SPOR Evidence Alliance
Strategy for Patient-Oriented Research
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Strategy for Patient-Oriented Research
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COVID-END
COVID-19 Evidence Network to support Decision-making ... in Canada

Pregnancy related risks associated with COVID-19

A rapid review

Date of Literature Search: 5/17/2021
Date of Submission: 8/20/2021

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Suggested citation: *Ahmed M. Abou-Setta, Otto Lam, Viraj Kasireddy, Nicole Askin, Andrea C. Tricco, George Okoli. Pregnancy related risks associated with COVID-19: a rapid review.*

GEORGE & FAY YEE
Centre for Healthcare Innovation

Funding Acknowledgement(s)

The SPOR Evidence Alliance (SPOR EA) is supported by the Canadian Institutes of Health Research (CIHR) under the Strategy for Patient-Oriented Research (SPOR) initiative.

COVID-19 Evidence Network to support Decision-making (COVID-END) is supported by the Canadian Institutes of Health Research (CIHR) through the Canadian 2019 Novel Coronavirus (COVID-19) Rapid Research Funding opportunity.

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Third-Party Materials

General Disclaimer

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EXECUTIVE SUMMARY

Objectives: *The purpose of this review was to provide evidence on the following:*

Key Question:

1. *Has there been a change in the rate of pregnant persons admitted to the ICU/developing severe COVID outcomes?*

Supporting Questions:

2. *What is the risk of pregnant women acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?*

    a) *Does the risk differ between trimesters?*

    b) *Does the risk differ between COVID-19 genomic variants (e.g., variants of interest, concern or high consequence)?*

    c) *What risk factors related to pregnancy, based on intersecting conditions of social and/or material disadvantage or certain health conditions (e.g., obesity, diabetes, hypertension, chronic respiratory illness), are associated with a higher risk?*

3. *What is the association of physiological changes during pregnancy (e.g., increased risk of thromboembolic events, natural state of immunosuppression) with increased risk of acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?*

Design: *Rapid review*

Method: *We searched four bibliographic databases (Medline, Embase, CovidLit and CochraneCovid). One reviewer selected studies for inclusion, extracted data and assessed the quality of systematic reviews using the AMSTAR tool.*

Results: *From 12760 citations identified through our search, we included 343 studies that met our inclusion criteria (*62 systematic reviews/ clinical practice guidelines, 158 clinical studies, 123 editorials, opinions, commentaries, and narrative reviews*). Numerous systematic reviews have been identified that provided evidence on the key questions and all were considered to be of 'low' to 'critically low' quality. Additional primary studies (n = 158) were identified that were not captured by previous evidence syntheses (mostly cohort studies and case reports/ series).*

In summary, only low summary evidence was available to answer the key and supporting questions:

1. Has there been a change in the rate of pregnant persons admitted to the ICU/developing severe COVID outcomes?

Pregnant persons testing positive for COVID-19 are more likely to be admitted to the ICU and there is some evidence that the rates were higher in the second wave compared with the first wave in the UK. Maternal deaths were shown to be higher during the pandemic compared to pre-pandemic.

2. What is the risk of pregnant women acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?

There is a large variability in the reported event rates for:

- *Developing severe illness (Median = 11.7%; IQR = 6.7%, 18.0%; Range: 1.4% - 22.0%),*
- *Requiring ICU admission (Median = 5.6%; IQR = 3.6%, 10.8%; Range: 1.9% - 29.0%),*
- *Death (Median = 1.0%; IQR = 0.2%, 1.7%; Range: 0.0% - 11.3%).*

a. Does the risk differ between trimesters?

Most COVID-19 diagnoses during pregnancy occurred in the third trimester:

- *1st trimester (Median = 1.8%; IQR = 1.4%, 2.5%; Range: 0.0% - 28.3%),*
- *2nd trimester (Median = 8.2%; IQR = 6.3%, 18.5%; Range: 3.2% - 97.8%),*
- *3rd trimester (Median = 90.2%; IQR = 73.9%, 92.6%; Range: 2.2% - 100.0%).*

b. Does the risk differ between COVID-19 genomic variants (e.g., variants of interest, concern or high consequence)?

Scant data is available on the association of genomic variants and outcomes during pregnancy with only one clinical study identified that reported more ICU admissions in the 2nd wave compared to the 1st wave.

c. What risk factors related to pregnancy, based on intersecting conditions of social and/or material disadvantage or certain health conditions (e.g., obesity, diabetes, hypertension, chronic respiratory illness), are associated with a higher risk?

Most common comorbidities discussed were obesity, diabetes, and maternal hypertension. There is no consensus on whether these conditions may be associated with higher risk of acquiring COVID-19 or having more severe complications.

3. What is the association of physiological changes during pregnancy (e.g., increased risk of thromboembolic events, natural state of immunosuppression) with increased risk of acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?

These complex physiologic adaptive changes (e.g., altered immune response) during pregnancies make pregnant individuals at a high-risk for viral respiratory infections. These changes include a gestational shift in the Th1-Th2 immune response, and a lower WBC count. With regards to hypercoagulability, there is less certainty and consensus if COVID-19 complicated pregnancies are at a higher risk of coagulopathy and thromboembolism.

Conclusion: *While there are many evidence syntheses, their poor quality and lack of including numerous potentially relevant studies, reflects the need for more well-conducted evidence syntheses and prospective cohort studies to answer the questions of relevance to this review.*

Methods

This rapid review was conducted according to World Health Organization guide for rapid reviews,[1] and reported according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines.[2] The primary research questions for this review were as follows:

Key Question:

1. Has there been a change in the rate of pregnant persons admitted to the ICU/developing severe COVID outcomes?

Supporting Questions:

2. What is the risk of pregnant women acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?
   a) Does the risk differ between trimesters?
   b) Does the risk differ between COVID-19 genomic variants (e.g., variants of interest, concern or high consequence)?
   c) What risk factors related to pregnancy, based on intersecting conditions of social and/or material disadvantage or certain health conditions (e.g., obesity, diabetes, hypertension, chronic respiratory illness), are associated with a higher risk?
3. What is the association of physiological changes during pregnancy (e.g., increased risk of thromboembolic events, natural state of immunosuppression) with increased risk of acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?

We utilized a hierarchical approach to the evidence synthesis with a focus on previously conducted systematic reviews (SRs), scoping reviews (ScRs), rapid reviews (RRs), meta-analyses (MAs), and clinical practice guidelines (CPGs)/ policy guidance statements (e.g., from governmental organizations or specialized societies). In addition, we identified primary clinical studies (CS) that were not captured by the previously conducted evidence syntheses. Lastly, we highlighted some key findings from Editorials, Commentaries, Opinions, and Narrative reviews (ECONs) that provided additional insight for the key questions.

Search strategy for identification of studies

A knowledge synthesis librarian prepared the original search for Medline (Ovid) and it was peer-reviewed using the PRESS checklist by a second librarian. The final search was translated to the other databases. We searched general health bibliographic databases [MEDLINE (Ovid) and EMBASE (Ovid), and COVID-19 specific databases Cochrane Covid (Wiley) (https://covid-19.cochrane.org/) and [LitCovid (NLM) (https://www.ncbi.nlm.nih.gov/research/coronavirus/). Searches were conducted from May 17-19, 2021. Each database was searched using an individualized search strategy (Appendix 1). Finally, the reference lists of relevant narrative and systematic reviews and included studies were hand-searched for relevant citations. We performed reference management in EndNote™ (version X9, Thomson Reuters, Carlsbad, CA, USA).

Study selection

We used a two-stage process for study screening and selection using standardized and piloted screening forms. One reviewer screened the titles and abstracts of search results to determine if a citation met the inclusion criteria. Full texts (if available) of all the selected citations were examined by one reviewer.

The population of interest for this review was limited to pregnant individuals irrespective of trimester. Non-pregnant, fetal, and newborn populations were not within the scope of this review. The diagnosis of COVID-19, requirements for hospital or ICU admission were author-defined. We also did not limit to studies that only include women with laboratory-confirmed infections. Lastly, we did not limit studies to any geographic location but limited to English-language publications for feasibility.

Data abstraction and management

One reviewer summarized the findings from included study reports. We tabulated the results, which were presented descriptively. Data management was performed using Microsoft Excel™ 2010 (Excel version 14, Microsoft Corp., Redmond, WA, USA).

Assessment of methodological quality and potential risk of bias

Due to the expedited nature of this rapid review, and that most of the evidence was expected to come from lower quality, single-arm observational studies, editorials, commentaries, opinions and narrative reviews, we did not assess the methodological quality or potential risk of bias of these included studies. However, we did assess the quality of systematic reviews (as defined by Cochrane) using the AMSTAR 2 tool. These assessments were done in duplicate with one reviewer conducting the initial evaluations and a second review double-checking for errors. Discrepancies were resolved through discussion and consensus. We rated the overall confidence in the results of a review as High (Zero or one non-critical weakness), Moderate (More than one non-critical weakness), Low (One critical flaw with or without non-critical weaknesses) or Critically low) following the guidance of the developers of the AMSTAR 2 tool (https://amstar.ca/Amstar-2.php).

Presentation of the results

For each Key Question, we have summarized the relevant evidence below. In addition, more information is presented in the associated Excel Workbook (Evidence Summary.xlsx). For example, to identify additional summaries from the publications that provided evidence to each Key Question,

1) Open the Excel filed named ‘Evidence Summary’;
2) Click on any of three tabs (Relevant SRs from CPGs, Additional Clinical Studies, or Editorials, Comments and Narrative Reviews;
3) Click on the column header for relevant Key Question (KQ);
4) Remove the tick marks for the ‘Blanks’ box leaving only the ‘Yes’ box checked.
5) This will filter the worksheet displaying only the relevant publications.

Instructions are also available in the first worksheet in the Excel Workbook titled: “Instructions”.

Results

From 12,760 citations identified through the search strategy and hand-searching, 342 studies met the inclusion criteria: 61 SRs,[3-63] one CPG,[64] 157 CS,[65-221] 123 ECONs[222-344] (Figure 1). The included studies are summarized in the associated Excel Workbook (Evidence Summary.xlsx) and is divided based on key question and evidence source. All the systematic reviews were rated as 'low' to very 'critically low' quality studies.

Key Question:

1. **Has there been a change in the rate of pregnant persons admitted to the ICU/developing severe COVID outcomes?**

   We identified three SRs,[8, 19, 58] one MA[248] and one additional CS[210] that was not captured by the SRs. The SRs were all rated as a critically low overall confidence in the results. Pregnant persons testing positive for COVID-19 are more likely to be admitted to the ICU. *Huntley et al., 2021*[19] reported that pregnant persons testing positive for COVID-19 were statistically significantly more likely to be admitted to the ICU (1.9% vs. 0.1%). Similarly, *Wei et al., 2021*[58] reported that the odds ratio of ICU admission was 4.78 (95% CI 2.03 to 11.25) for pregnant women with COVID-positive compared with COVID-negative pregnant women. Even so, a cumulative MA of ICU admission by *Dubey et al, 2021*[248] indicated no change in ICU admissions from May to August 2020.

   There is little evidence from the identified studies that directly compared maternal ICU admissions at different time points in the pandemic. Albeit there is some evidence that the rates were higher in the second wave compared with the first wave in the UK. The study by *Kadiwar et al., 2021*[210] reported that ICU admission rates were higher in the second wave (62 admissions – 6 requiring extracorporeal membrane oxygenation (ECMO)) compared with the first wave (34 admissions – 1 requiring ECMO).

   With regards to severe COVID outcomes, maternal deaths were shown to be higher during the pandemic compared to pre-pandemic. *Chmielewska et al., 2021*[8] highlighted a significant increase in maternal deaths during the pandemic (530/ 1237018) compared to pre-pandemic (698/ 2224859) [OR 1.37 (95% CI 1.22 to 1.53)]. *Huntley et al., 2021*[19] also reported that pregnant persons testing positive for COVID-19 were non-significantly more likely to die [0.5% (3/ 559) vs. 0.3% (8/ 3155)].

Supporting Questions:

2. **What is the risk of pregnant women acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?**

   We identified 53 SRs,[3, 5-7, 9-23, 25-38, 40-48, 50-56, 59, 61-63] one CPG,[64] 147 additional CSs,[65-105, 107-118, 120-128, 130-133, 135-166, 168-170, 172-179, 181-188, 190-197, 200-209, 211-221, 345] and 102 ECONs.[222, 223, 225-227, 229-237, 239, 240, 242, 243, 245-257, 260, 261, 263-268, 270, 272, 274-276, 278-292, 294-299, 301-311, 313-321, 323-328, 330, 331, 333, 336-339, 341-344] The SRs were all rated as a low[6, 10, 23, 28, 37, 54, 55, 59, 61] to critically low[3, 5, 7, 9, 11-22, 25-27, 29-36, 38, 40-48, 50-53, 56, 62, 63] overall

confidence in the results. Papanou et al., 2021[43] conducted an overview of 39 systematic reviews. They reported maternal ICU admission and mechanical ventilation rates of 3 to 28.5% and 1.4 to 12%, respectively; the maternal mortality rate was <2%.

