: 0.56 (0.12 – 2.66) PaO2/FiO2 ratio > 100: 0.54 (0.18 – 1.61)
		Days of hospital stay (90 days)	20 (11 – 35) [a]	22 (12 – 38) [a]	n/a
		Length of ICU stay (90 days)	11 (6 – 18) [a]	11 (6 – 24) [a]	n/a
	Wu 2020(31), Cohort (n = 201), China, COVID-19	Mortality (n.r.)	38/61	5/5	
	Yam 2005(32), Cohort (n = 493), Hong Kong (China), SARS	Mortality (n.r.)	4/42	113/451	0.24 (0.10 – 0.72)
		Need for invasive ventilation	n.r.	n.r.	0.36 (0.16 – 0.78)
	Duca 2020(26), Cohort (n = 320),	Mortality (up to 24 days)	46/71 (Helmet CPAP) 4/7 (NIV)	2/7	n/a

	Italy, COVID-19 (preprint)				
	Liu 2003(89), Cohort (n= 44), China, SARS	Hospital mortality (4 months)	0/5	8/10	n/a
		Pulmonary infection (11 days)	0/5	5/10	n/a
	Liu 2020(90), Cohort (n= 47), China, COVID-19	Length of hospital stay (Before death)	7 (4 – 9.75) [a]	13 (7 – 21) [a]	n/a
	Wang 2004(93), Cohort (n= 220), China, SARS	Mortality (50 days)	8/24	8/8	n/a
	Wang 2020(94), Cohort (n= 548), China, COVID-19	Mortality (15 days)	46/78	16/25	HR 1.61 (0.84 – 3.09)
	Yu 2003 (97), Cohort (n= 167), China, SARS	Hospital mortality (n.r.)	13/50	2/2	n/a
	Zheng 2004 (98), Cohort (n= 21), China, SARS	Hospital mortality (n.r.)	0/11	4/10	n/a
		Length of hospital stay (n.r.)	32.7 ±10.5	45.3 ±23.9	n/a
		Secondary infection after ventilation (n.r.)	1/11	8/10	n/a
NIV (intervention) versus no IMV including	Liu 2004(33), RCT (n =60), China, SARS	Mortality (n.r.)	0/30	3/30	No deaths in the NIV group (n = 30) and 3

conventional oxygen therapy (comparator)					deaths in the no MV group (n = 30)
	Xu 2010(12), Cohort (n = 127), China, SARS	Mortality (n.r.)	n.r.	n.r.	0.21 (0.09 - 0.47)
	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	8/13	3/4 (mask)	n/a
	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	8/13	34/51 (nasal catheter)	n/a
	He 2020 (86), Cohort (n= 37), China, COVID-19	Need for invasive ventilation (n.r.)	2/6	1/10	n/a
CPAP or BiPaP (intervention) vs HFNC (comparator)	He 2020 (86), Cohort (n= 37), China, COVID-19	Need for invasive ventilation (n.r.)	2/6	2/21	n/a
	Liu 2020 (91), Cohort (n= 32), China, COVID-19	Hospital mortality (n.r)	3/10	0/8	n/a
		Need for invasive ventilation (n.r.)	1/10	0/8	n/a
	Wang 2020(30), Cohort (n = 27), China, COVID-19	Need for invasive ventilation	1/9	2/17	n/a

	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	5/8	8/13	n/a
IMV (intervention) vs no IMV (comparator)	Li 2007(28), Cohort (n =59), Hong Kong (China), SARS	Hospital mortality (at discharge)	13/27	1/31	n/a
		Length of hospital stay (at discharge)	38 (22 – 77) [a]	23 (19 – 42) [a]	n/a
		Length of ICU stay (at discharge)	17 (10 – 38) [a]	6 (4 – 7) [a]	n/a
	Auld 2020 (84), Cohort (n= 217), USA, COVID-19 (preprint)	Deaths on ICU (n.r.)	47/133	5/48	n/a
	Booth 2003(23), Cohort (n = 144), Canada, SARS	Deaths on ICU (n.r.)	7/20	1/9	n/a
	Fowler 2004(27), Cohort (n = 71), Canada, SARS	HCW developing SARS due to performing/assisting in endotracheal intubation (21 days)	6/14	2/62	n/a
		Nurses developing SARS due to assisting in endotracheal intubation (21 days)	3/4	2/57	n/a

		Physicians developing SARS due to performing endotracheal intubation (21 days)	3/10	0/5	n/a
		Nurses developing SARS due to exposure in assisting NIPPV patients (21 days)	1/6	2/28	n/a
MV (intervention) vs No MV (comparator)	Choi 2016(25), Cohort (n = 186), South Korea, MERS	Mortality (n.r.)	20/45	8/141	n/a
	Guo 2003 (85), Cohort (n= 46), China, SARS	Hospital mortality (n.r.)	3/13	21/33	n/a
	Li 2003 (88), Cohort (n= 102), China, SARS	Hospital mortality (n.r.)	21/70	3/32	n/a
	Yang 2003 (95), Cohort (n= 63), China, SARS	Hospital mortality (n.r.)	16/35	4/28	n/a
	Yang 2004 (96), Cohort (n= 216), China, SARS	Pneumothorax and mediastinal emphysema	7/27	1/189	
MV (intervention) vs SOT (comparator)	Chiang 2004(24), Cohort (14 patients), Taiwan, SARS	Mortality	1/5	0/9	n/a
HFNC (intervention) vs Conventional	He 2020 (86), Cohort (n= 37), China, COVID-19	Need for invasive ventilation (n.r.)	2/21	1/10	n/a

oxygen therapy: mask (comparator)					
	Hua 2020 (87), Cohort (n= 45), China, COVID-19	Time to improvement in CT in days (absorption of lesion area ≥ 30%) (n.r)	4.8 ±2.4	8 ±2.8	n/a
	Mo 2020 (92), Cohort (n= 38), China, COVID-19	Need for invasive ventilation (n.r.)	5/22	5/16	n/a
	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	5/8	3/4	n/a
HFNC (intervention) vs Conventional oxygen therapy: Nasal catheter (comparator)	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	5/8	34/51	n/a
HFO (intervention) vs IMV (comparator)	Fowler 2004(27), Cohort (n = 71), Canada, SARS	Nurses developing SARS due to exposure in assisting HFO patients (21 days)	2/38	2/28	n/a
	Wang 2020 (94), Cohort (n= 548), China, COVID-19	Mortality (15 days)	9/24	16/25	HR 1.11 (0.43 – 2.83)
Nasal catheter (intervention) **vs** Mask (comparator)	Liao 2020(29), Cohort (n = 81), China, COVID-19 (preprint)	Recovery (28 days)	34/51	3/4	n/a

NIV: noninvasive mechanical ventilation; IMV: invasive mechanical ventilation; MV: mechanical ventilation; ECMO; Extracorporeal membrane oxygenation; SOT: standard oxygen therapy; HFNC; High flow oxygen by nasal canula; ETT: endotracheal tube; HFO: high flow oxygen; SARS:

