



PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3-4
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	7
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	7
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	8-9
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7-8
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8-9
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	9
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	10
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	10-11
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	10-11



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Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	10
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10-11
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	11
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	11
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	12
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	11-15
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	11-15
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	12
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	11-15
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	15-16
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16-21
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	21
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	22

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Appendix 2. Details of search strategies used to include studies in the living systematic review on COVID-19 in pregnant and recently pregnant women

1. Cochrane Gynaecology and Fertility

Pubmed

Item	Term
1	pregnancy/
2	pregnan*.tw.
3	neonatal.tw.
4	perinatal.tw.
5	mothers/.
6	mother.tw.
7	maternal.tw.
8	obstetric.tw.
9	infant, newborn/
10	infant.tw.
11	newborn.tw.
12	child*.tw.
13	or/1-12
14	COVID-19.tw.
15	COVID-2019.tw.
16	severe acute respiratory syndrome coronavirus 2.tw.
17	2019-nCoV.tw.
18	SARS-CoV-2.tw.
19	2019nCoV.tw
20	or/14-19
21	coronavirus.tw.
22	2019/12.pd
23	2020.pd.
24	or/22-23
25	21 and 24
24	or/20-25
25	13 and 24

Google Scholar and Google

Using the following text words (pregnancy OR neonatal OR perinatal OR maternal OR obstetric OR newborn) AND (COVID-19 or SARS-Cov-2)

2. EPPI Centre

The MEDLINE search strategy is the OVID Expert Search as developed by Wolters Kluwer and available at <http://tools.ovid.com/coronavirus/>

MEDLINE search strategy

- 1 exp Coronavirus/
- 2 exp Coronavirus Infections/
- 3 (coronavirus* or corona virus* or OC43 or NL63 or 229E or HKU1 or HCoV* or ncov* or covid* or sars-cov* or sarscov* or Sars-coronavirus* or Severe Acute Respiratory Syndrome Coronavirus*).mp.
- 4 (or/1-3) and ((20191* or 202*).dp. or 20190101:20301231.(ep).)
- 5 4 not (SARS or SARS-CoV or MERS or MERS-CoV or Middle East respiratory syndrome or camel* or dromedar* or equine or coronary or coronal or covidence* or covidien or influenza virus or HIV or bovine or calves or TGEV or feline or porcine or BCoV or PED or PEDV or PDCoV or FIPV or FCoV or SADS-CoV or canine or CCov or zoonotic or avian influenza or H1N1 or H5N1 or H5N6 or IBV or murine corona*).mp.
- 6 ((pneumonia or covid* or coronavirus* or corona virus* or ncov* or 2019-ncov or sars*).mp. or exp pneumonia/) and Wuhan.mp.
- 7 (2019-ncov or ncov19 or ncov-19 or 2019-novel CoV or sars-cov2 or sars-cov-2 or sarscov2 or sarscov-2 or Sars-coronavirus2 or Sars-coronavirus-2 or SARS-like coronavirus* or coronavirus-19 or covid19 or covid-19 or covid 2019 or ((novel or new or nouveau) adj2 (CoV on nCoV or covid or coronavirus* or corona virus or Pandemi*2)) or ((covid or covid19 or covid-19) and pandemic*2) or (coronavirus* and pneumonia)).mp.
- 8 COVID-19.rx,px,ox. or severe acute respiratory syndrome coronavirus 2.os.
- 9 ("32240632" or "32236488" or "32268021" or "32267941" or "32169616" or "32267649" or "32267499" or "32267344" or "32248853" or "32246156" or "32243118" or "32240583" or "32237674" or "32234725" or "32173381" or "32227595" or "32185863" or "32221979" or "32213260" or "32205350" or "32202721" or "32197097" or "32196032" or "32188729" or "32176889" or "32088947" or "32277065" or "32273472" or "32273444" or "32145185" or "31917786" or "32267384" or "32265186" or "32253187" or "32265567" or "32231286" or "32105468" or "32179788" or "32152361" or "32152148" or "32140676" or "32053580" or "32029604" or "32127714" or "32047315" or "32020111" or "32267950" or "32249952" or "32172715").ui.
- 10 or/6-9
- 11 5 or 10

The Embase search strategy as at 21st April 2020

- 1 exp Coronavirus Infections/
- 2 exp coronavirinae/
- 3 (coronavirus* or corona virus* or OC43 or NL63 or 229E or HKU1 or HCoV* or ncov* or covid* or sars-cov* or sarscov* or Sars-coronavirus* or Severe Acute Respiratory Syndrome Coronavirus*).mp.
- 4 or/1-3
- 5 4 not (SARS or SARS-CoV or MERS or MERS-CoV or Middle East respiratory syndrome or camel* or dromedar* or equine or coronary or coronal or covidence* or covidien or

influenza virus or HIV or bovine or calves or TGEV or feline or porcine or BCoV or PED or PEDV or PDCoV or FIPV or FCoV or SADS-CoV or canine or CCov or zoonotic or avian influenza or H1N1 or H5N1 or H5N6 or IBV or murine corona*).mp.

6 ((pneumonia or covid* or coronavirus* or corona virus* or ncov* or 2019-ncov or sars*).mp. or exp pneumonia/) and Wuhan.mp.

7 (2019-ncov or ncov19 or ncov-19 or 2019-novel CoV or sars-cov2 or sars-cov-2 or sarscov2 or sarscov-2 or Sars-coronavirus2 or Sars-coronavirus-2 or SARS-like coronavirus* or coronavirus-19 or covid19 or covid-19 or covid 2019 or ((novel or new or nouveau) adj2 (CoV on nCoV or covid or coronavirus* or corona virus or Pandemi*2)) or ((covid or covid19 or covid-19) and pandemic*2) or (coronavirus* and pneumonia)).mp.

8 6 or 7

9 5 or 8

3. WHO COVID-19 database

The WHO COVID-19 database contained articles on the novel coronavirus from the following sources:

- Web of Science
- Oxford Academic Journals
- Pubmed NIH
- Ishiyaku
- J Stage
- Cinii articles
- Ichushi Web – JAMAS
- Science Direct
- Wiley Online Journals
- JAMA Network
- British Medical Journal
- Mary Ann Liebert
- New England Journal of Medicine
- Sage Publications
- Taylor and Francis Online
- Springer Link
- Biomed Central
- MDPI
- ASM
- PLOS
- The Lancet
- Cell Press
- Cell Press Search Interface
- EMBASE
- KoreaMed

- Global Index Medics
- MMWR
- Epidemiology and Health
- American Chemical Society
- Eurosurveillance
- Cambridge Press
- LWW
- Airiti
- JIMR
- Emerging Infectious Diseases
- Osong Public Health & Research Perspectives
- BASE Bielefeld
- LitCOVID

An additional step using the following search terms was added to the WHO search from 12th May 2020

tw:(newborn* OR mother* OR bab* OR wom* OR pregnan* OR postpart* OR neonat* OR fetus OR fetal OR newborn OR mother OR bab*)

Appendix 3. Characteristics of cohort studies included in the systematic review of COVID-19 in pregnancy and postpartum

Study		Population			Exposure	Risk factors	Outcomes	
Author, Year	Study Design	No. of mothers	No. of babies	Inclusion and exclusion criteria	Diagnosis of COVID-19		Maternal	Fetal/ Neonatal
ROUNDS 1-2								
1	Blitz M, 2020 USA	Prospective cohort	3385 women 82 mothers with confirmed COVID-19	All women of reproductive age (defined as between 15-49 years) admitted and tested at 7 hospitals. Testing carried out on symptomatic patients. Two groups 1) Pregnant women with confirmed COVID-19 2) Non-pregnant women with confirmed COVID-19 Patients with incomplete data were excluded.	Mothers diagnosed with nasopharyngeal swabs on admission, during hospital stay or after delivery.	Age, pregnant	COVID-related: admission to ICU	
2	Breslin N (2), 2020 USA*	Retrospective cohort	43 women 43 mothers with confirmed COVID-19	All women attending the Labour and Delivery Triage Unit and tested. Testing was carried out for women following screening for signs/symptoms, risk factors and travel from 13-21 March. All women tested from 22 March.	Mothers and newborns were diagnosed by nasopharyngeal swabs.	Any symptom	COVID-related: pneumonia, oxygenation, admission to hospital and ICU, acute renal injury Pregnancy-related: preterm and term birth, spontaneous and induced labour, mode of delivery - caesarean section and vaginal, pregnancy-induced hypertension, pre-labour rupture of membranes at term	Admission to NICU, neonatal sepsis, Apgar scores at 1 and 5 minutes, respiratory distress, congenital malformation
3	Cao D, 2020 China*	Retrospective cohort	10 women 10 mothers with confirmed COVID-19	All pregnant women admitted and tested.	Mothers were diagnosed by throat swabs. Some newborns were diagnosed by throat swabs within 24 hours of birth.	Age, preeclampsia, gestational diabetes, multiple pregnancy, trimester Fever, cough, breathlessness	COVID-related: all-cause mortality, invasive ventilation Pregnancy-related: preterm birth, mode of delivery – caesarean-section and	Neonatal death, neonatal asphyxia, foetal distress, birthweight, gestational age at delivery, Apgar scores at 1 minute and 5 minutes

						Followed diagnostic criteria according to National Health Commission of China.		vaginal, preterm rupture of membranes, gestational diabetes	
4	Chen L, 2020 China	Retrospective cohort	118 women 118 mothers with suspected or confirmed COVID-19 84 mothers with confirmed COVID-19	70	All laboratory-confirmed and clinically diagnosed pregnant women admitted at all hospitals in Wuhan.	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women were diagnosed by RT-PCR. Clinically diagnosed women diagnosed by chest CT imaging. Some newborns were diagnosed by throat swabs.	Age, parity, fever, cough, breathlessness, any symptom	COVID-related: all-cause mortality, non-invasive ventilation Pregnancy-related: miscarriage, induced abortion, induced labour, preterm birth, mode of delivery – caesarean section and vaginal	Neonatal death, neonatal asphyxia, Apgar score at 1 minute
5	Ferrazzi E, 2020 Italy *	Prospective cohort	42 women 42 mothers with confirmed COVID-19	42	All women who were admitted for delivery and tested. Women with positive tests before delivery, 36 hours after delivery and those who delivered during the study were included.	Mother and newborns were diagnosed by throat swabs. Followed diagnostic criteria according to Italian National Procedures.	Parity, gestational diabetes, fever, cough, breathlessness, myalgia, lymphopenia, raised CRP, raised WCC	COVID-related: pneumonia, oxygenation, admission to ICU Pregnancy-related: preterm and term birth, gestational diabetes, mode of delivery – caesarean section and vaginal, spontaneous and induced labour, postpartum haemorrhage	Admission to NICU, Apgar scores at 5 minutes, birthweight
6	Khalil A, 2020 UK	Prospective cohort	129 women 9 mothers with confirmed COVID-19	9	All pregnant women admitted were universally screened.	Mothers were diagnosed by nasopharyngeal swabs.	Asthma, ethnicity	COVID-related: admission to hospital, length of stay	

7	Khan S (1), 2020 China	Retrospective cohort	17 women 17 mothers with suspected or confirmed COVID-19 12 mothers with confirmed COVID-19	17	All pregnant women admitted and diagnosed with COVID-19 pneumonia.	Followed diagnostic criteria according to New Coronavirus Pneumonia Prevention and Control Program. Laboratory-confirmed women were diagnosed by throat swabs. Clinically diagnosed women were diagnosed by CT imaging. Newborns were diagnosed by throat swabs collected straight after delivery.		COVID-related: admission to hospital Pregnancy-related: preterm birth, mode of delivery – caesarean section, preterm rupture of membranes	Neonatal death, stillbirth, neonatal pneumonia, birthweight, Apgar scores at 1 and 5 minutes
8	Li N, 2020 China*	Retrospective cohort	276 women 34 mothers with suspected or confirmed COVID-19 16 mothers with confirmed COVID-19	36	All women admitted to labour and tested during study period. Two case groups 1) Women with confirmed COVID-19 2) Women with suspected COVID-19 Women aged between 25-35 years randomly selected from records. Two control groups 3) Women admitted during study period 4) Women admitted at a similar time of year in 2019	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women were diagnosed by throat swabs. Clinically diagnosed women were diagnosed by chest CT imaging with negative swabs.	Any comorbidity, multiple pregnancy	COVID-related: admission to hospital and ICU, length of hospital stay, oxygenation Pregnancy-related: preterm delivery, mode of delivery – caesarean section and vaginal, gestational diabetes, preterm rupture of membranes, pregnancy-induced hypertension	Neonatal death, neonatal asphyxia, foetal distress, gestational age at delivery, birthweight – low birth weight defined as less than 2500 grams, Apgar scores at 1 and 5 minutes

						Some newborns were diagnosed by throat swabs.			
9	Liao J, 2020 China *	Retrospective cohort	63 women 10 mothers with suspected or confirmed COVID-19	10	Any women admitted and delivered vaginally. Two groups 1) Women with clinical diagnosis of COVID-19 on obstetric isolation ward. 2) Women without COVID-19 on general ward.	Mothers were diagnosed clinically with laboratory results and CT imaging – no throat swab tested. Followed diagnostic criteria according to National Health Commission of China. Isolated newborns tested with throat swabs.	Age, parity, trimester	Pregnancy-related: preterm birth, premature rupture of membranes, mode of delivery – vaginal, postpartum haemorrhage	Neonatal death, neonatal asphyxia, gestational age at delivery, birthweight, admission to NICU
10	Liu F, 2020 China	Prospective cohort	40 women 21 mothers with confirmed COVID-19	17	Any women admitted who was tested and with complete clinical and CT data. Two groups: 1) Pregnant women with confirmed COVID-19 2) Age-matched non-pregnant women with confirmed COVID-19 Cases with poor image quality for assessment or infection with another pathogen were excluded.	Mothers were diagnosed with throat swabs. RT-PCR tests carried out according to WHO guideline. Newborns were tested by RT-PCRs.	Age, fever, cough, breathlessness, lymphopenia, raised CRP, raised WCC, pregnant	COVID-related: ventilation, admission to hospital and ICU Pregnancy-related: preterm and term birth, gestational diabetes, mode of delivery – caesarean section and vaginal, preterm rupture of membranes, pregnancy-induced hypertension	Neonatal death, neonatal asphyxia, neonatal pneumonia, foetal distress, Apgar scores at 1 and 5 minutes
11	Liu F (1), 2020 China	Retrospective cohort	44 women 44 mothers with suspected or confirmed COVID-19	8	All pregnant women admitted with COVID-19.	Followed diagnostic criteria according to National Health Commission of China Confirmed women were diagnosed by RT-PCRs.		COVID-related: pneumonia Pregnancy-related: preterm rupture of membranes	

			16 mothers with confirmed COVID-19			Suspected women were diagnosed by typical chest CT imaging of COVID-19 pneumonia.			
						Newborns were diagnosed by RT-PCRs.			
12	Liu W (2), 2020 China*	Retrospective cohort	19 women 19 mothers with suspected or confirmed COVID-19 10 mothers with confirmed COVID-19	19	All women clinically diagnosed or laboratory-confirmed during late pregnancy and delivered.	Followed diagnostic criteria according to Coronavirus Pneumonia Prevention and Control Chinese Program. Clinically diagnosed women had a fever and/or respiratory symptom, radiological signs of viral pneumonia, low/normal white cell count or low lymphocyte count and no improvement after treatment for 3 days. Laboratory-confirmed women had a positive RT-PCR or matched genetic sequence for SARS-CoV-2. Newborns were tested by RT-PCR on throat swabs, gastric fluid after birth, urine and faeces.	Age, trimester, any symptom, cough, fever	Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm rupture of membranes	Admission to NICU, gestational age at delivery, birthweight, Apgar scores at 1 and 5 minutes

13	Nie R, 2020 China	Retrospective cohort	33 women 33 mothers with confirmed COVID-19	28	All consecutive pregnant women diagnosed with COVID-19 at five hospitals in Hubei province.	Followed the diagnostic criteria according to National Health Commission of China. Some mothers and newborns were diagnosed by throat swabs.	COVID-related: all-cause mortality, pneumonia, non-invasive and invasive ventilation, oxygenation, acute respiratory distress syndrome, admission to ICU Pregnancy-related: induced abortion, preterm birth, mode of delivery – caesarean section and vaginal, preterm-premature rupture of membranes, gestational diabetes, pregnancy-induced hypertension	Neonatal death, foetal distress, neonatal pneumonia, admission to NICU, birthweight – low birth weight defined as less than 2 500 grams and very low birth weight defined as less than 1 500 grams, Apgar scores at 1 and 5 minute, gestational age at delivery – defined either as less than 37 weeks or more than/equal to 37 weeks, respiratory distress syndrome
14	Pierce-Williams R, 2020 USA	Prospective cohort	64 women 64 mothers with suspected or confirmed COVID-19 63 mothers with confirmed COVID-19	33	All laboratory-confirmed pregnant and postpartum women admitted to 12 US hospitals with severe or critical COVID-19. Cases with unclear or negative tests, and women diagnosed more than 7 days postpartum were excluded.	Mothers were diagnosed by nasopharyngeal swabs or bronchoalveolar lavage.	COVID-related: all-cause mortality, respiratory failure, acute respiratory distress syndrome, acute cardiac injury, oxygenation, non-invasive and invasive ventilation, length of hospital stay Pregnancy-related: preterm birth (less than 34 weeks and 37 weeks), mode of delivery – caesarean section and vaginal, pregnancy-induced hypertension, postpartum haemorrhage – defined as blood loss more than 1 000 cc at time of delivery or symptomatic hypovolemia within 24 hours associated with blood loss, chorioamnionitis, preterm-premature rupture of membranes	Stillbirth, neonatal death, admission to NICU, foetal growth restriction, birthweight, gestational age at delivery, Apgar score at 5 minutes

