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# Timing of maternal mortality and severe morbidity during the postpartum period: a systematic review

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## ABSTRACT

**Objective:** The objective of this review was to determine the timing of overall and cause-specific maternal mortality and severe morbidity during the postpartum period.

**Introduction:** Many women continue to die or experience adverse health outcomes in the postpartum period; however, limited work has explored the timing of when women die or present complications during this period globally.

**Inclusion criteria:** This review considered studies that reported on women after birth up to 6 weeks postpartum and included data on mortality and/or morbidity on the first day, days 2–7, and days 8–42. Studies that reported solely on high-risk women (eg, those with antenatal or intrapartum complications) were excluded, but mixed population samples were included (eg, low-risk and high-risk women).

**Methods:** MEDLINE, Embase, Web of Science, and CINAHL were searched for published studies on December 20, 2019, and searches were updated on May 11, 2021. Critical appraisal was undertaken by 2 independent reviewers using standardized critical appraisal instruments from JBI. Quantitative data were extracted from included studies independently by at least 2 reviewers using a study-specific data extraction form. Quantitative data were pooled, where possible. Identified studies were used to obtain the summary estimate (proportion) for each time point. Maternal mortality was calculated as the maternal deaths during a given period over the total number of maternal deaths known during the postpartum period. For cause-specific analysis, number of deaths due to a specific cause was the numerator, while the total number of women who died due to the same cause in that period was the denominator. Random effects models were run to pool incidence proportion for relative risk of overall maternal deaths. Subgroup analysis was conducted according to country income classification and by date (ie, data collection before or after 2010). Where statistical pooling was not possible, the findings were reported narratively.

**Results:** A total of 32 studies reported on maternal outcomes from 17 reports, all reporting on mixed populations. Most maternal deaths occurred on the first day (48.9%), with 24.5% of deaths occurring between days 2 and 7, and 24.9% occurring between days 8 and 42. Maternal mortality due to postpartum hemorrhage and embolism occurred predominantly on the first day (79.1% and 58.2%, respectively). Most deaths due to postpartum eclampsia and hypertensive disorders occurred within the first week (44.3% on day 1 and 37.1% on days 2–7). Most deaths due to infection occurred between days 8 and 42 (61.3%). Due to heterogeneity, maternal morbidity data are described

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narratively, with morbidity predominantly occurring within the first 2 weeks. The mean critical appraisal score across all included studies was 85.9% (standard deviation = 13.6%).

**Conclusion:** Women experience mortality throughout the entire postpartum period, with the highest mortality rate on the first day. Access to high-quality care during the postpartum period, including enhanced frequency and quality of postpartum assessments during the first 42 days after birth, is essential to improving maternal outcomes and to continue reducing maternal mortality and morbidity worldwide.

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**Keywords:** maternal morbidity; maternal mortality; postnatal care; postpartum complications; timing

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## Introduction

In 2017 alone, approximately 295,000 maternal deaths occurred globally, reflecting a maternal mortality ratio (MMR) of 211 per 100,000 live births across 185 countries.<sup>1</sup> The global MMR between 2000 and 2017 declined 2.9% per year, on average, with the number of maternal deaths globally in 2017 estimated to be 35% lower than in 2000.<sup>1</sup> MMRs are significantly higher in low- and middle-income countries (LMICs), with sub-Saharan Africa and southern Asia accounting for 86% of all maternal deaths.<sup>1,2</sup> Evidence shows that some high-income countries (HICs) are also experiencing an increasing MMR, mostly among vulnerable populations.<sup>3</sup>

However, less is known about timing trends within the immediate 42-day postpartum period to identify when greater follow-up is needed to further reduce mortality. A systematic review of causes of maternal mortality outcomes up until 2012 identified that 73% of maternal deaths were due to direct obstetric causes, such as hemorrhage, hypertensive disorders, and sepsis.<sup>4</sup> Broadly, 40% to 45% of maternal deaths occur between the start of labor and the 24-hour period immediately after birth.<sup>5</sup> Much of this evidence focuses on LMICs where the risk of women dying during the postpartum period is significantly higher.<sup>1,2</sup>

Not only is maternal mortality an ongoing concern, but severe maternal morbidity also warrants attention.<sup>6,7</sup> Various conditions, including, but not limited to, severe postpartum hemorrhage and sepsis are common in the postpartum period.<sup>8</sup> Severe maternal morbidities are associated with numerous negative short-term and long-term consequences for maternal health and may result in death.<sup>6,7,9</sup> Severe maternal morbidities highlight the serious complications that can occur during the postpartum period, supporting

the need for further investigation into appropriate, timely, and high-quality postpartum care.

Given the growing evidence of severe maternal morbidity and mortality, and the critical role that access to quality care in a timely manner can play in improving outcomes,<sup>10</sup> it is essential to have access to synthesized information on when deaths and severe morbidities occur during the postpartum period and the range of causes among healthy, low-risk women. After childbirth, a shift occurs from intense monitoring near the end of pregnancy (when women are meeting with health care providers frequently) to significantly reduced care access and utilization.<sup>11</sup> Existing guidelines in HICs on the timing and frequency of postnatal follow-up care for healthy, low-risk women typically recommend only one visit within a range of 3–8 weeks.<sup>12,13</sup> Only 2 existing guidelines recommended a visit within the first week (World Health Organization [WHO]<sup>14</sup> and National Institute for Health and Care Excellence),<sup>15</sup> with a few guidelines also recommending individualized postnatal follow-up appointments as needed by the woman.<sup>12</sup>

In LMICs, coverage for some essential health care interventions for women (eg, skilled health care providers at birth) has improved, with the global emphasis on the Sustainable Development Goals and support of the Every Woman Every Child initiative.<sup>16</sup> Still, global estimates suggest that coverage is lower for interventions targeting the postpartum period, with further reductions in coverage for postpartum visits for women compared to newborns.<sup>16</sup> Understanding when and why mortality and severe morbidity occur in the postpartum period may influence policy and recommendations to enhance coverage of high-quality postnatal care. The current WHO recommendations are for postpartum care to be provided in the first 24 hours after birth at a

health facility or within 24 hours if birth took place at home, followed by a minimum of three postpartum contacts occurring within 48 to 72 hours, between days 7 and 14, and 6 weeks after birth.<sup>14</sup>

It is important to ensure the timings for postpartum contact are aligned with when healthy, low-risk women and newborns are experiencing the greatest health challenges in the postpartum period. In light of this, the WHO is currently in the process of updating the Recommendations on Postnatal Care of the Mother and Newborn, as existing guidelines were published in 2013.<sup>14</sup> Therefore, there is a need to review the literature to identify the timing and causes of maternal and neonatal mortalities and severe morbidities to inform global recommendations. The focus of this review is on maternal mortality and severe morbidities; a second, separate review will focus on neonatal mortality and severe morbidities.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and the *JBIR Database of Systematic Reviews and Implementation Reports* was conducted and no current or in-progress systematic reviews on the overall or causespecific timing of maternal mortality and severe morbidity in the postpartum period were identified. Previous reviews that were identified focused on specific aspects, such as frequency of maternal morbidity,<sup>17</sup> maternal cause-specific analysis between pregnancy and postpartum,<sup>4</sup> and maternal and perinatal mortality using institutional data in LMICs.<sup>18</sup> Given the growing number of reports on this topic and the upcoming update of the WHO postnatal care guidelines, it is important to consolidate existing evidence on maternal mortality and severe morbidity outcomes in the healthy, low-risk maternal population during the postpartum period.<sup>19</sup> Furthermore, the abovementioned review on maternal mortality by Say and colleagues included a search up to 2012<sup>4</sup>; our review adds insight into maternal mortality within the postpartum period by examining deaths on first day (day 1), days 2–7, and days 8–42, with a search up until 2021. Although there are significant contextual differences across HICs and LMICs and diverse health systems, the high mortality ratio and growing morbidity rate for women remain a global issue, thus warranting a review of this magnitude.