Severe acute respiratory syndrome; MERS: Middle East respiratory syndrome; HCW: healthcare worker: ICU: intensive care unit; NIPPV: noninvasive positive pressure ventilation

a: median (IQR);

b: median (minimum & maximum)

Supplement 7. Stream 2: Description of systematic reviews of high or moderate quality about the use of non-invasive ventilation in patients with hypoxemic respiratory failure since 2017

Interventions	Study	Population and detailed interventions	AMSTAR 2 quality judgment for the systematic review	Judgments about indirectness of the population (do the results apply to COVID-19)	Authors results and conclusion
NIV vs. standard care	Berbenetz 2019 (34)	Adults with acute cardiogenic pulmonary edema	High	Population considered too indirect for extrapolation to COVID-19 patients.	N/A
	Zheng 2019 (40)	Adults with acute respiratory failure; "helmet-assisted non-invasive ventilation" vs. conventional oxygen therapy	Moderate	Population possibly appropriate for extrapolation to COVID-19 patients but indirect	Four RCTs, one clearly in helmet CPAP, showed an OR=0.43 (95% CI: 0.22-0.81) for mortality (183 patients in the NIV and 179 patients in the comparison group).
	Xiu-Ping 2017 (39)	Acute hypoxemic (non hypercapnic) respiratory failure unrelated to exacerbation of COPD and cardiogenic pulmonary edema; NIV vs. standard oxygen therapy; BiPaP used and helmet NIV.	Moderate	Population possibly appropriate for extrapolation to COVID-19 patients but indirect	Eleven studies (1,480 patients) compared NIV with standard oxygen therapy. NIV reduced the need for intubation [RR 0.59 (95% CI, 0.44–0.79) moderate certainty]. Furthermore, hospital mortality was also reduced [(RR 0.46; 95% CI, 0.24–0.87) moderate certainty]. The results suggest that mild AHRF patients could benefit from NIV with helmet in reducing the hospital

					mortality. There was one out of six RCTs reporting hospital mortality with BiPAP and the authors concluded that BiPAP would possibly be more effective than CPAP.
CPAP in children	Bharadwaj 2020 (35)	Preterm infants; bubble CPAP vs all other CPAP forms	Moderate	Population considered **too indirect** for extrapolation to children with COVID-19 given pre-term infants.	N/A
	Jat 2019 (36)	Infants and children up to 3 years of age with acute bronchiolitis: CPAP vs. no CPAP	High	Population considered **too indirect** for extrapolation to children with COVID-19 – included children under 12 months of age.	N/A
HFNC vs standard care	Bocchile 2019 (41)	Adult critically ill patients; HFNC vs. conventional oxygen therapy	Moderate	Possibly too indirect, many studies in post extubation patients or surgery patients.	Seventeen studies involving 3,978 patients were included. There was no reduction in the need for intubation or re-intubation with high-flow nasal cannula (OR 0.72; 95%CI 0.52 - 1.01); There was no difference in the need for therapy escalation (OR 0.80, 95% CI 0.59 - 1.08), mortality at the longest follow-up (OR 0.94; 95%CI 0.70 - 1.25), hospital mortality (OR 0.84; 95% CI 0.56 - 1.26) or noninvasive ventilation (OR 0.64, 95%CI 0.39 -

					1.05).
	Luo 2019 (45) (subgroup)	**Children** with respiratory distress; HFNC vs. standard oxygen therapy or Nasal CPAP	Moderate	Bronchiolitis or pneumonia in nearly all studies.	Compared with standard oxygen therapy, HFNC reduced treatment failure (RR 0.49, 95% CI 0.40-0.60) in 5 RCTs of 1,978 patients. One RCT (n=146 patients) found a RR of 0.85 (95% CI 0.38-1.91) for mortality with HNFC.
	Rochwerg 2019 (44)	Acute hypoxemic respiratory failure of any cause; HFNC vs. Conventional oxygen therapy	Moderate	Population possibly appropriate for extrapolation to COVID-19 patients but indirect (one of 9 RCTs was conducted in patients with cardiopulmonary edema)	In 9 RCTs (n = 2,093 patients) the authors found no difference in mortality in patients treated with HFNC [(RR 0.94, 95% CI 0.67–1.31, moderate certainty)] compared to conventional oxygen therapy. The risk of requiring intubation [(RR 0.85, 95% CI 0.74–0.99) low certainty] or escalation of oxygen therapy (defined as crossover to HFNC in the control group, or initiation of non-invasive ventilation or invasive mechanical ventilation in either group) favoured HFNC-treated patients [(RR 0.71, 95% CI 0.51–0.98) low certainty]. HFNC had no effect on intensive care unit length of stay (mean difference [MD] 1.38 days more, 95% CI 0.90 days fewer to 3.66 days more, low certainty), hospital length of stay (MD 0.85 days fewer, 95% CI 2.07 days fewer to 0.37 days more, moderate certainty), patient reported comfort (SMD 0.12 lower, 95% CI 0.61 lower to 0.37 higher, very

				low certainty) or patient reported dyspnea (standardized mean difference [SMD] 0.16 lower, 95% CI 1.10 lower to 1.42 higher, low certainty). Complications of treatment were variably reported amongst included studies, but little harm was associated with HFNC use.
Huiying 2017 (42) (subgroup)	Adults with respiratory failure who received oxygen therapy: HFNC vs. conventional oxygen therapy	Moderate	Possibly too indirect, most studies in post extubation patients or surgery patients.	Nine RCTs (1,914 patients) comparing HFNC with conventional oxygen therapy. HFNC was associated with a significant reduction in intubation rate (OR 0.52, 95% CI 0.34 - 0.79, n = 1,854), mechanical ventilation rate (OR 0.56, 95% CI 0.33 to 0.97, n = 1,914) and the rate of escalation of respiratory support (OR 0.45, 95% CI 0.31 to 0.67, n = 1,914). There was no difference in mortality [(OR 1.01, 95% CI 0.67 to 1.53, n = 1,497), low to moderate certainty for these outcomes.
Ou 2017 (43) (subgroup)	Adults with acute hypoxemic respiratory failure; HFNC vs. conventional oxygen therapy	Moderate	Adults (age > 16 yr) in ICUs with acute hypoxemic respiratory failure (ratio of partial pressure of arterial oxygen to inspired fraction of oxygen [Pao2:Fio2] ≤ 300 mm Hg).	Four RCTs (n = 859) compared HNFC with conventional oxygen therapy. HFNC was associated with a lower intubation rate [RR 0.60, 95% CI 0.38 - 0.94).