15	Qiancheng X, 2020 China*	Retrospective cohort	82 women 28 mothers with confirmed COVID-19	23	All patients consecutively admitted with COVID-19 diagnosis. The study included pregnant women and non-pregnant women of reproductive age (defined as 18-41 years). Male patients were excluded.	Mothers were diagnosed by RT-PCR on respiratory samples or IgM serological test for SARS-CoV-2. Followed diagnostic criteria according to National Health Commission of China. Newborns tested twice by RT-PCR for SARS-CoV-2 24-48 hours apart.	Age, pregnant	COVID-related: mortality, pneumonia, severe pneumonia, admission to hospital Pregnancy-related: induced abortion, preterm birth, gestational diabetes, mode of delivery – caesarean section and vaginal, pregnancy-induced hypertension	Stillbirth, neonatal death, neonatal asphyxia, neonatal pneumonia, admission to NICU, birthweight – low birthweight defined as less than 2 500 grams, Apgar scores at 1 and 5 minutes
16	Sutton D, 2020 USA	Prospective cohort	215 women 33 mothers with confirmed COVID-19		All women admitted for delivery and tested.	Mothers were diagnosed by nasopharyngeal swabs.	Any symptom		
17	Tassis B, 2020 Italy	Prospective cohort	139 women 6 mothers with suspected or confirmed COVID-19 3 mothers with confirmed COVID-19		All women admitted and tested.	Mothers were diagnosed by nasopharyngeal swabs.			
18	UKOSS, 2020 UK#§	Prospective cohort	1121 women 427 mothers with	247	All pregnant women admitted and tested in all hospitals and obstetrics units in UK. Testing carried out on symptomatic women.	Mothers were all laboratory-confirmed. Some newborns were diagnosed by SARS-CoV-2 RNA (at less than 12 hours of age	Age, BMI, ethnicity, smoking, asthma, hypertension, diabetes, parity, multiple pregnancy, gestational diabetes, any comorbidity	COVID-related: COVID-specific mortality, admission to hospital and ICU Pregnancy-related: preterm birth, mode of delivery –	Stillbirth, miscarriage, neonatal death, admission to NICU

			confirmed COVID-19		Comparison cohort of pregnant women from 2017-18 was used.	or more than/equal to 12 hours).		caesarean section, vaginal and operative vaginal, gestational diabetes	
19	Vintzileos W, 2020 USA	Retrospective cohort	161 women 32 mothers with confirmed COVID-19	29	All women admitted to labour and delivery and tested. Testing for all admitted patients.	Mothers and newborns were diagnosed by nasopharyngeal swabs.	Any symptom		
20	Wu Y, 2020 China*	Prospective cohort	13 women 13 mothers with confirmed COVID-19	5	All pregnant women admitted and tested.	Followed diagnostic criteria according to National Health Commission of China. Mothers were diagnosed by throat swabs. Newborns were diagnosed by throat and anal swabs on first and third day after birth.	Trimester, age, parity, BMI, breathlessness, any symptom, cough, fever, raised CRP, abnormal LFT, lymphopenia	COVID-related: pneumonia, oxygenation, admission to ICU Pregnancy-related: miscarriage, preterm birth, mode of delivery – caesarean section and vaginal, preterm rupture of membranes	Stillbirth, neonatal death, neonatal asphyxia, neonatal pneumonia, foetal distress, birthweight – low birth weight defined as less than 2500 grams, small-for-gestational age – defined as less than 10 th percentile, large-for-gestational age – defined as more than 90 th percentile, Apgar scores at 1 and 5 minute
21	Yan J, 2020 China*	Retrospective cohort	116 women 116 mothers with suspected or confirmed COVID-19 65 mothers with confirmed COVID-19	99	All consecutive pregnant women laboratory-confirmed or with clinically diagnosed COVID-19 pneumonia from 25 hospitals inside and outside Hubei province.	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women were tested by throat swabs. Clinically diagnosed women were those with symptoms, significant history and CT imaging. Newborns tested by throat swabs straight after delivery in	Age, trimester, parity, gestational diabetes, preeclampsia, pregnancy hypertension, fever, cough, breathlessness, myalgia, any symptom, lymphopenia, raised CRP, raised WCC	COVID-related: all-cause mortality, severe, pneumonia, non-invasive and invasive ventilation, oxygenation, admission to ICU, length of ICU stay, hypo-proteinemia Pregnancy-related: miscarriage, preterm birth (< 34 weeks and < 37 weeks), preterm-premature rupture of membranes, gestational diabetes, mode of delivery – caesarean section and vaginal	Stillbirth, neonatal death, neonatal asphyxia, admission to NICU, foetal distress, gestational age at delivery, birthweight, Apgar score at 1 and 5 minutes

						operating room or delivery room.			
22	Yang H, 2020 China*	Retrospective cohort	55 women 55 mothers with suspected or confirmed COVID-19 13 mothers with confirmed COVID-19	57	All suspected Chinese pregnant women admitted to an isolated suite and delivered. Cases were screened based on pulmonary CT scan, routine bloods laboratory tests and signs/symptoms. Two groups 1) Women with confirmed COVID-19 2) Women without COVID-19 Non-Chinese or non-pregnant women were excluded.	Laboratory-confirmed women were diagnosed by throat swabs. Newborns were diagnosed by throat swabs 24 hours after birth.	Age, BMI, lymphopenia, gestational age, raised CRP	Pregnancy-related: preterm-premature rupture of membranes, mode of delivery – caesarean section and vaginal	Gestational age at delivery, admission to NICU, congenital malformation, respiratory distress syndrome, birthweight
23	Yin M, 2020 China	Retrospective cohort	66 women 31 mothers with confirmed COVID-19	17	All women of childbearing age (defined as between 20-40 years) admitted and tested. Two groups 1) Pregnant women with confirmed COVID-19 2) Non-pregnant women with confirmed COVID-19 Two cases were excluded due to cancer (one cervical cancer, one lymphoma).	Mothers were diagnosed by throat swabs upon admission. Newborns were diagnosed by throat and anal swabs straight after delivery. Followed diagnostic criteria according to National Health Commission of China.	Fever, cough, breathlessness, myalgia, lymphopenia, d-dimers, abnormal LFT, raised CRP, raised WCC, pregnant	COVID-related: pneumonia, severe pneumonia – defined as the disease when the respiratory rate is equal or greater than 30 per minute, oxygen saturation is less than or equal 93% at rest or when PaO2 is less than or equal to 300 mmHg, length of hospital stay Pregnancy-related: induced abortion, preterm birth, mode of delivery – caesarean section and vaginal	Stillbirth, neonatal death, neonatal asphyxia, congenital malformation, gestational age at delivery, birthweight – low birthweight defined as less than 2 500 grams, Apgar scores at 1 and 5 minutes
24	Yue L, 2020 China*	Retrospective cohort	30 women 30 mothers with suspected or confirmed COVID-19	32	All women admitted for scheduled or emergency caesarean section and were tested.	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women	Gestational age	COVID-related: pneumonia, respiratory failure, acute respiratory distress syndrome, length of hospital stay Pregnancy-related: preterm birth, mode of delivery –	Foetal distress, birthweight – low birth weight defined as less than 2 500 grams, respiratory distress syndrome, Apgar scores at 1 and 5 minutes

			14 mothers with confirmed COVID-19			were diagnosed by RT-PCR tests. Clinically diagnosed women were diagnosed by fulfilling at least two points of the criteria (exposure history, fever, lymphopenia or low white cell count, typical chest CT imaging of COVID-19 infection).		caesarean section, wound infection, postpartum haemorrhage	
25	Zeng L, 2020 China	Retrospective cohort	33 women 33 mothers with confirmed COVID-19	33	All neonates born to mothers with COVID-19 at the hospital.	Newborns were diagnosed by nasopharyngeal and anal swabs. Followed diagnostic criteria according to National Health Commission and Chinese Perinatal-Neonatal SARS-CoV-2 Committee.	Fever, cough	COVID-related: pneumonia, admission to ICU Pregnancy-related: preterm birth, mode of delivery – caesarean section and vaginal, preterm rupture of membranes	Stillbirth, neonatal death, neonatal asphyxia, small-for-gestational age, neonatal pneumonia, admission to NICU, length of stay in NICU, neonatal sepsis, respiratory distress syndrome

ROUND 3

26	Bianco A, 2020 USA*	Prospective cohort	301 women 24 mothers with confirmed COVID-19	24	All pregnant women scheduled for a planned delivery. Women and designated support persons were screened by a telephone screening tool for COVID-19. All women and screen-negative support persons were tested one day before delivery.	Mothers and support persons were diagnosed by nasopharyngeal swabs. Newborns were diagnosed by nasopharyngeal swabs at 24 hours of life. If the test was negative, the swab was repeated at 48 hours of life.	Age, ethnicity, parity		
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27	Campbell K, 2020 USA	Prospective cohort	770 women 30 mothers with confirmed COVID-19	30	All women admitted for childbirth were screened for COVID-19 consisting of questions related to travel, contacts and symptoms. Testing was carried out on women without a previous diagnosis of COVID-19. Women diagnosed with COVID-19 before admission and those considered recovered (defined as more than or equal to 14 days from onset of symptoms and more than or equal to 72 hours afebrile) were not tested.	Mothers were diagnosed by nasopharyngeal swabs. Newborns were diagnosed by nasopharyngeal swabs at 24 hours of age.	Age, parity, any symptom	Pregnancy-related: mode of delivery – caesarean section	Birthweight, Apgar scores at 1 and 5 minutes
28	Ceulemans D, 2020 Belgium	Retrospective cohort	470 women 13 mothers with confirmed COVID-19		All consecutive pregnant women admitted for delivery at four obstetrical units. Universal screening was carried out with almost all women tested.	Mothers were diagnosed by RT-PCRs.		COVID-related: all-cause mortality, severe pneumonia, admission to ICU	
29	Cheng B, 2020 China	Retrospective cohort	111 women 31 mothers with confirmed COVID-19	17	All women of childbearing age (defined as between 22-41 years) with confirmed COVID-19 admitted to hospital. Two groups 1) Pregnant women with confirmed COVID-19 2) Non-pregnant women with confirmed COVID-19	Mothers and newborns were diagnosed by nasal and throat swabs or serology IgM/IgG testing for SARS-CoV-2. Followed diagnostic criteria according to National Health Commission of China.	Age, diabetes, any comorbidity, fever, cough, breathlessness, myalgia, any symptom, lymphopenia, abnormal LFT, raised CRP, d-dimers	COVID-related: all-cause mortality, pneumonia, severe pneumonia, acute respiratory distress syndrome, oxygenation, invasive and non-invasive ventilation, admission to ICU Pregnancy-related: preterm birth	Neonatal death, neonatal asphyxia, birthweight, Apgar scores at 1 minute and 5 minute, congenital malformation, gestational age at delivery, admission to NICU
30	Dong Y, 2020 China	Retrospective cohort	103 women 103 mothers with suspected or		All laboratory-confirmed and clinically diagnosed pregnant women in China reported to the Chinese CDC.	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women	Age	COVID-related: all-cause mortality, pneumonia, severe pneumonia	

			confirmed COVID-19			were diagnosed by throat swabs.			
			81 mothers with confirmed COVID-19			Clinically-diagnosed women were diagnosed by clinical symptoms and exposures.			
31	Doria M, 2020 Portugal	Prospective cohort	103 women 12 mothers with confirmed COVID-19	11	All pregnant women admitted were universally screened.	Mothers were laboratory-confirmed (method of diagnosis is unclear). Newborns were diagnosed by RT-PCRs.	Age, trimester, asthma, any comorbidity, pregnant hypertension, any symptom	Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm-premature rupture of membranes, gestational diabetes, pregnancy-induced hypertension	Apgar scores at 1 and 5 minutes, birthweight, foetal growth restriction
32	Duffy C, 2020 USA	Retrospective cohort	37 women 37 mothers with suspected or confirmed COVID-19 15 mothers with confirmed COVID-19		All pregnant women admitted and screened by white blood cell count differential testing. COVID-19 testing carried out only for women with lymphopenia (defined as absolute lymphocyte count less than 0.8×10^3 / microlitre) or those with symptoms.	Mothers were diagnosed by nasopharyngeal swabs.	Lymphopenia	COVID-related: admission to ICU	
33	Fox N, 2020 USA*	Prospective cohort	757 women 92 mothers with suspected or confirmed COVID-19 33 mothers with confirmed COVID-19		All pregnant women at one obstetrical practice were questioned for symptoms suggestive of COVID-19 or any sick contacts. All women were included who were suspected or a positive RT-PCR test. Testing was not carried out in all suspected women due to lack of availability in the community. Women with only sick contacts were excluded.	Women with suspected COVID-19 were defined as having at least 2 of the following symptoms (fever, cough, dyspnoea, malaise, anosmia). Women with confirmed COVID-19 were diagnosed by nasopharyngeal swabs.	Fever, breathlessness, cough, any symptom	COVID-related: all-cause mortality, admission to hospital, oxygenation, invasive or non-invasive ventilation Pregnancy-related: miscarriage	

						Newborns were not tested due to lack of availability.		
34	Gagliardi L, 2020 Italy	Prospective cohort	533 women 3 mothers with confirmed COVID-19		All pregnant women admitted for delivery at 6 hospitals were universally screened.	Mothers were diagnosed by nasopharyngeal swabs.		
35	Liu P, 2020 China	Retrospective cohort	51 women 51 mothers with suspected or confirmed COVID-19 7 mothers with confirmed COVID-19	51	All neonates born to mothers with COVID-19 were admitted to NICU isolation ward. Premature newborns (defined as gestational age less than 35 weeks), newborns with congenital malformations and those with incomplete laboratory data were excluded.	Mothers were clinically diagnosed or laboratory-confirmed (diagnosed by RT-PCRs). Newborns were diagnosed by throat swabs on days 0, 1 and 5 after birth. Followed diagnostic criteria according to National Health Commission of China.	COVID-related: all-cause mortality, pneumonia Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm and term birth	Gestational age at delivery, birthweight, Apgar scores at 1 and 5 minutes, necrotising enterocolitis
36	Lokken E, 2020 USA	Retrospective cohort	46 women 46 mothers with confirmed COVID-19	8	All women aged 18 years or older with laboratory-confirmed COVID-19 identified from six hospital systems in Washington state. Women with confirmed COVID-19 during any trimester of pregnancy were included regardless of symptoms. Most women were tested due COVID-related symptoms. The rest were tested due to known exposure. (n = 3)	Mothers were diagnosed by RT-PCRs. Stillbirth was diagnosed by PCR post-mortem.	COVID-related: pneumonia, respiratory failure, oxygenation, admission to hospital and ICU, length of hospital and ICU stay Pregnancy-related: preterm and term birth, gestational diabetes, mode of delivery – caesarean section and vaginal, spontaneous and induced labour, pregnancy-induced hypertension	Stillbirth, foetal distress, gestational age at delivery

37	London V, 2020 USA	Retrospective cohort	156 women 156 mothers with suspected or confirmed COVID-19 68 mothers with confirmed COVID-19	48	All pregnant women admitted to antepartum and labour and delivery units. Testing was carried out for women screened for symptoms and exposure to patients with COVID-19 from 15 March to 10 April. All patients were tested after 10 April. Two groups 1) Symptomatic women with confirmed COVID-19 (n = 46) 2) Asymptomatic women with confirmed COVID-19 (n = 22)	Mothers were diagnosed by nasopharyngeal swabs. Most newborns were diagnosed by nasopharyngeal swabs on day 0 of life.	Age, BMI, parity, any comorbidity, lymphopenia, any symptom	COVID-related: all-cause mortality, oxygenation, invasive and non-invasive ventilation, length of hospital stay Pregnancy-related: preterm birth, mode of delivery – caesarean section, postpartum haemorrhage, pregnancy-induced hypertension, gestational diabetes	Stillbirth
38	Miller E, 2020 USA	Prospective cohort	635 women 31 mothers with suspected or confirmed COVID-19 23 mothers with confirmed COVID-19		All pregnant women admitted for delivery were universally screened.	Mothers were diagnosed by RT-PCRs.	Any symptom		
39	Naqvi M, 2020 USA	Prospective cohort	82 women 2 mothers with suspected or confirmed COVID-19 1 mother with confirmed COVID-19		All pregnant women admitted to labour and antepartum units and tested.	Mothers were diagnosed by nasopharyngeal swabs.	Any symptom		

40	Perlman J, 2020 USA	Prospective cohort	31 women 31 mothers with confirmed COVID-19	31	All laboratory-confirmed women admitted to labour and delivery, whose newborns were triaged to the well-baby nursery or admitted to NICU.	Mothers and newborns were diagnosed by nasopharyngeal swabs.		Pregnancy-related: preterm birth, mode of delivery – caesarean section and vaginal, pregnancy-induced hypertension	Gestational age at delivery, birthweight, admission to NICU, Apgar scores at 1 and 5 minutes
41	Pereira A, 2020 Spain	Retrospective cohort	60 women 60 mothers with confirmed COVID-19	23	First 60 pregnant women with laboratory-confirmed COVID-19. Women were admitted to the hospital after presenting in the Obstetrics Emergency Room due to clinical symptoms or due to labour. All were tested.	Mothers and newborns were diagnosed by nasopharyngeal swabs.		COVID-related: all-cause mortality, pneumonia, severe pneumonia, admission to hospital and ICU, length of hospital stay, oxygenation, acute cardiac and renal injury, respiratory failure Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm birth, pregnancy-induced hypertension	Foetal growth restriction – defined as foetal weight less than 3 rd percentile for gestational age, small-for-gestational age – defined as foetal weight less than 10 th percentile for gestational age, admission to NICU, respiratory distress syndrome
42	Qadri F, 2020 USA	Prospective cohort	192 women 16 mothers with confirmed COVID-19	12	All pregnant women admitted to hospital. Testing for SARS-CoV-2 was not universal on admission during this study.	Mothers were diagnosed by nasopharyngeal swabs. Newborns were diagnosed by RT-PCRs at 48 hours of age.		COVID-related: pneumonia, oxygenation, coagulopathy, length of hospital stay Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm birth, preterm rupture of membranes, chorioamnionitis	Birthweight, Apgar scores at 1 and 5 minutes, small-for-gestational age
43	Savasi V, 2020 Italy *	Prospective cohort	77 women 77 mothers with confirmed COVID-19	57	All laboratory-confirmed women admitted at any gestational age of pregnancy or the immediate postpartum period (defined as within 3 days after birth) in 12 maternal hospitals in Northern Italy. Testing was carried out only for women with symptoms or known contacts with suspected or confirmed cases. One subgroup of patients were those with severe disease	Mothers were diagnosed by nasopharyngeal swabs. Newborns were diagnosed by RT-PCRs. Followed diagnostic criteria according to Italian guidelines.	BMI, smoking, ethnicity, any comorbidity, parity, fever, cough, breathlessness, lymphopenia, abnormal LFT, raised CRP	COVID-related: all-cause mortality, pneumonia, admission to ICU, oxygenation, invasive or non-invasive ventilation Pregnancy-related: preterm birth, mode of delivery – caesarean section and vaginal, caesarean section before labour	Birthweight, gestational age at delivery, admission to NICU, cord blood pH, Apgar score at 5 minutes