The objective of this review is to determine the timing of overall and cause-specific maternal

mortality and severe morbidity in the postpartum period.

## Review questions

What is the timing of overall and cause-specific maternal mortality and severe morbidity in healthy, low-risk women in the postpartum period?

In particular:

- i) When do women die within the first 42 days after giving birth?
- ii) What are the causes of death in women within the first 42 days after giving birth?
- iii) When do women experience severe morbidity within the first 42 days after giving birth (overall and cause-specific)?

## Inclusion criteria

### Participants

The review considered reports that included healthy, low-risk women after vaginal or cesarean birth to 6 weeks (42 days) postpartum, consistent with current WHO definitions.<sup>20</sup> Studies that reported solely on women who were considered high risk (ie, women who need referral for additional management or specialist care; women with intrapartum complications; or women considered high risk as defined by study authors, such as obesity, or preeclampsia prior to delivery) during the perinatal period, or solely on women who delivered before 37 weeks' gestation or after 42 weeks' gestation were excluded. Studies that included low-risk and highrisk women (mixed samples) were included.

### Condition

This review sought to locate existing evidence on the overall and cause-specific timing of maternal mortality and severe morbidity during the postpartum period for low-risk women. Maternal death for this study used the following WHO definition, removing the pregnancy portion: “the death of a woman . . . within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.”<sup>20(p.156)</sup> Severe maternal morbidity only included severe, direct morbidities that were reported to have occurred after birth and before the end of the postpartum period (42 days). We excluded morbidities and deaths identified during the antenatal period (eg, gestational diabetes,

eclampsia) or intrapartum period (eg, intrapartum hemorrhage). Causes were identified using the International Statistical Classification of Diseases, 10<sup>th</sup> Revision (ICD-10)<sup>8,21</sup> or as reported by study authors.

### Context

This review considered studies that identified women who gave birth in a health facility or at home. Included studies must have stated that they followed women up to a minimum of 42 days postpartum and must have reported data on first day (day 1), days 2–7, and days 8–42. First-day mortality was defined as death that occurred on the first day or within 24 hours after childbirth, depending on study definition. Although the significant burden of maternal and newborn mortality occurs in LMICs,<sup>22</sup> given that the Sustainable Development Goals focus on development for all countries,<sup>23</sup> no limits were placed on country.

### Outcomes

The primary outcomes for this review were as follows:

- timing of maternal mortality: overall
- timing of maternal mortality: cause-specific
- timing and type of severe maternal morbidity.

Due to lack of reporting, the originally defined secondary outcomes in the review protocol<sup>24</sup> (timing of rehospitalization/readmission by cause and unscheduled use of health services) are not included in this review.

### Types of studies

This review considered studies that provided prevalence or incidence data for maternal mortality and severe morbidity outcomes. This included, but was not limited to, population studies, facility-based studies, and empirical studies (non-experimental). Civil registration vital statistics and population-based records as available through accessing ministry of health websites of the 194 WHO Member States<sup>25</sup> and WHO Mortality Database<sup>26</sup> were also reviewed. Only quantitative studies reporting on prevalence or incidence data were included; qualitative studies and modeling or estimate data (eg, Bayesian modeling, country-level estimates of mortality or morbidity) were excluded. Relevant systematic reviews were used to identify original studies not captured in the search.<sup>17,18</sup>

### Methods

The systematic review was conducted in accordance with JBI methodology for systematic reviews of prevalence and incidence.<sup>27</sup> An advisory panel with clinical expertise in the areas of neonatology and obstetrics was established to provide consultation and guidance to the review team throughout all stages of the review. This review was conducted in accordance with an *a priori* protocol.<sup>24</sup> Although the protocol includes both maternal and neonatal outcomes, the neonatal outcomes are reported separately.

### Search strategy

The search strategy, including all identified keywords and index terms, was adapted for each database and developed by a health librarian, as well as peer-reviewed by a second information specialist (Appendix I). The original search was conducted on December 20, 2019, and was updated on May 11, 2021. A Google Scholar search was carried out between July 2–6, 2020, and was updated June 9–12, 2021, using each of the WHO Member States<sup>28</sup> and (maternal OR neonatal) AND (mortality OR morbidity) to further identify potential sources. The reference lists of all studies selected for critical appraisal were screened for additional studies.

No language limitations were applied to the searches. Studies published in English, French, and Spanish were eligible for inclusion. All reports published since 2000 on data after 2000 were considered for this review. This cut-off was selected to provide the most up-to-date evidence to be used for the update of the 2013 WHO Recommendations on Postnatal Care of the Mother and Newborn.<sup>14</sup> Additionally, after the introduction of the Millennium Development Goals in 2000, there was a worldwide shift in measurement of mortality and morbidity, resulting in improved quality of data after this period.<sup>29</sup> Studies that reported on data both before and after 2000 were included and this is noted in the characteristics of the studies. If data were reported separately by year, data older than 2000 were not included.

The databases searched included MEDLINE ALL (Ovid), CINAHL with Full Text (EBSCO), Web of Science Core Collection, and Embase. Search results were limited to publications since January 1, 2000. Sources of unpublished studies and gray literature included ministry of health websites and the Google

Scholar search described previously. Prior work in this area was reviewed for additional studies.<sup>4,30,31</sup> Due to lack of access to a librarian familiar with the database, we were unable to complete the search in LILACS (BIREME – PAHO/WHO website) as stated in the protocol.

### *Study selection*

All identified citations were uploaded into Covidence (Veritas Health Innovation, Melbourne, Australia) and duplicates were removed through the Covidence automation tool. Titles and abstracts and full texts were then screened by two independent reviewers (JSD, BH, RD, JM, RO, HDS), with disagreements resolved with a third reviewer (JC, MB, JSD, BH) or discussion. Reasons for exclusion of full-text studies that did not meet the inclusion criteria were recorded (Appendix II).

### *Assessment of methodological quality*

Eligible studies were critically appraised by two independent reviewers (JSD, BR for the English studies and MB, NR for the French and Spanish studies) using standardized critical appraisal instruments from JBI, as appropriate.<sup>32,33</sup> Any disagreements that arose were resolved through discussion. The results of critical appraisal are reported in narrative form and in tables. All studies, regardless of methodological quality, were included in data extraction and synthesis.