HFNC vs standard care with NIV	Luo 2019 (45) (subgroup)	**Children** with respiratory distress; HFNC vs. standard oxygen therapy or Nasal CPAP	Moderate	Bronchiolitis or pneumonia in nearly all studies.	Compared with nCPAP, HFNC increased the risk for treatment failure (RR 1.74, 95% CI 1.20-2.52) in 4 RCTs of 360 patients. Three RCTs (n=329 patients) found a RR of 2.87 (95% CI 0.97-8.54) for mortality with HNFC compared to nCPAP. HFNC had an increased risk of treatment failure compared with nasal CPAP in infants age 1-6 months with severe hypoxemia (SpO2 <90% on room air or SpO2 >90% on supplemental oxygen) (RR 1.77, 95% CI 1.17-2.67). HFNC had a lower risk of nasal trauma compared with nCPAP (RR 0.35, 95% CI 0.16-0.77)
	Ni 2018 (37)	Adult patients with acute hypoxemic respiratory failure secondary to heart failure, COPD, lung transplant - HFNC vs. conventional oxygen therapy and NIPPV	Moderate	Population considered **too indirect** for extrapolation to COVID-19 patients.	N/A
	Huiying 2017 (42) (subgroup)	Adults with respiratory failure who received oxygen therapy: HFNC vs. NIV	Moderate	Possibly indirect, most studies in post extubation patients or surgery patients.	There was no difference in the intubation rate in 3 RCTs (n= 1,651) between NIV and HFNC (OR 0.96; 95% CI 0.66 to 1.39), the rate of escalation of respiratory support (OR 1.00, 95% CI 0.77 to 1.28) or mortality (OR 0.85, 95% CI 0.43 to 1.68) between the two groups, very low certainty for all outcomes.
	Ou 2017 (43) (subgroup)	Adults with acute hypoxemic	Moderate	Adults (age > 16 yr) in ICUs with acute	Two RCTs (n = 1,033) compared HNFC with NIV. HFNC showed a RR of 0.86,

		respiratory failure; HFNC vs. NIV		hypoxemic respiratory failure (ratio of partial pressure of arterial oxygen to inspired fraction of oxygen [Pao2:Fio2] ≤ 300 mm Hg).	95% CI 0.68 to 1.09 for the need for intubation, compared with NIV.
	Ni 2017 (38)	Adult patients with acute hypoxemic respiratory failure secondary to heart failure, COPD, surgery, trauma, lung transplant; HFNC vs. conventional oxygen therapy and NIPPV	Moderate	Population considered **too indirect** for extrapolation to COVID-19 patients.	N/A

ARF: acute respiratory failure; BiPAP: Bilevel positive airway pressure; CPAP: Continuous positive airway pressure; nCPAP: Continuous positive airway pressure nasal application; NIV: non-invasive mechanical ventilation; IMV: invasive mechanical ventilation; MV: mechanical ventilation; HFNC; High flow oxygen by nasal canula; NIPPV: non-invasive positive pressure ventilation; RR: relative risk; OR: odds ratio; RCT: randomized controlled trial; AMSTAR-2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both

Supplement 8. Stream 4: Characteristics of studies reproduced from CADTH review (1) (n =10)

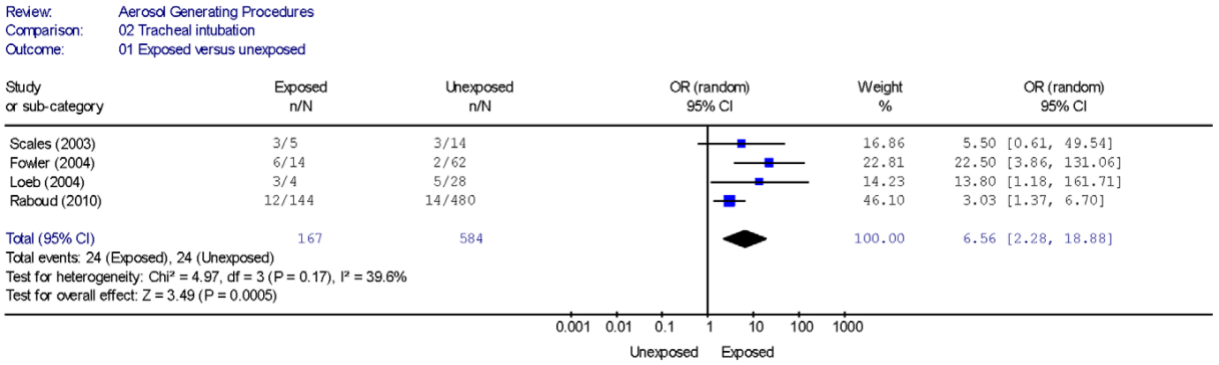
Study; Country	**Design/ Setting**	**Period of Evaluation**	**Population**	**Assessment of Training and Protection Equipment?**	**Laboratory Tests**	**Risk of Bias[1]**
Raboud et al, 2010 (2) Canada	Retrospective cohort study; Multiple hospitals	2003 SARS outbreak in Toronto	624 HCWs (physicians, residents, nurses, therapists, technologists, housekeepers, others)	Yes	Culture and PCR for SARS-CoV	7/9 Concern related to selection
Chen et al, 2009 (3) China	Case-control study; Hospital	2003 SARS outbreak in Guangzhou	758 HCWs (doctors, nurses, health attendants, technicians, others)	Yes	ELISA for antibody against SARS-CoV	8/9 No major concern
Liu et al, 2009 (4) China	Case-control; Hospital	2003 SARS outbreak in Beijing	477 HCWs (medical staff, nursing	Yes	ELISA for antibody against SARS-CoV	6/9

[1] Using the Newcastle-Ottawa Scale (NOS)

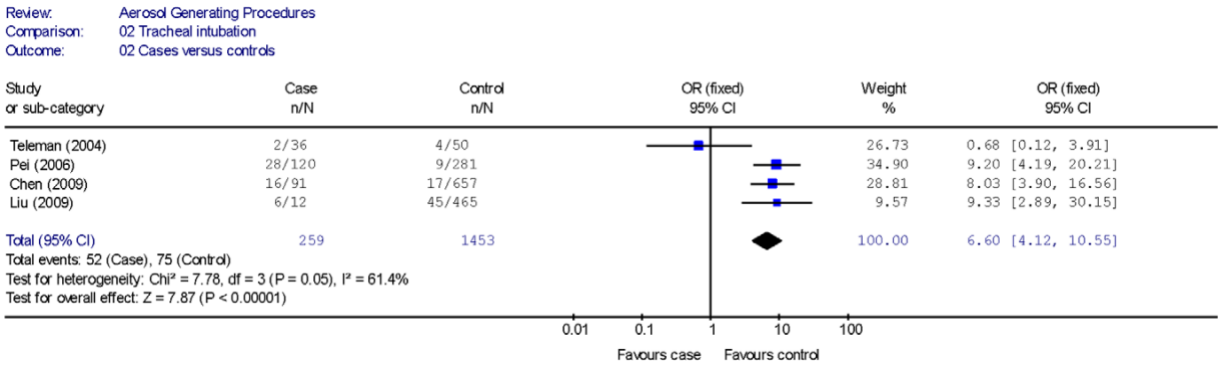
			staff, others)			Concern related to exposure
Pei et al, **2006 (5)** **China**	Case-control study; Three hospitals	2002–2003 SARS outbreak in Beijing and Tianjin	443 HCWs (doctors, nurses, technicians, administrators, others)	Yes	No mention of methods to detect antibodies against SARS-CoV	7/9 Concern related to exposure
Fowler et al, **2004 (6)** **Canada**	Retrospective cohort study; Intensive care unit	2003 SARS outbreak in Toronto	122 critical care staff (physicians, nurses, nursing assistants, respiratory therapists, others)	No, on training. All HCWs wore gloves, gowns, N-95/PCM 2,000 masks, and hairnets. Eye and face shields were variably employed	PCR or serology for SARS-CoV	5/9 Concern related to selection and comparability
Loeb et al, **2004 (7)** **Canada**	Retrospective cohort study; Intensive care unit; Coronary care unit	2003 SARS outbreak in Toronto	43 nurses	Yes	Serology, immunofluorescence	5/9 Concern related to selection and comparability