					(defined by need of urgent delivery for the deterioration of respiratory status or by ICU or subintensive care admission or both).				
44	Wei L, 2020 China *	Retrospective cohort	43 women 17 mothers with confirmed COVID-19		All pregnant and non-pregnant women with laboratory-confirmed COVID-19 admitted to hospital. Women with any underlying complication due to a chronic disease (hypertension, diabetes, heart disease, kidney transplantation, lymphoma, connective tissue disease) were excluded.	Women were diagnosed by throat swabs. Followed diagnostic criteria according to National Health Commission of China.	Age, support person positive, any symptom, lymphopenia, raised CRP, thrombocytopenia	COVID-related: all-cause mortality, pneumonia, oxygenation, invasive and non-invasive ventilation, admission to ICU, acute respiratory distress syndrome, coagulopathy, acute cardiac and renal injury, secondary infection, sepsis, length of hospital stay, duration of viral shedding after COVID-19 onset	
45	Yang H (2), 2020 China*	Retrospective cohort	27 women 24 27 mothers with suspected or confirmed COVID-19 19 mothers with confirmed COVID-19		All hospitalised pregnant women with laboratory-confirmed or clinically diagnosed COVID-19.	Followed diagnostic criteria according to National Health Commission of China. Laboratory-confirmed women were tested by nasal and throat swabs and/or serology IgM/IgG testing of SARS-CoV-2. Clinically diagnosed women were those presenting with fever, respiratory symptoms, typical COVID-19 findings on laboratory and radiological findings and a negative result for the presence of SARS-CoV-2. Newborns were tested by throat swabs and/or	D-dimers, abnormal LFT	COVID-related: pneumonia, severe pneumonia, oxygenation, admission to hospital, coagulopathy Pregnancy-related: induced abortion, preterm and term birth, preterm-premature rupture of membranes, gestational diabetes, mode of delivery – caesarean section and vaginal, preterm rupture of membranes, caesarean section before labour, pregnancy-induced hypertension	Foetal distress, neonatal asphyxia, birthweight – low birthweight defined as less than 2 500 grams), gestational age at delivery, Apgar scores at 1 and 5 minutes

						serology IgM/IgG testing of SARS-CoV-2.		
46	Zeng Y, 2020 China	Retrospective cohort	16 women 16 mothers with confirmed COVID-19	16	All pregnant women with laboratory-confirmed COVID-19 and ground-glass opacity on chest CT scan admitted to one obstetric unit.	Mothers and newborns were diagnosed by RT-PCRs.	COVID-related: all-cause mortality, length of hospital stay, oxygenation, invasive and non-invasive ventilation, acute cardiac injury Pregnancy-related: mode of delivery – caesarean section and vaginal preterm rupture of membranes, preterm birth	Neonatal death, gestational age at delivery, foetal growth restriction, birthweight, Apgar scores at 1 and 5 minutes
ROUND 4								
47	Buckley A, 2020 USA	Prospective cohort	307 women 307 mothers with suspected or confirmed COVID-19 50 mothers with confirmed COVID-19		All pregnant women presenting in labour to two institutions within Mount Sinai Health System (all underwent testing). All pregnant women admitted were universally screened.	Test used not specified.	Support person positive	
48	SIVEP-Gripe (23 May), 2020 Brazil	Prospective cohort	484 women 484 mothers with confirmed COVID-19		All pregnant women hospitalised in Brazilian hospitals who tested positive for COVID-19. Exclusion criteria: over 50 years old, age of patient missing.	Method of diagnosis and testing strategy unclear.	Age, ethnicity, trimester, diabetes, asthma, hypertension, obesity	COVID-related: all-cause mortality, admission to ICU, non-invasive and invasive ventilation

49	Andrikopoulou M, 2020 USA*	Prospective cohort	158 women 158 mothers with confirmed COVID-19	8	2 groups: 1) Pregnant women presenting to inpatient or outpatient setting with symptoms 2) Universal testing for all women admitted to the labour unit for delivery or admitted for antepartum indication and postpartum complications 2 hospitals in New York City	Mothers were diagnosed by nasopharyngeal swabs.	Trimester, asthma, gestational diabetes, cough, fever, myalgia, breathlessness	COVID-related: acute kidney injury, sepsis, acidosis, admission to hospital, admission to ICU, oxygenation, invasive ventilation
50	Giannini A, 2020 Italy	Retrospective cohort	21 women 21 mothers with confirmed COVID-19		All pregnant women admitted to the ICU who tested positive for COVID-19 in a tertiary hospital in Lombardy, Italy.	Method of diagnosis unclear.		COVID-related: pneumonia, respiratory failure, admission to ICU, invasive and non-invasive ventilation, oxygenation Pregnancy-related: mode of delivery – caesarean section
51	Goldfarb IT (1), 2020 USA	Prospective cohort	192 women 192 mothers with suspected or confirmed COVID-19 61 mothers with confirmed COVID-19		All women with COVID-19 symptoms while pregnant or within 2 weeks post-partum at a single centre. Women tested based on symptoms and epidemiological factors (insufficient testing capacity to test all symptomatic women). Two groups: Hispanic and non-Hispanic women	Mothers were diagnosed by nasopharyngeal swabs.		COVID-related: admission to hospital, admission to ICU, all-cause mortality
52	Goldfarb IT, 2020 USA	Prospective cohort	757 women 139 mothers with suspected or confirmed COVID-19 20 mothers with		All women admitted to labour and delivery in four hospitals affiliated with Mass General Brigham Health tested for SARS-CoV-2. They all received universal testing on admission. 2 groups 1. Symptomatic pregnant women 2. Asymptomatic pregnant women	Mothers were diagnosed by nasopharyngeal swabs. Test used on newborns is unclear.	Any symptom	

			confirmed COVID-19		Both groups subdivided according to PCR test result.				
53	Kayem G, 2020 France	Prospective cohort	617 women 617 mothers with suspected or confirmed COVID-19 597 mothers with confirmed COVID-19	197	All pregnant women in 33 French maternity units with an PCR diagnosis of COVID-19 or with suspected COVID-19 based on chest CT scan findings. Women tested based on symptoms or diagnosed contacts (following French health authorities' recommendations).	Mothers were diagnosed by nasal samples. Clinically diagnosed women were diagnosed by CT imaging. Newborns were diagnosed by PCR.	Age, BMI, diabetes, hypertension, pregnancy hypertension, asthma, chronic respiratory disease, gestational diabetes, smoking, COPD	COVID-related: admission to hospital, oxygenation, non-invasive and invasive ventilation, COVID-specific mortality Pregnancy-related: preterm delivery (22-31 weeks and 32-36 weeks), mode of delivery – caesarean section, miscarriage	Stillbirth, neonatal death, admission to NICU
54	Knight M, 2020 UK	Prospective cohort	427 women 427 mothers with confirmed COVID-19	268	All pregnant women admitted to hospital with confirmed COVID-19 in all 194 consultant-led maternity units in the UK. Women tested only if they had COVID-19 symptoms. All women were included who had a positive RT-PCR test or respiratory compromise in the presence of characteristic radiological changes of COVID-19.	Mothers were clinically diagnosed (radiological findings) or laboratory-confirmed (diagnosed by PCR testing of blood or nasopharyngeal swabs). Newborns were diagnosed by PCR testing of blood or nasopharyngeal swab or aspirate (results presented according to timing of positive test. Either <12hr or >12hr of birth).		COVID-related: hospital admission, admission to ICU, invasive ventilation, all-cause mortality Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm delivery, miscarriage	Stillbirth, foetal distress, neonatal death, encephalopathy, gestational age at delivery
55	LaCourse S, 2020 USA	Retrospective cohort	230 women 60 mothers with suspected or		All pregnant and post-partum women who underwent SARS-CoV-2 testing at UW Northwest Birth Center. Both outpatients (mostly within 48-72hrs of planned admission) and upon admission.	Women were diagnosed by RT-PCR. 42 under targeted symptomatic testing 188 under universal testing (approach was	Any symptom	Pregnancy-related: miscarriage, induced abortion	

			confirmed COVID-19		2 groups: 1) Women tested under targeted symptomatic testing 2) Women tested under universal testing approach	started half-way through study).			
			13 mothers with confirmed COVID-19						
56	Lumbreras-Marquez MI, 2020 Mexico	Prospective cohort	308 women 308 mothers with confirmed COVID-19		All COVID-positive pregnant women in open database from the Mexican Ministry of Health.	Test used not specified.	Age, ethnicity, diabetes, BMI, asthma, hypertension, smoking, COPD	COVID-related: admission to hospital, admission to ICU, pneumonia, invasive ventilation, all-cause mortality	
57	Martinez Peres O, 2020 Spain	Retrospective cohort	82 women 82 mothers with confirmed COVID-19	82	All women with singleton pregnancies and positive PCR test and who delivered within the next 14 days at 96 level 2 or level 3 maternity hospitals in Spain. Women tested if they were symptomatic or had a history of potential exposure. Some hospitals used universal screening.	Mothers were diagnosed by RT-PCR. Neonates: nasopharyngeal swab for RT-PCR within 6hrs of life.	Age, parity, any comorbidity, gestational diabetes, preeclampsia, asthma, smoking, any symptom, abnormal LFT, lymphopenia	COVID-related: oxygenation, invasive ventilation, admission to ICU, sepsis, severe pneumonia, ICU length of stay Pregnancy-related: mode of delivery – caesarean section, preterm delivery (<34 weeks and <37 weeks), preterm rupture of membranes, preterm-premature rupture of membranes, labour onset – spontaneous and induced	Admission to NICU, Apgar score at 5 minutes, cord blood pH, birthweight, gestational age at delivery
58	Mendoza M, 2020 Spain*	Prospective cohort	42 women 42 mothers with confirmed COVID-19		All singleton pregnancies with COVID-19 at >20+0 weeks presenting to the emergency department at a tertiary referral hospital with suspected COVID-19 (dry cough and fever) and had laboratory-confirmed COVID-19.	Mothers were diagnosed by RT PCR assay of nasal and pharyngeal swabs.	Age, BMI, ethnicity, gestational age, smoking, parity, hypertension, diabetes, preeclampsia	COVID-related: admission to ICU, severe pneumonia Pregnancy-related: mode of delivery – caesarean section	
59	Ochiai D, 2020 Japan	Retrospective cohort	52 women 3 mothers with suspected or	3	All pregnant women admitted to Keio University Hospital with confirmed or suspected COVID-19. Universal screening was carried out. Testing performed prior to	Mothers were diagnosed by PCR. Newborns were diagnosed by PCR.	Any symptom	Pregnancy-related: mode of delivery – caesarean section	Admission to NICU, Apgar score at 1 and 5 minutes, birth weight

			confirmed COVID-19		admission in all cases, except 2 which were in labour before testing.				
			2 mothers with confirmed COVID-19						
60	Romagano MP, 2020 USA	Retrospective cohort	73 women 73 mothers with confirmed COVID-19	8	All pregnant women and their neonates requiring critical care for severe COVID-19 in 2 hospitals in New Jersey.	Mothers: study does not specify test used. Newborns were diagnosed by RT-PCR on nasopharyngeal samples. Timing and number of tests varied between neonates (at 24hrs – 10 days)		COVID-related: oxygenation, invasive ventilation, respiratory failure Pregnancy-related: mode of delivery - caesarean section, preterm delivery	Admission to NICU, respiratory distress syndrome, gestational age at delivery, birth weight, Apgar score at 1 and 5 minutes, length of stay in NICU, NEC
61	Servei Català 29/05, 2020 Spain	Prospective cohort	260 women 260 mothers with confirmed COVID-19	129	All pregnant women with COVID-19 reported from all centres in Catalonia.	Method of diagnosis unclear.	Age, any comorbidity, fever, cough, breathlessness	COVID-related: admission to hospital, admission to ICU, invasive ventilation Pregnancy-related: mode of delivery - caesarean section, vaginal and operative vaginal	Neonatal death
62	Wang Z, 2020 China	Retrospective cohort	72 women 30 mothers with suspected or confirmed COVID-19 13 mothers with confirmed COVID-19	31	All pregnant and nonpregnant women admitted to the Central Hospital of Wuhan. Exclusion criteria: negative result by nasopharyngeal swabs and RT PCR (repeated twice every 2 days in 2 different labs), male, female patients younger than 20 years or older than 40 years, patients referred from one department to another or from other hospitals (excluded because of difficulty in obtaining their medical data) + exclusion of 2 nonpregnant women who died during the study period because they had	Women were diagnosed by RT-PCR Clinically diagnosed women were diagnosed based on chest CT findings (bilateral ground-glass opacities, consolidation, rounded morphology, peripheral lung distribution – Fleischner Society guidelines).	Diabetes, hypertension, multiple pregnancy, obesity, asthma, fever, cough, breathlessness, any symptom	COVID-related: admission to hospital, pneumonia Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm rupture of membranes	

					severe underlying health conditions.		
63	Yuan L, 2020 China	Retrospective cohort	28 women 28 mothers with confirmed COVID-19	17	All pregnant women admitted to the Department of Obstetrics, East Hospital of People's Hospital of Wuhan University.	Mothers were diagnosed following Chinese diagnostic criteria. Test used was PCR. Newborns were diagnosed by throat swab.	COVID-related: pneumonia Pregnancy-related: preterm delivery Apgar scores at 1 and 5 minutes
ROUND 5							
64	Blitz M (1), 2020 USA	Retrospective cohort	462 women 462 mothers with confirmed COVID-19		All symptomatic pregnant and postpartum women admitted to the ICU with confirmed COVID-19 in 11 hospitals in New York.. Women who tested positive but were admitted to the ICU for indications other than acute or impending hypoxemic respiratory failure were excluded.	Mothers were diagnosed by nasopharyngeal swab. Newborns were diagnosed by PCR on the first day of life.	COVID-related: all-cause maternal death, ICU length of stay, invasive ventilation, acute kidney injury Pregnancy-related: preterm delivery, mode of delivery – caesarean section and vaginal, labour onset - induced
65	Cohen J, 2020 France	Retrospective cohort	194 women 194 mothers with suspected or confirmed COVID-19 98 mothers with confirmed COVID-19		All pregnant women with suspected or confirmed COVID-19 who responded to an anonymous national French survey.	Mothers were diagnosed by RT-PCR or serology. Clinically diagnosed mothers were diagnosed based on lung CT scan findings.	COVID-related: hospital admission, oxygenation Pregnancy-related: mode of delivery – caesarean section

66	Cosma S, 2020 Italy	Prospective cohort	225 women 225 mothers with suspected or confirmed COVID-19 23 mothers with confirmed COVID-19	2 groups: 1) Women referred for first trimester spontaneous abortion care (case group) 2) women 12 weeks pregnant admitted to hospital for nuchal translucency (control group)	Women were diagnosed by RT- PCR on nasopharyngeal swabs or serology (IgG/IgM Ab against SARS-CoV-2).		COVID-related: pneumonia, hospital admission
67	Crovetto F, 2020, Spain	Prospective cohort	874 women 874 mothers with suspected or confirmed COVID-19 125 mothers with confirmed COVID-19	All pregnant women attending hospital for first trimester screening (10-16wk gestation) or delivery.	Mothers were diagnosed by serology (IgG and IgM/IgA antibodies).	Trimester	COVID-related: hospital admission
68	Emeruwa U, 2020 USA*	Prospective cohort	396 women 396 mothers with suspected or confirmed COVID-19 71 mothers with confirmed COVID-19	All pregnant women admitted to the labour and delivery unit. Universal testing was carried out. Exclusion criteria: patient not linked to buildings and neighbourhoods in New York city (according to the US Census Bureau's American Community Survey and real state tax data).	Mothers were diagnosed by nasopharyngeal PCR test.	Hypertension, diabetes	

69	Freiesleben N, 2020 Denmark	Prospective cohort	1055 women 30 mothers with confirmed COVID-19		2 groups: 1) pregnant women with double test (β -hCG and PAPP-A) taken in first trimester risk assessment 2) women with a first trimester pregnancy loss before double test Copenhagen University Hospital Hvidovre Exclusion criteria: did not provide informed consent.	Women were diagnosed by serology (IgM and IgG antibodies). Cohort 1: serology on serum from double test Cohort 2: serology on blood sample			Pregnancy-related: miscarriage
70	Griffin I, 2020 USA	Prospective cohort	78 women 78 mothers with suspected or confirmed COVID-19 26 mothers with confirmed COVID-19		All maternal-infant dyads whose mothers had confirmed/suspected COVID-19 before their admission to labour and delivery (L&D) or at any time before their discharge at 2 hospitals in New Jersey. Exclusion criteria: women presenting to L&D but did not deliver, pregnant women presenting to gynaecology services, pregnant women with viable foetuses being cared for outside labour and delivery (unless they delivered), neonates who were readmitted from home.	Mothers were diagnosed by RT-PCR on nasopharyngeal swabs. Newborns were diagnosed by RT-PCR on nasopharyngeal swabs. 15 newborns were tested. Swabs taken after 24hrs of life.			Pregnancy-related: mode of delivery – vaginal and caesarean section
71	Khoury R, 2020 USA	Prospective cohort	241 women 241 mothers with confirmed COVID-19	247	All pregnant women with confirmed COVID-19 in the third trimester who were admitted and delivered at 5 hospitals in New York. Testing strategy used varied according to hospital. Some used universal screening, others symptom/epidemiological risk factor-based testing.	Mothers were diagnosed by RT-PCR on nasopharyngeal swabs. Test used to diagnose newborns unclear.	Age, ethnicity, BMI, hypertension, diabetes, any symptom	COVID-related: admission to ICU, invasive ventilation, all-cause mortality, pneumonia Pregnancy-related: premature rupture of membranes, mode of delivery – caesarean section, vaginal and operative vaginal, preterm delivery (<34 weeks and <37 weeks)	Admission to NICU, stillbirth, birthweight, gestational age at delivery, Apgar score at 5 minutes, sepsis, respiratory distress syndrome, congenital malformation