### *Data extraction*

Data were extracted from papers included in the review by at least two independent reviewers (BH, RD, JM, RO, NR, MB, HDS) using a data extraction tool developed by the reviewers, which was modified and revised through piloting prior to full data extraction (see Appendix III). Any disagreements between reviewers were resolved with a third reviewer (JSD for the English studies) or through discussion for the French/Spanish studies. Authors of two papers were contacted to request missing or additional data for clarification, but they did not respond and were excluded.<sup>34,35</sup>

### *Data synthesis*

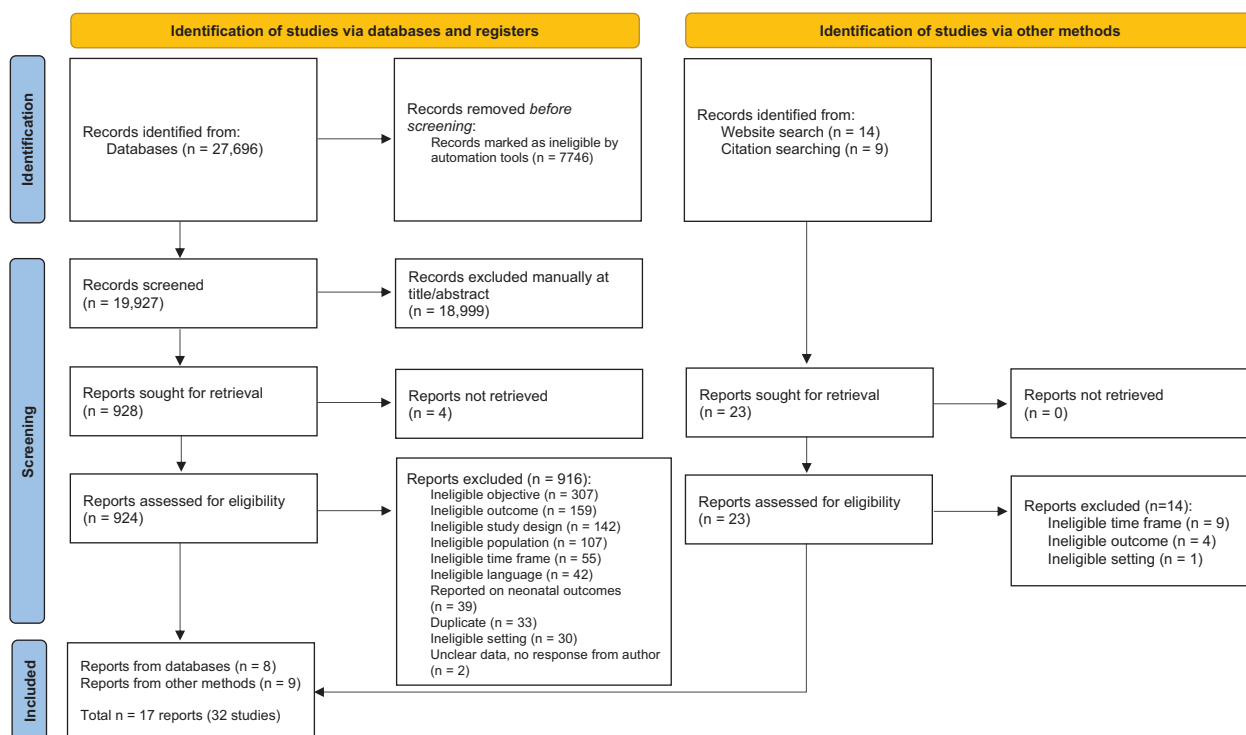
Due to the analysis approach used, there was a deviation from the protocol where the Stata v.14.0 (Stata Corp LLC, Texas, USA) metaprop command was used to conduct analysis of binomial data<sup>36</sup>

instead of the previously planned RevMan v.5.3 (Copenhagen: The Nordic Cochrane Centre, Cochrane). Random effects models were run to pool incidence proportion for overall maternal deaths for most analyses. The metaprop procedures are designed for analysis of binomial data and can manage proportions that are close to 0. Given this, when there were proportions of 0 (ie, studies with 0 deaths at a certain period or for a certain cause at that period), the Freeman-Tukey double arcsine transformation was used to compute the weighted pooled estimate, which stabilizes the variances and ensures they are included in the meta-analysis.

Timing of maternal mortality was calculated as the maternal deaths during a given period over the total number of maternal deaths known during the whole postpartum period (ie, days 1–42). For timing of cause-specific analysis, the number of deaths due to a specific cause on a specific day or period was the numerator while the total number of women who died due to the same cause over the entire postpartum period was the denominator (eg, number of deaths on day 1 related to infection/total number of women who died due to infection in the 42 days following childbirth).

Due to an insufficient number of studies in each category, subgroup analysis on location of birth (facility vs. home) and type of study (population vs. facility-based) were not possible. Subgroup analysis was conducted based on high-, upper-middle-, lower-middle-, and low-income countries according to the 2021 World Bank classification.<sup>37</sup> While not in the original protocol, the analysis was split by studies that reported on data collected in or before 2010 (2000–2010) and those that collected from 2011 onward (2011–2020) to reflect the changes in maternal mortality that may have occurred over time. Where statistical pooling was not possible for morbidity, the findings are presented in narrative form.

To be included in this review, studies were required to have data on first day mortality (day 1), days 2–7, and days 8–42. Identified studies were used to obtain the summary estimate (proportion) for each time point, and no estimation or extrapolation occurred for missing time points because there were no missing data. One article reported data from multiple countries individually,<sup>5</sup> and the findings are reported separately at the country level. Another article reported data from multiple countries combined,<sup>38</sup>



**Figure 1: Search results and study selection and inclusion process<sup>39</sup>**

and the findings are reported collectively. All other articles reported on a single country. Hereafter, manuscripts with results from multiple countries are referred to as “studies” although multiple “studies” may have data originating from a single published article.

## Results

### Study inclusion

Based on the combined search for maternal and neonatal outcomes, 27,673 articles were identified through the original search strategy, and 23 reports were identified through supplementary means (eg, searching reference lists, Google Scholar, ministry of health websites, previously identified systematic reviews). After duplicates were removed through automation tools, 19,927 records were screened using titles and abstracts, after which 18,999 records were excluded. A total of 924 full-text articles were reviewed (4 reports were not able to be retrieved), with 916 excluded for reasons listed in Appendix II. In total, 8 reports were included (see Figure 1<sup>39</sup>). Of the 23 records identified through website and citation

searching, 14 were excluded due to irrelevant outcomes, time frames, and settings, and 9 were included. A total of 32 studies from 17 reports were located and included in this review.

The reports were from 23 countries. One article reported on country-level maternal mortality data from seven countries across 10 sites<sup>5</sup> and another article reported data from seven countries,<sup>40</sup> with each country considered separately in this analysis (ie, 15 articles reported on data from one country each, and two articles reported on data from a total of 17 country sites = 32 studies).