Ma et al, 2004 (8) China	Case-control study; Five hospitals	2003 SARS outbreak in Beijing	HCWs (nurse assistants, janitors and others) (N = 473)	Yes	Diagnostic criteria for SARS from Chinese Minister of Health	Not assessed (full text not found)
Teleman et al, 2004 (9) Singapore	Case-control study; Hospital	2003 SARS outbreak in Singapore	86 HCWs (doctors, nurses, others)	Not mentioned	Symptoms, chest X-ray and Serology	6/9 Concern related to comparability and exposure
Wong et al, 2004 (10) China	Retrospective cohort study; Hospital	2003 SARS outbreak in Hong Kong	66 medical students	Yes, on personal protection equipment No, on training	Indirect immunofluorescent to detect antibodies against SARS-CoV	6/9 Concern related to selection and comparability
Scales et al, 2003 (11) Canada	Retrospective cohort study; Intensive care unit	2003 SARS outbreak in Toronto	69 intensive care staff	Unclear	Radiographic lung infiltrates	5/9 Concern related to selection and comparability

Supplement 9. Risk of severe acute respiratory syndrome transmission to healthcare workers exposed to tracheal Intubation – cohort studies (reproduced from (1))



Supplement 10. Figure 4. Risk of severe acute respiratory syndrome transmission to healthcare workers exposed to tracheal Intubation – case-control studies (reproduced from (1))



Supplement 11. Risk of SARS Transmission to HCWs Exposed and Not Exposed to Aerosol-Generating Procedures, and Aerosol Generating Procedures as Risk Factors for SARS Transmission (reproduced from the CADTH original review) (stream 4)

Aerosol Generating Procedures	**Odds ratio (95% CI)**	
	Point estimate	**Pooled estimate; I2**
Tracheal intubation (4 cohort studies)	3.0 (1.4, 6.7)(2)	6.6 (2.3, 18.9); 39.6%
	22.8 (3.9, 131.1)(6)	
	13.8 (1.2, 161.7)(7)	
	5.5 (0.6, 49.5) (11)	
Tracheal intubation (4 case-control studies)	0.7 (0.1, 3.9) (9)	6.6 (4.1, 10.6); 61.4%
	9.2 (4.2, 20.2)(5)	
	8.0 (3.9, 16.6) (3)	
	9.3 (2.9, 30.2) (4)	
Suction before intubation (2 cohort studies)	13.8 (1.2, 161.7) (7)	3.5 (0.5, 24.6); 59.2%
	1.7 (0.7, 4.2) (2)	
Suction after intubation (2 cohort studies)	0.6 (0.1, 3.0) (7)	1.3 (0.5, 3.4); 28.8%
	1.8 (0.8, 4.0) (2)	
Nebulizer treatment (3 cohort studies)	6.6 (0.9, 50.5) (7)	0.9 (0.1, 13.6); 73.1%
	0.1 (0.0*, 1.0)(10)	
	1.2 (0.1, 20.7) (2)	
Manipulation of oxygen mask (2 cohort studies)	17.0 (1.8, 165.0) (7)	4.6 (0.6, 32.5); 64.8%

	2.2 (0.9, 4.9) (2)	
Bronchoscopy (2 cohort studies)	3.3 (0.2, 59.6) (7)	1.9 (0.2, 14.2); 0%
	1.1 (0.1, 18.5) (2)	
Non-invasive ventilation (2 cohort studies)	2.6 (0.2, 34.5) (6)	3.1 (1.4, 6.8); 0%
	3.2 (1.4, 7.2) (2)	
Insertion of nasogastric tube (2 cohort studies)	1.7 (0.2, 11.5)(7)	1.2 (0.4, 4.0); 0%
	1.0 (0.2, 4.5) (2)	
Chest compressions (1 case-control study)	4.5 (1.5, 13.8)(4)	
Chest compressions (2 cohort studies)	3.0 (0.4, 24.5) (2)	1.4 (0.2, 11.2); 27.3%
	0.4 (0.0**, 7.8)(7)	
Defibrillation (2 cohort studies)	0.5 (0.0**, 12.2) (7)	2.5 (0.1, 43.9); 55.3%
	7.9 (0.8, 79.0) (2)	
Chest physiotherapy (2 cohort studies)	1.3 (0.2, 8.3)(7)	0.8 (0.2, 3.2); 0%
	0.5 (0.1, 3.5) (2)	
High-frequency oscillatory ventilation (1 cohort study)	0.7 (0.1, 5.5)(6)	
High flow oxygen (1 cohort study)	0.4 (0.1, 1.7) (2)	
Tracheotomy (1 case-control study)	4.2 (1.5, 11.5) (3)	
Intubation, tracheotomy, airway care, and cardiac resuscitation (1 case-control study)	6.2 (2.2, 18.1) (8)	
Manipulation of BiPAP mask (1 cohort study)	6.2 (2.2, 18.1)(7)	

Endotracheal aspiration (1 cohort study)	1.0 (0.2, 5.2) (7)	
Suction of body fluid (1 case-control study)	1.0 (0.4, 2.8)(9)	
Administration of oxygen (I case-control study)	1.0 (0.3, 2.8) (9)	
Mechanical ventilation (1 cohort study)	0.9 (0.4, 2.0) (2)	
Manual ventilation before intubation (1 cohort study)	2.8 (1.3, 6.4) (2)	
Manual ventilation after intubation (1 cohort study)	1.3 (0.5, 3.2) (2)	
Manual ventilation (1 cohort study)	1.3 (0.2, 8.3)(7)	
Collection of sputum sample (1 cohort study)	2.7 (0.9, 8.2) (2)	

BiPAP: bi-level positive airway pressure; CI: confidence interval. *actual value is 0.01;
**actual value is 0.02.
doi:10.1371/journal.pone.0035797.t002

Supplement 12. Characteristics of included studies of COVID-19, SARS and MERS Transmission to HCWs Exposed and Not Exposed to Aerosol-Generating Procedures, and Aerosol Generating Procedures as Risk Factors for Transmission (2020 update, n =15)