72	Maraschini A, 2020 Italy	Prospective cohort	146 women 146 mothers with suspected or confirmed COVID-19 142 mothers with confirmed COVID-19	149	All women with confirmed COVID-19 who have birth in any Italian hospital.	Mothers were diagnosed by RT-PCR on nasopharyngeal swabs. Clinically diagnosed mothers were diagnosed based on chest x-ray findings. Test used on newborns unclear. 5 newborns were tested on the day of delivery, 1 the day after, 3 6-9 days from birth.	Age, any comorbidity, obesity, diabetes, hypertension, smoking, parity, multiple pregnancy, fever, cough, breathlessness, myalgia, any symptom, lymphopenia, raised CRP	COVID-related: pneumonia, invasive and non-invasive ventilation, admission to ICU, respiratory failure, all-cause mortality Pregnancy-related: preterm delivery (<32 weeks and <37 weeks), mode of delivery – vaginal and caesarean section, labour onset – spontaneous and induced, postpartum haemorrhage, preterm-premature rupture of membranes	Gestational age at delivery, stillbirth, respiratory distress syndrome, admission to NICU, neonatal death, birthweight, Apgar scores at 1 and 5 minutes, neonatal death
73	Mohr-Sasson A, 2020 Israel	Retrospective cohort	36 women 11 mothers with confirmed COVID-19		2 groups: 1) All pregnant women examined at the obstetric emergency room with confirmed COVID-19 Exclusion criteria: patients with substantial comorbidity 2) Non-pregnant women with confirmed COVID-19 matched (to group 1) by age	Women were diagnosed by RT-PCR on oropharyngeal and/or nasopharyngeal swab samples.		COVID-related: admission to hospital	
74	San-Juan R, 2020 Spain	Retrospective cohort	32 women 32 mothers with confirmed COVID-19		All adult (18 and over) pregnant women with COVID-19 who attended the department of obstetrics at Hospital 12 de Octubre, Madrid. Exclusion: COVID-19 diagnosis at the time of or after delivery 2 groups: 1) COVID-19 pneumonia (diagnosis required positive PCR and presence of infiltrates in chest x-ray) 2) COVID-19 URTI (positive PCR but no radiological findings and/or absence of cough, dyspnoea, and chest pain)	Mothers were diagnosed by RT-PCR on nasopharyngeal swab or sputum samples. Newborns were diagnosed by PCR on nasopharyngeal swabs.	Age, gestational age, asthma, BMI, gestational diabetes, hypertension, any comorbidity, cough, breathlessness, fever, myalgia	COVID-related: hospital admission, pneumonia, severe pneumonia, oxygenation, invasive ventilation, ARDS, admission to ICU Pregnancy-related: mode of delivery – caesarean section and vaginal, preterm delivery	

75	Sentilhes L, 2020 France	Retrospective cohort	54 women 54 mothers with suspected or confirmed COVID-19 38 mothers with confirmed COVID-19	21	All pregnant women with confirmed or suspected COVID-19 infection admitted to Strasbourg university Hospital. Exclusion criteria: women with ongoing pregnancy and a time from illness onset to April 3 shorter than 14 days. Testing performed on symptomatic women.	Mothers were diagnosed RT-PCR on nasopharyngeal swabs. Clinically diagnosed mothers had to have at least 2 clinical manifestations (symptoms, imaging features, decreased/normal total number of leukocytes and lymphocyte counts in early stage disease) for diagnosis. Newborns were diagnosed by RT-PCR on neonatal throat and rectal swabs at birth or on day 1, again on day 3 in term neonates and on days 7 and 14 in preterm neonates.	Age, BMI, asthma, hypertension, diabetes, asthma, multiple pregnancy, parity, smoking, gestational diabetes, pregnancy hypertension, gestational age, support person positive, fever, cough, breathlessness, lymphopenia, raised CRP, abnormal LFT	COVID-related: oxygenation, non-invasive and invasive ventilation, respiratory failure, admission to ICU, ICU length of stay, secondary infection, pneumonia, acute kidney failure, ARDS Pregnancy-related: miscarriage, induced abortion, preterm delivery, mode of delivery – caesarean section, vaginal and operative vaginal, labour onset – spontaneous and induced, postpartum haemorrhage (blood loss $\geq 500\text{mL}$), preterm-premature rupture of membranes	Gestational age at delivery, neonatal death, admission to NICU, birth weight, small for gestational age, Apgar score at 5 minutes, foetal growth restriction, stillbirth
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ROUND 6a

76	Ellington S, 2020, USA	Prospective cohort	91412 women 8207 mothers with confirmed COVID-19		All women of reproductive age (15-44 years). Data received by Centers for disease control and prevention (CDC) as part of COVID-19 surveillance. Study compares pregnant to non-pregnant women.	Mothers were diagnosed by SARS-CoV-2 RNA detection in a clinical specimen using a molecular amplification detection test.	Age, ethnicity, cough, fever, myalgia, breathlessness, any symptom, diabetes, any comorbidity	COVID-related: admission to hospital, admission to ICU, COVID-19-related mortality, invasive ventilation	
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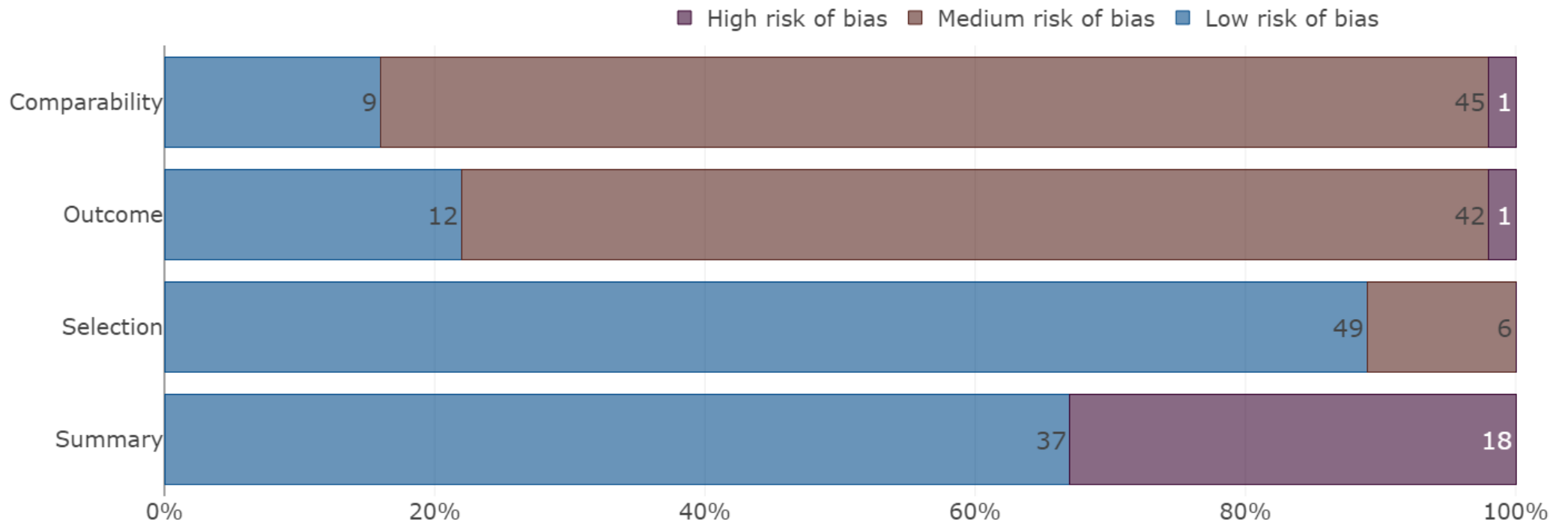
77	NethOSS, 2020 (June 19 update) Netherlands	Prospective cohort	241 women 241 pregnant women with confirmed COVID-19	75	All COVID-19 positive women registered in the Netherlands.	COVID-19 was laboratory-confirmed in women and newborns. Test used not specified.	COVID-related: all-cause mortality, admission to ICU, hospital admission, pneumonia, oxygenation, non-invasive and invasive ventilation Pregnancy-related: miscarriage, mode of delivery – caesarean section, preterm birth (<36 weeks and >36 weeks)	Neonatal mortality, foetal distress, admission to NICU
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* Selected risk factors excluded from analysis on suspicion of duplication

Only contributed to comparative cohort analysis

§ UKOSS pre-print and Knight M. et al treated as different publications for some analysis

Appendix 4a: Quality assessment using the Newcastle-Ottawa Scale for risk of bias of studies included in the living systematic review on COVID-19 and pregnancy



Appendix 4b: Quality assessment of prevalence studies included in the living systematic review on COVID-19 and pregnancy using the tool by Hoy et al

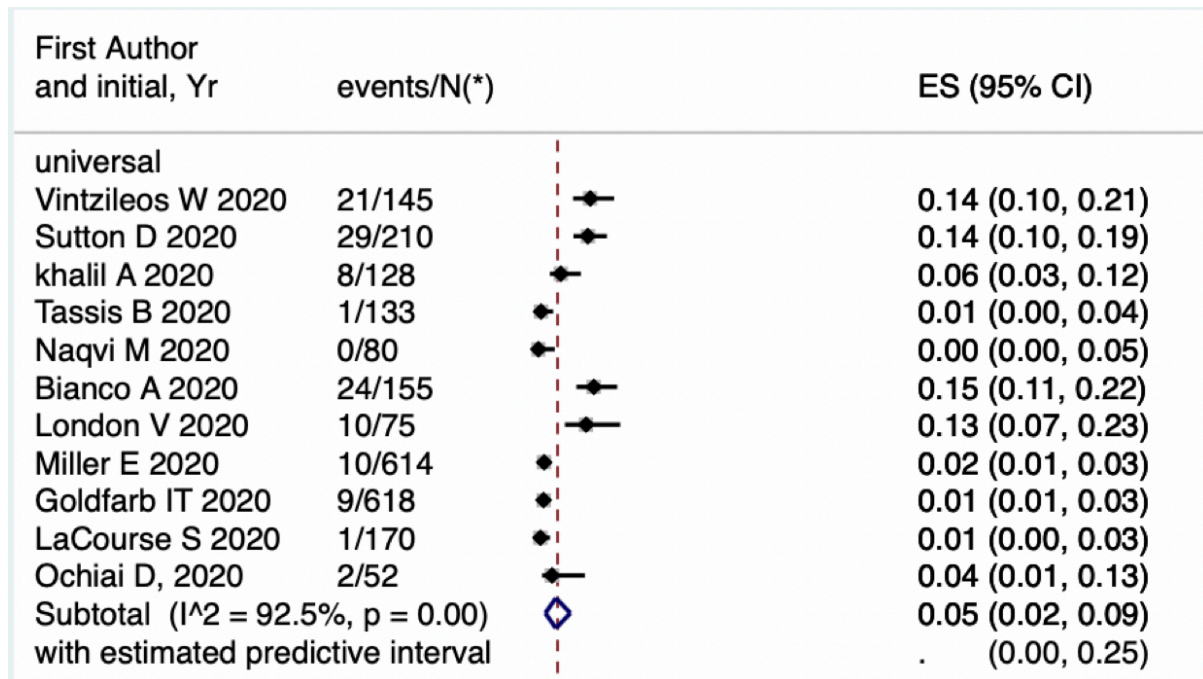
Study	External Validity				Internal validity						Summary
	Representativeness	Sampling frame	Selection	Non-response	Data collection	Case definition	Measurement	Differential verification	Adequate follow up	Appropriate numerator and denominator	Summary
Andrikopoulou M 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Bianco A 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Blitz M (1) 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Blitz M 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Breslin N 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Buckley A 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Campbell KH 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Cao D 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Ceulemans D 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	LOW	MODERATE
Chen L 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Cheng B 2020	HIGH	HIGH	HIGH	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW	MODERATE
Chow N 2020	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Cohen J 2020	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	HIGH	LOW	MODERATE
Cosma S 2020	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Crovetto F 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW
Dong Y 2020	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	LOW	MODERATE

Doria M 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW
Duffy C 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Ellington S 2020	LOW	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Emeruwa U 2020	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Ferrazzi E 2020	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Fox NS 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	LOW	MODERATE
Freiesleben N 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Gagliardi L 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW
Giannini A 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Goldfarb IT (1) 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Goldfarb IT 2020	HIGH	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	MODERATE
Griffin I 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Kayem G 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Khalil A 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Khan S 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Khoury R 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Knight M 2020	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	HIGH	MODERATE
LaCourse S 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Li N 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Liao J 2020	HIGH	LOW	HIGH	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Liu F 2020	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Liu W (2) 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	MODERATE
Liu F (1) 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	MODERATE

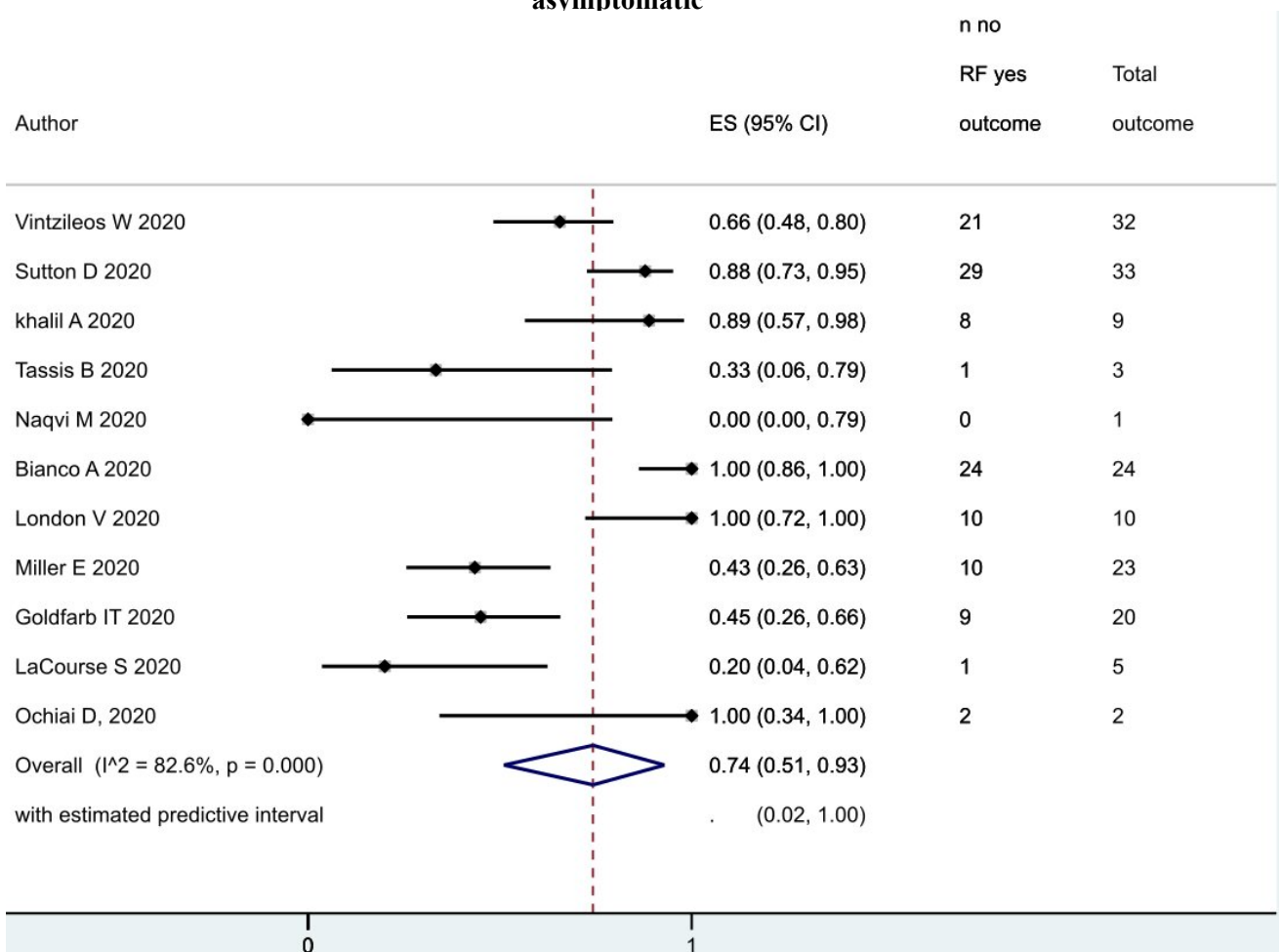
Lokken E 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW	MODERATE
London V 2020	HIGH	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	MODERATE
Lumbreras-Marquez MI 2020	LOW	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Maraschini A 2020	LOW	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	LOW
Martinez-Perez O 2020	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	MODERATE
Mendoza M 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Miller ES 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW
Mohr-Sasson A 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW	LOW
Naqvi M 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
NethOSS (NVOG19/06)	LOW	HIGH	LOW	LOW	HIGH	HIGH	LOW	HIGH	HIGH	HIGH	LOW	MODERATE
Nie R 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	HIGH	MODERATE
Ochiai D 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW
Pearlman J 2020	HIGH	HIGH	HIGH	HIGH	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
Penfield CA 2020	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
Pereira A 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	HIGH	HIGH	HIGH	LOW	MODERATE
Pierce-Williams R 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
Qadri F 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
Qiancheng X 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	MODERATE
Ramogano MP 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW

San-Juan R 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Savasi VM 2020	HIGH	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	MODERATE
Sentilhes L 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	HIGH	MODERATE
Servei Català de la Salut 2020	LOW	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	LOW
SIVEP-Gripe 23 May	LOW	HIGH	LOW	LOW	HIGH	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Sutton D 2020	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Tassis B 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW	HIGH	HIGH	MODERATE
Vintzileos W 2020	HIGH	LOW	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Wang Z 2020	HIGH	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW	LOW
Wei L 2020	HIGH	LOW	LOW	LOW	LOW	LOW	LOW	LOW	HIGH	LOW	LOW
Wu Y 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Yan J 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	HIGH	HIGH	MODERATE
Yang H (2) 2020	HIGH	HIGH	HIGH	LOW	LOW	LOW	LOW	HIGH	HIGH	LOW	MODERATE
Yang H 2020	HIGH	LOW	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
Yin M 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	HIGH	LOW	MODERATE
Yue L 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	MODERATE
Zeng L 2020	HIGH	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	MODERATE
Zeng Y 2020	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	LOW

Appendix 5a: Prevalence of SARS-CoV-2 infection in asymptomatic pregnant and recently pregnant women identified by universal screening strategy



Appendix 5b: Proportion of COVID-19 diagnosis in universally screened population that are asymptomatic



Appendix 6a: Maternal factors associated with COVID-19 in pregnant (and recently pregnant women)

Risk factor	No. of studies	Total No. of women	COVID-19 present n/N	COVID-19 absent n/N	OR (95% CI)	I ²
Age ≥ 35yrs	2	1276	451*	825*	1.23 (0.55; 2.78)	NE
Parity ≥ 1	2	1272	279/447	521/825	0.96 (0.61; 1.51)	29%
BMI ≥ 30	1	1080	140/407	155/673	1.75 (1.34; 2.30)	NE
Non-Caucasian vs Caucasian	3	1390	244/450	230/940	1.71 (0.35; 8.36)	91%
Multiple pregnancy	1	1121	8/427	13/694	1.00 (0.41; 2.43)	NE
Gestation ≥ 28 w	1	874	71/125	431/749	0.97 (0.66; 1.42)	NE
Smoking	1	1103	20/419	135/684	0.20 (0.13; 0.33)	NE
Any co-morbidity	1	1121	145/427	166/694	1.64 (1.25; 2.13)	NE
Chronic hypertension	2	1517	19/498	29/1019	2.71 (0.53; 14.02)	78%
Pre-existing diabetes	2	1517	15/482	25/1035	1.62 (0.37; 7.07)	65%
Asthma	2	1250	31/436	32/814	1.71 (1.03; 2.84)	0%
Support person positive	1	199	23/28	16/171	44.56 (14.90; 133.28)	NE
Gestational diabetes	1	1121	50/427	36/694	2.42 (1.55; 3.79)	NE