Evidence from the remaining SRs identified by this review, supported by evidence from the additional CSs and ECONs, revealed that there is a large variability in the reported event rates:

- Developing severe illness[7, 9, 10, 36, 44, 45, 59]
  (Median = 11.7%; IQR = 6.7%, 18.0%; Range: 1.4% to 22.0%),
- Requiring ICU admission[3, 5, 6, 9, 10, 12-17, 19, 23, 28, 29, 34, 36-38, 42, 44, 46, 47, 50, 52, 54, 55, 61-63]
  (Median = 5.6%; IQR = 3.6%, 10.8%; Range: 1.9% to 29.0%),
- Death[3, 5, 6, 9, 10, 12-17, 19, 21, 22, 25, 26, 28, 29, 31-35, 37, 38, 40, 41, 44-48, 50, 53-56, 61-63]
  (Median = 1.0%; IQR = 0.2%, 1.7%; Range: 0.0% to 11.3%).

a. Does the risk differ between trimesters?

We identified 29 SRs,[3, 6, 7, 11, 14-18, 21, 25-28, 30, 31, 33-38, 40, 43-45, 50, 52, 55] one CPG,[64] 61 additional CSs,[65, 67-69, 71, 82, 83, 89, 92, 94, 95, 97-99, 105, 106, 109, 112-115, 118-120, 129, 131, 132, 134, 136-138, 142-144, 147, 153, 155, 157, 158, 161, 162, 164, 166, 168-171, 180, 184, 186-188, 193, 196, 198, 199, 202, 204, 208, 212, 221] and 15 ECONs.[234, 239, 248, 250, 252, 264, 281, 286, 288, 303, 306, 316, 321, 327, 334] The SRs were all rated as a low[6, 28, 37, 55] to critically low[3, 7, 11, 14-18, 21, 25-27, 30, 31, 33-36, 38, 40, 43-45, 50, 52] overall confidence in the results. Evidence from the SRs, supported by evidence from the additional CSs and ECONs, revealed that most COVID-19 diagnoses during pregnancy occurred in the third trimester:

- 1st trimester[3, 14, 17, 33, 34, 38, 44, 50, 52, 55, 64]
  (Median = 1.8%; IQR = 1.4%, 2.5%; Range: 0.0% to 28.3%),
- 2nd trimester[3, 17, 27, 31, 33, 34, 38, 44, 50, 52, 55]
  (Median = 8.2%; IQR = 6.3%, 18.5%; Range: 3.2% to 97.8%),
- 3rd trimester[3, 6, 7, 11, 14-17, 21, 25-28, 30, 31, 33-38, 40, 44, 50, 52, 55]
  (Median = 90.2%; IQR = 73.9%, 92.6%; Range: 2.2% to 100.0%).

b. Does the risk differ between COVID-19 genomic variants (e.g., variants of interest, concern or high consequence)?

We identified one CS discussing the potential association of COVID-19 severity in pregnancy and clinical variants. In the study by *Kadiwar et al., 2021*,[210] they reported that while in the 1st wave in the UK, 34 women were admitted to the ICU and one required ECMO, during the 2nd wave the corresponding numbers were 62 and six, respectively.

c. What risk factors related to pregnancy, based on intersecting conditions of social and/or material disadvantage or certain health conditions (e.g., obesity, diabetes, hypertension, chronic respiratory illness), are associated with a higher risk?

We identified 13 SRs,[8, 18, 19, 22, 25, 26, 28, 30, 34, 46, 51, 58, 60] 44 additional CSs,[65, 82, 85, 90, 94, 96, 101, 118, 119, 122-124, 126, 128, 129, 131, 133, 137-139, 141, 144, 146, 148, 151, 152, 154, 158, 159, 163, 164, 175, 179, 189, 190, 192, 195-197, 201, 207-209, 212] and 27 ECONs.[222, 224, 225, 229, 233, 234, 242, 248, 250, 258, 260, 264-266, 268, 276, 277, 281, 283, 284, 292, 304, 315, 316, 321, 335, 338] The SRs were all rated as a low[28, 60] to critically low[8, 18, 19, 22, 25, 26, 30, 34, 46, 51, 58] overall confidence in the results. The most common comorbidities that were discussed were obesity, diabetes, and maternal hypertension. Having said that, there was no consensus on whether these conditions may be associated with higher risk of acquiring COVID-19 or having more severe complications.

3. What is the association of physiological changes during pregnancy (e.g., increased risk of thromboembolic events, natural state of immunosuppression) with increased risk of acquiring COVID-19, developing severe illness, being hospitalized, requiring ICU admission or death?

We identified 9 SRs,[4, 15, 20, 24, 39, 48, 49, 55, 57] one CPG,[64] 7 additional CSs,[125, 167, 178, 179, 190, 198, 220] and 61 ECONs.[224-226, 228, 233, 234, 236, 238, 241, 242, 244, 247, 250, 252-256, 258-260, 262, 267-269, 271-274, 276, 277, 279-281, 283, 286-289, 291, 293, 294, 296-298, 300, 302, 305, 307, 308, 311, 312, 318, 322, 329, 332, 337, 340, 341, 343, 344] The SRs were all rated as a low[55] to critically low[4, 15, 20, 24, 39, 48, 49, 57] overall confidence in the results. Evidence from the SRs, supported by evidence from the additional CSs and ECONs, emphasized that the physiological changes during pregnancy change throughout the trimesters to suit the needs of the growing fetus. These complex adaptive changes (e.g., altered immune response), make pregnancies at a high-risk for viral respiratory infections. These changes include a gestational shift in the Th1-Th2 immune response, and a lower WBC count.

With regards to hypercoagulability, there is less certainty and consensus if COVID-19 complicated pregnancies are at a higher risk of coagulopathy and thromboembolism.

Conclusions

Overall, the quality of the evidence from previous evidence synthesis is weak and decision-making should consider looking closely at higher-quality primary studies (e.g., prospective, longitudinal studies). Large, prospective cohort studies of pregnant individuals should be continued to provide further evidence on the risks and harms of COVID-19 infections during pregnancy.

References

1. Tricco AC, Langlois E, Straus SE, World Health O. Rapid reviews to strengthen health policy and systems: a practical guide: World Health Organization; 2017.
2. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Annals of internal medicine* 2009; **151**(4): W65-94.
3. Amaral WND, Moraes CL, Rodrigues A, Noll M, Arruda JT, Mendonca CR. Maternal Coronavirus Infections and Neonates Born to Mothers with SARS-CoV-2: A Systematic Review. *Healthcare* 2020; **8**(4).
4. Areia AL, Mota-Pinto A. Can immunity during pregnancy influence SARS-CoV-2 infection? - A systematic review. *J Reprod Immunol* 2020; **142**: 103215.
5. Bellos I, Pandita A, Panza R. Maternal and perinatal outcomes in pregnant women infected by SARS-CoV-2: A meta-analysis. *European journal of obstetrics, gynecology, and reproductive biology* 2021; **256**: 194-204.
6. Capobianco G, Saderi L, Aliberti S, et al. COVID-19 in pregnant women: A systematic review and meta-analysis. *European journal of obstetrics, gynecology, and reproductive biology* 2020; **252**: 543-58.
7. Chi J, Gong W, Gao Q. Clinical characteristics and outcomes of pregnant women with COVID-19 and the risk of vertical transmission: a systematic review. *Archives of gynecology and obstetrics* 2021; **303**(2): 337-45.
8. Chmielewska B, Barratt I, Townsend R, et al. Effects of the COVID-19 pandemic on maternal and perinatal outcomes: a systematic review and meta-analysis. *The Lancet Global health* 2021; **9**(6): e759-e72.
9. Debrabandere ML, Farabaugh DC, Giordano C. A Review on Mode of Delivery during COVID-19 between December 2019 and April 2020. *American journal of perinatology* 2021; **38**(4): 332-41.
10. Huntley BJF, Huntley ES, Di Mascio D, Chen T, Berghella V, Chauhan SP. Rates of Maternal and Perinatal Mortality and Vertical Transmission in Pregnancies Complicated by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Co-V-2) Infection: A Systematic Review. *Obstetrics and gynecology* 2020; **136**(2): 303-12.
11. Della Gatta AN, Rizzo R, Pilu G, Simonazzi G. Coronavirus disease 2019 during pregnancy: a systematic review of reported cases. *American journal of obstetrics and gynecology* 2020; **223**(1): 36-41.
12. Di Toro F, Gjoka M, Di Lorenzo G, et al. Impact of COVID-19 on maternal and neonatal outcomes: a systematic review and meta-analysis. *Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases* 2021; **27**(1): 36-46.
13. Diriba K, Awulachew E, Getu E. The effect of coronavirus infection (SARS-CoV-2, MERS-CoV, and SARS-CoV) during pregnancy and the possibility of vertical maternal-fetal transmission: a systematic review and meta-analysis. *European journal of medical research* 2020; **25**(1): 39.
14. Elshafeey F, Magdi R, Hindi N, et al. A systematic scoping review of COVID-19 during pregnancy and childbirth. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **150**(1): 47-52.
15. Figueiro-Filho EA, Yudin M, Farine D. COVID-19 during pregnancy: an overview of maternal characteristics, clinical symptoms, maternal and neonatal outcomes of 10,996 cases described in 15 countries. *Journal of perinatal medicine* 2020; **48**(9): 900-11.
16. Galang RR, Chang K, Strid P, et al. Severe Coronavirus Infections in Pregnancy: A Systematic Review. *Obstetrics and gynecology* 2020; **136**(2): 262-72.

17. Han Y, Ma H, Suo M, et al. Clinical manifestation, outcomes in pregnant women with COVID-19 and the possibility of vertical transmission: a systematic review of the current data. *Journal of perinatal medicine* 2020; **48**(9): 912-24.
18. Hessami K, Homayoon N, Hashemi A, Vafaei H, Kasraeian M, Asadi N. COVID-19 and maternal, fetal and neonatal mortality: a systematic review. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-6.
19. Huntley BJF, Mulder IA, Di Mascio D, et al. Adverse Pregnancy Outcomes Among Individuals With and Without Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2): A Systematic Review and Meta-analysis. *Obstetrics and gynecology* 2021; **137**(4): 585-96.
20. Irani M, Pakfetrat A, Mask MK. Novel coronavirus disease 2019 and perinatal outcomes. *J Educ Health Promot* 2020; **9**: 78.
21. Islam MM, Poly TN, Walther BA, et al. Clinical Characteristics and Neonatal Outcomes of Pregnant Patients With COVID-19: A Systematic Review. *Front Med (Lausanne)* 2020; **7**: 573468.
22. Jafari M, Pormohammad A, Sheikh Neshin SA, et al. Clinical characteristics and outcomes of pregnant women with COVID-19 and comparison with control patients: A systematic review and meta-analysis. *Rev Med Virol* 2021: e2208.
23. Juan J, Gil MM, Rong Z, Zhang Y, Yang H, Poon LC. Effect of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcome: systematic review. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2020; **56**(1): 15-27.
24. Kadir RA, Kobayashi T, Iba T, et al. COVID-19 coagulopathy in pregnancy: Critical review, preliminary recommendations, and ISTH registry-Communication from the ISTH SSC for Women's Health. *Journal of thrombosis and haemostasis : JTH* 2020; **18**(11): 3086-98.
25. Karimi L, Makvandi S, Vahedian-Azimi A, Sathyapalan T, Sahebkar A. Effect of COVID-19 on Mortality of Pregnant and Postpartum Women: A Systematic Review and Meta-Analysis. *Journal of pregnancy* 2021; **2021**: 8870129.
26. Karimi L, Vahedian-Azimi A, Makvandi S, Sahebkar A. A Systematic Review of 571 Pregnancies Affected by COVID-19. *Advances in experimental medicine and biology* 2021; **1321**: 287-98.
27. Kasraeian M, Zare M, Vafaei H, et al. COVID-19 pneumonia and pregnancy; a systematic review and meta-analysis. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-8.
28. Khalil A, Kalafat E, Benlioglu C, et al. SARS-CoV-2 infection in pregnancy: A systematic review and meta-analysis of clinical features and pregnancy outcomes. *EClinicalMedicine* 2020; **25**: 100446.
29. Kim CNH, Hutcheon J, van Schalkwyk J, Marquette G. Maternal outcome of pregnant women admitted to intensive care units for coronavirus disease 2019. *American journal of obstetrics and gynecology* 2020; **223**(5): 773-4.
30. La Verde M, Riemma G, Torella M, et al. Maternal death related to COVID-19: A systematic review and meta-analysis focused on maternal co-morbidities and clinical characteristics. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **154**(2): 212-9.
31. Lopes de Sousa AF, Carvalho HEF, Oliveira LB, et al. Effects of COVID-19 Infection during Pregnancy and Neonatal Prognosis: What Is the Evidence? *International journal of environmental research and public health* 2020; **17**(11).
32. Makvandi S, Ashtari S, Vahedian-Azimi A. Manifestations of COVID-19 in pregnant women with focus on gastrointestinal symptoms: a systematic review. *Gastroenterology and hepatology from bed to bench* 2020; **13**(4): 305-12.