Study; Country	Design; Setting; Infection	Period of Evaluation	Population	Assessment of Training and Protection Equipment?	Laboratory Tests	Risk of bias assessment[2]
Buchholz et al., 2013 (12) **Germany**	Case-contact investigation; Hospital; Novel Coronavirus (NCoV)	October–November 2012	120 exposed HCWs to NCoV infected case[3,4] (nursing staff, physicians, laboratory technicians, physician and team assistants, physiotherapists, house maintenance, cleaning staff)	No on training. Protective measures limited to wearing gloves and gowns when providing intimate care and use of surgical face masks during suctioning. N = 9 performed AGPs and wore facemask rarely or not at all during 3rd or 4th week of the patient's illness.	Serological testing by indirect immunofluorescence assay (IFA)	6/9; concern related to selection and comparability
Amer et al., 2018 (13) **Saudi Arabia**	Descriptive report; Hospital (AGP occurred in the medical ward and	June 2017 during MERS-CoV outbreak at King Saud Medical City (KSMC)	879 exposed HCWs to MERS-CoV infected patients[5] (nurses, RRT nurses, beside nurses,	Mention of protection but no data reported.	Real-time PCR (RT-PCR) of nasopharyngeal	5/9; concern related to

[2] Using the Newcastle-Ottawa Scale (NOS)
[3] 69% reported contact at a distance of less than or equal to 2 m, 11% of more than 2 m, and 20% of unknown distance to the patient
[4] n=9 performed aerosol-generating procedures within the third or fourth week of illness
[5] HCWs included all persons who were in attendance in the same area where the index case had stayed. Number performing AGPs is not specified.

	emergency department); Middle East Respiratory Syndrome (MERS-CoV)		ICU specialist, cardiology specialist)		samples for MERS-CoV	selection and comparability
Alraddadi et al., 2016 (14) **Saudi Arabia**	Retrospective cohort; Hospital (Emergency Department and Intensive care unit where patients with MERS-CoV were treated, and neurology unit, where no MERS-CoV patients were treated); Middle East Respiratory Syndrome (MERS-CoV)	March 24–May 3, 2014 during MERS-CoV outbreak at Faisal Specialist Hospital and Research Center; Study conducted during May–July 2014	255 exposed HCWs to MERS-CoV infected patients and 33 HCWs non-exposed to MERS-CoV infected patients (radiologists technicians, nurses, respiratory therapists, physicians, clerical staff, patient transporters)	Yes. Protective measures during aerosol -generating procedures limited to wearing eye protection and/or covering nose and mouth with a medical mask or N95 respirator. Wearing gloves or gowns during aerosol -generating procedures were not reported.	Serum screening for antibodies against MERS-CoV nucleocapsid (N) protein by ELISA. Positive samples confirmed by immunofluorescence assay, microneutralization assay, or both.	4/9; concern related to selection and comparability
Alanazi et al., 2019 (15) **Saudi Arabia**	Outbreak investigation; Tertiary hospital (Intensive care unit and Emergency department), Specialty pulmonary hospital, outpatient clinic, and outpatient dialysis unit; Middle East Respiratory Syndrome (MERS-CoV)	May 28-June 19 during MERS-CoV outbreak involving multiple healthcare facilities in Riyadh, Saudi Arabia	26 confirmed MERS-CoV HCWs cases	No on training. Mentioned for some exposed HCPs as not wearing an N95 mask or a powered air purifying respirator, or no airborne precautions in place during intubation, or not mentioned.	Serum testing for anti-MERS-CoV antibodies using ELISA for nucleocapsid (N) and spike (S) proteins followed by a confirmatory microneutralization	4/9; concern related to selection, comparability and outcome

					test (MNT) for MERS-CoV.	
Assiri et al., 2013 (16) **Saudi Arabia**	Outbreak investigation; 4 hospitals (reported that AGP occurred in Intensive care unit); Middle East Respiratory Syndrome (MERS-CoV)	April – May 2013 during MERS-CoV outbreak involving four health care facilities in the eastern province of Saudi Arabia	Exposed hospital staff workers to MERS-CoV infected patients; AGP reported for a nurse administrator	No	Confirmed case of MERS-CoV infection defined as: laboratory evidence of MERS-CoV and having either fever and at least one respiratory symptom or two respiratory symptoms without another identifiable cause	5/9; concern related to selection and comparability
Cai et al., 2020 **China (17)**	Descriptive report; Intensive care unit; COVID-19	January - February 2020	9 HCWs involved in AGP (endotracheal intubation) for COVID-19 confirmed cases	Yes. Protective measures were limited to Personal Protective Equipment (PPE) with positive protective hood	COVID-19 nucleic acid detection by oropharyngeal swab	5/9; concern related to selection and comparability
Folgueira et al., 2020 (18) **Spain**	Descriptive report; Hospital (emergency department, hospital ward, intensive care unit, resuscitation unit, laboratory, pharmacy, kitchen, administration);	March 2020 during COVID-19 epidemic at a large-public hospital in Madrid, Spain	2085 exposed hospital employees to COVID-19 infected patients	No	SARS-CoV-2 PCR of both nasopharyngeal and oropharyngeal swabs	6/9; concern related to selection and comparability

	COVID-19					
Hall et al., 2014 (19) **Saudi Arabia**	Case-contact investigation; Hospital; Middle East Respiratory Syndrome (MERS-CoV)	Investigation done in October 2012, data collected for period June 15–July 4, 2012)	48 exposed HCWs to MERS-CoV infected case and 48 controls (nurses, physician, respiratory technicians, housekeeping, radiology, infection control staff member)	No for training. HCW practiced hand hygiene (100%) and/or wearing of gloves (93.8%), surgical mask (87.5%), gown (39.6%), and N95 mask (33.3%). None wore eye protection. Among those reporting use of these precautions, some admitted to <100% compliance.	Serum screening for MERS-CoV antibody by nucleocapsid enzyme immunoassay (EIA), confirmed by immunofluorescence or microneutralization assay	6/9; concern related to selection and comparability
Hunter et al., 2016 (20) **UAE (Abu Dhabi)**	Case-contact investigation; Hospital; MERS-CoV	January 1, 2013–May 9 during 2014 MERS-CoV outbreak	14 HCWs who became infected with MERS-CoV after caring for a source case-patient	No on training. Yes on use of mask or N95, gloves and gowns or all three.	RT-PCR for MERS-CoV	6/9; concern related to selection and comparability
Memish et al., 2013 (21) **Saudi Arabia**	Case series; Saudi Arabian Ministry of Health routine screening of all individuals in close contact with a confirmed MERS-CoV case;	Not reported	7 HCWs with positive diagnosis (nurse, nurse aid)	No on training. Yes on use of surgical mask, respirator, eye protection, gloves and gowns.	RT-PCR for MERS-CoV	3/9; concern related to selection, comparability and outcome

	MERS-CoV					
Zhong et al., 2020 (22)	'Retrospective, single centre, observational cohort study'; Hospital (spinal anaesthesia); COVID-19	January 1, 2020 and February 14, 2020 during COVID-19 outbreak	44 anaesthetists who had directly cared (within 1 m proximity) for patients with confirmed COVID-19, but who had no contact with patients with COVID-19 outside the hospital. All patients had a nasal cannula.	No on training. Yes, on use of category 1 vs category 3 PPE[6]	RT-PCR for COVID-19	5/9; concern related to selection and comparability
Angel et al., 2020 (23) **United States of America (USA)**	Single arm follow-up study (assessing a percutaneous tracheostomy technique); Hospital (intensive-care unit); COVID-19	March-April 2020	6 physicians and 2 nurses who participated across bedside percutaneous tracheostomies of confirmed NCoV patients	No on training. Protective measures: standard personal protective equipment (hair cover, N-95 mask, surgical mask, face shield, gown, and 2 layers of gloves)	Nasopharyngeal swab for RT-PCR for COVID-10	4/9; concern related to selection, comparability and outcome
Heinzerling et al., 2020 (24)	Case-control; Hospital;	February 2020	37 HCWs who were in contact with a confirmed	No on training. HCWs only used gloves and/or face masks.	Nasopharyngeal and oropharyngeal	6/9; concern related to