Appendix 6b. Comparison of characteristics of pregnant (and recently pregnant) women with COVID-19 vs non-pregnant reproductive aged women with COVID-19

Risk factor	No. of studies	Total No. of women	Pregnant (and recently pregnant) women with COVID-19 n/N	Non-pregnant reproductive aged women with COVID-19 n/N	OR (95% CI)	I ²
Age ≥ 35yrs	4	92106	8304*	83384*	0.48 (0.31; 0.76)	43%
BMI ≥ 30	1	72	1/31	0/41	4.08 (0.16; 103.66)	NE
Non-Caucasian vs Caucasian	1	65383	5082/6602	41484/58781	1.39 (1.31; 1.48)	NE
Any co-morbidity	2	91523	1884/8238	29152/83285	0.83 (0.29; 2.40)	74%
Chronic hypertension	1	72	5/34	1/38	6.38 (0.71; 57.65)	NE
Pre-existing diabetes	3	91595	293/8269	1868/83326	1.78 (1.03; 3.05)	10%
Asthma	1	72	0/25	5/47	0.15 (0.01; 2.86)	NE
Support person positive	1	43	4/17	19/26	0.11 (0.03; 0.47)	NE

**Includes one or more studies with continuous measurement of risk factor*

Appendix 7. Clinical manifestations of coronavirus disease (COVID-19) in pregnant and recently pregnant women with suspected or confirmed disease

Clinical manifestations	Subgroup	Studies	Events/N(*)	Proportion (95% CI)	I-squared	Range	
Symptom	Fever	All studies	29	2733/8328	0.397 (0.308; 0.490)	97.4%	(0.111-0.729)
		Risk based	15	196/495	0.378 (0.288; 0.471)	74.9%	(0.147-0.688)
		NHCC					
		Universal	5	177/438	0.307 (0.129; 0.518)	92.1%	(0.111-0.531)
		Symptom based	4	618/1158	0.494 (0.343; 0.647)	95.2%	(0.259-0.667)
		Not known	5	1742/6237	0.451 (0.193; 0.723)	99.3%	(0.222-0.729)
		Confirmed Covid-19	25	2407/7553			
		Admitted	16	982/1641	0.417 (0.310; 0.529)	97.7%	(0.105-0.729)
		All	3	1498/6097	0.470 (0.384; 0.557)	88.5%	(0.111-0.729)
		Selected	9	244/546	0.285 (0.132; 0.468)	98.6%	(0.184-0.462)
		Any risk	29	2733/8328	0.366 (0.256; 0.484)	82.7%	(0.147-0.636)
		High risk	NA	NA	NA	NA	NA
		HIC	12	2176/7328	0.397 (0.308; 0.490)	97.4%	(0.111-0.729)
		LMIC	17	557/1000	0.404 (0.287; 0.527)	90.9%	(0.147-0.729)
	Cough	All studies	28	3432/8317	0.389 (0.308; 0.473)	96.8%	(0.029-0.806)
		Risk based	15	148/495	0.301 (0.223; 0.385)	70.8%	(0.029-0.625)
		NHCC					
Universal		5	179/438	0.273 (0.088; 0.508)	93.8%	(0.111-0.558)	
Symptom based		4	696/1158	0.601 (0.560; 0.641)	33.1%	(0.567-0.667)	
Not known		4	2409/6226	0.565 (0.293; 0.817)	99.4%	(0.336-0.806)	
Confirmed Covid-19		24	3013/7542				
Admitted		15	990/1630	0.401 (0.312; 0.493)	96.6%	(0.000-0.806)	
All		3	2205/6097	0.483 (0.382; 0.584)	92.0%	(0.111-0.806)	
Selected		9	228/546	0.373 (0.174; 0.597)	99.0%	(0.176-0.622)	
Any risk		28	3432/8317	0.273 (0.131; 0.442)	92.5%	(0.029-0.631)	
High risk		NA	NA	NA	NA	NA	
		HIC	11	2888/7317	0.461 (0.353; 0.571)	97.5%	(0.111-0.667)
		LMIC	17	544/1000	0.339 (0.190; 0.506)	95.3%	(0.029-0.806)
Dyspnoea		All studies	22	1928/8159	0.188 (0.128; 0.255)	96.2%	(0.000-0.622)
		Risk based	10	35/358	0.085 (0.043; 0.137)	47.8%	(0.000-0.258)
		NHCC					
	Universal	3	71/406	0.113 (0.016; 0.271)	91.4%	(0.048-0.238)	
	Symptom based	4	362/1158	0.325 (0.254; 0.401)	79.7%	(0.267-0.407)	
	Not known	5	1460/6237	0.350 (0.153; 0.576)	99.0%	(0.137-0.622)	
	Confirmed Covid-19	20	1754/7456				
	Admitted	12	602/1572	0.194 (0.127; 0.271)	96.2%	(0.000-0.622)	
				0.247 (0.140; 0.371)	95.5%	(0.033-0.622)	

Myalgia	All	3	1218/6097	0.175 (0.107; 0.254)	94.6%	(0.064-0.267)	
	Selected	7	108/490	0.099 (0.014; 0.234)	91.5%	(0.000-0.365)	
	Any risk	22	1928/8159	0.188 (0.128; 0.255)	96.2%	(0.000-0.622)	
	High risk	NA	NA	NA	NA	NA	
	HIC	10	1591/7296	0.256 (0.196; 0.321)	93.9%	(0.064-0.545)	
	LMIC	12	337/863	0.113 (0.008; 0.290)	96.5%	(0.000-0.622)	
	All studies	9	1411/6078	0.099 (0.046; 0.167)	90.7%	(0.000-0.247)	
	Risk based NHCC	6	10/150	0.051 (0.013; 0.104)	17.8%	(0.000-0.152)	
	Universal	NA	NA	NA	NA	NA	
	Symptom based	1	50/427	0.117 (0.088; 0.151)	-	(0.117-0.117)	
	Not known	2	1351/5501	0.245 (0.233; 0.256)	-	(0.192-0.247)	
	Confirmed Covid-19 Admitted	9	1411/6078	0.099 (0.046; 0.167)	90.7%	(0.000-0.247)	
	All	5	82/652	0.096 (0.046; 0.160)	67.5%	(0.000-0.192)	
	All	1	1323/5355	0.247 (0.236; 0.259)	-	(0.247-0.247)	
	Ageusia	Selected	3	6/71	0.061 (0.002; 0.167)	38.5%	(0.000-0.152)
Any risk		9	1411/6078	0.099 (0.046; 0.167)	90.7%	(0.000-0.247)	
High risk		NA	NA	NA	NA	NA	
HIC		3	1401/5928	0.183 (0.099; 0.285)	95.8%	(0.117-0.247)	
LMIC		6	10/150	0.051 (0.013; 0.104)	17.8%	(0.000-0.152)	
All studies		3	24/310	0.145 (0.003; 0.412)	93.6%	(0.025-0.283)	
Risk based NHCC		NA	NA	NA	NA	NA	
Universal		2	11/264	0.027 (0.008; 0.053)	-	(0.025-0.217)	
Symptom based		1	13/26	0.283 (0.160; 0.435)	-	(0.283-0.283)	
Not known		NA	NA	NA	NA	NA	
Confirmed Covid-19 Admitted		3	24/310	0.145 (0.003; 0.412)	93.6%	(0.025-0.283)	
All		1	6/241	0.025 (0.009; 0.053)	-	(0.025-0.025)	
All		1	13/46	0.283 (0.160; 0.435)	-	(0.283-0.283)	
Diarrhoea		Selected	1	5/23	0.217 (0.075; 0.437)	-	(0.217-0.217)
		Any risk	3	24/310	0.145 (0.003; 0.412)	93.6%	(0.025-0.283)
	High risk	NA	NA	NA	NA	NA	
	HIC	3	24/310	0.145 (0.003; 0.412)	93.6%	(0.025-0.283)	
	LMIC	NA	NA	NA	NA	NA	
	All studies	17	659/7525	0.068 (0.050; 0.089)	65.5%	(0.000-0.182)	
	Risk based NHCC	8	18/283	0.066 (0.017; 0.135)	63.4%	(0.000-0.182)	
	Universal	2	10/148	0.062 (0.026; 0.111)	-	(0.043-0.072)	
	Symptom based	3	80/1098	0.081 (0.035; 0.142)	87.1%	(0.040-0.167)	
	Not known	4	551/5996	0.082 (0.075; 0.090)	0.0%	(0.079-0.182)	
	Confirmed Covid-19 Admitted	14	595/6810	0.066 (0.048; 0.087)	56.8%	(0.015-0.182)	
	All	9	89/1218	0.079 (0.047; 0.116)	59.5%	(0.040-0.182)	

	All	3	560/6097	0.091 (0.084; 0.098)	0.0%	(0.072-0.093)
	Selected	5	10/210	0.045 (0.000; 0.133)	70.3%	(0.000-0.182)
	Any risk	17	659/7525	0.068 (0.050; 0.089)	65.5%	(0.000-0.182)
	High risk	NA	NA	NA	NA	NA
	HIC	8	603/6758	0.076 (0.054; 0.100)	70.0%	(0.040-0.182)
	LMIC	9	56/767	0.064 (0.027; 0.112)	60.5%	(0.000-0.182)
Laboratory findings						
Raised white cell count	All studies	6	50/251	0.274 (0.087; 0.511)	92.3%	(0.026-0.524)
	Risk based NHCC	5	39/230	0.231 (0.055; 0.472)	92.1%	(0.026-0.519)
	Universal	1	11/21	0.524 (0.298; 0.743)	-	(0.524-0.524)
	Symptom based	NA	NA	NA	NA	NA
	Not known	NA	NA	NA	NA	NA
	Confirmed Covid-19	6	46/192	0.280 (0.117; 0.479)	86.7%	(0.046-0.526)
	Admitted	3	30/79	0.387 (0.152; 0.651)	81.8%	(0.161-0.524)
	All	NA	NA	NA	NA	NA
	Selected	3	20/172	0.175 (0.005; 0.477)	92.7%	(0.026-0.357)
	Any risk	6	50/251	0.274 (0.087; 0.511)	92.3%	(0.026-0.524)
	High risk	NA	NA	NA	NA	NA
	HIC	6	50/251	0.274 (0.087; 0.511)	92.3%	(0.026-0.524)
	LMIC	NA	NA	NA	NA	NA
	Lymphopaenia	All studies	15	262/780	0.350 (0.255; 0.451)	85.6%
Risk based NHCC		NA	NA	NA	NA	NA
Universal		2	39/179	0.208 (0.150; 0.273)	-	(0.184-0.476)
Symptom based		3	40/167	0.255 (0.056; 0.526)	91.9%	(0.085-0.444)
Not known		2	78/157	0.497 (0.415; 0.578)	-	(0.455-0.500)
Confirmed Covid-19		12	204/625	0.324 (0.209; 0.450)	88.6%	(0.085-0.585)
Admitted		9	167/533	0.324 (0.197; 0.465)	88.8%	(0.085-0.500)
All		NA	NA	NA	NA	NA
Selected		6	95/247	0.388 (0.254; 0.530)	75.3%	(0.206-0.900)
Any risk		14	253/749	0.355 (0.254; 0.462)	86.6%	(0.085-0.900)
High risk		1	9/31	0.290 (0.142; 0.480)	-	(0.290-0.290)
HIC		6	147/482	0.304 (0.153; 0.480)	92.6%	(0.085-0.500)
LMIC		9	115/298	0.382 (0.281; 0.488)	64.1%	(0.206-0.900)
Thrombocytopenia		All studies	7	36/428	0.082 (0.019; 0.177)	85.3%
	Risk based NHCC	5	33/216	0.131 (0.058; 0.226)	59.5%	(0.036-0.353)
	Universal	1	2/158	0.013 (0.002; 0.045)	-	(0.013-0.013)
	Symptom based	1	1/54	0.019 (0.000; 0.099)	-	(0.019-0.019)
	Not known	NA	NA	NA	NA	NA
	Confirmed Covid-19	6	12/288	0.049 (0.002; 0.133)	76.1%	(0.000-0.353)

Abnormal liver function test	Admitted	4	12/256	0.075 (0.002; 0.211)	85.3%	(0.013-0.353)
	All	NA	NA	NA	NA	NA
	Selected	3	24/172	0.102 (0.028; 0.208)	62.5%	(0.036-0.181)
	Any risk	7	36/428	0.082 (0.019; 0.177)	85.3%	(0.013-0.353)
	High risk	NA	NA	NA	NA	NA
	HIC	2	3/212	0.013 (0.001; 0.035)	-	(0.013-0.019)
	LMIC	5	33/216	0.131 (0.058; 0.226)	59.5%	(0.036-0.353)
	All studies	9	51/491	0.106 (0.052; 0.175)	74.1%	(0.000-0.294)
	Risk based NHCC	5	16/120	0.114 (0.020; 0.254)	72.8%	(0.000-0.294)
	Universal	1	7/158	0.044 (0.018; 0.089)	-	(0.044-0.044)
	Symptom based	3	28/213	0.131 (0.056; 0.229)	71.1%	(0.061-0.204)
	Not known	NA	NA	NA	NA	NA
	Confirmed Covid-19	7	37/431	0.084 (0.031; 0.156)	76.8%	(0.000-0.294)
	Admitted	8	51/463	0.124 (0.066; 0.196)	71.8%	(0.044-0.294)
Raised procalcitonin	All	NA	NA	NA	NA	NA
	Selected	1	0/28	0.000 (0.000; 0.123)	-	(0.000-0.000)
	Any risk	9	51/491	0.106 (0.052; 0.175)	74.1%	(0.000-0.294)
	High risk	NA	NA	NA	NA	NA
	HIC	4	35/371	0.103 (0.041; 0.188)	80.3%	(0.044-0.204)
	LMIC	5	16/120	0.114 (0.020; 0.254)	72.8%	(0.000-0.294)
	All studies	5	60/261	0.211 (0.001; 0.588)	96.6%	(0.000-0.968)
	Risk based NHCC	4	33/103	0.221 (0.000; 0.802)	97.4%	(0.000-0.968)
	Universal	1	27/158	0.171 (0.116; 0.239)	-	(0.171-0.171)
	Symptom based	NA	NA	NA	NA	NA
	Not known	NA	NA	NA	NA	NA
	Confirmed Covid-19	5	59/253	0.206 (0.000; 0.595)	96.6%	(0.000-0.968)
	Admitted	4	59/233	0.269 (0.000; 0.738)	97.3%	(0.000-0.968)
	Raised C-reactive protein	All	NA	NA	NA	NA
Selected		1	1/28	0.036 (0.001; 0.183)	-	(0.036-0.036)
Any risk		5	60/261	0.211 (0.001; 0.588)	96.6%	(0.000-0.968)
High risk		NA	NA	NA	NA	NA
HIC		1	27/158	0.171 (0.116; 0.239)	-	(0.171-0.171)
LMIC		4	33/103	0.221 (0.000; 0.802)	97.4%	(0.000-0.968)
All studies		7	174/426	0.493 (0.355; 0.632)	86.2%	(0.233-0.714)
Risk based NHCC		4	103/205	0.538 (0.415; 0.659)	60.1%	(0.440-0.704)
Universal		1	15/21	0.714 (0.478; 0.887)	-	(0.714-0.714)
Symptom based		1	22/54	0.407 (0.276; 0.550)	-	(0.407-0.407)
Not known		1	34/146	0.233 (0.167; 0.310)	-	(0.233-0.233)
Confirmed Covid-19		7	123/329	0.450 (0.280; 0.626)	88.2%	(0.158-0.737)

	Admitted	4	90/248	0.498 (0.258; 0.738)	91.5%	(0.233-0.714)
	All	NA	NA	NA	NA	NA
	Selected	3	84/178	0.479 (0.391; 0.568)	19.1%	(0.440-0.607)
	Any risk	7	174/426	0.493 (0.355; 0.632)	86.2%	(0.233-0.714)
	High risk	NA	NA	NA	NA	NA
	HIC	2	56/200	0.276 (0.216; 0.341)		(0.233-0.407)
	LMIC	5	118/226	0.569 (0.447; 0.687)	63.3%	(0.440-0.714)
Radiological findings						
Ground glass appearance	All studies	10	246/387	0.686 (0.408; 0.910)	96.5%	(0.093-1.000)
	Risk based NHCC	9	241/333	0.755 (0.511; 0.938)	94.8%	(0.152-1.000)
	Universal	NA	NA	NA	NA	NA
	Symptom based	1	5/54	0.093 (0.031; 0.203)	-	(0.093-0.093)
	Not known	NA	NA	NA	NA	NA
	Confirmed Covid-19	8	155/255	0.613 (0.307; 0.879)	95.8%	(0.026-0.968)
CT-chest abnormality	Admitted	4	70/128	0.681 (0.142; 1.000)	97.5%	(0.093-0.968)
	All	NA	NA	NA	NA	NA
	Selected	5	165/215	0.774 (0.441; 0.986)	95.1%	(0.152-1.000)
	Any risk	10	246/387	0.686 (0.408; 0.910)	96.5%	(0.093-1.000)
	High risk	NA	NA	NA	NA	NA
	HIC	1	5/54	0.093 (0.031; 0.203)	-	(0.093-0.093)
	LMIC	9	241/333	0.755 (0.511; 0.938)	94.8%	(0.152-1.000)
	All studies	20	599/1968	0.648 (0.456; 0.819)	98.4%	(0.024-1.000)
	Risk based NHCC	13	334/432	0.800 (0.648; 0.921)	91.2%	(0.250-1.000)
	Universal	2	22/146	0.090 (0.046; 0.145)	-	(0.024-0.905)
	Symptom based	4	213/1149	0.397 (0.116; 0.722)	99.0%	(0.083-1.000)
	Not known	1	30/241	0.124 (0.086; 0.173)	-	(0.124-0.124)
	Confirmed Covid-19	17	408/1159	0.657 (0.455; 0.835)	97.4%	(0.024-1.000)
	Admitted	10	294/692	0.741 (0.441; 0.956)	97.7%	(0.185-1.000)
	All	2	54/742	0.070 (0.052; 0.090)	-	(0.024-0.083)
Selected	7	240/490	0.772 (0.389; 0.997)	98.3%	(0.124-1.000)	
Any risk	20	599/1968	0.648 (0.456; 0.819)	98.4%	(0.024-1.000)	
High risk	NA	NA	NA	NA	NA	
HIC	5	195/1464	0.119 (0.053; 0.204)	94.2%	(0.024-0.237)	
LMIC	15	404/504	0.831 (0.694; 0.936)	91.6%	(0.250-1.000)	

