UNIVERSITY *of York*
Centre for Reviews and Dissemination

# Systematic review

## 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.

Comparing protection of N95 respirator versus medical mask against respiratory viruses: a network meta-

analysis

## 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.

13/03/2020

## 4. * Anticipated completion date.

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

19/04/2020

## 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 | Yes |
| Piloting of the study selection process | Yes | Yes |
| Formal screening of search results against eligibility criteria | Yes | Yes |
| Data extraction | Yes | Yes |
| Risk of bias (quality) assessment | Yes | Yes |
| Data analysis | Yes | Yes |

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

All procedures are accomplished but the article is still not submitted to any journal.

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## 6. * Named contact.

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

Jiawen Li

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

Dr Li

## 7. * Named contact email.

Give the electronic mail address of the named contact.

752649107@qq.com

## 8. Named contact address

Give the full postal address for the named contact.

No. 17, Section 3, South Renmin Road, Wuhou District, Chengdu city, Sichuan province, China

## 9. Named contact phone number.

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

18302807386

## 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.

West China the Second Hospital of Sichuan University

## Organisation web address:

http://www.motherchildren.com/

## 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.**

Mr jiawen Li. West China the Second Hospital of Sichuan University
Dr Yifei Li. West China the Second Hospital of Sichuan University
Dr Peng Yue. West China the Second Hospital of Sichuan University

## 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.

This work was supported by National Natural Science Foundation of China 81570369 to Kaiyu Zhou,

National Natural Science Foundation of China 81700360 to Yifei Li.

## 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.**

## 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.

Which respiratory personal protective equipment (rPPE) has best protective effectiveness to different

respiratory infectious diseases, for example, SARS, MERS, H1N1, influenza. Also consider needs of different

occupations facing with infectious diseases especially lack of rPPE when facing with epidemics outbreak.

## 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.)

PubMed, EMBASE(1988 to present), MEDLINE(1946 to present), Web of Science(1991 to present), Ovid

Cochrane Central Register of Controlled Trials, EBSCO Cumulative Index to Nursing and Allied Health

Literature (1980 to present), Scopus (1996 to present)

## 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.

https://www.crd.york.ac.uk/PROSPEROFILES/173279_STRATEGY_20200312.pdf

Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

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.

The diseases can be prevented by rPPE (ie, N95 respirator, medical mask), such as SARS, MERS, pH1N1

and COVID-19. It includes selection of rPPE in both routine influenza seasons and epidemics outbreak of

high-level infectivity.

## 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.

Exclusion criteria:1) all populations HCWs 2) intervention: rPPE 3) participants wore different rPPE during

study period.

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

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

Use of different rPPE for different occupation in different settings. The rPPE includes N95 respirators,

medical mask, cotton mask, etc. Occupation includes doctors, nurses, assistant, cleaner and family

members of patients. The settings include family, ICU, emergency department, general ward, pediatric ward

and respiratory ward.

## 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.

The health-care related workers (HCWs) , with definite contact history, not wearing rPPE in medical settings

or other dense spaces, made up the control group. And subjects with different rPPE can be regarded as

control to each other. Inconsistent wearing subjects would be seen as no mask group. And subjects who had

history of wearing different rPPE in study period will be excluded.

## 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.

RCT, case-control study, cohort study and cross-sectional study will be included. Editorials, guidelines,

reviews, news articles will be excluded.

## 23. Context.

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

With COVID-19 outbreak worldwide, medical source becomes more and more scarce, especially personal

protective equipment. Although many studies about use of rPPE had been published after lots of respiratory

epidemics outbreak, no definite conclusion about how to select rPPE in different setting. To our knowledge,

there has been several systematic interviews or meta-analyses conducted in this specific area, but included

studies is insufficient to provide high-level evidence in every aspects. In consideration of many high-value

trials completed in recent years, we determined to accomplish the systematic review and meta-analysis.

## 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.

Outcome consists of the risk respiratory infectious diseases confirmed by laboratory tests or clinical

symptoms. And quantified data, such as number of infected persons and attack rate, will be analyzed.

## * Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Risk ratio.

## 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

Compliance rate.

## * Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Odds ratio.

## 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.

Data will be extracted as followings: journal, publication year, design, study period, setting, fit-tested, country

of population, Participants number, intervention group number( Percentage, %), control number (

Percentage, %), large-scale epidemics outbreak, occupation, mean age, percentage of women, follow-up

duration, diagnositc Criteria, Number(Percentage %) of positive and negative participants, correlation

coefficient(Confidence Interval). The data in included studies was extracted by screening of full context and

recorded in pre-specified excels.Two researchers have been involved in selecting studies for review and

extracting data. calculate the risk ratios and confidential interval. Discrepancies will be resolved through

consensus, with advice from other senior researchers on the team.


## 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.

RCT and RCS were assessed by Cochrane Risk of Bias tool, including:

II) Allocation concealment;

IV) Blinding of participants, personnel and outcome assessors (laboratory-confirmed outcomes);

VI) Incomplete outcome data;

VII) Selective outcome reporting;

VIII) Other potential threats to validity;

Case-control studies was evaluated by Newcastle-Ottawa scales, including bias of selection, comparability,

and exposure. Cohort studies was evaluated by Newcastle-Ottawa scales, including bias of selection,

comparability, and outcome.


## 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.

The dataset was divided according to different occupations, settings, respiratory infectious diseases and

design type. For each combination of above-mentioned aspects, the following comparisons were made: N95

vs No rPPE, medical mask vs No rPPE, N95 vs medical mask, and others with appropriate data. For each

comparison, RR or OR were calculated using a mixed effect model in Stata (version 16).

Heterogeneity was quantified using the I² statistic, where I²?75.00% indicated substantial heterogeneity, with

p0.05 defined as the threshold for statistical significance.Results with substantial heterogeneity are not

reliable and reported in systematic review but are not used to draw conclusions. Egger's regression test was

used to assess for potential publication bias, with p0.05 defined as the threshold for statistical significance

and funnel plots produced for visualization.Analyses with significant publication bias are reported but are not

used to draw conclusions.


## 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.

If applicable we will attempt to analyze the effect in subgroups based on occupations, settings, respiratory

infectious diseases and design type for intervention and control groups.

## 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
Yes

Individual patient data (IPD) meta-analysis
No

Intervention
No

Meta-analysis
Yes

Methodology
No

Narrative synthesis
No

Network meta-analysis
Yes

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

COVID-19
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.

China

## 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

Give the link to the published protocol.

Alternatively, upload your published protocol to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

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

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

## 35. Dissemination plans.

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

### 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.

respiratory personal protective equipment, medical mask, N95 respirator, infectious respiratory diseases

## 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.
Please provide anticipated publication date

Review_Completed_not_published

## 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) or preprints if available.

This field should be left empty until details of the completed review are available OR you have a link to a preprint.

Give the link to the published review.