[6] Category 1 PPE is limited to surgical mask, hat, gloves, and gowns. Category 3 PPE is required when the highest level of respiratory, skin, eye, and mucous membrane protection is needed, including positive pressure (pressure demand), self-contained breathing apparatus, and a fully encapsulating chemical protective suit plus inner and outer chemical resistant gloves)

USA	COVID-19		case of NCoV (including 3 with positive results)		specimens for real-time RT-PCR testing	comparability and exposure
Ng et al., 2020 (25) **Singapore**	Case-contact investigation; Hospital (intensive-care unit); COVID-19	February 2020	41 HCWs responsible for caring for patient with severe pneumonia before confirming diagnosis of NCoV. *HCWs were exposed to AGPs (endotracheal intubation, extubation, noninvasive ventilation, and exposure to aerosols in an open circuit) for at least 10 minutes at less than 2 meters from the index patient*	No on training. Yes on surgical mask or N-95 masks	Nasopharyngeal swab for PCR assay testing	5/9; concern related to selection and comparability
Nam et al., 2017 (26) **Korea**	Epidemiological investigation; Hospital; MERS	June, 2015	A nurse who was involved in a cardiopulmonary resuscitation (CPR) for a patient with bacterial pneumonia (patient was confirmed afterwards as a MERS case).	No on training. The nurse touched the mask and goggle with her hands in contaminated gloves.	Throat swab specimen; confirmatory test with sputum	3/9; concern related to selection and comparability

AGP: aerosol-generating procedure; COVID-19: coronavirus disease 2019; HCW: health care worker; MERS-CoV: Middle East Respiratory Syndrome Coronavirus.

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Supplement 13. Stream 4. Findings of included studies of COVID-19, SARS and MERS Transmission to HCWs Exposed and Not Exposed to Aerosol-Generating Procedures, and Aerosol Generating Procedures as Risk Factors for Transmission (2020 update, n =15) (stream 4)

Study	**Findings**
Buchholz et al., 2013 **(57)**	Proportion of acute respiratory illnesses (ARI) in those exposed in the 3rd or 4th week to MERS-CoV was 22% among high risk contacts ("i.e. performing AGPs, face mask rarely/not worn") and 25% among others (p-value = 0.870)
Amer et al., 2018 **(67)**	Out of 15 HCWs who contracted MERS-CoV: ● Performed intubation (n=5); ● Performed intubation assistance (n=1); ● Connected infected patients on Bilevel positive airway pressure (BiPAP) (n=1).
Alraddadi et al., 2016 **(59)**	● Rate of infection among HCW "always wearing eye protection" and performing the following procedures: direct contact: 1/47 (2.1%); AGPs: 3/62 (4.8) ● Rate of infection among HCW "sometimes/never wearing" and performing the following procedures: direct contact: 17/165 (10.3); AGPs: 11/100 (11.0) ● Rate of infection among HCW "always covering nose and mouth with medical mask or N95 respirator" and performing the following procedures: direct contact: 11/151 (7.3); AGPs: 8/133 (6.0) ● Rate of infection among HCW "sometimes/never covering nose and mouth with medical mask or N95 respirator" and performing the following procedures: direct contact: 7/66 (10.6); AGPs: 6/32 (18.8) ● Rate of infection among HCW "always wearing a medical mask" and performing the following procedures: direct contact: 9/69 (13.0); AGPs: 5/81 (6.2) ● Rate of infection among HCW "sometimes/never wearing a medical mask" and performing the following procedures: direct contact: 9/142 (6.3); AGPs: 8/76 (10.5) ● Rate of infection among HCW "always wearing an N95 respirator" and performing the following procedures: direct contact: 6/116 (5.2); AGPs: 5/90 (5.6) • Rate of infection among HCW "sometimes/never wearing an N95 respirator" and performing the following procedures: direct contact: 12/101 (11.9); AGPs: 9/73 (12.3)
Alanazi et al., 2019 **(68)**	● Out of 19 HCWs MERS-CoV cases, 5 were on ward A, where index patient was intubated (without airborne precautions in place) ● Out of 6 HCWs MERS-CoV cases in Ward B, 4 were present during the intubation procedure on a patient case

	● Out of 10 HCWs MERS-CoV cases, 4 reported having been in the same room as a patient case during intubation, and none reported wearing an N95 mask or a powered air purifying respirator
Assiri et al., 2013 **(65)**	A nurse administrator who was present in the ICU during two simultaneous cardiac resuscitations and had face-to-face contact with a febrile HCW developed MERS-CoV infection.
Cai et al., 2020 **(61)**	There was no infection among medical staff (n=9) after bronchoscope-guided endotracheal intubation through nasal insertion (under the three-level protection of positive pressure filter head cover) of a patient with COVID-19.
Folgueira et al., 2020 **(58)**	No significant differences in the infection rates of HCWs and hospital personnel between the groups of areas of high, intermediate and low exposure risk* ● High risk areas* ○ Rates of infection among HCW: COVID19 hospitalization: 45.26%; ICU: 52.31%; ER: 37.04%; anesthesia: 45.45% ○ Mean percentage of infection among HCW: 43.6% ● Intermediate risk areas* ○ Rates of infection among HCW: surgery: 45.14%; oncology/hematology: 44.29%; medical areas no COVID-19: 37.35%; pediatrics/neonates: 48.62%; OB/GYN: 39.51%; radiology: 37.98%; outpatient consultation: 31.82% ○ Mean percentage of infection among HCW: 40.96% ● Low risk areas* ○ Rates of infection among HCW: administrative areas, clerical, informatics, communication, pharmacy: 55.22%; laboratories: 33.33%; kitchen: 38.30% ○ Mean percentage of infection among HCW: 41.92% ***HCW were classified according to their exposure to infected patients and/or aerosol generation
Hall et al., 2014 **(56)**	Out of the total HCWs reporting contact with the MERS-CoV case-patient, 50% were present during airway suction, 29% during nebulizer treatment, 23% during sputum induction, 8% during bronchoscopy, and 6% during intubation. None of the HCWs reporting contact with the MERS-CoV case-patient contracted MERS-CoV.
Hunter et al., 2016 **(69)**	5 HCWs out of the 14 HCW MERS-CoV cases had an interaction with a patient case through a potential AGP as follows: ● Manipulation of cannula or oxygen mask (n = 3); ● Administration of inhaler or nebulizer treatment (n = 2); ● Intubation (n = 1); ● Suctioning before intubation (n= 1).
Memish et al., 2013 **(70)**	Out of the 7 HCW MERS-CoV cases: ● Exposed to intubation (n=5);