*N** – Number of pregnant or recently pregnant women for whom manifestations were reported; *CI* – Confidence Interval; *CT* – Computerised tomography; *NHCC* National Health Commission China; *NA*- Not available; *HIC* – High Income Countries; *LMIC* – Low and Middle Income Countries
Risk based NHCC, Universal and Symptom based, Not Known=Sampling frames for detecting COVID-19; Confirmed COVID-19=Analysis restricted to women with laboratory confirmation of COVID-19 only; Admitted, All, Selected = Population types of women in studies; Any risk, High risk = Pregnancy risk status

Appendix 8. Prevalence of coronavirus disease (COVID-19) and pregnancy related outcomes in pregnant or recently pregnant women with suspected or confirmed disease

Outcomes	Subgroup	Studies	Events/N(*)	Proportion (95% CI)	I-squared	Range	
Covid-19 related outcomes							
All-cause mortality	All studies	26	73/11580	0.001 (0.000; 0.007)	80.2%	(0.000-0.074)	
	Risk based NHCC	13	2/508	0.000 (0.000; 0.005)	0.0%	(0.000-0.019)	
	Universal	3	0/104	0.000 (0.000; 0.035)	NE	-	
	Symptom based	5	11/1582	0.004 (0.000; 0.011)	35.5%	(0.000-0.012)	
	Not known	5	60/9386	0.013 (0.000; 0.047)	96.4%	(0.000-0.074)	
	Confirmed Covid-19	23	73/11333	0.001 (0.000; 0.009)	82.6%	(0.000-0.074)	
	Admitted	13	46/1793	0.002 (0.000; 0.016)	76.1%	(0.000-0.074)	
	All	4	26/9235	0.006 (0.000; 0.018)	84.5%	(0.002-0.023)	
	Selected	8	1/508	0.000 (0.000; 0.002)	0.0%	(0.000-0.004)	
	High risk	NA	NA	NA	NA	NA	
	Any risk	26	73/11580	0.001 (0.000; 0.007)	80.2%	(0.000-0.074)	
	HIC	10	28/10229	0.000 (0.000; 0.001)	44.5%	(0.000-0.012)	
	LMIC	16	45/1351	0.003 (0.000; 0.017)	61.6%	(0.000-0.074)	
	Admission to intensive care unit	All studies	17	323/10901	0.041 (0.018; 0.071)	93.6%	(0.000-0.132)
		Risk based NHCC	5	8/231	0.010 (0.000; 0.047)	48.3%	(0.000-0.069)
Universal		4	20/376	0.046 (0.011; 0.098)	47.6%	(0.000-0.110)	
Symptom based		3	86/908	0.093 (0.075; 0.113)	0.0%	(0.093-0.096)	
Not known		5	209/9389	0.046 (0.011; 0.101)	96.8%	(0.015-0.132)	
Confirmed Covid-19		17	318/10812	0.041 (0.017; 0.072)	93.5%	(0.000-0.132)	
Admitted		10	177/1949	0.069 (0.044; 0.097)	72.7%	(0.000-0.132)	
All		2	130/8515	0.014 (0.012; 0.017)	NE	(0.015-0.032)	
Selected		5	16/437	0.021 (0.003; 0.050)	36.6%	(0.000-0.069)	
High risk		NA	NA	NA	NA	NA	
Any risk		17	323/10901	0.041 (0.018; 0.071)	93.6%	(0.000-0.132)	
HIC		9	240/9857	0.052 (0.021; 0.094)	94.5%	(0.000-0.110)	
LMIC		8	83/1044	0.028 (0.002; 0.073)	84.3%	(0.000-0.132)	
Sever COVID-19		All studies	21	417/2271	0.128 (0.063; 0.209)	95.5%	(0.000-1.000)
		Risk based NHCC	10	39/450	0.063 (0.023; 0.117)	69.8%	(0.000-0.323)
	Universal	5	88/482	0.082 (0.001; 0.241)	94.2%	(0.000-0.311)	
	Symptom based	4	218/1202	0.174 (0.138; 0.213)	52.1%	(0.130-0.207)	
	Not known	2	72/137	0.605 (0.521; 0.686)	NE	(0.110-1.000)	
	Confirmed Covid-19	19	409/2102	0.145 (0.073; 0.236)	95.6%	(0.000-1.000)	
	Admitted	10	121/630	0.114 (0.049; 0.198)	85.2%	(0.000-0.323)	

Invasive ventilation	All	4	151/891	0.115 (0.035; 0.230)	92.5%	(0.024-0.207)	
	Selected	7	145/750	0.157 (0.000; 0.462)	98.2%	(0.000-1.000)	
	High risk	3	142/599	0.465 (0.009; 0.971)	99.3%	(0.110-1.000)	
	Any risk	18	205/1672	0.088 (0.047; 0.139)	87.5%	(0.000-0.323)	
	HIC	10	377/1800	0.212 (0.095; 0.359)	97.5%	(0.000-1.000)	
	LMIC	11	40/471	0.062 (0.024; 0.112)	66.5%	(0.000-0.323)	
	All studies	13	155/10713	0.026 (0.008; 0.052)	93.5%	(0.000-0.089)	
	Risk based NHCC	4	2/180	0.003 (0.000; 0.025)	0.0%	(0.000-0.017)	
	Universal	2	7/103	0.064 (0.021; 0.123)	NE	(0.048-0.073)	
	Symptom based	2	57/1044	0.054 (0.041; 0.069)	NE	(0.047-0.066)	
	Not known	5	89/9386	0.027 (0.005; 0.063)	95.2%	(0.005-0.089)	
	Confirmed Covid-19	13	155/10638	0.027 (0.008; 0.055)	93.6%	(0.000-0.092)	
	Admitted	8	75/1224	0.050 (0.034; 0.068)	15.2%	(0.000-0.089)	
	Need for ECMO	All	3	75/9132	0.018 (0.001; 0.054)	96.2%	(0.005-0.047)
Selected		2	5/357	0.014 (0.003; 0.029)	NE	(0.012-0.017)	
High risk		NA	NA	NA	NA	NA	
Any risk		13	155/10713	0.026 (0.008; 0.052)	93.5%	(0.000-0.089)	
HIC		6	121/9720	0.040 (0.011; 0.086)	96.5%	(0.005-0.089)	
LMIC		7	34/993	0.015 (0.001; 0.038)	57.0%	(0.000-0.056)	
All studies		9	16/1935	0.004 (0.001; 0.009)	0%	(0.000-0.014)	
Risk based NHCC		3	1/181	0.002 (0.000; 0.020)	0.0%	(0.000-0.009)	
Universal		NA	NA	NA	NA	NA	
Symptom based		3	14/1471	0.009 (0.005; 0.015)	0.0%	(0.009-0.010)	
Not known		3	1/283	0.001 (0.000; 0.011)	0.0%	(0.000-0.014)	
Confirmed Covid-19		9	16/1841	0.003 (0.001; 0.008)	0.0%	(0.000-0.015)	
Admitted		5	9/1104	0.005 (0.001; 0.011)	0.0%	(0.000-0.014)	
Pregnancy related maternal outcomes		All	1	6/617	0.010 (0.004; 0.021)	NE	(0.010-0.010)
	Selected	3	1/214	0.002 (0.000; 0.017)	0.0%	(0.000-0.009)	
	High risk	2	1/137	0.005 (0.000; 0.028)	NE	(0.000-0.014)	
	Any risk	7	15/1798	0.005 (0.001; 0.009)	0.0%	(0.000-0.010)	
	HIC	6	15/1754	0.006 (0.003; 0.011)	0.0%	(0.000-0.014)	
	LMIC	3	1/181	0.002 (0.000; 0.020)	0.0%	(0.000-0.009)	
	Preterm birth <37 weeks	All studies	30	386/1872	0.169 (0.132; 0.209)	71.5%	(0.000-0.594)
		Risk based NHCC	13	66/374	0.162 (0.115; 0.213)	27.4%	(0.037-0.357)
		Universal	6	70/397	0.148 (0.063; 0.255)	75.0%	(0.000-0.375)
		Symptom based	8	196/851	0.165 (0.105; 0.235)	77.4%	(0.000-0.276)
	Not known	3	54/250	0.263 (0.075; 0.510)	92.8%	(0.097-0.594)	

Spontaneous preterm birth	Confirmed Covid-19 Admitted	25	362/1670	0.184 (0.141; 0.230)	74.8%	(0.000-0.594)
	All	18	262/1320	0.157 (0.115; 0.203)	69.7%	(0.000-0.375)
	Selected	2	51/189	0.258 (0.193; 0.327)	NE	(0.125-0.276)
	High risk	10	73/363	0.185 (0.100; 0.286)	77.1%	(0.038-0.594)
	Any risk	1	19/32	0.594 (0.406; 0.763)	NE	(0.594-0.594)
	HIC	29	367/1840	0.160 (0.126; 0.195)	64.8%	(0.000-0.375)
	LMIC	15	308/1431	0.171 (0.119; 0.229)	82.2%	(0.000-0.594)
	All studies	15	78/441	0.165 (0.120; 0.214)	33.9%	(0.037-0.375)
	Risk based NHCC	10	56/870	0.061 (0.034; 0.094)	55.0%	(0.018-0.312)
	Universal	3	8/153	0.049 (0.017; 0.092)	0.0%	(0.036-0.061)
	Symptom based	3	19/116	0.157 (0.060; 0.283)	45.8%	(0.056-0.312)
	Not known	3	27/569	0.046 (0.029; 0.065)	0.0%	(0.018-0.053)
	Confirmed Covid-19 Admitted	1	2/32	0.062 (0.008; 0.208)	NE	(0.062-0.062)
	All	10	53/821	0.062 (0.034; 0.097)	55.1%	(0.018-0.312)
	Caesarean section	Selected	6	46/685	0.072 (0.030; 0.128)	74.7%
High risk		NA	NA	NA	NA	NA
Any risk		4	10/185	0.051 (0.021; 0.091)	0.0%	(0.036-0.062)
HIC		1	2/32	0.062 (0.008; 0.208)	NE	(0.062-0.062)
LMIC		9	54/838	0.062 (0.033; 0.098)	59.9%	(0.018-0.312)
All studies		6	43/701	0.058 (0.029; 0.095)	57.4%	(0.018-0.159)
Risk based NHCC		4	13/169	0.078 (0.015; 0.174)	61.0%	(0.036-0.312)
Universal		28	1060/1933	0.647 (0.565; 0.726)	91.3%	(0.329-1.000)
Symptom based		11	280/347	0.821 (0.740; 0.891)	65.5%	(0.650-1.000)
Not known		6	208/485	0.523 (0.390; 0.654)	81.3%	(0.339-1.000)
Confirmed Covid-19 Admitted		8	474/851	0.539 (0.417; 0.659)	89.4%	(0.333-0.941)
All		3	98/250	0.467 (0.260; 0.680)	89.9%	(0.329-0.750)
Selected		25	909/1753	0.616 (0.537; 0.692)	88.8%	(0.329-1.000)
High risk		17	719/1391	0.613 (0.515; 0.707)	90.9%	(0.329-1.000)
Perinatal outcomes		Any risk	2	90/189	0.475 (0.400; 0.551)	NE
	HIC	9	251/353	0.742 (0.577; 0.880)	89.7%	(0.333-1.000)
	LMIC	1	24/32	0.750 (0.566; 0.885)	NE	(0.750-0.750)
	All studies	27	1036/1901	0.643 (0.559; 0.723)	91.5%	(0.329-1.000)
	Risk based NHCC	15	723/1519	0.478 (0.406; 0.551)	83.8%	(0.329-1.000)
	Universal	13	337/414	0.821 (0.741; 0.890)	70.7%	(0.562-1.000)
	Stillbirth	27	18/2837	0.000 (0.000; 0.001)	0.0%	(0.000-0.022)
	Risk based NHCC	11	0/376	0.000 (0.000; 0.010)	NE	
	Universal	6	2/396	0.000 (0.000; 0.004)	0.0%	(0.000-0.008)

Neonatal death	Symptom based	7	14/1614	0.003 (0.000; 0.007)	0.0%	(0.000-0.022)
	Not known	3	2/451	0.002 (0.000; 0.015)	43.0%	(0.000-0.014)
	Confirmed Covid-19	24	18/2650			
	Admitted	16	10/1599	0.000 (0.000; 0.001)	0.0%	(0.000-0.022)
	All	2	8/663	0.000 (0.000; 0.002)	0.0%	(0.000-0.014)
	Selected	9	0/575	0.008 (0.002; 0.018)	NE	(0.011-0.022)
	High risk	1	0/64	0.000 (0.000; 0.006)	NE	-
	Any risk	1	0/64	0.000 (0.000; 0.056)	NE	(0.000-0.000)
	HIC	26	18/2773	0.000 (0.000; 0.001)	0.0%	(0.000-0.022)
	LMIC	14	18/2389	0.000 (0.000; 0.003)	0.0%	(0.000-0.022)
	All studies	13	0/448	0.000 (0.000; 0.008)	NE	
	Risk based NHCC	26	6/1728	0.000 (0.000; 0.000)	0.0%	(0.000-0.010)
	Universal	11	1/307	0.000 (0.000; 0.009)	0.0%	(0.000-0.010)
	Symptom based	6	0/397	0.000 (0.000; 0.009)	NE	-
	Not known	6	5/770	0.000 (0.000; 0.003)	0.0%	(0.000-0.008)
	Confirmed Covid-19	23	6/1575			
	Admitted	15	4/1188	0.000 (0.000; 0.000)	0.0%	(0.000-0.020)
	All	2	1/200	0.000 (0.000; 0.004)	NE	(0.000-0.005)
	Selected	9	1/340	0.000 (0.000; 0.007)	0.0%	(0.000-0.010)
	High risk	1	0/33	0.000 (0.000; 0.106)	NE	(0.000-0.000)
Any risk	25	6/1695	0.000 (0.000; 0.000)	0.0%	(0.000-0.010)	
HIC	13	5/1353	0.000 (0.000; 0.000)	0.0%	(0.000-0.008)	
LMIC	13	1/375	0.000 (0.000; 0.007)	0.0%	(0.000-0.010)	
All studies	17	368/1348	0.246 (0.143; 0.366)	94.9%	(0.000-1.000)	
Risk based NHCC	6	58/204	0.149 (0.003; 0.409)	92.9%	(0.000-0.700)	
Universal	4	27/140	0.124 (0.024; 0.270)	69.6%	(0.000-0.268)	
Symptom based	4	219/750	0.464 (0.189; 0.750)	98.4%	(0.193-1.000)	
Not known	3	64/254	0.333 (0.118; 0.592)	93.2%	(0.154-0.636)	
Confirmed Covid-19	15	280/1239				
Admitted	9	232/864	0.175 (0.120; 0.239)	82.8%	(0.000-0.636)	
All	1	37/192	0.236 (0.088; 0.423)	96.5%	(0.000-1.000)	
Selected	7	99/292	0.193 (0.139; 0.256)	NE	(0.193-0.193)	
High risk	1	21/33	0.266 (0.096; 0.478)	91.9%	(0.000-0.700)	
Any risk	1	21/33	0.636 (0.451; 0.796)	NE	(0.636-0.636)	
HIC	16	347/1315	0.225 (0.124; 0.344)	94.9%	(0.000-1.000)	
LMIC	10	259/1093	0.226 (0.165; 0.293)	79.9%	(0.000-0.636)	
	7	109/255	0.289 (0.014; 0.694)	97.4%	(0.000-1.000)	

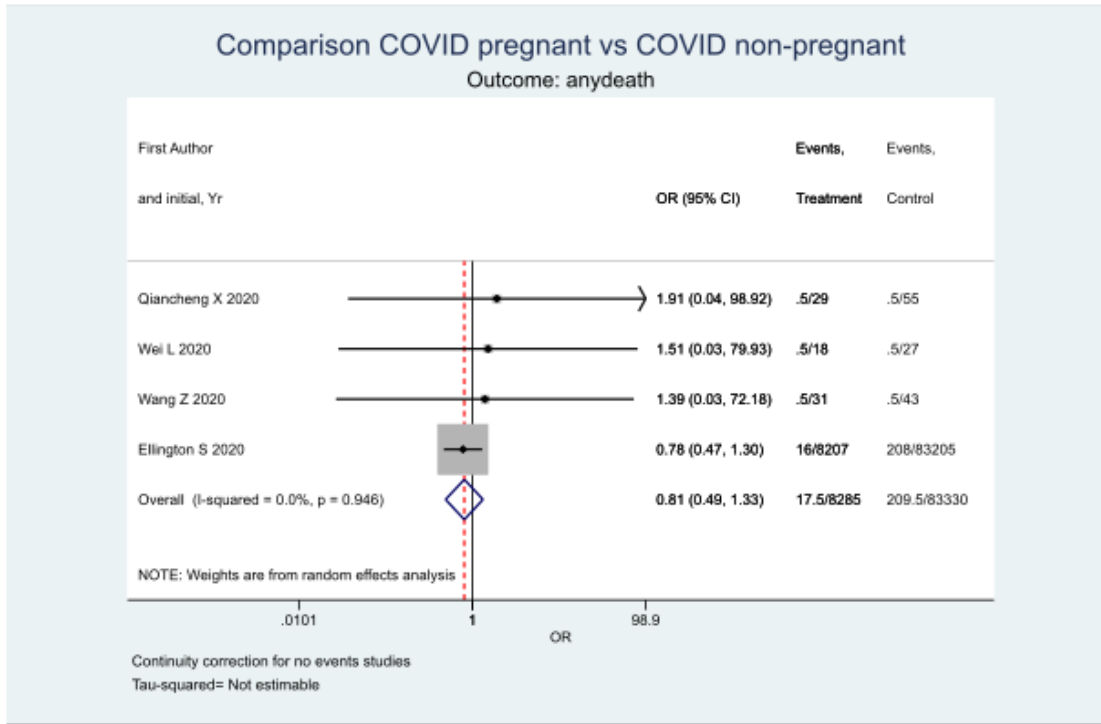
N – Number of pregnant or recently pregnant women for COVID-related outcomes and for preterm birth outcomes; number of women delivered for caesarean section; number of babies born for perinatal outcomes; CI – Confidence Interval; ECMO – Extra corporeal

membrane oxygenation; NHCC National Health Commission China; NA – Not available; NE – Not estimatable; HIC – High Income Countries; LMIC – Low and Middle Income Countries
Risk based NHCC, Universal and Symptom based, Not Known=Sampling frames for detecting COVID-19; Confirmed COVID-19=Analysis restricted to women with laboratory confirmation of COVID-19 only; Admitted, All, Selected = Population types of women in studies; Any risk, High risk = Pregnancy risk status