### Methodological quality

Articles meeting inclusion criteria were critically appraised for methodological quality as appropriate to their study design. Three studies were analytical cross-sectional studies (Table 1),<sup>41-43</sup> 2 with a score of 100%<sup>42,43</sup> and one with a score of 63%,<sup>41</sup> due to unclear reporting on measurement (Q3) and appropriate statistical analysis (Q8), as well as no strategy stated for dealing with confounding factors (Q6). One study was a case-control study with a score of

**Table 1: Critical appraisal of included analytical cross-sectional studies**

| Citation                              | Q1  | Q2  | Q3 | Q4  | Q5  | Q6  | Q7  | Q8 | %   |
|---------------------------------------|-----|-----|----|-----|-----|-----|-----|----|-----|
| Ferdousy et al. <sup>41</sup> 2018    | Y   | Y   | U  | Y   | Y   | N   | Y   | U  | 63  |
| Kingdom of Morocco <sup>42</sup> 2013 | Y   | Y   | Y  | Y   | N/A | N/A | Y   | Y  | 100 |
| Kingdom of Morocco <sup>43</sup> 2010 | Y   | Y   | Y  | Y   | N/A | N/A | Y   | Y  | 100 |
| %                                     | 100 | 100 | 67 | 100 | 100 | 0   | 100 | 67 |     |

Y, yes; No, no; U, unclear; N/A, not applicable  
 JBI critical appraisal checklist for analytical cross-sectional studies  
 Q1. Were the criteria for inclusion in the sample clearly defined?  
 Q2. Were the study subjects and the setting described in detail?  
 Q3. Was the exposure measured in a valid and reliable way?  
 Q4. Were objective, standard criteria used for measurement of the condition?  
 Q5. Were confounding factors identified?  
 Q6. Were strategies to deal with confounding factors stated?  
 Q7. Were the outcomes measured in a valid and reliable way?  
 Q8. Was appropriate statistical analysis used?

**Table 2: Critical appraisal checklist for included case-control study**

| Citation                         | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | %   |
|----------------------------------|----|----|----|----|----|----|----|----|----|-----|-----|
| Acosta et al. <sup>44</sup> 2014 | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y   | 100 |

Y, yes  
 JBI critical appraisal checklist for case-control studies  
 Q1. Were the groups comparable other than the presence of disease in cases or the absence of disease in controls?  
 Q2. Were cases and controls matched appropriately?  
 Q3. Were the same criteria used for identification of cases and controls?  
 Q4. Was exposure measured in a standard, valid, and reliable way?  
 Q5. Was exposure measured in the same way for cases and controls?  
 Q6. Were confounding factors identified?  
 Q7. Were strategies to deal with confounding factors stated?  
 Q8. Were outcomes assessed in a standard, valid, and reliable way for cases and controls?  
 Q9. Was the exposure period of interest long enough to be meaningful?  
 Q10. Was appropriate statistical analysis used?

100% (Table 2).<sup>44</sup> The prominent type of study design was the cohort study, with 10 studies<sup>5,45-53</sup> having critical scores ranging from 70% to 100% (Table 3). For this study type, the greatest concerns were whether confounding factors were identified (Q4) and dealt with appropriately (Q5), and whether appropriate statistical analysis was used (Q11). The remaining three articles were prevalence studies,<sup>40,54,55</sup> with critical appraisal scores ranging from 75% to 88% (Table 4). For prevalence studies, areas where studies scored low included whether the sample was appropriate for the population (Q1), whether the sample size was adequate (Q3), whether the setting/sample were described in detail (Q4), and whether appropriate statistical analysis was used (Q8). Overall, the studies were of sufficient quality, with no studies receiving a score of 60% or below. The mean critical appraisal score was 86% (standard deviation [SD] = 13.6%). Given that the overall critical appraisal scores were high in most of the

included studies, this lends credibility to the strength of the findings.

*Characteristics of included studies*

Twenty-six studies reported data on overall maternal mortality timing, six reported on cause-specific timing outcomes, and seven reported on severe maternal morbidity outcomes. The number of live births or deliveries reported across all mortality studies was 7,704,230 with 6142 maternal deaths. Studies were published between 2006 and 2020 with the time period of data collection between 1996 and 2017. Five studies included data that were collected solely or predominantly in or before 2010, and 21 studies included data collected solely or predominantly from 2011 onward. Fifteen reports were published in English and two were published in French.<sup>42,43</sup> Most studies reported on a population sample with four studies based on health facilities. The following countries had data from two studies:

**Table 3: Critical appraisal of included cohort studies**

| Citation                                | Q1 | Q2 | Q3  | Q4 | Q5 | Q6  | Q7 | Q8  | Q9 | Q10 | Q11 | %   |
|---|----|----|-----|----|----|-----|----|-----|----|-----|-----|-----|
| AIHW <sup>45</sup> 2020                 | Y  | Y  | Y   | U  | N  | Y   | Y  | Y   | Y  | N/A | U   | 70  |
| AMANHI <sup>5</sup> 2018                | Y  | Y  | Y   | U  | Y  | Y   | Y  | Y   | U  | U   | Y   | 73  |
| Desai et al. <sup>46</sup> 2013         | Y  | Y  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | N/A | Y   | 100 |
| Dossou et al. <sup>47</sup> 2015        | Y  | Y  | Y   | U  | U  | Y   | U  | Y   | Y  | N/A | Y   | 70  |
| Feng et al. <sup>48</sup> 2010          | Y  | Y  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | N/A | Y   | 100 |
| Galambosi et al. <sup>49</sup> 2014     | Y  | Y  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | N/A | Y   | 100 |
| Hacettepe University <sup>50</sup> 2006 | U  | N  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | N/A | Y   | 80  |
| Iyengar et al. <sup>51</sup> 2009       | Y  | Y  | Y   | U  | Y  | Y   | Y  | Y   | Y  | N/A | U   | 80  |
| Petersen et al. <sup>52</sup> 2019      | Y  | Y  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | N/A | U   | 90  |
| Tang et al. <sup>53</sup> 2009          | Y  | Y  | Y   | Y  | Y  | Y   | Y  | Y   | Y  | Y   | Y   | 100 |
| %                                       | 90 | 90 | 100 | 70 | 80 | 100 | 90 | 100 | 90 | 50  | 70  |     |

Y, yes; No, no; U, unclear; N/A, not applicable. AIHW, Australian Institute of Health and Welfare; AMANHI, Alliance for Maternal and Newborn Health Improvement  
 JBI critical appraisal checklist for cohort studies  
 Q1. Were the two groups similar and recruited from the same population?  
 Q2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?  
 Q3. Was the exposure measured in a valid and reliable way?  
 Q4. Were confounding factors identified?  
 Q5. Were strategies to deal with confounding factors stated?  
 Q6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?  
 Q7. Were the outcomes measured in a valid and reliable way?  
 Q8. Was the follow-up time reported and sufficient to be long enough for outcomes to occur?  
 Q9. Was follow-up complete, and if not, were the reasons to loss to follow-up described and explored?  
 Q10. Were strategies to address incomplete follow-up utilized?  
 Q11. Was appropriate statistical analysis used?