33. Makvandi S, Mahdavian M, Kazemi-Nia G, et al. The 2019 Novel Coronavirus Disease in Pregnancy: A Systematic Review. *Advances in experimental medicine and biology* 2021; **1321**: 299-307.
34. Mark EG, McAleese S, Golden WC, et al. Coronavirus Disease 2019 in Pregnancy and Outcomes Among Pregnant Women and Neonates: A Literature Review. *The Pediatric infectious disease journal* 2021; **40**(5): 473-8.
35. Matar R, Alrahmani L, Monzer N, et al. Clinical Presentation and Outcomes of Pregnant Women With Coronavirus Disease 2019: A Systematic Review and Meta-analysis. *Clin Infect Dis* 2021; **72**(3): 521-33.
36. Mirbeyk M, Saghazadeh A, Rezaei N. A systematic review of pregnant women with COVID-19 and their neonates. *Archives of gynecology and obstetrics* 2021; **304**(1): 5-38.
37. Muhidin S, Behboodi Moghadam Z, Vizheh M. Analysis of Maternal Coronavirus Infections and Neonates Born to Mothers with 2019-nCoV; a Systematic Review. *Archives of academic emergency medicine* 2020; **8**(1): e49.
38. Novoa RH, Quintana W, Llancari P, Urbina-Quispe K, Guevara-Rios E, Ventura W. Maternal clinical characteristics and perinatal outcomes among pregnant women with coronavirus disease 2019. A systematic review. *Travel medicine and infectious disease* 2021; **39**: 101919.
39. Oliveira LVd, Silva CRACd, Lopes LP, Agra IKR. Current evidence of SARS-CoV-2 vertical transmission: an integrative review. *Revista da Associacao Medica Brasileira* 2020; **66Suppl 2**(Suppl 2): 130-5.
40. Oltean I, Tran J, Lawrence S, et al. Impact of SARS-CoV-2 on the clinical outcomes and placental pathology of pregnant women and their infants: A systematic review. *Heliyon* 2021; **7**(3): e06393.
41. Oshay RR, Chen MYC, Fields BKK, et al. COVID-19 in pregnancy: a systematic review of chest CT findings and associated clinical features in 427 patients. *Clinical imaging* 2021; **75**: 75-82.
42. Panahi L, Amiri M, Pouy S. Risks of Novel Coronavirus Disease (COVID-19) in Pregnancy; a Narrative Review. *Archives of academic emergency medicine* 2020; **8**(1): e34.
43. Papapanou M, Papaioannou M, Petta A, et al. Maternal and Neonatal Characteristics and Outcomes of COVID-19 in Pregnancy: An Overview of Systematic Reviews. *International journal of environmental research and public health* 2021; **18**(2).
44. Pastick KA, Nicol MR, Smyth E, et al. A Systematic Review of Treatment and Outcomes of Pregnant Women With COVID-19-A Call for Clinical Trials. *Open forum infectious diseases* 2020; **7**(9): ofaa350.
45. Pettirosso E, Giles M, Cole S, Rees M. COVID-19 and pregnancy: A review of clinical characteristics, obstetric outcomes and vertical transmission. *The Australian & New Zealand journal of obstetrics & gynaecology* 2020; **60**(5): 640-59.
46. Reichelt AJ, Hirakata VN, Genro VK, Oppermann MLR. A snapshot of the prevalence of endocrine disorders in pregnancies complicated by COVID-19: A narrative review with meta-analysis. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **154**(2): 204-11.
47. Rodrigues C, Baia I, Domingues R, Barros H. Pregnancy and Breastfeeding During COVID-19 Pandemic: A Systematic Review of Published Pregnancy Cases. *Frontiers in public health* 2020; **8**: 558144.
48. Servante J, Swallow G, Thornton JG, et al. Haemostatic and thrombo-embolic complications in pregnant women with COVID-19: a systematic review and critical analysis. *BMC pregnancy and childbirth* 2021; **21**(1): 108.
49. Silva CRACD, Oliveira LVD, Lopes LP, Santos WAGD, Agra IKR. Immunological aspects of coronavirus disease during pregnancy: an integrative review. *Revista da Associacao Medica Brasileira* 2020; **66**(5): 696-700.
50. Smith V, Seo D, Warty R, et al. Maternal and neonatal outcomes associated with COVID-19 infection: A systematic review. *PloS one* 2020; **15**(6): e0234187.

51. Soheili M, Moradi G, Baradaran HR, Soheili M, Mokhtari MM, Moradi Y. Clinical manifestation and maternal complications and neonatal outcomes in pregnant women with COVID-19: a comprehensive evidence synthesis and meta-analysis. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-14.
52. Teles Abrao Trad A, Ibirogba ER, Elrefaei A, et al. Complications and outcomes of SARS-CoV-2 in pregnancy: where and what is the evidence? *Hypertens Pregnancy* 2020; **39**(3): 361-9.
53. Thomas P, Alexander PE, Ahmed U, et al. Vertical transmission risk of SARS-CoV-2 infection in the third trimester: a systematic scoping review. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-8.
54. Trippella G, Ciarcia M, Ferrari M, et al. COVID-19 in Pregnant Women and Neonates: A Systematic Review of the Literature with Quality Assessment of the Studies. *Pathogens* 2020; **9**(6).
55. Turan O, Hakim A, Dashraath P, Jeslyn WJL, Wright A, Abdul-Kadir R. Clinical characteristics, prognostic factors, and maternal and neonatal outcomes of SARS-CoV-2 infection among hospitalized pregnant women: A systematic review. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **151**(1): 7-16.
56. Uygun-Can B, Acar-Bolat B. Clinical Properties and Diagnostic Methods of COVID-19 Infection in Pregnancies: Meta-Analysis. *Biomed Res Int* 2020; **2020**: 1708267.
57. Vakili S, Savardashtaki A, Jamalnia S, et al. Laboratory Findings of COVID-19 Infection are Conflicting in Different Age Groups and Pregnant Women: A Literature Review. *Archives of medical research* 2020; **51**(7): 603-7.
58. Wei SQ, Bilodeau-Bertrand M, Liu S, Auger N. The impact of COVID-19 on pregnancy outcomes: a systematic review and meta-analysis. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne* 2021; **193**(16): E540-E8.
59. Yang Z, Wang M, Zhu Z, Liu Y. Coronavirus disease 2019 (COVID-19) and pregnancy: a systematic review. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-4.
60. Yee J, Kim W, Han JM, et al. Clinical manifestations and perinatal outcomes of pregnant women with COVID-19: a systematic review and meta-analysis. *Sci Rep* 2020; **10**(1): 18126.
61. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. *Acta obstetricia et gynecologica Scandinavica* 2020; **99**(7): 823-9.
62. Wright A, Nassar AH, Visser G, Ramasauskaite D, Theron G. FIGO good clinical practice paper: management of the second stage of labor. *International Journal of Gynecology and Obstetrics* 2021; **152**(2): 172-81.
63. Cunarro-Lopez Y, Pintado-Recarte P, Cueto-Hernandez I, et al. Review the profile of the obstetric patients with sars-cov-2 infection according to country of origin of the publication: A systematic review of the literature. *Journal of Clinical Medicine* 2021; **10**(2): 1-19.
64. Donders F, Lonnee-Hoffmann R, Tsiakalos A, et al. ISIDOG Recommendations Concerning COVID-19 and Pregnancy. *Diagnostics (Basel)* 2020; **10**(4).
65. Abedzadeh-Kalahroudi M, Sehat M, Vahedpour Z, Talebian P. Maternal and neonatal outcomes of pregnant patients with COVID-19: A prospective cohort study. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **153**(3): 449-56.
66. Abel MK, Alavi MX, Tierney C, Weintraub MR, Avins A, Zaritsky E. Coronavirus Disease 2019 (COVID-19) and the Incidence of Obstetric and Gynecologic Emergency Department Visits in an Integrated Health Care System. *Obstetrics and gynecology* 2021; **137**(4): 581-3.
67. Afshar Y, Gaw SL, Flaherman VJ, et al. Clinical Presentation of Coronavirus Disease 2019 (COVID-19) in Pregnant and Recently Pregnant People. *Obstetrics and gynecology* 2020; **136**(6): 1117-25.

68. Alay I, Yildiz S, Kaya C, et al. The clinical findings and outcomes of symptomatic pregnant women diagnosed with or suspected of having coronavirus disease 2019 in a tertiary pandemic hospital in Istanbul, Turkey. *J Obstet Gynaecol Res* 2020.
69. Anuk AT, Polat N, Akdas S, et al. The Relation Between Trace Element Status (Zinc, Copper, Magnesium) and Clinical Outcomes in COVID-19 Infection During Pregnancy. *Biol Trace Elem Res* 2020.
70. Artymuk NV, Belokrinitskaya TE, Filippov OS, Frolova NI, Surina MN. Perinatal outcomes in pregnant women with COVID-19 in Siberia and the Russian Far East. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-4.
71. Askary E, Poordast T, Shiravani Z, et al. Coronavirus disease 2019 (COVID-19) manifestations during pregnancy in all three trimesters: A case series. *Int J Reprod Biomed* 2021; **19**(2): 191-204.
72. Bachani S, Arora R, Dabral A, et al. Clinical Profile, Viral Load, Maternal-Fetal Outcomes of Pregnancy With COVID-19: 4-Week Retrospective, Tertiary Care Single-Centre Descriptive Study. *J Obstet Gynaecol Can* 2021; **43**(4): 474-82.
73. Badr DA, Mattern J, Carlin A, et al. Are clinical outcomes worse for pregnant women at >/=20 weeks' gestation infected with coronavirus disease 2019? A multicenter case-control study with propensity score matching. *American journal of obstetrics and gynecology* 2020; **223**(5): 764-8.
74. Basu JK, Chauke L, Magoro T. Maternal mortality from COVID 19 among South African pregnant women. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-3.
75. Bender WR, Hirshberg A, Coutifaris P, Acker AL, Srinivas SK. Universal testing for severe acute respiratory syndrome coronavirus 2 in 2 Philadelphia hospitals: carrier prevalence and symptom development over 2 weeks. *Am J Obstet Gynecol MFM* 2020; **2**(4): 100226.
76. Berry M, Wang A, Clark SM, et al. Clinical Stratification of Pregnant COVID-19 Patients based on Severity: A Single Academic Center Experience. *American journal of perinatology* 2021; **38**(5): 515-22.
77. Bianco A, Buckley AB, Overbey J, et al. Testing of Patients and Support Persons for Coronavirus Disease 2019 (COVID-19) Infection Before Scheduled Deliveries. *Obstetrics and gynecology* 2020; **136**(2): 283-7.
78. Biasucci G, Cannalire G, Raymond A, et al. Safe Perinatal Management of Neonates Born to SARS-CoV-2 Positive Mothers at the Epicenter of the Italian Epidemic. *Front Pediatr* 2020; **8**: 565522.
79. Blasco Santana L, Miraval Wong E, Alvarez-Troncoso J, Sanchez Garcia L, Bartha JL, Regojo-Zapata RM. Maternal and perinatal outcomes and placental pathologic examination of 29 SARS-CoV-2 infected patients in the third trimester of gestation. *J Obstet Gynaecol Res* 2021; **47**(6): 2131-9.
80. Blitz MJ, Rochelson B, Prasannan L, et al. Racial and ethnic disparity and spatiotemporal trends in severe acute respiratory syndrome coronavirus 2 prevalence on obstetrical units in New York. *Am J Obstet Gynecol MFM* 2020; **2**(4): 100212.
81. Burwick RM, Yawetz S, Stephenson KE, et al. Compassionate Use of Remdesivir in Pregnant Women with Severe Covid-19. *Clin Infect Dis* 2020.
82. Cardona-Perez JA, Villegas-Mota I, Helguera-Repetto AC, et al. Prevalence, clinical features, and outcomes of SARS-CoV-2 infection in pregnant women with or without mild/moderate symptoms: Results from universal screening in a tertiary care center in Mexico City, Mexico. *PloS one* 2021; **16**(4): e0249584.
83. Carrasco I, Munoz-Chapuli M, Vigil-Vazquez S, et al. SARS-COV-2 infection in pregnant women and newborns in a Spanish cohort (GESNEO-COVID) during the first wave. *BMC pregnancy and childbirth* 2021; **21**(1): 326.
84. Ceulemans M, Verbakel JY, Van Calsteren K, Eerdekens A, Allegaert K, Foulon V. SARS-CoV-2 Infections and Impact of the COVID-19 Pandemic in Pregnancy and Breastfeeding: Results from an