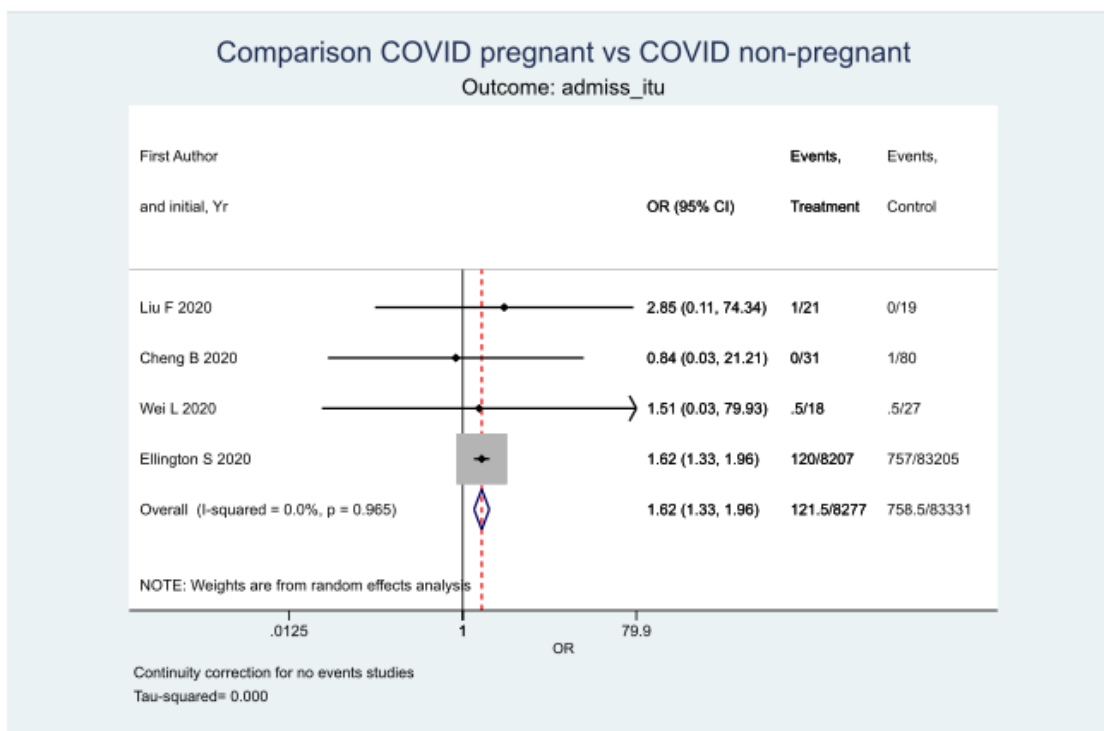
Appendix 9: Study-level forest plots for COVID-19, pregnancy-related maternal and perinatal outcomes