**Table 4: Critical appraisal of included studies reporting prevalence data**

| Citation                          | Q1 | Q2  | Q3 | Q4 | Q5  | Q6  | Q7  | Q8 | Q9  | %  |
|-----------------------------------|----|-----|----|----|-----|-----|-----|----|-----|----|
| Leonard et al. <sup>54</sup> 2019 | Y  | Y   | Y  | N  | Y   | Y   | Y   | U  | N/A | 75 |
| Tepper et al. <sup>55</sup> 2014  | U  | Y   | U  | Y  | Y   | Y   | Y   | Y  | N/A | 75 |
| Vousden et al. <sup>40</sup> 2020 | U  | Y   | Y  | Y  | Y   | Y   | Y   | Y  | N/A | 88 |
| %                                 | 33 | 100 | 67 | 67 | 100 | 100 | 100 | 67 | N/A |    |

Y, yes; No, no; U, unclear; N/A, not applicable  
 JBI critical appraisal checklist for studies reporting prevalence data.  
 Q1. Was the sample frame appropriate to address the target population?  
 Q2. Were study participants sampled in an appropriate way?  
 Q3. Was the sample size adequate?  
 Q4. Were the study subjects and the setting described in detail?  
 Q5. Was the data analysis conducted with sufficient coverage of the identified sample?  
 Q6. Were valid methods used for the identification of the condition?  
 Q7. Was the condition measured in a standard, reliable way for all participants?  
 Q8. Was there appropriate statistical analysis?  
 Q9. Was the response rate adequate, and if not, was the low response rate managed appropriately?

Bangladesh,<sup>5,41</sup> Kenya,<sup>5,46</sup> Morocco,<sup>42,43</sup> Pakistan,<sup>5</sup> Tanzania,<sup>5</sup> United Kingdom,<sup>44,54</sup> and the United States.<sup>52,55</sup> with India having data from three studies.<sup>5,51</sup> Additionally, there were data for each of the following countries: Australia,<sup>45</sup> China,<sup>48</sup> Democratic Republic of the Congo,<sup>5</sup> Ethiopia,<sup>40</sup> Finland,<sup>49</sup> France,<sup>47</sup> Ghana,<sup>5</sup> Haiti,<sup>40</sup> Malawi,<sup>40</sup> Sierra Leone,<sup>40</sup> Taiwan,<sup>53</sup> Turkey,<sup>50</sup> Uganda,<sup>40</sup> Zambia,<sup>40</sup> and Zimbabwe.<sup>40</sup> Tables 5 and 6 outline the study characteristics.

*Review findings*

**Timing of overall postpartum maternal mortality**  
 Based on data from 26 studies including 8,704,230 women, most postpartum maternal deaths occur on day 1 (48.9%), with 24.5% of deaths between days 2 and 7, and 24.9% between days 8 and 42 (see Figure 2). See Appendix IV for confidence intervals. These proportions remain consistent when considering studies that report on data from or before 2010 and 2011 onward (see Figure 3).



**Table 5: Characteristics of maternal mortality studies**

| Study/country   | Methods                                | Study population  | Live births/deliveries  | Postpartum deaths   | Summary of data collection | Results  | Maternal inclusion criteria  | Limitations/comments |
|---|--|---|---|---|----------------------------|--|--|----------------------|
| AMANHI <sup>5</sup><br>multi-site                                     | Prospective<br>July 2012–February 2016 | Population based<br>Bangladesh, DRC,<br>India, Pakistan,<br>Ghana, Kenya,<br>Tanzania | Bangladesh 26,295<br>India (H) 35,000<br>India (U) 37,813<br>Pakistan (M) 27,062<br>Pakistan (K) 17,189<br>DRC 6145<br>Ghana 23,640<br>Kenya 30,992<br>Tanzania (I) 8128<br>Tanzania (P) 18,882 | Bangladesh 103<br>India (H) 41<br>India (U) 113<br>Pakistan (M) 51<br>Pakistan (K) 62<br>DRC 24<br>Ghana 42<br>Kenya 17<br>Tanzania (I) 24<br>Tanzania (P) 53 | Verbal autopsy             | Day 1<br>Bangladesh: 48 (46.6%)<br>India (H): 17 (41.5%)<br>India (U): 75 (66.4%)<br>Pakistan (M): 33 (64.7%)<br>Pakistan (K): 41 (66.1%)<br>DRC: 19 (79.2%)<br>Ghana: 20 (47.6%)<br>Kenya: 8 (47.1%)<br>Tanzania (I): 11 (45.8%)<br>Tanzania (P): 32 (60.4%)<br>Days 2-7<br>Bangladesh: 17 (16.5%)<br>India (H): 10 (24.4%)<br>India (U): 17 (15.0%)<br>Pakistan (M): 9 (17.6%)<br>Pakistan (K): 7 (11.3%)<br>DRC: 2 (87.5%)<br>Ghana: 6 (14.3%)<br>Kenya: 0 (0%)<br>Tanzania (I): 7 (29.2%)<br>Tanzania (P): 7 (13.2%)<br>Days 8-42<br>Bangladesh: 38 (36.9%)<br>India (H): 1434.1%)<br>India (U): 21 (18.6%)<br>Pakistan (M): 9 (17.6%)<br>Pakistan (K): 15 (24.2%)<br>DRC: 3 (12.5%)<br>Ghana: 16 (38.1%)<br>Kenya: 9 (52.9%)<br>Tanzania (I): 6 (25%)<br>Tanzania (P): 14 (26.4%) | Pregnant women of reproductive age (15–49 years), followed from birth to 42 days postpartum  | —                    |
| Australian Institute of Health and Welfare <sup>45</sup><br>Australia | Cohort study<br>2015–2017              | Population based  | 915,610   | 128   | National data              | Day 1: 40 (31.2%)<br>Days 2-7: 29 (22.7%)<br>Days 8-42: 59 (46.1%)<br>Weekly   | Death of a woman while pregnant or within 42 days of the end of pregnancy, irrespective of the duration and outcome of the pregnancy, from any cause related to or aggravated by the pregnancy | —                    |