	• Exposed to airway suctioning (n=4); • Exposed to sputum induction (n=2).
Zhong et al., 2020 **(64)**	COVID-19 infection was confirmed by PCR in 11.4% of anaesthetists (5/44) • Of 37 anaesthetists who wore Category 3 PPE, one (2.7%) developed PCR-confirmed COVID-19 compared with 4/7 (57.1%) anaesthetists who had Category 1 protection in the operating theatre (RRR: 95.3%, 95% CI: 63.7-99.4; p-value <0.01).
Angel et al., 2020 (62)	• None of the eight team members who participated across 98 bedside percutaneous tracheostomies using a novel technique (including 4 who agreed to test via nasal pharyngeal swab for RT-PCR assay testing) developed any COVID-19symptoms (fever, general malaise, cough, shortness of breath) or tested positive for COVID-19. • Additional nurses, respiratory and physical therapists providing care to the COVID-19 patients post tracheostomy did not develop any symptoms (fever, general malaise, cough, shortness of breath) or test positive for COVID-19.
Heinzerling et al., 2020 (60)	• Among 43 HCW who were exposed (95% were at high or medium risk exposure[1]), three were positive for COVID-19. • Being present for or assisting with nebulizer treatments was more common among HCWs who developed COVID-19 (67%) than among those who did not (9%) (p = 0.04). • Being present for or assisting with BiPAP was more common among HCWs with COVID-19 (p = 0.06). • The median duration of exposure during AGPs was higher among HCWs with NCoV (95 minutes) than among those without NCoV (0 minutes) (p = 0.13).
Ng et al., 2020 (63)	41 HCWs were identified as having exposure to AGPs (included endotracheal intubation, extubation, noninvasive ventilation, and exposure to aerosols in an open circuit) for at least 10 minutes at a distance of less than 2 meters from the index patient. None of the exposed HCWs developed symptoms and all had negative PCR test results (85% of HCWs were exposed during an AGP while wearing a surgical mask, and the remainder were wearing N-95 masks).
Nam et al., 2017 (66)	The interviewed nurse tested positive for MERS. She stayed in the case patient room for 3 hours (1 hour for CPR). Large amount of body fluids splashed on the nurses' PPE during the CPR. The nurse touched the mask and goggle with her hands in contaminated gloves. One of the routes hypothesized for transmission was aerosolization during CPR.

[1] Risk based on factors such as exposure to the patient during AGPs, personal protective equipment use, and source control

Supplement 14. Ongoing studies regarding non-invasive ventilation, aerosol generating procedures and COVID-19

Trial ID	Public title	Study type	Intervention
ChiCTR2000030763	A Medical Records Based analysis for Risk Factors for Outcomes After Respiratory Support in Patients with ARDS Due to Novel Coronavirus Pneumonia (COVID-19)	Observational	No specific intervention.
ChiCTR2000030753	A medical records based analysis of the Incidence and Risk Factors of Ventilator-associated Pneumonia in ARDS Patients with Novel Coronavirus Pneumonia (COVID-19)	Observational	No specific intervention.
ChiCTR2000031836	A Medical Records Based study for the Clinical Characteristics Of Hospitalized Novel Coronavirus Pneumonia (COVID-19) Patients With Acute Respiratory Distress Syndrome	Observational	No specific intervention.
ChiCTR2000029739	A Multicenter, Randomized, Parallel Controlled Clinical Study of Hydrogen-Oxygen Nebulizer to Improve the Symptoms of Patients With Novel Coronavirus Pneumonia (COVID-19)	Interventional	Experimental group: Hydrogen-Oxygen Nebulizer. Control group: Oxygen concentrator.
NCT04347993	A Prospective "Universal" Observational Database for COVID-19	Observational [Patient Registry]	No specific intervention.
NCT04307459	Acute Respiratory Failure and COVID-19 in Real Life	Observational	Other: standard operating procedures
ACTRN12620000472976	Adapting the Decathlon Group Easybreathe® snorkelling face mask for the safer administration of oxygen and/or continuous positive airway pressure and in the intra/interhospital transportation of patients with proven or suspected COVID 19 infection.	Interventional	Novel mask (the Decathlon group EasyBreathe snorkel mask)
NCT04347941	Awake Prone Positioning to Reduce Invasive VEntilation in COVID-19 Induced Acute Respiratory failurE	Interventional	Procedure: Prone Positioning; Procedure: Standard of care.
NCT04331366	Bidirectional Oxygenation Valve in the Management of Pulmonary Complications of COVID-19	Interventional	Device: GO2 PEEP MOUTHPIECE
ChiCTR2000031227	Clinical features and prognosis of invasive mechanical ventilation patients with novel coronavirus pneumonia (COVID-19) in Wuhan, China: a single-centered, retrospective, observational study	Observational	No applicable (case series)
NCT04320056	Closed-Loop Oxygen to Verify That Healthcare Workers Interventions Decrease During Pneumonia	Interventional	Other: Standard administration of oxygen flow; Device: Automated oxygen administration - FreeO2

Supplement 14. Ongoing studies regarding non-invasive ventilation, aerosol generating procedures and COVID-19

NL8521	Continuous positive airway pressure in severe Covid-19 pneumonia	Interventional	1. Oxygen delivery via a nonrebreathing mask (current standard of care) with sufficient inflow of O2 (which does not create PEEP). 2. Oxygen delivery via the adapted face mask with zero PEEP in order to test the effect of the mask alone. 3. Oxygen delivery via the adapted face mask with PEEP of 7.5 cmH2O in order to test effect of moderate PEEP.
NCT04344730	Dexamethasone and Oxygen Support Strategies in ICU Patients With Covid-19 Pneumonia	Interventional	Drug: Dexamethasone injection; Drug: placebo; Procedure: conventional oxygen; Procedure: CPAP; Procedure: HFNO; Procedure: mechanical ventilation
NCT04326075	Early CPAP in COVID Patients With Respiratory Failure.	Interventional	Device: CPAP treatment
NCT04323878	Early CPAP in COVID Patients With Respiratory Failure. A Prospective Cohort Study.	Observational	No applicable (case series)
NCT04325906	Early PP With HFNC Versus HFNC in COVID-19 Induced Moderate to Severe ARDS	Interventional	Device: high flow nasal cannula (HFNC) Procedure: Prone positioning (PP)
IRCT20180129038542N1	Early tracheostomy in COVID-19	interventional	Intervention group: Patients in this group received medications for the treatment of COVID-19 based on the Fifth Edition of the Novel Corona Virus Guidelines, in addition they indicated for mechanical ventilation and the airway management was selected using the tracheotomy tube within 3 days from intubation. Intervention Control group: Patients in this group received medications for the treatment of COVID-19 based on the Fifth Edition of the Novel Corona Virus Guidelines, in addition they indicated for mechanical ventilation and the airway management was selected using the Orotracheal tube.
ChiCTR2000032011	Efficacy and Safety of Hyperbaric Oxygen Therapy to patients with novel coronavirus pneumonia (COVID-19)	Interventional	1.5ATA:1.5ATA HBO; 2.5ATA:2.5ATA HBO;