Observational Study in Primary Care in Belgium. *International journal of environmental research and public health* 2020; **17**(18).
85. Chornock R, Iqbal SN, Wang T, Kodama S, Kawakita T, Fries M. Incidence of Hypertensive Disorders of Pregnancy in Women with COVID-19. *American journal of perinatology* 2021; **38**(8): 766-72.
86. Cosma S, Carosso AR, Borella F, et al. Prenatal Biochemical and Ultrasound Markers in COVID-19 Pregnant Patients: A Prospective Case-Control Study. *Diagnostics (Basel)* 2021; **11**(3).
87. Cosma S, Carosso AR, Cusato J, et al. Coronavirus disease 2019 and first-trimester spontaneous abortion: a case-control study of 225 pregnant patients. *American journal of obstetrics and gynecology* 2021; **224**(4): 391 e1- e7.
88. Cronin S, Piacquadio M, Brendel K, et al. RE: Universal SARS-CoV-2 testing on admission to the labor and delivery unit: Low prevalence among asymptomatic obstetric patients. *Infect Control Hosp Epidemiol* 2021; **42**(7): 908-9.
89. Crovetto F, Crispi F, Llurba E, Figueras F, Gomez-Roig MD, Gratacos E. Seroprevalence and presentation of SARS-CoV-2 in pregnancy. *Lancet* 2020; **396**(10250): 530-1.
90. Crovetto F, Crispi F, Llurba E, et al. Impact of SARS-CoV-2 Infection on Pregnancy Outcomes: A Population-Based Study. *Clin Infect Dis* 2021.
91. Cruz-Lemini M, Ferriols Perez E, de la Cruz Conty ML, et al. Obstetric Outcomes of SARS-CoV-2 Infection in Asymptomatic Pregnant Women. *Viruses* 2021; **13**(1).
92. Curi B, Sabre A, Benjamin I, Serventi L, Nuritdinova D. Coronavirus infection in a high-risk obstetrical population of the South Bronx, New York. *Am J Obstet Gynecol MFM* 2020; **2**(4): 100203.
93. D'Ambrosi F, Iurlaro E, Tassis B, et al. Sociodemographic characteristics of pregnant women tested positive for COVID-19 admitted to a referral center in Northern Italy during lockdown period. *J Obstet Gynaecol Res* 2021; **47**(5): 1751-6.
94. D'Antonio F, Sen C, Mascio DD, et al. Maternal and perinatal outcomes in high compared to low risk pregnancies complicated by severe acute respiratory syndrome coronavirus 2 infection (phase 2): the World Association of Perinatal Medicine working group on coronavirus disease 2019. *Am J Obstet Gynecol MFM* 2021; **3**(4): 100329.
95. de Vasconcelos Gaspar A, Santos Silva I. SARS-CoV-2 in Pregnancy-The First Wave. *Medicina (Kaunas)* 2021; **57**(3).
96. DeBolt CA, Bianco A, Limaye MA, et al. Pregnant women with severe or critical coronavirus disease 2019 have increased composite morbidity compared with nonpregnant matched controls. *American journal of obstetrics and gynecology* 2021; **224**(5): 510 e1- e12.
97. Deng Q, Cao S, Wang H, et al. Application of quantitative lung ultrasound instead of CT for monitoring COVID-19 pneumonia in pregnant women: a single-center retrospective study. *BMC pregnancy and childbirth* 2021; **21**(1): 259.
98. Di Guardo F, Di Grazia FM, Di Gregorio LM, et al. Poor maternal-neonatal outcomes in pregnant patients with confirmed SARS-Cov-2 infection: analysis of 145 cases. *Archives of gynecology and obstetrics* 2021; **303**(6): 1483-8.
99. Di Mascio D, Sen C, Saccone G, et al. Risk factors associated with adverse fetal outcomes in pregnancies affected by Coronavirus disease 2019 (COVID-19): a secondary analysis of the WAPM study on COVID-19. *Journal of perinatal medicine* 2020; **49**(1): 111-5.
100. Donati S, Corsi E, Salvatore MA, et al. Childbirth Care among SARS-CoV-2 Positive Women in Italy. *International journal of environmental research and public health* 2021; **18**(8).
101. Dotters-Katz SK, Harris H, Wheeler SM, Swamy GK, Hughes BL. Specialized prenatal care delivery for coronavirus disease 2019-exposed or -infected pregnant women. *American journal of obstetrics and gynecology* 2021; **224**(3): 325-7.
102. Emeruwa UN, Spiegelman J, Ona S, et al. Influence of Race and Ethnicity on Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection Rates and Clinical Outcomes in Pregnancy. *Obstetrics and gynecology* 2020; **136**(5): 1040-3.

103. Engjom H, Aabakke AJM, Klungsoyr K, et al. COVID-19 in pregnancy-characteristics and outcomes of pregnant women admitted to hospital because of SARS-CoV-2 infection in the Nordic countries. *Acta obstetricia et gynecologica Scandinavica* 2021.
104. Erol Koc EM, Findik RB, Akkaya H, Karadag I, Tokalioglu EO, Tekin OM. Comparison of hematological parameters and perinatal outcomes between COVID-19 pregnancies and healthy pregnancy cohort. *Journal of perinatal medicine* 2021; **49**(2): 141-7.
105. Erol SA, Polat N, Akdas S, et al. Maternal selenium status plays a crucial role on clinical outcomes of pregnant women with COVID-19 infection. *J Med Virol* 2021.
106. Fan C, Guo Y, Qu P, et al. No obviously adverse pregnancy complications and outcomes of the recovered pregnant women from COVID-19. *Reprod Toxicol* 2021; **100**: 163-6.
107. Ferrazzi E, Beretta P, Bianchi S, et al. SARS-CoV-2 infection testing at delivery: a clinical and epidemiological priority. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-3.
108. Figueiredo R, Tavares S, Moucho M, Ramalho C. Systematic screening for SARS-CoV-2 in pregnant women admitted for delivery in a Portuguese maternity. *Journal of perinatal medicine* 2020; **48**(9): 977-80.
109. Gao X, Wang S, Zeng W, et al. Clinical and immunologic features among COVID-19-affected mother-infant pairs: antibodies to SARS-CoV-2 detected in breast milk. *New Microbes New Infect* 2020; **37**: 100752.
110. Goldfarb IT, Diouf K, Barth WH, et al. Universal SARS-CoV-2 testing on admission to the labor and delivery unit: Low prevalence among asymptomatic obstetric patients. *Infect Control Hosp Epidemiol* 2020; **41**(9): 1095-6.
111. Gonzalez-Calatayud DM, Vargas-Abrego DB, Gutierrez-Uvalle DGE, et al. Observational study of the suspected or confirmed cases of sars COV-2 infection needing emergency surgical intervention during the first months of the pandemic in a third level hospital: Case series. *Ann Med Surg (Lond)* 2020; **60**: 149-54.
112. Gracia PV, Caballero LC, Sanchez J, et al. Pregnancies recovered from SARS-CoV-2 infection in second or third trimester: obstetric evolution. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2020; **56**(5): 777-8.
113. Grechukhina O, Greenberg V, Lundsberg LS, et al. Coronavirus disease 2019 pregnancy outcomes in a racially and ethnically diverse population. *Am J Obstet Gynecol MFM* 2020; **2**(4): 100246.
114. Grossi E, Agnoli B, Baldini M, Illari S, Bonini R, Scagnelli G. Universal Sars-Cov-2 Screening in Pregnant Women: Experience from the Italian Epidemic Outbreak. *Acta Biomed* 2021; **92**(S2): e2021001.
115. Guo Y, Yuan J, Wang M, Yu Y, Bian J, Fan C. Case series of 20 pregnant women with 2019 novel coronavirus disease in Wuhan, China. *J Obstet Gynaecol Res* 2021; **47**(4): 1344-52.
116. Halici-Ozturk F, Ocal FD, Aydin S, et al. Investigating the risk of maternal-fetal transmission of SARS-CoV-2 in early pregnancy. *Placenta* 2021; **106**: 25-9.
117. Hall M, Endress D, Holbfer S, Maier B. SARS-CoV-2 in pregnancy: maternal and perinatal outcome data of 34 pregnant women hospitalised between May and October 2020. *Journal of perinatal medicine* 2021; **49**(2): 138-40.
118. Haye MT, Cartes G, Gutierrez J, et al. Maternal and perinatal outcomes in pregnant women with confirmed severe and mild COVID-19 at one large maternity hospital in Chile. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-6.
119. Hernandez-Cruz RG, Sanchez-Cobo D, Acevedo-Gallegos S, et al. Clinical characteristics and risk factors for SARS-CoV-2 infection in pregnant women attending a third level reference center in Mexico City. *The journal of maternal-fetal & neonatal medicine : the official journal of the European*

Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet 2021: 1-5.
120. Jani S, Jacques SM, Qureshi F, et al. Clinical Characteristics of Mother-Infant Dyad and Placental Pathology in COVID-19 Cases in Predominantly African American Population. *AJP Rep* 2021; **11**(1): e15-e20.
121. Janssen O, Thompson M, Milburn S, et al. The impact of perinatal severe acute respiratory syndrome coronavirus 2 infection during the peripartum period. *Am J Obstet Gynecol MFM* 2021; **3**(1): 100267.
122. Johnson-Agbakwu CE, Eakin CM, Bailey CV, et al. Severe acute respiratory syndrome coronavirus 2: a canary in the coal mine for public safety net hospitals. *AJOG global reports* 2021; **1**(2): 100009.
123. Joseph NT, Stanhope KK, Badell ML, Horton JP, Boulet SL, Jamieson DJ. Sociodemographic Predictors of SARS-CoV-2 Infection in Obstetric Patients, Georgia, USA. *Emerg Infect Dis* 2020; **26**(11): 2787-9.
124. Kalafat E, Yassa M, Koc A, Tug N, collaboration T. Utility of lung ultrasound assessment for probable SARS-CoV-2 infection during pregnancy and universal screening of asymptomatic individuals. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2020; **56**(4): 624-6.
125. Kalinka J, Wielgos M, Leszczynska-Gorzelak B, et al. COVID-19 impact on perinatal care: risk factors, clinical manifestation and prophylaxis. Polish experts' opinion for December 2020. *Ginekol Pol* 2021.
126. Katz D, Bateman BT, Kjaer K, et al. The Society for Obstetric Anesthesia and Perinatology Coronavirus Disease 2019 Registry: An Analysis of Outcomes Among Pregnant Women Delivering During the Initial Severe Acute Respiratory Syndrome Coronavirus-2 Outbreak in the United States. *Anesth Analg* 2021; **133**(2): 462-73.
127. Kawamura H, Orisaka M, Yoshida Y. Mentality of pregnant women and obstetric healthcare workers about prenatal SARS-CoV-2 testing: A regional survey over the first wave of the COVID-19 pandemic in Japan. *J Obstet Gynaecol Res* 2021; **47**(5): 1763-71.
128. Kayem G, Lecarpentier E, Deruelle P, et al. A snapshot of the Covid-19 pandemic among pregnant women in France. *J Gynecol Obstet Hum Reprod* 2020; **49**(7): 101826.
129. Kazemi Aski S, Norooznezhad AH, Shamshirsaz AA, et al. Clinical features and risk factors associated with acute respiratory distress syndrome in pregnant women diagnosed with COVID-19: a multi-center case-control study. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-5.
130. Kazemi Aski S, Sharami SH, Hosseinzadeh F, et al. Risk Factors, Clinical Symptoms, Laboratory Findings and Imaging of Pregnant Women Infected with COVID-19 in North of Iran. *Arch Iran Med* 2020; **23**(12): 856-63.
131. Knight M, Bunch K, Vousden N, et al. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. *BMJ* 2020; **369**: m2107.
132. la Cour Freiesleben N, Egerup P, Hviid KVR, et al. SARS-CoV-2 in first trimester pregnancy: a cohort study. *Hum Reprod* 2021; **36**(1): 40-7.
133. Liu C, Andrusier M, Silver M, Applewhite L, Clare CA. Effect of SARS-CoV-2 Infection on Pregnancy Outcomes in an Inner-City Black Patient Population. *J Community Health* 2021.
134. Liu J, Cao Y, Xu C, et al. Midwifery and Nursing Strategies to protect against COVID-19 During the Third Trimester of Pregnancy. *Midwifery* 2021; **92**: 102876.
135. Liu Y, Chen H, Tan W, et al. Clinical characteristics and outcome of SARS-CoV-2 infection during pregnancy. *J Infect* 2021; **82**(6): e9-e10.
136. Llorca J, Lechosa-Muniz C, Gortazar P, et al. COVID-19 in a cohort of pregnant women and their descendants, the MOACC-19 study. *BMJ open* 2021; **11**(2): e044224.