**Table 5: (Continued)**

| Study/country  | Methods  | Study population                                       | Live births/deliveries | Postpartum deaths | Summary of data collection  | Results  | Maternal inclusion criteria   | Limitations/comments  |
|--|--|--|------------------------|-------------------|---|--|---|---|
| Desai <i>et al.</i> <sup>46</sup><br>Kenya                                   | Cohort study, case control<br>January 2003–December 2008 | Population based<br>Nyanza Province                    | NR                     | 103               | Verbal autopsy;<br>Health and Demographic Surveillance System           | Day 1: 37 (36.0%)<br>Days 2-7: 33 (32.0%)<br>Days 8-42: 33 (32.0%)               | All female residents aged 15–49 years at the time of death                                      | Overall mortality   |
| Feng <i>et al.</i> <sup>48</sup><br>China                                    | Cohort study<br>1996-2006                                | Population based<br>Beijing, Shanghai, Tianjin regions | 6,253,008              | 2347              | National data   | Day 1: 1592 (67.8%)<br>Days 2-7: 409 (17.4%)<br>Days 8-42: 346 (14.7%)<br>Weekly | No limitations  | Includes data collected prior to 2000<br>Overall and cause-specific mortality |
| Hacettepe University Institute of Population Studies <sup>50</sup><br>Turkey | Cohort study<br>October 2004–December 2006               | Population based<br>Various regions in Turkey          | 763,585                | 158               | Health center data; verbal autopsy; national data; cemetery burial list | Day 1: 61 (38.6%)<br>Days 2-7: 43 (27.2%)<br>Days 8-42: 54 (34.2%)               | All women of reproductive age 15–49 years   | Multiple gestations included in sample  |
| Iyengar <i>et al.</i> <sup>51</sup><br>India                                 | Cohort study<br>June 2002–May 2003                       | Population based<br>Southern Rajasthan region          | 4648                   | 24                | Verbal autopsy  | Day 1: 7 (29.2%)<br>Days 2-7: 8 (33.3%)<br>Days 8-42: 9 (37.5%)                  | Pregnancy-related deaths of women aged 15–49 years  | Overall and cause-specific mortality  |
| Kingdom of Morocco 2010 <sup>43</sup><br>Morocco                             | Cross-sectional<br>January–December 2009                 | Population based                                       | NR                     | 225               | Health center data; verbal autopsy; national data                       | Day 1: 142 (63.1%)<br>Days 2-7: 55 (24.4%)<br>Days 8-42: 28 (12.4%)              | Maternal death cases with completed reports, occurring during pregnancy and 42 days after birth | Overall and cause-specific mortality  |
| Kingdom of Morocco 2013 <sup>42</sup><br>Morocco                             | Cross-sectional<br>January–December 2010                 | Population based                                       | NR                     | 210               | Health center data; verbal autopsy; national data                       | Day 1: 133 (63.3%)<br>Days 2-7: 55 (26.2%)<br>Days 8-42: 22 (10.5%)              | Maternal death cases with completed reports, occurring during pregnancy and 42 days after birth | Overall and cause-specific mortality  |
| Petersen <i>et al.</i> <sup>52</sup><br>United States                        | Retrospective<br>2011–2015 and 2013–2017                 | Population based                                       | NR                     | 1702              | National data; death certificates                                       | Day 1: 506 (29.7%)<br>Days 2-7: 556 (32.7%)<br>Days 8-42: 640 (37.6%)            | All women who died during pregnancy or within 1 year after delivery                             | Overall and cause-specific mortality  |

**Table 5: (Continued)**

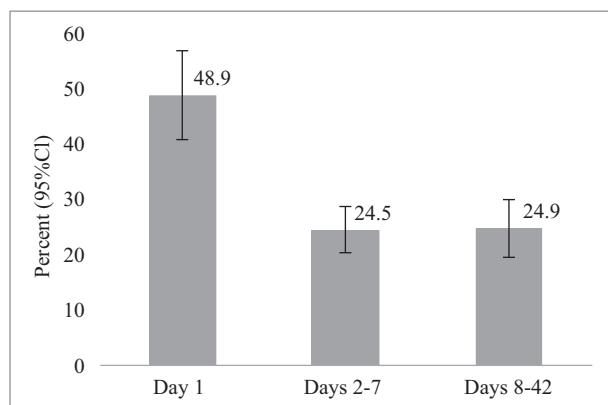
| Study/country                                     | Methods   | Study population  | Live births/deliveries   | Postpartum deaths  | Summary of data collection              | Results  | Maternal inclusion criteria   | Limitations/comments |
|---|---|---|--|--|---|--|---|----------------------|
| Vousden <i>et al.</i> <sup>40</sup><br>Multi-site | Secondary analysis of randomized controlled trial<br>April 2016–<br>November 2017 | Population based<br>Zimbabwe, Zambia,<br>Sierra Leone, Malawi,<br>Ethiopia, Uganda,<br>Haiti, and India | Ethiopia 35,429<br>Haiti 14,910<br>India 22,876<br>Sierra Leone 23,806<br>Malawi 62,165<br>Uganda 188,319<br>Zambia 150,345<br>Zimbabwe 38,383 | Ethiopia 29<br>Haiti 23<br>India 25<br>Sierra Leone 99<br>Malawi 118<br>Uganda 289<br>Zambia 80<br>Zimbabwe 52 | Health center<br>data; national<br>data | Day 0<br>Ethiopia: 13 (44.8%)<br>Haiti: 13 (56.5%)<br>India: 5 (20%)<br>Sierra Leone: 61 (61.6%)<br>Malawi: 57 (48.3%)<br>Uganda: 168 (58.1%)<br>Zambia: 31 (38.8%)<br>Zimbabwe: 8 (15.4%)<br>Days 1-6<br>Ethiopia: 10 (34.5%)<br>Haiti: 9 (39.1%)<br>India: 7 (28%)<br>Sierra Leone: 28 (28.3%)<br>Malawi: 34 (28.8%)<br>Uganda: 100 (34.6%)<br>Zambia: 31 (38.8%)<br>Zimbabwe: 29 (55.8%)<br>Days 7-42<br>Ethiopia: 6 (20.7%)<br>Haiti: 1 (4.3%)<br>India: 13 (52%)<br>Sierra Leone: 10 (10.1%)<br>Malawi: 27 (22.9%)<br>Uganda: 21 (7.3%)<br>Zambia: 18 (22.5%)<br>Zimbabwe: 15 (28.8%) | All women who were recorded as having died at any gestation or up to 42 days after delivery, from any cause | —                    |

DRC, Democratic Republic of Congo; H, Haryana; I, Ifakara; K, Karachi; M, Matiari; NR, not reported; P, Pemba; U, Uttar Pradesh

**Table 6: Characteristics of maternal morbidity studies**

| Study/country   | Methods  | Study population  | Live births/deliveries | Postpartum deaths | Summary of data collection                                  | Morbidity focus                          | Maternal inclusion criteria  | Limitations/comments        |
|---|--|---|------------------------|-------------------|---|--|--|-----------------------------|
| Acosta <i>et al.</i> <sup>44</sup><br>United Kingdom  | Prospective case-control<br>June 2011 – May 2012               | Population based<br>England, Northern Ireland, Scotland, Wales and Crown Dependencies | 780,537                | NR                | National data, United Kingdom Obstetric Surveillance System | Severe sepsis                            | Women who gave birth to a live or stillborn infant of greater than 24 completed weeks of gestation   | —                           |
| Dossou <i>et al.</i> <sup>47</sup><br>France          | Retrospective<br>January 2004 – February 2013                  | Facility-based  | 26,023                 | NR                | Health center data  | Late postpartum hemorrhage               | All women who gave birth at the Clermont-Ferrand University Hospital Center (level III) and who had severe secondary postpartum hemorrhage                 | —                           |
| Ferdousy <i>et al.</i> <sup>41</sup><br>Bangladesh    | Cross-sectional<br>January 2016 – December 2016                | Facility-based  | NR                     | NR                | Health center data  | Late postpartum hemorrhage               | All patients admitted in Rangpur Medical College Hospital with a diagnosis of secondary postpartum hemorrhage over a period of 1 year                      | —                           |
| Galambosi <i>et al.</i> <sup>49</sup><br>Finland      | Cohort study<br>2001 – 2011                                    | Population based  | 634,292                | NR                | National data   | Venous thromboembolism                   | Women with an inpatient or outpatient admission after date of delivery with a diagnosis of venous thromboembolism  | —                           |
| Leonard <i>et al.</i> <sup>54</sup><br>United Kingdom | Retrospective, cross-sectional<br>January 2010 – December 2016 | Population based<br>London and Southeast regions                                      | 1,598,069              | NR                | Health center data  | Maternal Group A streptococcal infection | All laboratory-confirmed invasive Group A streptococcus cases in women in London and the Southeast of England with a date of onset within 28 days of birth | —                           |
| Tang <i>et al.</i> <sup>53</sup><br>Taiwan            | Cohort study<br>1999 – 2003                                    | Facility-based  | NR                     | NR                | National data   | Stroke                                   | Women where the birth certificate dataset and delivery entries in the NHI hospital discharge data were successfully linked                                 | Includes data prior to 2000 |
| Tepper <i>et al.</i> <sup>55</sup><br>United States   | Retrospective<br>2005 – 2011                                   | Facility-based<br>Commercial and Medicaid databases                                   | 2,542,562              | NR                | National data   | Venous thromboembolism                   | Women aged 15–44 years with information on pharmaceutical claims who had a delivery hospitalization  | —                           |