Supplement 14. Ongoing studies regarding non-invasive ventilation, aerosol generating procedures and COVID-19

			Control group: Routine treatment;
NCT04336462	Hydrogen-Oxygen Generator With Nebulizer in the Improvement of Symptoms in Patients Infected With COVID-19	Interventional	Device: oxyhydrogen; Device: Oxygen
NCT04332081	Hyperbaric Oxygen for COVID-19 Patients	Interventional	Device: hyperbaric oxygen therapy (HBOT)
NCT04343183	Hyperbaric Oxygen Therapy (HBOT) as a Treatment for COVID-19 (COVID-19) Infection	Interventional	Device: Hyperbaric Oxygen Therapy
NCT04358926	Hyperbaric Oxygen Therapy Effect in COVID-19 RCT (HBOTCOVID19)	Interventional	Device: Hyperbaric oxygen therapy; Device: Normobaric oxygen therapy
ChiCTR2000030322	Identification and Clinical Treatment of Severe novel coronavirus pneumonia (COVID-19) Patients	Observational	Light and common type group: Conventional treatment; Severe group: Conventional treatment; Western medicine treatment group: Give routine western medicine treatment; Chinese and western medicine combined treatment group: Traditional Chinese medicine is combined with conventional western medicine treatment.; Non-invasive mechanical ventilation group: Give noninvasive mechanical ventilation and respiratory support; Nasal high flow oxygen therapy group: Give nasal high flow oxygen therapy respiratory support
NCT04363463	Impact of Prone Position in Patients Under Spontaneous Breathing on Intubation or Non-invasive Ventilation or Death Incidence During COVID-19 Acute Respiratory Distress	Interventional	Other: prone position
NCT04346420	Impact of the Double-Trunk Mask on Oxygenation Titration in COVID-19	Interventional	Other: Standard interface; Device: Double-Trunk Mask
NCT04344431	Management by Hyperbaric Oxygen Therapy of Patients With Hypoxaemic Pneumonia With SARS-CoV-2 (COVID-19)	Interventional	Combination Product: Hyperbaric oxygen treatment (HBOT) i.e. inhalation of pressurized oxygen delivered by a hyperbaric chamber (drug/device)
NCT04368923	Management of Covid-19 Patients During Home Isolation	Interventional	Device: Oxygen Therapy Procedure: Physical Therapy

Supplement 14. Ongoing studies regarding non-invasive ventilation, aerosol generating procedures and COVID-19

ChiCTR2000029658	Nasal high-flow preoxygenation assisted fibre-optic bronchoscope intubation in patients with critical novel coronavirus pneumonia (COVID-19)	Interventional	Experimental group: high-fow therapy by nasal cannulae (HFNC); Control group: bag- valve mask oxygenation (SMO)
NCT04342104	NIV and CPAP Failure Predictors in COVID-19 Associated Respiratory Failure	Observational	Other: Monitoring for aggravation; Other: Evaluate HACOR score effectivity in these patients
NCT04344925	Non Invasive Positive Pressure Ventilation to Minimize Aerosolization for COVID 19	Observational	Device: Aerosol-reducing Mask; Device: Standard Mask
ChiCTR2000030741	Observational Study for Prone Position Ventilation and Conventional Respiratory Support in ARDS Patients with Novel Coronavirus Pneumonia (COVID-19)	Observational	Transnasal high-flow oxygen therapy: prone position ventilation; Noninvasive mechanical ventilation: prone position ventilation; Invasive mechanical ventilation: prone position ventilation;
NCT04346342	PRactice of VENTilation in COVID-19 Patients (PRoVENT-COVID)	Observational	No applicable (case series)
NCT04358939	Prone Position in Patients on High-flow Nasal Oxygen Therapy for COVID-19 (HIGH-PRONE-COVID-19)	Interventional	Other: Prone decubitus
NCT04366856	PROne Positioning in coVID-19 Oxygeno-dependent Patients in Spontaneous Ventilation (PROVID Study)	Interventional	Behavioral: 1: Prone positioning; Behavioral: 2: No instruction regarding positioning
NCT04345536	Prospective Quality Register of Patients With Confirmed Covid-19 at Oslo University Hospital	Observational	No applicable (case series)
ISRCTN16912075	RECOVERY Respiratory Support: Respiratory Strategies in patients with coronavirus COVID-19 CPAP, high-flow nasal oxygen, and standard care	Interventional	Arm 1: Continuous positive airway pressure (CPAP), administered according to local protocol/guidelines. Administration will be left to clinical discretion. Arm 2: High flow nasal oxygen (HFNO) will be administered according to local protocol/guidelines. Administration will be left to clinical discretion. Arm 3: Standard care. Standard oxygen therapy according to local protocol/guidelines.
DRKS00021506	Registry of hospitalized pediatric Patients with SARS-CoV-2 infection (COVID-19)	Observational	No applicable (case series)

Supplement 14. Ongoing studies regarding non-invasive ventilation, aerosol generating procedures and COVID-19

NCT04369274	Repeated Measures Trial of Temporary Automated Manual Ventilation Versus Noninvasive Oxygenation or Conventional Vent	Interventional	Device: Mechanical ventilation with the automated BVM compressor
NCT04327505	Safety and Efficacy of Hyperbaric Oxygen for ARDS in Patients With COVID-19	Interventional	Drug: Hyperbaric oxygen
NCT04298814	Safety Related Factors of Endotracheal Intubation in Patients With Severe Covid-19 Pneumonia	Observational	Other: severe covid-19 pneumonia with ET
NCT04312100	Sequential Oxygen Therapy Strategy for Patients With COVID-19	Observational	Other: oxygen treatment
ChiCTR2000030056	Study for the effect of early endotracheal intubation on the outcome of novel coronavirus pneumonia (COVID-19) patients	Observational	No applicable (case series)
ChiCTR2000030855	Study for the effect of external diaphragmatic pacing assisted invasive ventilation and weaning in patients with severe novel coronavirus pneumonia (COVID-19)	Interventional	external diaphragmatic pacing assisted invasive ventilation
ChiCTR2000030485	Study for timing of mechanical ventilation for critically ill patients with novel coronavirus pneumonia (COVID-19): A medical records based retrospective Cohort study	Observational	Group 2: conservation mechanical ventilation group; Group 1: aggressive mechanical ventilation;
ChiCTR2000030831	The analysis of related factors on improving oxygenation status by endotracheal intubation ventilation in severe patients suffered from novel coronavirus pneumonia (COVID-19): a single center and descriptive study in Wuhan	Observational	external diaphragmatic pacing assisted invasive ventilation
NCT04326452	Treating COVID-19 With a Bidirectional Oxygenation Valve	Interventional	Device: bidirectional oxygenation mouthpiece
NCT04376580	Use of the Nasal Cannula During COVID-19	Observational	No applicable (case series)
CTRI/2020/04/024473	Viral Infection and Respiratory illness Universal Study	Observational	No applicable (case series)
NCT04323787	Viral Infection and Respiratory Illness Universal Study[VIRUS]: COVID-19 Registry	Observational	No applicable (case series)