137. Lokken EM, Huebner EM, Taylor GG, et al. Disease severity, pregnancy outcomes, and maternal deaths among pregnant patients with severe acute respiratory syndrome coronavirus 2 infection in Washington State. *American journal of obstetrics and gynecology* 2021; **225**(1): 77 e1- e14.
138. Lokken EM, Taylor GG, Huebner EM, et al. Higher severe acute respiratory syndrome coronavirus 2 infection rate in pregnant patients. *American journal of obstetrics and gynecology* 2021; **225**(1): 75 e1- e16.
139. Lumbreras-Marquez MI, Campos-Zamora M, Lizaola-Diaz de Leon H, Farber MK. Maternal mortality from COVID-19 in Mexico. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **150**(2): 266-7.
140. Lumbreras-Marquez MI, Campos-Zamora M, Seifert SM, et al. Excess Maternal Deaths Associated With Coronavirus Disease 2019 (COVID-19) in Mexico. *Obstetrics and gynecology* 2020; **136**(6): 1114-6.
141. Lumley SF, Eyre DW, McNaughton AL, et al. SARS-CoV-2 antibody prevalence, titres and neutralising activity in an antenatal cohort, United Kingdom, 14 April to 15 June 2020. *Euro Surveill* 2020; **25**(42).
142. Luo Q, Yao D, Xia L, Cheng Y, Chen H. Characteristics and Pregnancy Outcomes of Asymptomatic and Symptomatic Women with COVID-19: Lessons from Hospitals in Wuhan. *J Infect Dev Ctries* 2021; **15**(4): 463-9.
143. Magallanes-Garza GI, Valdez-Alatorre C, Davila-Gonzalez D, et al. Rapid improvement of a critically ill obstetric patient with SARS-CoV-2 infection after administration of convalescent plasma. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **152**(3): 439-41.
144. Mahajan NN, Ansari M, Gaikwad C, et al. Impact of SARS-CoV-2 on multiple gestation pregnancy. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **152**(2): 220-5.
145. Mahajan NN, Pednekar R, Patil SR, et al. Preparedness, administrative challenges for establishing obstetric services, and experience of delivering over 400 women at a tertiary care COVID-19 hospital in India. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **151**(2): 188-96.
146. Malhotra Y, Knight C, Patil UP, et al. Impact of evolving practices on SARS-CoV-2 positive mothers and their newborns in the largest public healthcare system in America. *J Perinatol* 2021; **41**(5): 970-80.
147. Mancilla-Galindo J, Garcia-Mendez JO, Marquez-Sanchez J, et al. All-cause mortality among patients treated with repurposed antivirals and antibiotics for COVID-19 in Mexico City: A real-world observational study. *EXCLI J* 2021; **20**: 199-222.
148. Maraschini A, Corsi E, Salvatore MA, Donati S, It OSSC-WG. Coronavirus and birth in Italy: results of a national population-based cohort study. *Ann Ist Super Sanita* 2020; **56**(3): 378-89.
149. Marin Gabriel MA, Reyne Vergeli M, Caserio Carbonero S, et al. Maternal, Perinatal and Neonatal Outcomes With COVID-19: A Multicenter Study of 242 Pregnancies and Their 248 Infant Newborns During Their First Month of Life. *The Pediatric infectious disease journal* 2020; **39**(12): e393-e7.
150. Martinez-Portilla RJ, Sotiriadis A, Chatzakis C, et al. Pregnant women with SARS-CoV-2 infection are at higher risk of death and pneumonia: propensity score matched analysis of a nationwide prospective cohort (COV19Mx). *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **57**(2): 224-31.
151. Maru S, Patil U, Carroll-Bennett R, et al. Universal screening for SARS-CoV-2 infection among pregnant women at Elmhurst Hospital Center, Queens, New York. *PloS one* 2020; **15**(12): e0238409.
152. Massarotti C, Adriano M, Cagnacci A, et al. Asymptomatic SARS-CoV-2 infections in pregnant patients in an Italian city during the complete lockdown. *J Med Virol* 2021; **93**(3): 1758-60.
153. Mattar CN, Kalimuddin S, Sadarangani SP, et al. Pregnancy Outcomes in COVID-19: A Prospective Cohort Study in Singapore. *Ann Acad Med Singap* 2020; **49**(11): 857-69.

154. Mattern J, Vauloup-Fellous C, Zakaria H, et al. Post lockdown COVID-19 seroprevalence and circulation at the time of delivery, France. *PloS one* 2020; **15**(10): e0240782.
155. McCarty KL, Tucker M, Lee G, Pandey V. Fetal Inflammatory Response Syndrome Associated With Maternal SARS-CoV-2 Infection. *Pediatrics* 2020; **147**(4).
156. Menezes MO, Takemoto MLS, Nakamura-Pereira M, et al. Risk factors for adverse outcomes among pregnant and postpartum women with acute respiratory distress syndrome due to COVID-19 in Brazil. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **151**(3): 415-23.
157. Mercedes BR, Serwat A, Naffaa L, et al. New-onset myocardial injury in pregnant patients with coronavirus disease 2019: a case series of 15 patients. *American journal of obstetrics and gynecology* 2021; **224**(4): 387 e1- e9.
158. Metz TD, Clifton RG, Hughes BL, et al. Disease Severity and Perinatal Outcomes of Pregnant Patients With Coronavirus Disease 2019 (COVID-19). *Obstetrics and gynecology* 2021; **137**(4): 571-80.
159. Molteni E, Astley CM, Ma W, et al. Symptoms and syndromes associated with SARS-CoV-2 infection and severity in pregnant women from two community cohorts. *Sci Rep* 2021; **11**(1): 6928.
160. Moreno SC, To J, Chun H, Ngai IM. Vertical Transmission of COVID-19 to the Neonate. *Infect Dis Obstet Gynecol* 2020; **2020**: 8460672.
161. Mullins E, Hudak ML, Banerjee J, et al. Pregnancy and neonatal outcomes of COVID-19: coreporting of common outcomes from PAN-COVID and AAP-SONPM registries. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **57**(4): 573-81.
162. Nasrallah S, Nguyen AQ, Hitchings L, et al. Pharmacological treatment in pregnant women with moderate symptoms of coronavirus disease 2019 (COVID-19) pneumonia. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2021: 1-8.
163. Norman M, Naver L, Soderling J, et al. Association of Maternal SARS-CoV-2 Infection in Pregnancy With Neonatal Outcomes. *Jama* 2021; **325**(20): 2076-86.
164. Oakes MC, Kernberg AS, Carter EB, et al. Pregnancy as a risk factor for severe coronavirus disease 2019 using standardized clinical criteria. *Am J Obstet Gynecol MFM* 2021; **3**(3): 100319.
165. Ogamba I, Kliss A, Rainville N, et al. Initial review of pregnancy and neonatal outcomes of pregnant women with COVID-19 infection. *Journal of perinatal medicine* 2021; **49**(3): 263-8.
166. Olivares F, Munoz D, Fica A, et al. Clinical features of 47 patients infected with COVID-19 admitted to a Regional Reference Center. *Rev Med Chil* 2020; **148**(11): 1577-88.
167. Omer S, Ali S, Babar ZUD. Preventive measures and management of COVID-19 in pregnancy. *Drugs Ther Perspect* 2020: 1-4.
168. Ortiz Molina E, Hernandez Pailos R, Pola Guillen M, Pascual Pedreno A, Rodriguez Rodriguez E, Hernandez Martinez A. COVID-19 infection in symptomatic pregnant women at the midpoint of the pandemic in Spain: a retrospective analysis. *Ginekol Pol* 2020; **91**(12): 755-63.
169. Ozsurmeli M, Terzi H, Hocaoglu M, et al. Clinical characteristics, maternal and neonatal outcomes of pregnant women with SARS-CoV-2 infection in Turkey. *Bratisl Lek Listy* 2021; **122**(2): 152-7.
170. Pecks U, Kuschel B, Mense L, Oppelt P, Rudiger M, Network C. Pregnancy and SARS-CoV-2 Infection in Germany-the CRONOS Registry. *Dtsch Arztebl Int* 2020; **117**(49): 841-2.
171. Poon LC, Leung BW, Ma T, et al. Relationship between viral load, infection-to-delivery interval and mother-to-child transfer of anti-SARS-CoV-2 antibodies. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **57**(6): 974-8.
172. Qeadan F, Mensah NA, Tingey B, Stanford JB. The risk of clinical complications and death among pregnant women with COVID-19 in the Cerner COVID-19 cohort: a retrospective analysis. *BMC pregnancy and childbirth* 2021; **21**(1): 305.

173. Rasmussen SA, Jamieson DJ. Coronavirus disease 2019 and pregnancy. *American journal of obstetrics and gynecology* 2021; **224**(4): 420-1.
174. Reale SC, Fields KG, Lumbreras-Marquez MI, et al. Association Between Number of In-Person Health Care Visits and SARS-CoV-2 Infection in Obstetrical Patients. *Jama* 2020; **324**(12): 1210-2.
175. Reale SC, Lumbreras-Marquez MI, King CH, et al. Patient characteristics associated with SARS-CoV-2 infection in parturients admitted for labour and delivery in Massachusetts during the spring 2020 surge: A prospective cohort study. *Paediatr Perinat Epidemiol* 2021; **35**(1): 24-33.
176. Remaeus K, Savchenko J, Brismar Wendel S, et al. Characteristics and short-term obstetric outcomes in a case series of 67 women test-positive for SARS-CoV-2 in Stockholm, Sweden. *Acta obstetricia et gynecologica Scandinavica* 2020; **99**(12): 1626-31.
177. Rolnik DL, Korman TM, Rindt A, et al. Coronavirus testing in women attending antenatal care. *Women Birth* 2020.
178. Rosenbloom JI, Raghuraman N, Carter EB, Kelly JC. Coronavirus disease 2019 infection and hypertensive disorders of pregnancy. *American journal of obstetrics and gynecology* 2021.
179. Samadi P, Alipour Z, Ghaedrahmati M, Ahangari R. The severity of COVID-19 among pregnant women and the risk of adverse maternal outcomes. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **154**(1): 92-9.
180. Sanchez J, Vigil-De Gracia P, Guerrero E, et al. Severe acute respiratory syndrome coronavirus 2 detected in placentas of 2 coronavirus disease 2019-positive asymptomatic pregnant women-case report. *AJOG global reports* 2021; **1**(1): 100001.
181. Saviron-Cornudella R, Villalba A, Esteban LM, et al. Screening of severe acute respiratory syndrome coronavirus-2 infection during labor and delivery using polymerase chain reaction and immunoglobulin testing. *Life Sci* 2021; **271**: 119200.
182. Saviron-Cornudella R, Villalba A, Zapardiel J, Andeyro-Garcia M, Esteban LM, Perez-Lopez FR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) universal screening in gravids during labor and delivery. *European journal of obstetrics, gynecology, and reproductive biology* 2021; **256**: 400-4.
183. Sena GR, Lima TPF, Vidal SA, et al. Clinical Characteristics and Mortality Profile of COVID-19 Patients Aged less than 20 years Old in Pernambuco - Brazil. *Am J Trop Med Hyg* 2021.
184. Sharma R, Seth S, Sharma R, Yadav S, Mishra P, Mukhopadhyay S. Perinatal outcome and possible vertical transmission of coronavirus disease 2019: experience from North India. *Clin Exp Pediatr* 2021; **64**(5): 239-46.
185. Sharma S, Wazir S, Kumar RK. Universal Screening for SARS-CoV-2 in Asymptomatic Pregnant Women: A Multi-center Experience. *J Obstet Gynaecol India* 2021: 1-4.
186. Shmakov RG, Prikhodko A, Polushkina E, et al. Clinical course of novel COVID-19 infection in pregnant women. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-7.
187. Singh V, Choudhary A, Datta MR, Ray A. Maternal and Neonatal Outcomes of COVID-19 in Pregnancy: A Single-Centre Observational Study. *Cureus* 2021; **13**(2): e13184.
188. Soffer MD, Shook LL, James K, et al. Protocol-Driven Intensive Outpatient Management of Pregnant Patients With Symptomatic Coronavirus Disease 2019. *Open forum infectious diseases* 2020; **7**(11): ofaa524.
189. Soto-Torres E, Hernandez-Andrade E, Huntley E, Mendez-Figueroa H, Blackwell SC. Ultrasound and Doppler findings in pregnant women with SARS-CoV-2 infection. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **58**(1): 111-20.
190. Steffen HA, Swartz SR, Jackson JB, et al. SARS-CoV-2 Infection during Pregnancy in a Rural Midwest All-delivery Cohort and Associated Maternal and Neonatal Outcomes. *American journal of perinatology* 2021; **38**(6): 614-21.