COVID-19 related outcomes

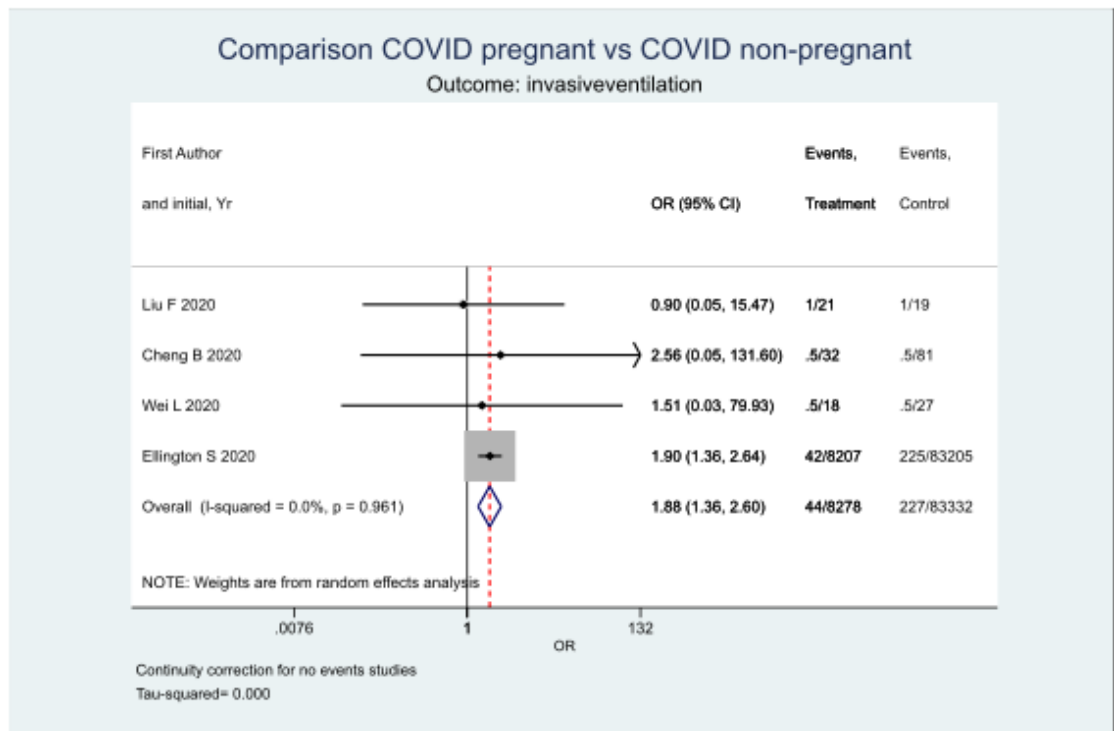
Any Mortality



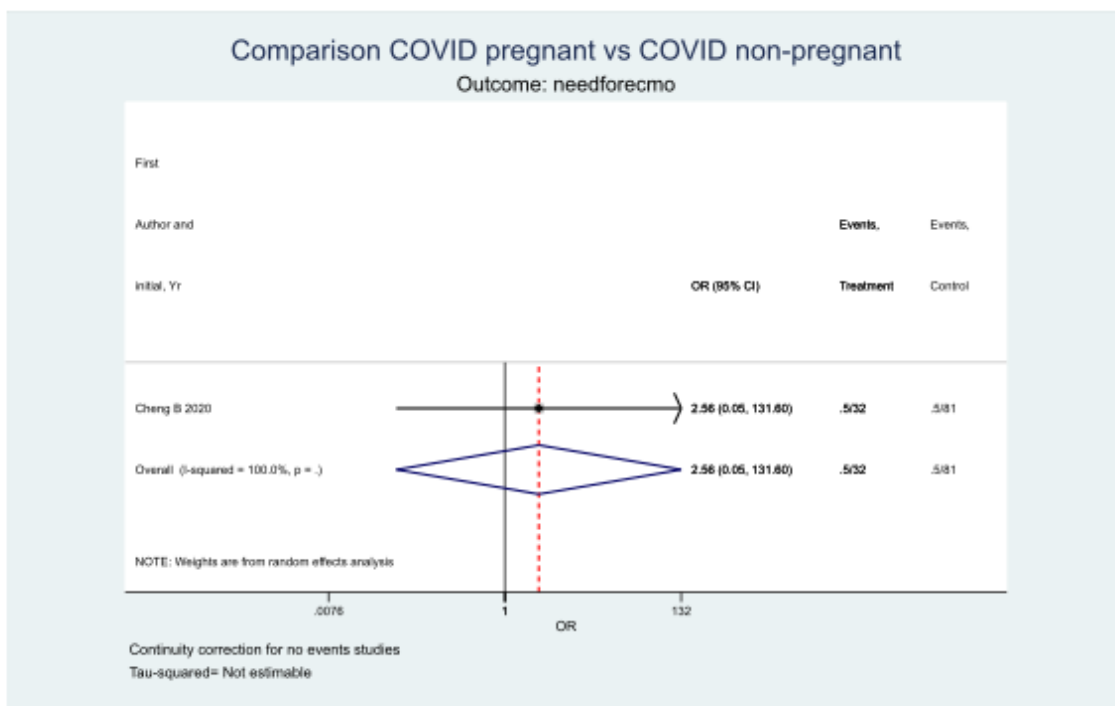
Admission to Intensive Care Unit



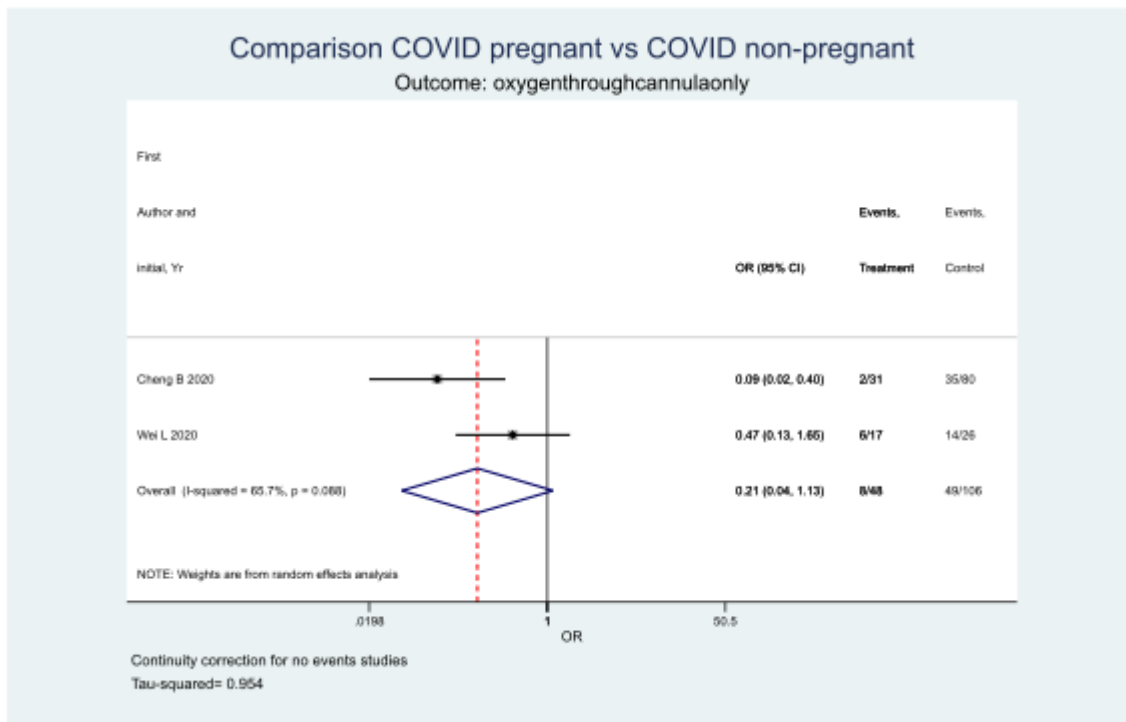
Invasive ventilation



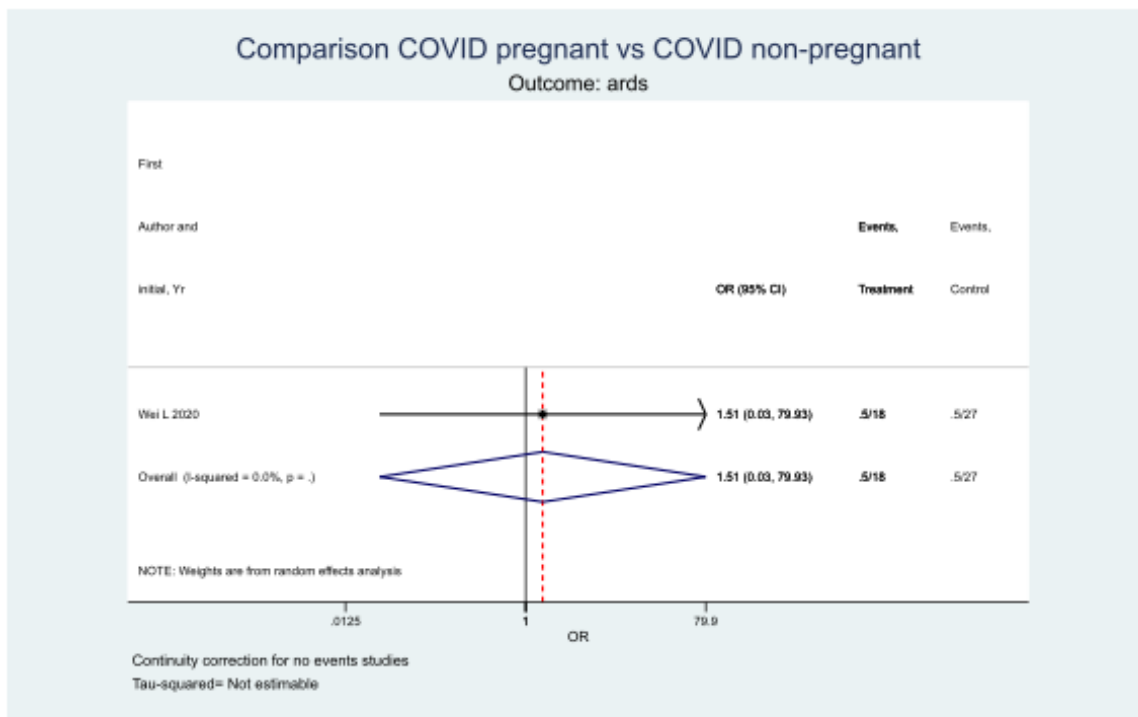
Need for ECMO



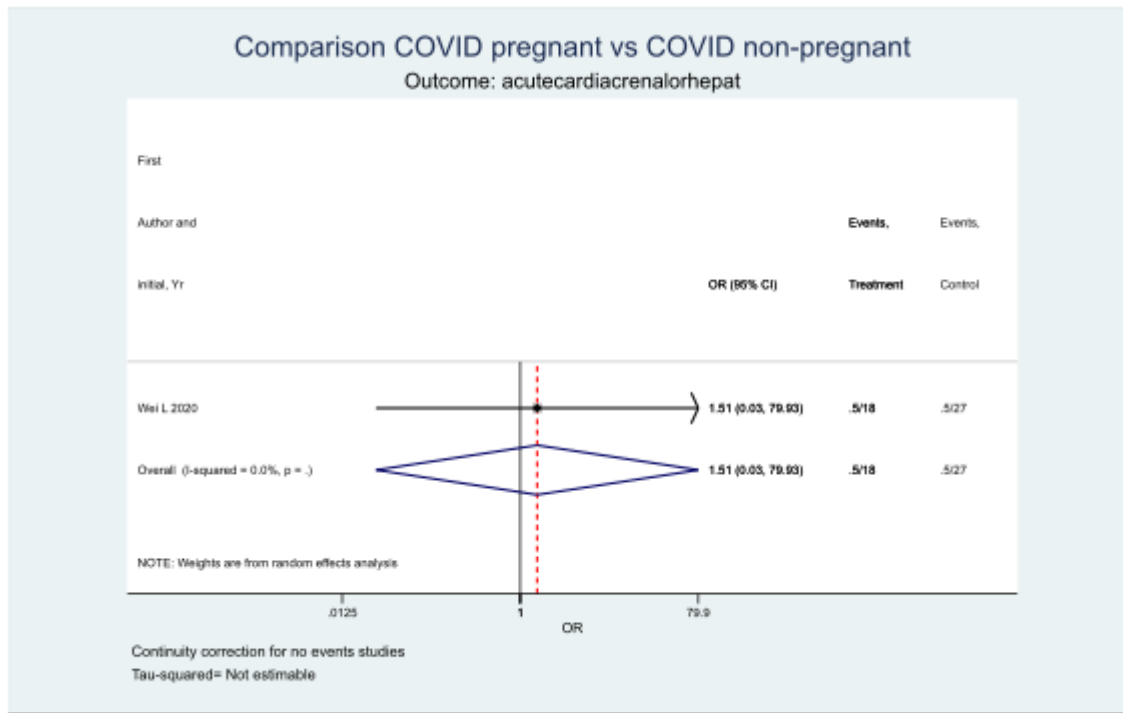
Oxygen through nasal canula



ARDS

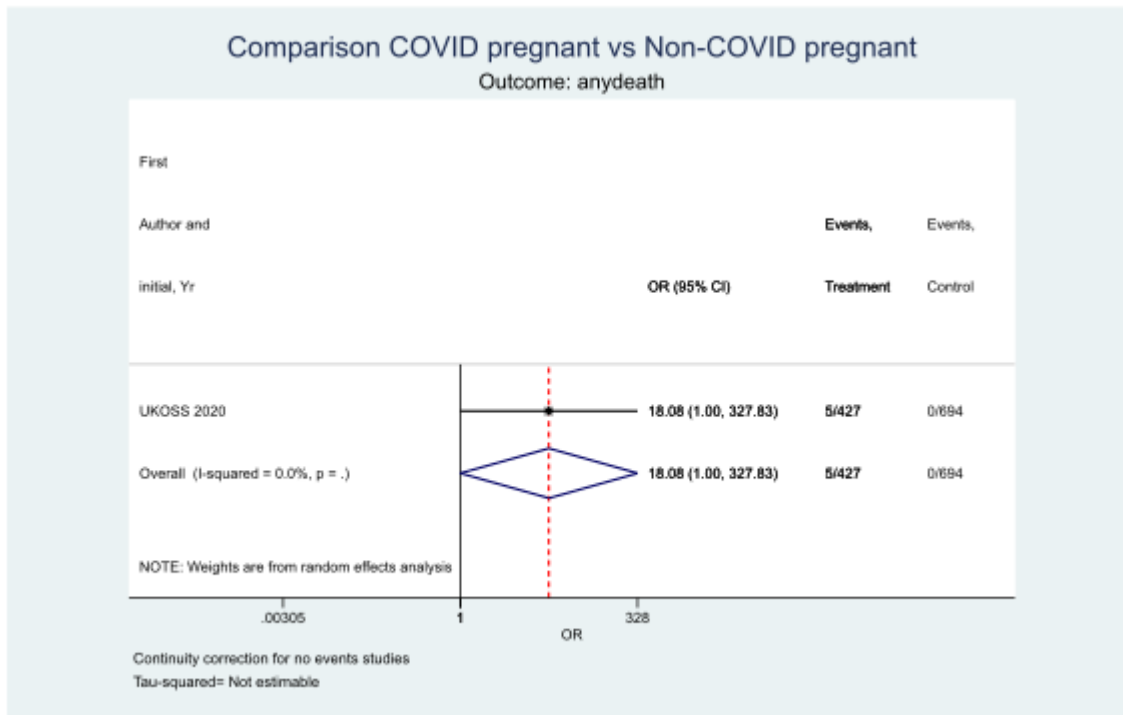


Cardiac/Liver/Renal failure

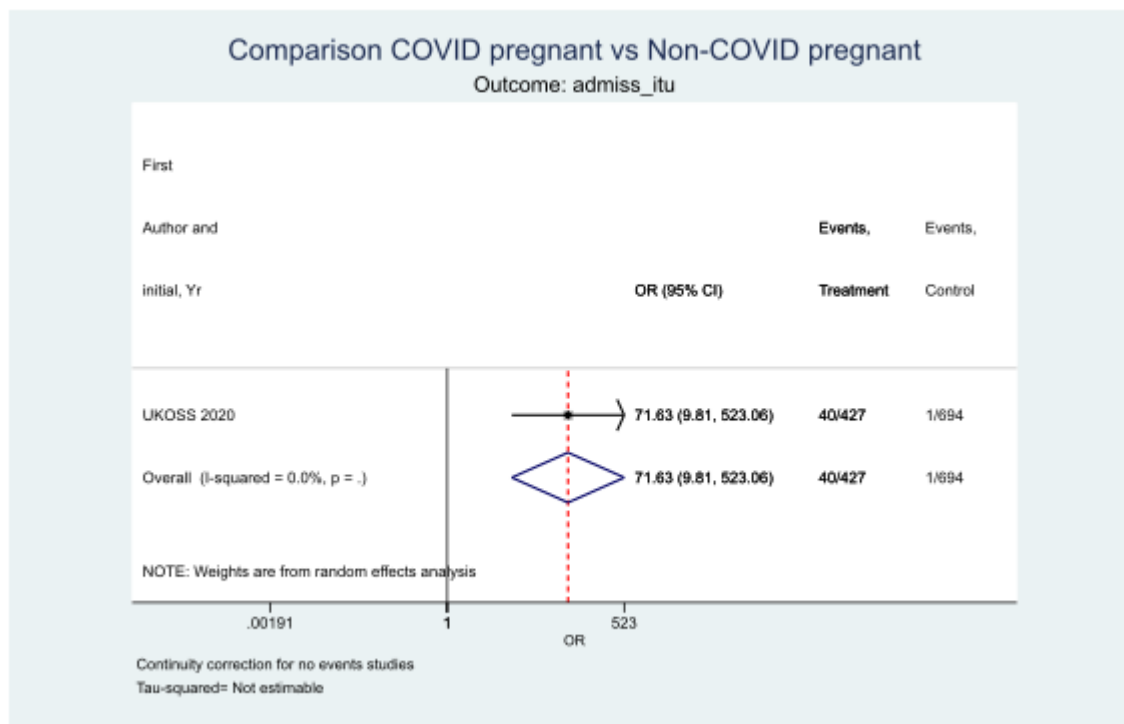


Pregnancy-related maternal outcomes

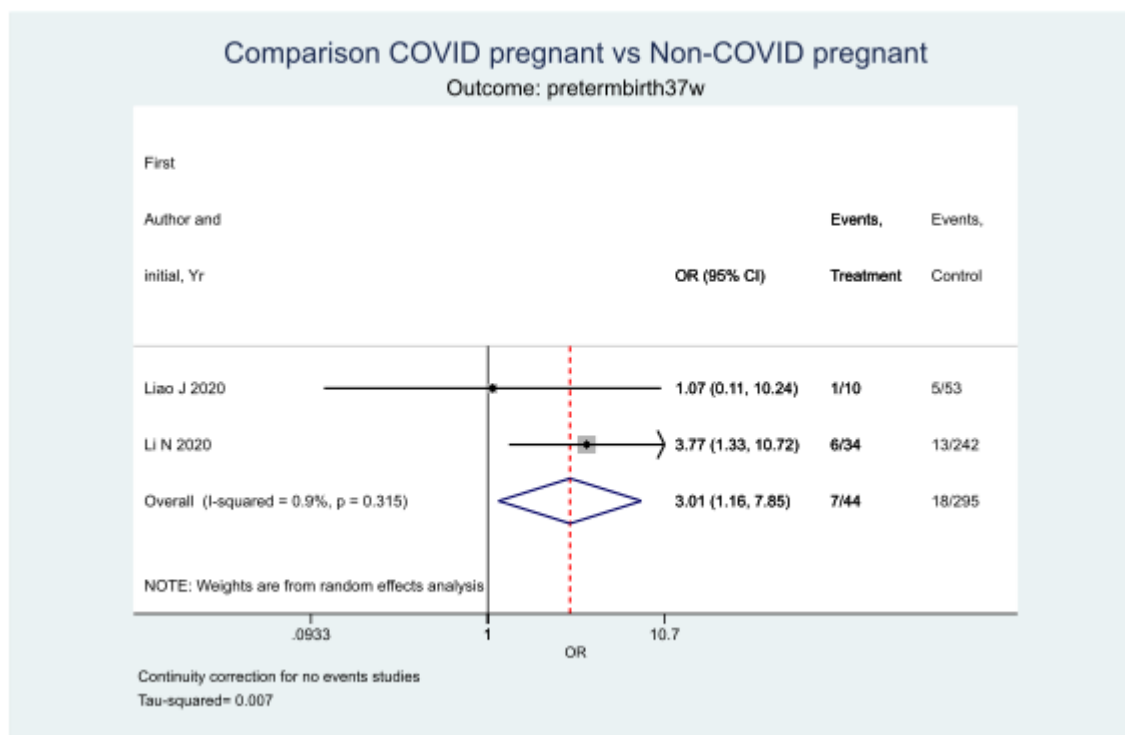
Any mortality



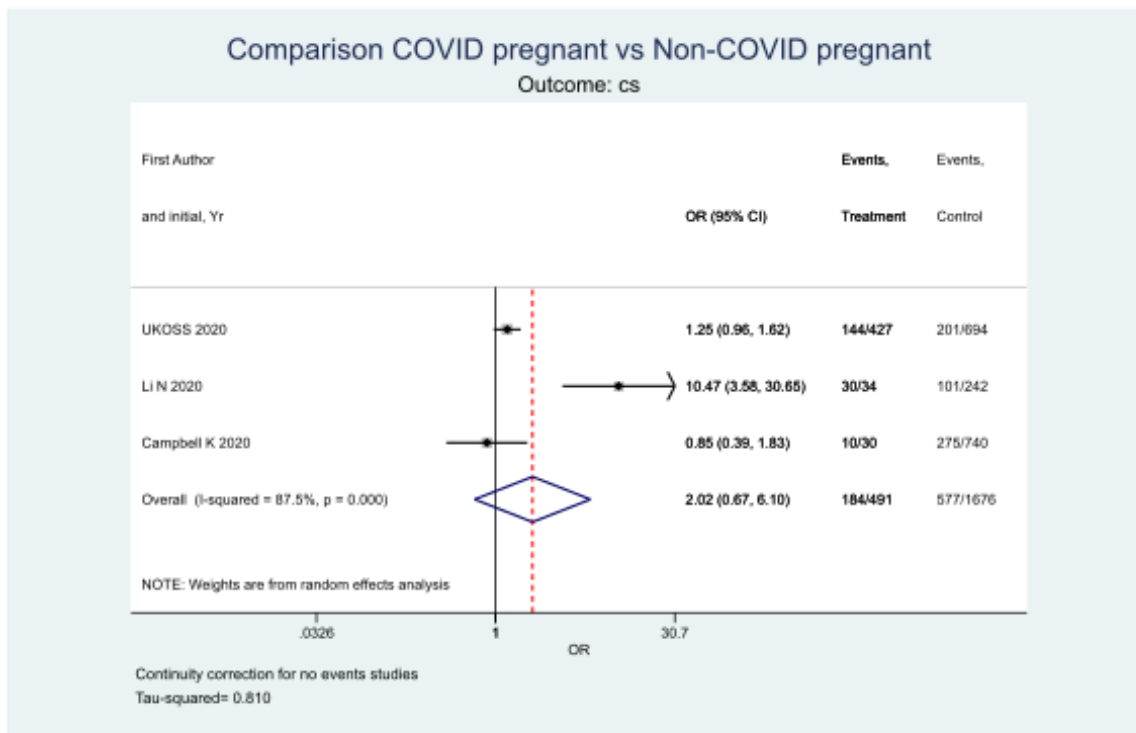
Admission to Intensive Care Unit



Preterm birth <37 weeks

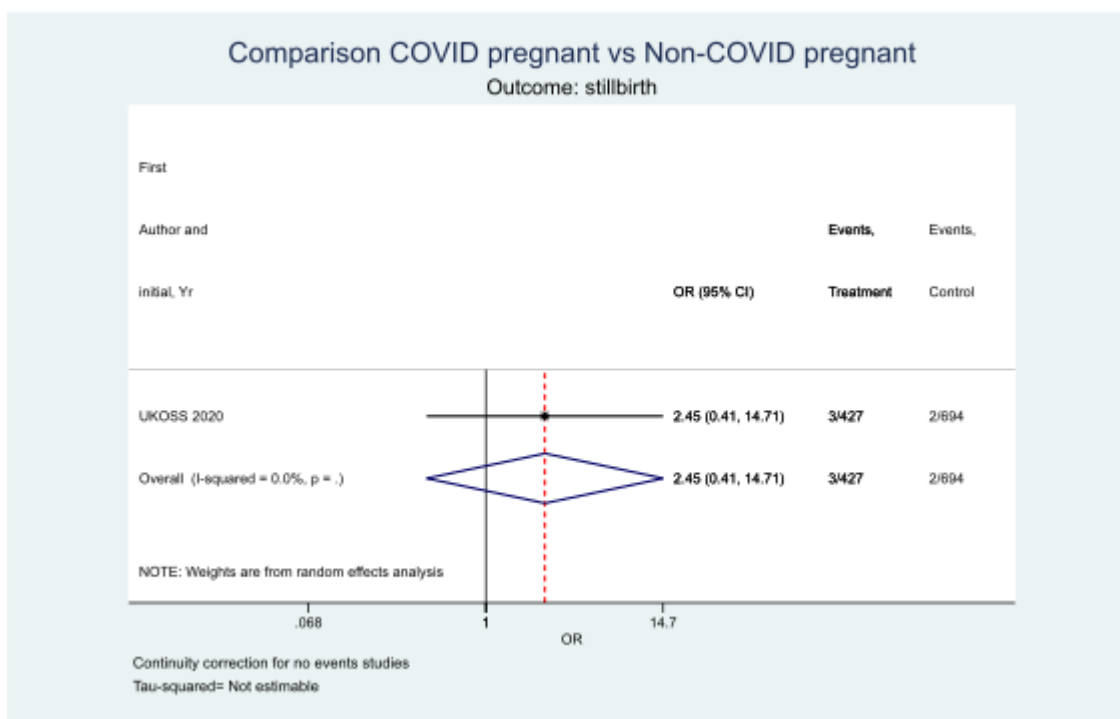


Caesarean section

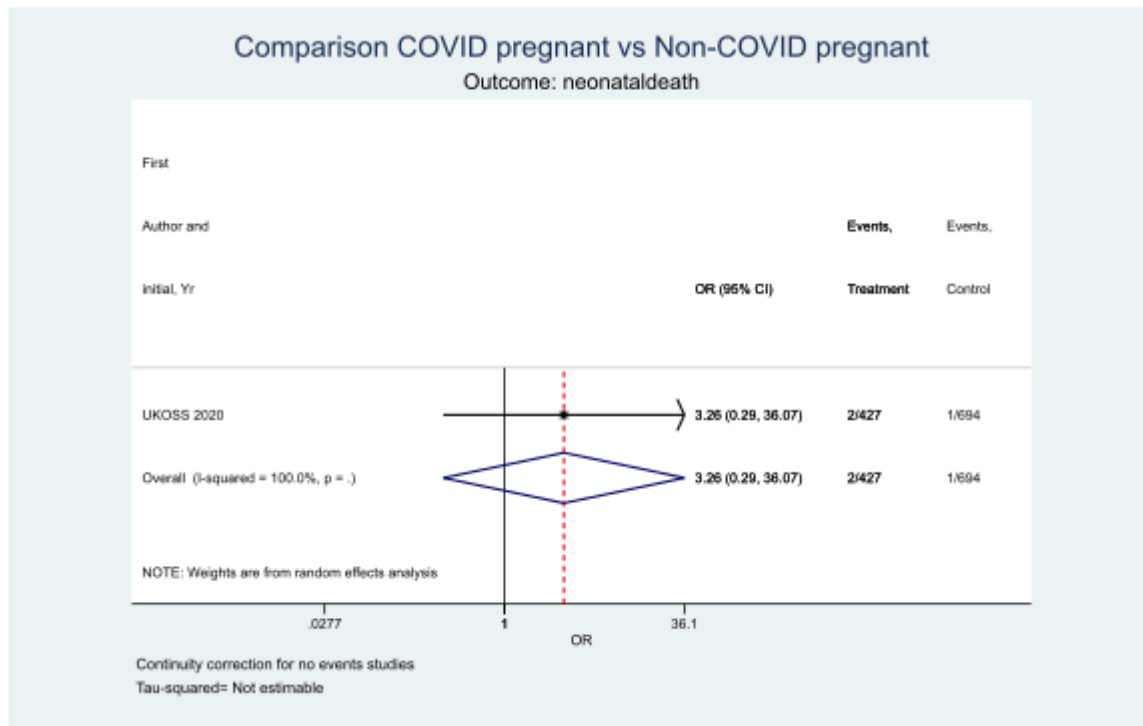


Perinatal Outcomes

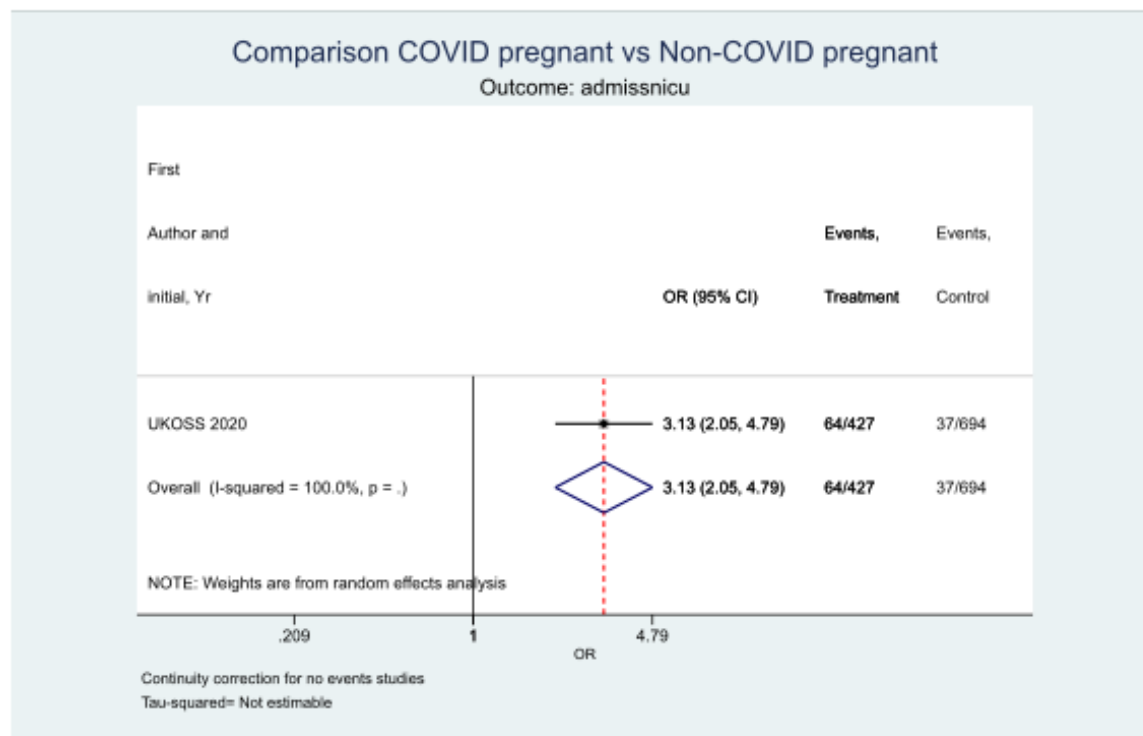
Stillbirth



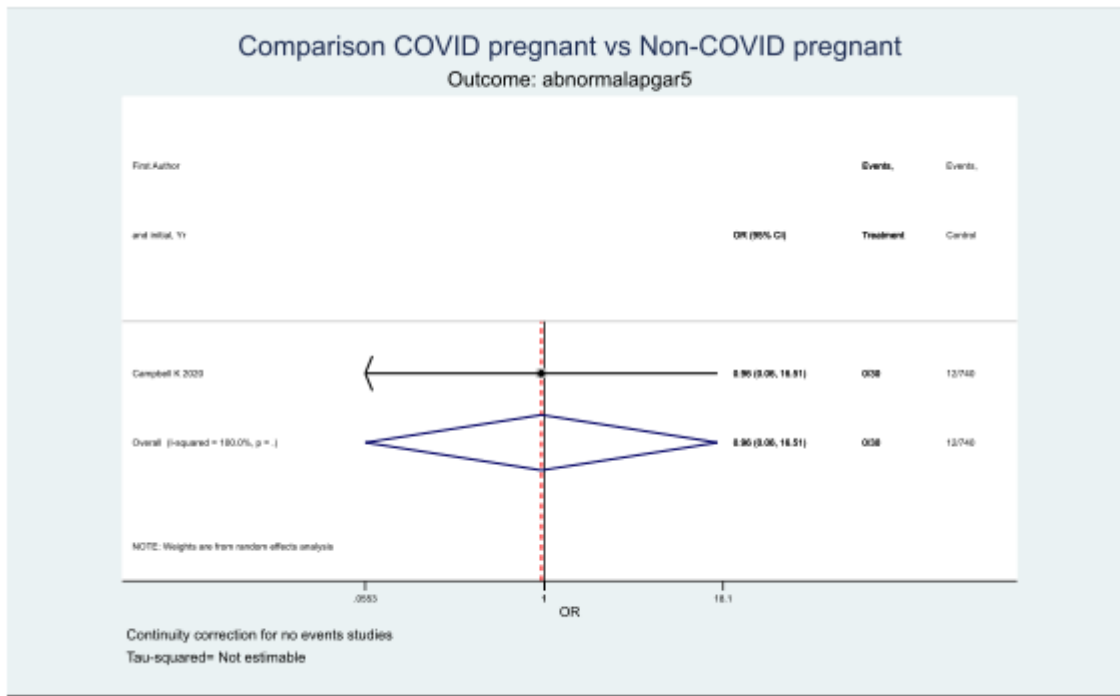
Neonatal death



Admission to neonatal unit



Abnormal Apgar at 5min



Fetal distress