NHI, national health insurance; NR, not reported.



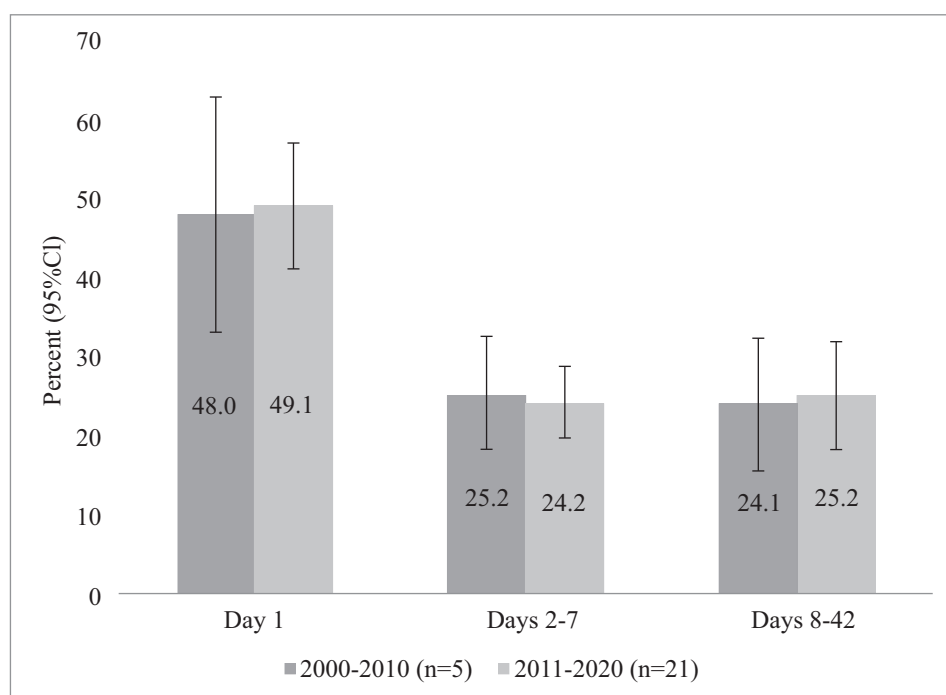
**Figure 2: Proportion of postpartum maternal deaths on day 1, days 2–7, and days 8–42 based on data from 26 studies including 8,704,230 women and 6142 maternal deaths; see Appendix IV for confidence intervals**

When considering postpartum maternal mortality by country income classification, timing of maternal deaths varies (Figure 4). For low-income countries (n = 8 studies; 519,502 women) and lower-

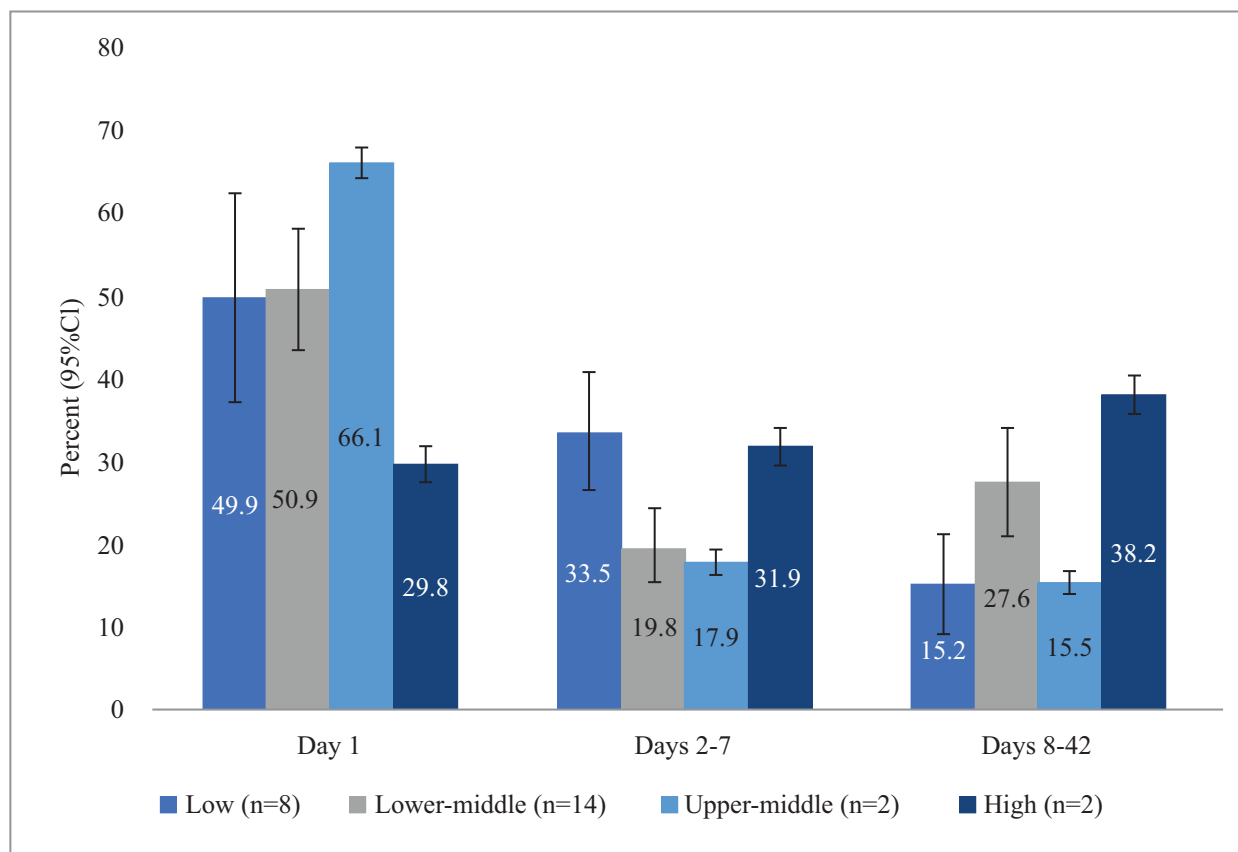
middle-income countries (n = 14 studies; 252,525 women), the proportion of maternal deaths is similar on day 1 (49.9% and 50.9%, respectively); however, there are differences in the distribution of subsequent deaths. In low-income countries, the proportion of deaths decreased over the postpartum period, with fewer occurring on days 2–7 (33.5%) and days 8–42 (15.2%). In lower-middle-income countries, more deaths occurred in days 8–42 (27.6%) than in days 2–7 (19.8%). For upper-middle-income countries (n = 2 studies, 7,955,078 women), a higher proportion of deaths occur on day 1 (66.1%) compared with other country-level income groups. High-income countries (n = 2 studies, 915,610 women) have the lowest proportion of deaths on day 1 at 29.8% and the highest between days 8–42 at 38.2%. See Appendix IV for confidence intervals.