191. Sterbenc A, Premru Srsen T, Lucovnik M, et al. Usefulness of COVID-19 screen-and-test approach in pregnant women: an experience from a country with low COVID-19 burden. *Journal of perinatal medicine* 2021; **49**(3): 269-73.
192. Sutton D, Wen T, Staniczenko AP, et al. Clinical and Demographic Risk Factors for COVID-19 during Delivery Hospitalizations in New York City. *American journal of perinatology* 2021; **38**(8): 857-68.
193. Trahan MJ, Malhame I, O'Farrell P, et al. Obstetrical and Newborn Outcomes Among Patients With SARS-CoV-2 During Pregnancy. *J Obstet Gynaecol Can* 2021; **43**(7): 888-92 e1.
194. Trahan MJ, Mitric C, Malhame I, Abenhaim HA. Screening and Testing Pregnant Patients for SARS-CoV-2: First-Wave Experience of a Designated COVID-19 Hospitalization Centre in Montreal. *J Obstet Gynaecol Can* 2021; **43**(5): 571-5.
195. Villar J, Ariff S, Gunier RB, et al. Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection: The INTERCOVID Multinational Cohort Study. *JAMA Pediatr* 2021.
196. Vizheh M, Muhidin S, Aghajani F, et al. Characteristics and outcomes of COVID-19 pneumonia in pregnancy compared with infected nonpregnant women. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021; **153**(3): 462-8.
197. Vousden N, Bunch K, Morris E, et al. The incidence, characteristics and outcomes of pregnant women hospitalized with symptomatic and asymptomatic SARS-CoV-2 infection in the UK from March to September 2020: A national cohort study using the UK Obstetric Surveillance System (UKOSS). *PloS one* 2021; **16**(5): e0251123.
198. Wang Y, Liang X, Wang H, Li L, Xiong G, Mi L. A considerable asymptomatic proportion and thromboembolism risk of pregnant women with COVID-19 infection in Wuhan, China. *Journal of perinatal medicine* 2021; **49**(2): 237-40.
199. Woodworth KR, Olsen EO, Neelam V, et al. Birth and Infant Outcomes Following Laboratory-Confirmed SARS-CoV-2 Infection in Pregnancy - SET-NET, 16 Jurisdictions, March 29-October 14, 2020. *MMWR Morb Mortal Wkly Rep* 2020; **69**(44): 1635-40.
200. Yassa M, Yirmibes C, Cavusoglu G, et al. Outcomes of universal SARS-CoV-2 testing program in pregnant women admitted to hospital and the adjuvant role of lung ultrasound in screening: a prospective cohort study. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020; **33**(22): 3820-6.
201. Zambrano LD, Ellington S, Strid P, et al. Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status - United States, January 22-October 3, 2020. *MMWR Morb Mortal Wkly Rep* 2020; **69**(44): 1641-7.
202. Abedzadeh-Kalahroudi M, Sehat M, Vahedpour Z, Talebian P, Haghighi A. Clinical and obstetric characteristics of pregnant women with Covid-19: a case series study on 26 patients. *Taiwanese journal of obstetrics & gynecology* 2021; **60**(3): 458-62.
203. Bhadade R, Harde M, deSouza R, et al. Appraisal of Critically Ill COVID-19 Patients at a Dedicated COVID Hospital. *Journal of the Association of Physicians of India* 2020; **68**(9): 14-9.
204. Blitz MJ, Rochelson B, Rausch AC, et al. Universal testing for coronavirus disease 2019 in pregnant women admitted for delivery: prevalence of peripartum infection and rate of asymptomatic carriers at four New York hospitals within an integrated healthcare system. *American journal of obstetrics & gynecology MFM* 2020; **2**(3): 100169.
205. Campbell KH, Tornatore JM, Lawrence KE, et al. Prevalence of SARS-CoV-2 Among Patients Admitted for Childbirth in Southern Connecticut. *Jama* 2020; **323**(24): 2520-2.
206. Chen L, Li Q, Zheng D, et al. Clinical Characteristics of Pregnant Women with Covid-19 in Wuhan, China. *N Engl J Med* 2020; **382**(25): e100.
207. Di Martino D, Chiaffarino F, Patane L, et al. Assessing risk factors for severe forms of COVID-19 in a pregnant population: A clinical series from Lombardy, Italy. *International journal of gynaecology*

and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics 2021; **152**(2): 275-7.
208. Emeruwa U, Ona S, Shaman JL, et al. Associations Between Built Environment, Neighborhood Socioeconomic Status, and SARS-CoV-2 Infection Among Pregnant Women in New York City. *Jama* 2020; **324**(4): 390-2.
209. Flannery D, Gouma S, Dhudasia MB, et al. SARS-CoV-2 Seroprevalence Among Parturient Women. *Medrxiv* 2020: 2020.07.08.20149179.
210. Kadiwar S, Smith JJ, Ledot S, et al. Were pregnant women more affected by COVID-19 in the second wave of the pandemic? *Lancet (london, england)* 2021; **397**(10284): 1539-40.
211. Lokken EM, Taylor GG, Huebner EM, et al. Higher SARS-CoV-2 Infection Rate in Pregnant Patients. *American journal of obstetrics and gynecology* 2021.
212. Milln J, Heard S, Gunganah K, Velauthar L, Saeed F. Clinical characteristics and pregnancy outcomes of women diagnosed with SARS-CoV-2 in London's most ethnically diverse borough: a cross-sectional study. *Obstetric medicine* 2021.
213. Gupta P, Kumar S, Sharma SS. SARS-CoV-2 prevalence, maternal and perinatal outcomes among pregnant women admitted for delivery: experience from Covid-19 dedicated maternity hospital in Jammu, Jammu and Kashmir (India). *J Med Virol* 2021; **93**: 5505- 14.
214. Quiner T, Smiley SG, Magill-Collins M, et al. 672 Native American gravidas are more likely to develop severe COVID-19 illness than non-Native American women. *American journal of obstetrics and gynecology* 2021; **224**(2): S422-S3.
215. Snyman LC, Molokoane F, Seopela L, Mopane N, Mojela M. First results of universal SARS-CoV-2 virus testing of asymptomatic pregnant patients presenting for antenatal care at the Kalafong Provincial Tertiary Hospital. *Obstetrics and gynaecology forum* 2020; **30**(2): 19-21.
216. Ullah R, Memon FS, Anjum S. The alarming rate of COVID-19 among pregnant women in Pakistan. *Anaesthesia, pain and intensive care* 2020; **24**(4): 471-2.
217. Waghmare R, Gajbhiye R, Mahajan NN, Modi D, Mukherjee S, Mahale SD. Universal screening identifies asymptomatic carriers of SARS-CoV-2 among pregnant women in India. *European journal of obstetrics, gynecology, and reproductive biology* 2021; **256**: 503-5.
218. Sharief M, Jaafar G, Hussan A. Maternal and perinatal outcomes of pandemic Covid-19 in pregnancy in Basrah. *European Journal of Molecular and Clinical Medicine* 2021; **8**(3): 517-29.
219. Gheysarzadeh A, Sadeghifard N, Safari M, Rashidian T, Mohammadyari E, Tavan H. Case series of four pregnant women with COVID-19 in Ilam, Iran. *New Microbes & New Infections* 2020; **38**: 100783.
220. Hageman JR. The Evolving COVID-19 Pandemic: An Update. *Pediatric annals* 2020; **49**(5): e201-e3.
221. Money D. Report #4: Canadian Surveillance of COVID-19 in Pregnancy: Epidemiology, Maternal and Infant Outcomes. 2021.
222. Acosta-Elias J, Espinosa-Tanguma R. The Folate Concentration and/or Folic Acid Metabolites in Plasma as Factor for COVID-19 Infection. *Front Pharmacol* 2020; **11**: 1062.
223. Aghaamoo S, Ghods K, Rahmanian M. Pregnant women with COVID-19: the placental involvement and consequences. *J Mol Histol* 2021; **52**(3): 427-35.
224. Ahmed R. Novel Coronavirus SARS-CoV-2 (COVID-19) and Pregnancy: A hypothetical view. *Endocr Metab Immune Disord Drug Targets* 2020.
225. Altendahl M, Afshar Y, de St Maurice A, Fajardo V, Chu A. Perinatal Maternal-Fetal/Neonatal Transmission of COVID-19: A Guide to Safe Maternal and Neonatal Care in the Era of COVID-19 and Physical Distancing. *Neoreviews* 2020; **21**(12): e783-e94.
226. Antonakou A. The latest update on the effects of COVID-19 infection in pregnancy. *Eur J Midwifery* 2020; **4**: 12.
227. Api O, Sen C, Debska M, et al. Clinical management of coronavirus disease 2019 (COVID-19) in pregnancy: recommendations of WAPM-World Association of Perinatal Medicine. *Journal of perinatal medicine* 2020; **48**(9): 857-66.

228. Avila WS, Carvalho RC. COVID-19: A New Challenge in Pregnancy and Heart Disease. *Arq Bras Cardiol* 2020; **115**(1): 1-4.
229. Bahado-Singh R, Hassan SS, Szymanska M, Sokol RJ. Starting a regional collaborative research group for COVID-19 in pregnancy: the Southern Michigan experience. *Journal of perinatal medicine* 2020; **48**(9): 883-91.
230. Bajpai D, Shah S. COVID-19 Pandemic and Pregnancy in Kidney Disease. *Adv Chronic Kidney Dis* 2020; **27**(5): 397-403.
231. Berghella V. Attack on coronavirus disease 2019 from American Journal of Obstetrics & Gynecology MFM. *Am J Obstet Gynecol MFM* 2020; **2**(2): 100119.
232. Berhan Y. What immunological and hormonal protective factors lower the risk of COVID-19 related deaths in pregnant women? *J Reprod Immunol* 2020; **142**: 103180.
233. Bernstein K, Landau R. Management of maternal COVID-19: considerations for anesthesiologists. *Curr Opin Anaesthesiol* 2021; **34**(3): 246-53.
234. Boushra MN, Koyfman A, Long B. COVID-19 in pregnancy and the puerperium: A review for emergency physicians. *The American journal of emergency medicine* 2021; **40**: 193-8.
235. Carvalho BR, Adami KS, Goncalves-Ferri WA, Samama M, Ferriani RA, Marcolin AC. COVID-19: Uncertainties from Conception to Birth. *Rev Bras Ginecol Obstet* 2021; **43**(1): 54-60.
236. Cavalcante MB, Cavalcante C, Sarno M, Barini R, Kwak-Kim J. Maternal immune responses and obstetrical outcomes of pregnant women with COVID-19 and possible health risks of offspring. *J Reprod Immunol* 2021; **143**: 103250.
237. Chen L, Jiang H, Zhao Y. Pregnancy with COVID-19: Management considerations for care of severe and critically ill cases. *American journal of reproductive immunology* 2020; **84**(5): e13299.
238. Chen M, Zeng J, Liu X, et al. Changes in physiology and immune system during pregnancy and coronavirus infection: A review. *European journal of obstetrics, gynecology, and reproductive biology* 2020; **255**: 124-8.
239. Ciobanu AM, Peltecu G, Panaitescu AM. Coronavirus in pregnancy. What we know so far? *Maedica (Bucur)* 2020; **15**(1): 6-10.
240. Coxon K, Turienzo CF, Kweekel L, et al. The impact of the coronavirus (COVID-19) pandemic on maternity care in Europe. *Midwifery* 2020; **88**: 102779.
241. Dang D, Wang L, Zhang C, Li Z, Wu H. Potential effects of SARS-CoV-2 infection during pregnancy on fetuses and newborns are worthy of attention. *J Obstet Gynaecol Res* 2020; **46**(10): 1951-7.
242. Dangal G. COVID-19 in Pregnancy: Pregnant Women Might be at Greater Risk for Severe COVID-19. *Kathmandu Univ Med J (KUMJ)* 2020; **18**(70): 1-2.
243. Dashraath P, Wong JLJ, Lim MXK, et al. Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. *American journal of obstetrics and gynecology* 2020; **222**(6): 521-31.
244. de Souza Silva GA, da Silva SP, da Costa MAS, et al. SARS-CoV, MERS-CoV and SARS-CoV-2 infections in pregnancy and fetal development. *J Gynecol Obstet Hum Reprod* 2020: 101846.
245. Di Mascio D, Buca D, Berghella V, et al. Counseling in maternal-fetal medicine: SARS-CoV-2 infection in pregnancy. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **57**(5): 687-97.
246. Dotters-Katz SK, Hughes BL. Considerations for Obstetric Care during the COVID-19 Pandemic. *American journal of perinatology* 2020; **37**(8): 773-9.
247. D'Souza R, Malhame I, Teshler L, Acharya G, Hunt BJ, McLintock C. A critical review of the pathophysiology of thrombotic complications and clinical practice recommendations for thromboprophylaxis in pregnant patients with COVID-19. *Acta obstetricia et gynecologica Scandinavica* 2020; **99**(9): 1110-20.
248. Dubey P, Thakur B, Reddy S, et al. Current trends and geographical differences in therapeutic profile and outcomes of COVID-19 among pregnant women - a systematic review and meta-analysis. *BMC pregnancy and childbirth* 2021; **21**(1): 247.

