

Systematic review

1. * Review title.

Give the title of the review in English

The impact of the COVID-19 pandemic and mitigation strategies on pregnancy care and outcomes: a systematic review

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

20/09/2020

4. * Anticipated completion date.

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

31/12/2020

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

Tick the boxes to show which review tasks have been started and which have been completed. Update this field each time any amendments are made to a published record.

Reviews that have started data extraction (at the time of initial submission) are not eligible for inclusion in PROSPERO. If there is later evidence that incorrect status and/or completion date has been supplied, the published PROSPERO record will be marked as retracted.

This field uses answers to initial screening questions. It cannot be edited until after registration.

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.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Rosemary Townsend

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

Dr Townsend

7. * Named contact email.

Give the electronic email address of the named contact.

futuresrosy@gmail.com

8. Named contact address

Give the full institutional/organisational postal address for the named contact.

Croydon University Hospital, 530 London Road, CR7 7YE

9. Named contact phone number.

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

07740285018

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.

St George's Hospital NHS Foundation Trust, Tooting, LONDON

Organisation web address:

11. * Review team members and their organisational affiliations.

Give the personal details and the organisational affiliations of each member of the review team. Affiliation

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refers to groups or organisations to which review team members belong. **NOTE: email and country now MUST be entered for each person, unless you are amending a published record.**

Dr Rosemary Townsend. St George's Hospital NHS Foundation Trust, Tooting, LONDON

Dr Basia CHMIELEWSKA. St George's Hospital NHS Foundation Trust

Professor Asma Khalil. St George's Hospital NHS Foundation Trust

Miss Imogen Barratt. St George's University of London

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

None

Grant number(s)

State the funder, grant or award number and the date of award

13. * Conflicts of interest.

List actual or perceived conflicts of interest (financial or academic).

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 must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. 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 or similar where relevant.

What are the changes in pregnancy outcomes observed during the COVID-19 pandemic? The population includes all women pregnant during the COVID-19 pandemic, compared to pregnancy outcomes in the same setting prior to the pandemic. The pregnancy outcomes of interest include stillbirth, preterm birth, pregnancy hypertension, gestational diabetes, perinatal mental health, caesarean section, neonatal death and morbidity and maternal mortality or severe morbidity. We will additionally review changes in health care usage including antenatal care attendance, mode and place of delivery, induction of labour

16. * Searches.

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

MEDLINE, Embase and the Covid-19 database from 1st Jan 2020. No language restrictions will be applied.

We will hand search reference lists and the MedXriv pre-print server to identify any other potentially relevant studies.

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including

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the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible. Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

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 in your systematic review.

Pregnancy outcomes - the primary outcome will be stillbirth. Secondary outcomes: preterm birth, miscarriage, pregnancy hypertension caesarean section, neonatal death and morbidity and maternal mortality or severe morbidity. Health care usage will also be included. Where additional relevant outcomes are identified during the search they will be considered for addition to the review.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

The whole obstetric population, not limited to those women infected with COVID 19.

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

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

The COVID-19 pandemic and subsequent healthcare service restructuring

21. * Comparator(s)/control.

Where relevant, give details of the alternatives against which the intervention/exposure 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 equivalent population in the period preceding the pandemic

22. * Types of study to be included.

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

Observational studies - prospective and retrospective designs will be included

23. Context.

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

Country setting will be considered 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.

Primary outcome: stillbirth. Secondary outcomes: preterm birth, pregnancy hypertension, gestational diabetes caesarean section, neonatal death and morbidity and maternal mortality or severe morbidity.

Reports of health care and resource usage changes will be included. Where additional relevant outcomes are identified during the search they will be considered for addition to the review.

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.

Where possible we will assess the relative risks pre and during pandemic response

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

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.

Not applicable

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.

Studies will be reviewed in duplicate, and studies reporting on pregnancy outcomes before and during the pandemic will be included. Data on country, HDI (human development index), healthcare context, population type, local mitigation strategies used (quantified using the Government Response Stringency Index (GRSI) during the exposure time period for each study) , pregnancy and healthcare usage outcomes before and during the pandemic will be extracted. In addition study funding, population selection and follow up and outcome selection and measurement will be extracted.

27. * Risk of bias (quality) assessment.

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

This review will include observational studies only, and therefore the Newcastle-Ottawa scale will be used to assess risk of bias - each study will be assessed in duplicate with discrepancies being resolved by consensus. These findings will be used to assess the reliability and limitations of the review findings.

28. * Strategy for data synthesis.

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data. If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and

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software package to be used.

It is anticipated that there will be substantial heterogeneity in outcomes and populations. We will undertake a narrative synthesis to draw out the impact of the pandemic response on maternal and neonatal outcomes.

Where data of sufficient quality is available meta-analysis will be conducted using R. We will assess statistical heterogeneity and use a random effects approach where significant heterogeneity is present.

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.

Where possible we will undertake subgroup analysis for pregnancy outcomes during 'lockdown' and after stringent local measures are lifted

30. * Type and method of review.

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness

No

Diagnostic

No

Epidemiologic

Yes

Individual patient data (IPD) meta-analysis

No

Intervention

No

Living systematic review

No

Meta-analysis

Yes

Methodology

No

Narrative synthesis

Yes

Network meta-analysis

No

Pre-clinical

No

Prevention

No

Prognostic

No

Prospective meta-analysis (PMA)

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No

Review of reviews

No

Service delivery

Yes

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

Yes

For COVID-19 registrations please tick all categories that apply. Doing so will enable your record to appear in area-specific searches

Chinese medicine

Diagnosis

Epidemiological

Genetics

Health impacts

Immunity

Long COVID

Mental health

PPE

Prognosis

Public health intervention

Rehabilitation

Service delivery

Transmission

Treatments

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Vaccines
Other

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
No

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

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No

Pregnancy and childbirth

Yes

Public health (including social determinants of health)

No

Rehabilitation

No

Respiratory disorders

No

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 not an English language summary

32. * Country.

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

England

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them. 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.

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If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

Add web link to the published protocol.

Or, upload your published protocol here in pdf format. Note that the upload will be 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.

Do you intend to publish the review on completion?

Yes

Give brief details of plans for communicating review findings.?

The findings of the review will be published in peer reviewed journals, presented at academic conferences and disseminated on social media.

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords 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.

pregnancy, COVID-19, pandemic, stillbirth, antenatal care, pre-eclampsia, perinatal death

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

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published. New registrations must be ongoing so this field is not editable for initial submission.

Please provide anticipated publication date

Review_Completed_not_published

39. Any additional information.

Provide any other information relevant to the registration of this review.

Field 16/18 updated to clarify the resources searched since the primary outcome is stillbirth/late pregnancy

Field 27 updated to describe the risk of bias assessment for the review

Field 28 updated to specify that R is used for the analysis

Field 26 update to specify the use of GRSI to quantify local mitigation stringency

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission). List authors, title and journal details preferably in Vancouver format.

Give the link to the published review or preprint.