249. Ellington S, Strid P, Tong VT, et al. Characteristics of Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status - United States, January 22-June 7, 2020. *MMWR Morb Mortal Wkly Rep* 2020; **69**(25): 769-75.
250. Elsaddig M, Khalil A. Effects of the COVID pandemic on pregnancy outcomes. *Best Pract Res Clin Obstet Gynaecol* 2021; **73**: 125-36.
251. Fairlie L, Sawry S, Patel F, et al. COVID-19 in pregnancy in South Africa: Tracking the epidemic and defining the natural history. *S Afr Med J* 2020; **110**(8): 729-31.
252. Fathi M, Vakili K, Deravi N, et al. Coronavirus diseases and pregnancy: COVID-19,SARS, and MERS. *Przegl Epidemiol* 2020; **74**(2): 276-89.
253. Ferrer-Oliveras R, Mendoza M, Capote S, et al. Immunological and physiopathological approach of COVID-19 in pregnancy. *Archives of gynecology and obstetrics* 2021; **304**(1): 39-57.
254. Forestieri S, Marcialis MA, Migliore L, Panisi C, Fanos V. Relationship between pregnancy and coronavirus: what we know. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-12.
255. Ghi T, di Pasquo E, Mekinian A, Calza L, Frusca T. Sars-CoV-2 in pregnancy: Why is it better than expected? *European journal of obstetrics, gynecology, and reproductive biology* 2020; **252**: 476-8.
256. Golden TN, Simmons RA. Maternal and neonatal response to COVID-19. *Am J Physiol Endocrinol Metab* 2020; **319**(2): E315-E9.
257. Goncalves AK. The Real Impact of the Coronavirus Disease 2019 (covid-19) on the Pregnancy Outcome. *Rev Bras Ginecol Obstet* 2020; **42**(5): 303-4.
258. Govender R, Moodley J, Naicker T. The COVID-19 Pandemic: an Appraisal of its Impact on Human Immunodeficiency Virus Infection and Pre-Eclampsia. *Curr Hypertens Rep* 2021; **23**(2): 9.
259. Gujski M, Humeniuk E, Bojar I. Current State of Knowledge About SARS-CoV-2 and COVID-19 Disease in Pregnant Women. *Med Sci Monit* 2020; **26**: e924725.
260. Hanna N, Hanna M, Sharma S. Is pregnancy an immunological contributor to severe or controlled COVID-19 disease? *American journal of reproductive immunology* 2020; **84**(5): e13317.
261. Hapshy V, Aziz D, Kahar P, Khanna D, Johnson KE, Parmar MS. COVID-19 and Pregnancy: Risk, Symptoms, Diagnosis, and Treatment. *SN Compr Clin Med* 2021: 1-7.
262. Hashem NM, Abdelnour SA, Alhimaidi AR, Swelum AA. Potential impacts of COVID-19 on reproductive health: Scientific findings and social dimension. *Saudi J Biol Sci* 2021; **28**(3): 1702-12.
263. Hudak ML. Consequences of the SARS-CoV-2 pandemic in the perinatal period. *Curr Opin Pediatr* 2021; **33**(2): 181-7.
264. Jardine J, Morris E. COVID-19 in Women's health: Epidemiology. *Best Pract Res Clin Obstet Gynaecol* 2021; **73**: 81-90.
265. Joseph NT, Rasmussen SA, Jamieson DJ. The effects of COVID-19 on pregnancy and implications for reproductive medicine. *Fertil Steril* 2021; **115**(4): 824-30.
266. Klaritsch P, Ciresa-Konig A, Pristauz-Telsnigg G, board of the O. COVID-19 During Pregnancy and Puerperium - A Review by the Austrian Society of Gynaecology and Obstetrics (OEGGG). *Geburtshilfe und Frauenheilkunde* 2020; **80**(8): 813-9.
267. Krupa A, Schmidt M, Zborowska K, Jorg D, Czajkowska M, Skrzypulec-Plinta V. Impact of COVID-19 on pregnancy and delivery - current knowledge. *Ginekol Pol* 2020; **91**(9): 564-8.
268. Kucirka LM, Norton A, Sheffield JS. Severity of COVID-19 in pregnancy: A review of current evidence. *American journal of reproductive immunology* 2020; **84**(5): e13332.
269. Lai YJ, Chang CM, Lin CK, et al. Severe acute respiratory syndrome coronavirus-2 and the deduction effect of angiotensin-converting enzyme 2 in pregnancy. *J Chin Med Assoc* 2020; **83**(9): 812-6.
270. Lakshminrusimha S, Sridhar A, Guerra AAH, Higgins RD, Saade G. Perinatal COVID-19 Infection Prevention: Infographics for Patients and Providers. *American journal of perinatology* 2020; **37**(12): 1185-8.

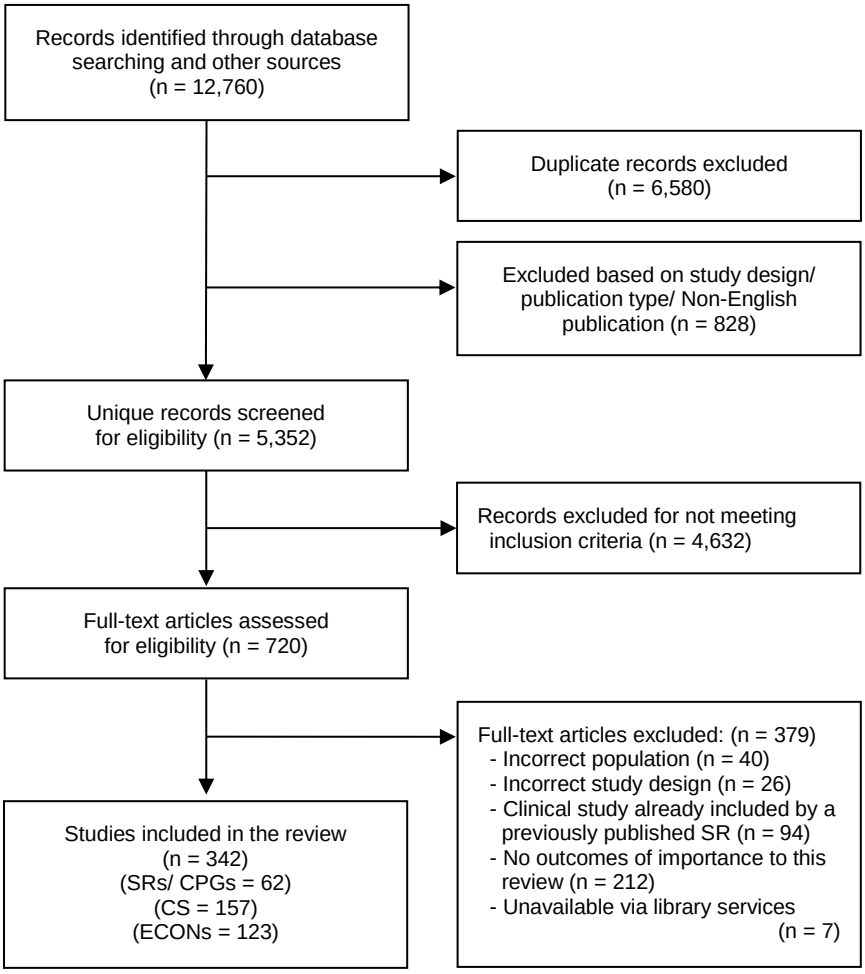
271. Landau R. COVID-19 Pandemic and Obstetric Anaesthesia. *Anaesth Crit Care Pain Med* 2020; **39**(3): 327-8.
272. Li W, Yu N, Kang Q, et al. Clinical manifestations and maternal and perinatal outcomes with COVID-19. *American journal of reproductive immunology* 2020; **84**(5): e13340.
273. Liu H, Wang LL, Zhao SJ, Kwak-Kim J, Mor G, Liao AH. Why are pregnant women susceptible to COVID-19? An immunological viewpoint. *J Reprod Immunol* 2020; **139**: 103122.
274. Lopez M, Gonce A, Meler E, et al. Coronavirus Disease 2019 in Pregnancy: A Clinical Management Protocol and Considerations for Practice. *Fetal Diagn Ther* 2020; **47**(7): 519-28.
275. Madjunkov M, Dviri M, Librach C. A comprehensive review of the impact of COVID-19 on human reproductive biology, assisted reproduction care and pregnancy: a Canadian perspective. *J Ovarian Res* 2020.
276. Makatsariya A, Slukhanchuk E, Bitsadze V, et al. COVID-19, neutrophil extracellular traps and vascular complications in obstetric practice. *Journal of perinatal medicine* 2020; **48**(9): 985-94.
277. Makatsariya AD, Slukhanchuk EV, Bitsadze VO, et al. Thrombotic microangiopathy, DIC-syndrome and COVID-19: link with pregnancy prothrombotic state. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-9.
278. Maleki Dana P, Kolahdooz F, Sadoughi F, Moazzami B, Chaichian S, Asemi Z. COVID-19 and pregnancy: a review of current knowledge. *Le infezioni in medicina* 2020; **28**(suppl 1): 46-51.
279. Manchanda K, Singh J, Bhagat R, Tiwana IK, Singh H. Safety of pharmacological options for the management of COVID-19 in pregnant women: An Indian perspective. *Int J Risk Saf Med* 2021; **32**(1): 3-17.
280. Mann A, Dahiya A, Souza LC, Letra A. Considerations for Pregnant Dental and Health Care Workers amid COVID-19. *JDR Clin Trans Res* 2020; **5**(4): 300-6.
281. Marim F, Karadogan D, Eyuboglu TS, et al. Lessons Learned so Far from the Pandemic: A Review on Pregnants and Neonates with COVID-19. *Eurasian J Med* 2020.
282. Martinez-Portilla RJ, Gil MM, Poon LC. Scientific effort in combating COVID-19 in obstetrics and gynecology. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2021; **57**(2): 189-94.
283. Mazur-Bialy AI, Kolomanska-Bogucka D, Tim S, Oplawski M. Pregnancy and Childbirth in the COVID-19 Era-The Course of Disease and Maternal-Fetal Transmission. *J Clin Med* 2020; **9**(11).
284. McCartney SA, Kachikis A, Huebner EM, Walker CL, Chandrasekaran S, Adams Waldorf KM. Obesity as a contributor to immunopathology in pregnant and non-pregnant adults with COVID-19. *American journal of reproductive immunology* 2020; **84**(5): e13320.
285. Mimouni F, Lakshminrusimha S, Pearlman SA, Raju T, Gallagher PG, Mendlovic J. Perinatal aspects on the covid-19 pandemic: a practical resource for perinatal-neonatal specialists. *J Perinatol* 2020; **40**(5): 820-6.
286. Monteleone PA, Nakano M, Lazar V, Gomes AP, de HM, Bonetti TC. A review of initial data on pregnancy during the COVID-19 outbreak: implications for assisted reproductive treatments. *JBRA assisted reproduction* 2020; **24**(2): 219-25.
287. Moore KM, Suthar MS. Comprehensive analysis of COVID-19 during pregnancy. *Biochem Biophys Res Commun* 2021; **538**: 180-6.
288. Moradi B, Kazemi MA, Gity M, Hantoushzadeh S. Do we expect important complications of COVID-19 infection during pregnancy? *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-2.
289. Muhidin S, Vizheh M, Behboodi Moghadam Z. Asymptomatic coronavirus infection among pregnant women: a necessity for universal screening of COVID-19 in pregnant women admitted to labor. *The journal of maternal-fetal & neonatal medicine : the official journal of the European*

Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet 2020: 1-2.
290. Mullins E, Evans D, Viner RM, O'Brien P, Morris E. Coronavirus in pregnancy and delivery: rapid review. *Ultrasound in obstetrics & gynecology : the official journal of the International Society of Ultrasound in Obstetrics and Gynecology* 2020.
291. Muyayalo KP, Huang DH, Zhao SJ, Xie T, Mor G, Liao AH. COVID-19 and Treg/Th17 imbalance: Potential relationship to pregnancy outcomes. *American journal of reproductive immunology* 2020; **84**(5): e13304.
292. Nachega JB, Sam-Agudu NA, Budhram S, et al. Effect of SARS-CoV-2 Infection in Pregnancy on Maternal and Neonatal Outcomes in Africa: An AFREhealth Call for Evidence through Multicountry Research Collaboration. *Am J Trop Med Hyg* 2020.
293. Naidoo N, Moodley J, Naicker T. Maternal endothelial dysfunction in HIV-associated preeclampsia comorbid with COVID-19: a review. *Hypertension research : official journal of the Japanese Society of Hypertension* 2021; **44**(4): 386-98.
294. Naidu SAG, Clemens RA, Pressman P, Zaigham M, Davies KJA, Naidu AS. COVID-19 during Pregnancy and Postpartum. *J Diet Suppl* 2020: 1-37.
295. Nakamura-Pereira M, Betina Andreucci C, de Oliveira Menezes M, Knobel R, Takemoto MLS. Worldwide maternal deaths due to COVID-19: A brief review. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2020; **151**(1): 148-50.
296. Nasir U, Ahmad S. Management and Perspective of Coronavirus Disease 2019 (COVID-19), Pregnancy, and Hypercoagulability. *SN Compr Clin Med* 2021: 1-4.
297. Ortiz EI, Herrera E, De La Torre A. Coronavirus (COVID 19) Infection in Pregnancy. *Colomb Med (Cali)* 2020; **51**(2): e4271.
298. Oxford-Horrey C, Savage M, Prabhu M, et al. Putting It All Together: Clinical Considerations in the Care of Critically Ill Obstetric Patients with COVID-19. *American journal of perinatology* 2020; **37**(10): 1044-51.
299. Pantelis C, Jayaram M, Hannan AJ, et al. Neurological, neuropsychiatric and neurodevelopmental complications of COVID-19. *Aust N Z J Psychiatry* 2020: 4867420961472.
300. Phoswa WN, Khaliq OP. Is pregnancy a risk factor of COVID-19? *European journal of obstetrics, gynecology, and reproductive biology* 2020; **252**: 605-9.
301. Prochaska E, Jang M, Burd I. COVID-19 in pregnancy: Placental and neonatal involvement. *American journal of reproductive immunology* 2020; **84**(5): e13306.
302. Rajewska A, Mikolajek-Bedner W, Lebdowicz-Knul J, Sokolowska M, Kwiatkowski S, Torbe A. COVID-19 and pregnancy - where are we now? A review. *Journal of perinatal medicine* 2020.
303. Rasmussen SA, Jamieson DJ. Caring for Women Who Are Planning a Pregnancy, Pregnant, or Postpartum During the COVID-19 Pandemic. *Jama* 2020; **324**(2): 190-1.
304. Rogan SC, Beigi RH. Management of Viral Complications of Pregnancy: Pharmacotherapy to Reduce Vertical Transmission. *Obstet Gynecol Clin North Am* 2021; **48**(1): 53-74.
305. Ryan GA, Purandare NC, McAuliffe FM, Hod M, Purandare CN. Clinical update on COVID-19 in pregnancy: A review article. *J Obstet Gynaecol Res* 2020; **46**(8): 1235-45.
306. Sahu KK, Mishra AK, Lal A. A twin challenge to handle: COVID-19 with pregnancy. *J Med Virol* 2020; **92**(10): 1718-20.
307. Salem D, Katranji F, Bakdash T. COVID-19 infection in pregnant women: Review of maternal and fetal outcomes. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics* 2021.
308. Sankaran D, Nakra N, Cheema R, Blumberg D, Lakshminrusimha S. Perinatal SARS-CoV-2 Infection and Neonatal COVID-19: A 2021 Update. *Neoreviews* 2021; **22**(5): e284-e95.
309. Sarli L. SARS-CoV-2 docet. *Acta Biomed* 2021; **92**(S2): e2021012.
310. Schwartz DA. The Effects of Pregnancy on Women With COVID-19: Maternal and Infant Outcomes. *Clin Infect Dis* 2020; **71**(16): 2042-4.

311. Selim M, Mohamed S, Abdo M, Abdelhaffez A. Is COVID-19 Similar in Pregnant and Non-Pregnant Women? *Cureus* 2020; **12**(6): e8888.
312. Sharma S, Burd I, Liao A. Special issue on COVID-19 and pregnancy: Consequences for maternal and neonatal health. *American journal of reproductive immunology* 2020; **84**(5): e13354.
313. Shrestha N, Dangal G. Revisiting Strategies for Maternal Health Care in the Face of COVID-19 Pandemic. *Kathmandu Univ Med J (KUMJ)* 2020; **18**(70): 62-7.
314. Silva FVD, Souza KV. The unacceptable tragedy of maternal mortality associated with COVID-19: (re)politicization of women's health and rights and the position of Brazilian nursing. *Rev Bras Enferm* 2020; **73**(suppl 4): e73supl04.
315. Stafford IA, Parchem JG, Sibai BM. The coronavirus disease 2019 vaccine in pregnancy: risks, benefits, and recommendations. *American journal of obstetrics and gynecology* 2021; **224**(5): 484-95.
316. Stanczyk P, Jachymski T, Sieroszewski P. COVID-19 during pregnancy, delivery and postpartum period based on EBM. *Ginekol Pol* 2020; **91**(7): 417-23.
317. Subbaraman N. Pregnancy and COVID: what the data say. *Nature* 2021; **591**(7849): 193-5.
318. Sulentic RO, Seferovic MD, Aagaard KM, Valentine GC. Perinatal COVID-19 outcomes: evaluating the strength of current evidence. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-7.
319. Sutton D, Bertozzi-Villa C, Lasky J, Fuchs K, Friedman A. Outcomes and epidemiology of COVID-19 infection in the obstetric population. *Semin Perinatol* 2020; **44**(7): 151283.
320. Syeda S, Baptiste C, Breslin N, Gyamfi-Bannerman C, Miller R. The clinical course of COVID in pregnancy. *Semin Perinatol* 2020; **44**(7): 151284.
321. Takemoto MLS, Menezes MO, Andreucci CB, et al. Maternal mortality and COVID-19. *The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstet* 2020: 1-7.
322. Todros T, Masturzo B, De Francia S. COVID-19 infection: ACE2, pregnancy and preeclampsia. *European journal of obstetrics, gynecology, and reproductive biology* 2020; **253**: 330.
323. Wang CL, Liu YY, Wu CH, Wang CY, Wang CH, Long CY. Impact of COVID-19 on Pregnancy. *Int J Med Sci* 2021; **18**(3): 763-7.
324. Wastnedge EAN, Reynolds RM, van Boeckel SR, et al. Pregnancy and COVID-19. *Physiol Rev* 2021; **101**(1): 303-18.
325. Westgren M, Pettersson K, Hagberg H, Acharya G. Severe maternal morbidity and mortality associated with COVID-19: The risk should not be downplayed. *Acta obstetricia et gynecologica Scandinavica* 2020; **99**(7): 815-6.
326. Wong YP, Khong TY, Tan GC. The Effects of COVID-19 on Placenta and Pregnancy: What Do We Know So Far? *Diagnostics (Basel)* 2021; **11**(1).
327. Zimmermann P, Curtis N. COVID-19 in Children, Pregnancy and Neonates: A Review of Epidemiologic and Clinical Features. *The Pediatric infectious disease journal* 2020.
328. Vigil-De Gracia P, Caballero LC, Chinkee JN, et al. COVID-19 and pregnancy. Review and update. *Revista Peruana de Ginecologia y Obstetricia* 2020; **66**(2): 41-8.
329. Berhan Y. COVID-19, a Disease of Enigma: Why Pregnant Women are Less Vulnerable? *Ethiopian Journal of Health Sciences* 2020; **30**(3): 315-8.
330. DeMartino ES, Chor J. Potential for State Restrictions to Impact Critical Care of Pregnant Patients With Coronavirus Disease 2019. *Chest* 2021; **159**(2): 873-5.
331. Metz TD. Is Universal Testing for Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Needed on All Labor and Delivery Units? *Obstetrics & Gynecology* 2020; **136**(2): 227-8.
332. Nath KA. In the Limelight: August 2020. *Mayo Clinic Proceedings* 2020; **95**(8): 1559-61.
333. Adam S, Maswime S, Soma-Pillay P, et al. Judicious use of personal protective equipment to prevent the spread of COVID-19 in maternity units. *South African Journal of Obstetrics and Gynaecology* 2020; **26**(1): 2-3.

334. Bradley SH, Kirby E, Wheatstone P. Managing individual and population risk from covid-19. *BMJ* 2020; **369 (no pagination)**(m2098).
335. Brooks OT. What If They Threw A Pandemic And Nobody Came? *Journal of the National Medical Association* 2020; **112**(2): 115-6.
336. Deruelle P, De Marcillac F. COVID-19, a brutal blow. *Gynecologie, obstetrique, fertilite & senologie* 2020; **48**(5): 407-8.
337. Haghdoost SM, Gol MK. The necessity of paying more attention to the neurological and psychological problems caused by covid-19 pandemic during pregnancy. *International Journal of Women's Health and Reproduction Sciences* 2020; **8**(3): 243-4.
338. Kurdoglu M, Khaki A. What is the current state of knowledge about the novel coronavirus infection during pregnancy? *International Journal of Women's Health and Reproduction Sciences* 2020; **8**(2): 110-1.
339. La Marca A, Niederberger C, Pellicer A, Nelson SM. COVID-19: lessons from the Italian reproductive medical experience. *Fertility and Sterility* 2020; **113**(5): 920-2.
340. Malhotra J, Agrawal P, Garg R, Malhotra N, Singh SV. Corona virus disease (COVID-19) and pregnancy: What obstetrician should know. *Journal of SAFOG* 2019; **11**(6): 337-9.
341. Mardani M, Pourkaveh B. A controversial debate: Vertical transmission of COVID-19 in pregnancy. *Archives of Clinical Infectious Diseases* 2020; **15 (1) (no pagination)**(e102286).
342. Nader ND, Mahmoodpoor A. COVID-associated respiratory distress syndrome (Cards) in pregnancy; what makes it so different? *International Journal of Women's Health and Reproduction Sciences* 2020; **8**(4): 336-7.
343. Papageorghiou AT. A year in pandemic mode. *BJOG: An International Journal of Obstetrics and Gynaecology* 2020; **127**(13): 1583-4.
344. Wang C, Chen DJ, Yang HX. Updates on COVID-19 Infection during Pregnancy. *Maternal-Fetal Medicine* 2020; **2**(2): 65-7.
345. D'Antonio F, Sen C, Mascio DD, et al. Maternal and perinatal outcomes in high compared to low risk pregnancies complicated by severe acute respiratory syndrome coronavirus 2 infection (phase 2): the World Association of Perinatal Medicine working group on coronavirus disease 2019. *Am J Obstet Gynecol MFM* 2021; **3**(4): 100329.

Figure 1. Modified PRISMA flow-chart



Appendix 1. Medline (Ovid) Search Strategy

1. exp Coronavirus/ or exp Coronavirus Infections/ (96880)
2. (OC43 or NL63 or D614G or 229E or HKU1 or hcov* or ncov* or covid* or sarscov* or sars-cov* or sarscoronavir* or sars-coronavir* or 2019ncov* or 19ncov* or novel cov* or 2019novel cov* or severe acute respiratory syndrome corona*).ti,ab,kf,nm,ot,ox,rx,px. (138705)
3. ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV)).ti,ab,kf,ot. (42496)
4. ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).ti,ab,kf,ot. (7974)
5. ((wuhan or hubei) adj5 pneumonia).ti,ab,kf,ot. (335)
6. (COVID-19 or SARS-CoV-2).rx,px,ox,rn. or (COVID-19 or COVID-19 serotherapy or ORF7b protein, SARS-CoV-2 or ORF6 protein, SARS-CoV-2 or ORF8 protein, SARS-CoV-2 or pediatric multisystem inflammatory disease, COVID-19 related or envelope protein, SARS-CoV-2 or ORF7a protein, SARS-CoV-2 or spike protein, SARS-CoV-2 or ORF3a protein, SARS-CoV-2 or COVID-19 drug treatment or severe acute respiratory syndrome coronavirus 2 or membrane protein, SARS-CoV-2 or ORF1ab polyprotein, SARS-CoV-2 or nucleocapsid protein, Coronavirus or COVID-19 vaccine or COVID-19 diagnostic testing).os,ps,rn,rs. (7980)
7. or/1-6 (156700)
8. limit 7 to yr="2019 -Current" (140838)
9. exp pregnant women/ or exp pregnancy/ or exp pregnancy complications/ or exp maternal health services/ or exp prenatal care/ or exp perinatal care/ (959417) ()
10. (pregnan* or gestation* or gravidity or maternal or maternity or antenatal or ante natal or antepartum or ante partum or prenatal or pre natal or perinatal or peri natal or obstetric*).ti,ab,kf. (921768)
11. or/9-10 (1293208)
12. 8 and 11 (3599)
13. exp animals/ not humans.sh. (4832753)
14. 12 not 13 (3576)
15. limit 14 to english language (3472)

Appendix 2. Embase (Ovid) Search Strategy

1. exp betacoronavirus/ or coronavirinae/ or exp coronavirus infection/ (139351)
2. (OC43 or NL63 or D614G or 229E or HKU1 or hcov* or ncov* or covid* or sarscov* or sars-cov* or sarscoronavir* or sars-coronavir* or 2019ncov* or 19ncov* or novel cov* or 2019novel cov* or severe acute respiratory syndrome corona*).ti,ab,kw,hw,ot. (137391)
3. ((new or novel or "19" or "2019" or Wuhan or Hubei or China or Chinese) adj3 (coronavirus* or corona virus* or betacoronavirus* or CoV or HCoV)).ti,ab,kw,hw,ot. (118690)
4. ((coronavirus* or corona virus* or betacoronavirus*) adj3 (pandemic* or epidemic* or outbreak* or crisis)).ti,ab,kw,ot. (7454)
5. ((Wuhan or Hubei) adj5 pneumonia).ti,ab,kw,ot. (370)
6. (COVID-19 or severe acute respiratory syndrome coronavirus 2).ox,dq,dj,od. (30511)
7. or/1-6 (158494)
8. limit 7 to yr="2019 -Current" (141942)
9. pregnant woman/ or exp pregnancy disorder/ or exp pregnancy/ or exp prenatal care/ or exp perinatal care/ (1090452)
10. (pregnan* or gestation* or gravidity or maternal or maternity or antenatal or ante natal or antepartum or ante partum or prenatal or pre natal or perinatal or peri natal or obstetric*).ti,ab,kw. (1128235)
11. or/9-10 (1462229)
12. 8 and 11 (4414)
13. (exp animal/ or nonhuman/) not exp human/ (6577992)
14. 12 not 13 (4381)
15. limit 14 to english language (4234)

Appendix 3. Cochrane Covid (Wiley) Search Strategy

pregnan* or gestation* or gravidity or maternal or maternity or antenatal or "ante natal" or antepartum or "ante partum" or prenatal or "pre natal" or perinatal or "peri natal" or obstetric* (2253)

Appendix 4. LitCovid (NLM) Search Strategy

pregnan* or gestation* or gravidity or maternal or maternity or antenatal or "ante natal" or antepartum or "ante partum" or prenatal or "pre natal" or perinatal or "peri natal" or obstetric* (2427)