**Timing of cause-specific postpartum maternal mortality**

Seven studies reported on cause-specific timing of postpartum maternal mortality. Of the total 6142 maternal deaths identified, causes were available for 2727 deaths (44.4%). Based on the causes reported,



**Figure 3: Proportion of postpartum maternal deaths on day 1, days 2–7, and days 8–42 between 2000 and 2010 (n = 5 studies, 7,021,214 women) and between 2011 and 2020 (n = 21 studies, 1,682,989 women)**



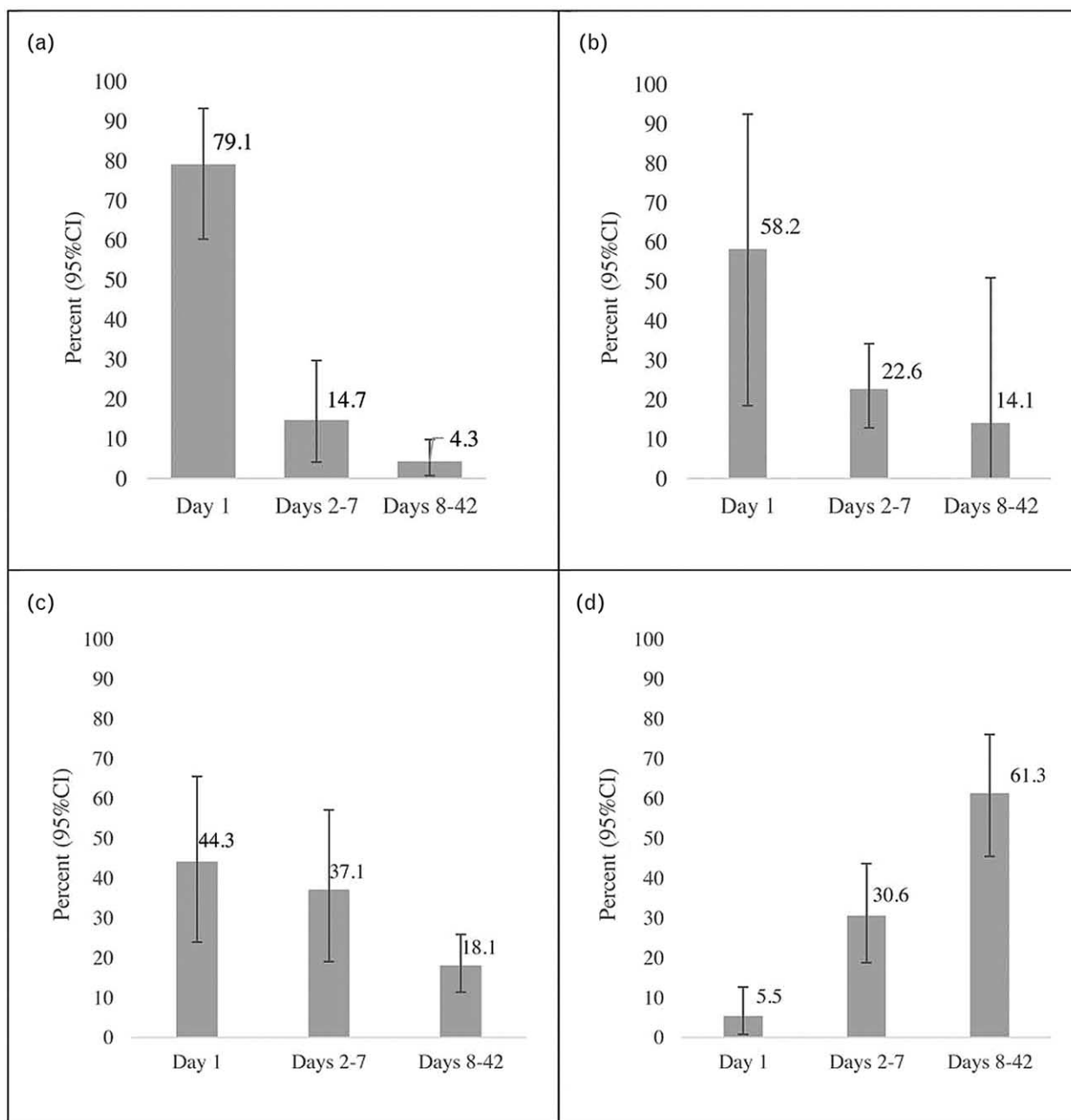
**Figure 4: Proportion of postpartum maternal deaths by country income level (number of studies) on day 1, days 2–7, and days 8–42; see Appendix IV for confidence intervals**

timing of maternal mortality was grouped by postpartum hemorrhage, embolism (eg, amniotic fluid embolism, thrombotic pulmonary, other embolism), infection (eg, sepsis and not specified), and eclampsia/hypertensive disorders. Of note, these deaths occurred in the postpartum period, but the onset of the cause leading to death may have been in the antenatal/intrapartum period. As shown in Figure 5, with confidence intervals in Appendix IV, maternal mortality due to postpartum hemorrhage and embolism occurred predominantly on day 1 (79.1% and 58.2%, respectively). Postpartum deaths due to eclampsia/hypertensive disorders occurred mainly in the first week, with 44.3% of deaths on day 1 and 37.1% of deaths on days 2–7. Deaths due to infection were more likely to occur between days 8–42 (61.3%) followed by days 2–7 (30.6%). Due to the small number of studies for each cause, no subgroup analysis was possible.

#### Timing and causes of severe postpartum maternal morbidity

Seven studies reported on severe postpartum maternal morbidity outcomes, with these reported narratively due to heterogeneity across outcomes.

Acosta and colleagues<sup>44</sup> reported on severe sepsis, with no specified source and inclusive of septic shock, in women who had obstetrician-assisted births in health centers across the United Kingdom. Between 2011 and 2012, the authors reported a median time between birth and development of maternal sepsis of 3 days (interquartile ratio [IQR] 1–7 days). Critical care was required for 79.2% of postpartum women and septic shock occurred in 23.8%. Leonard and colleagues<sup>54</sup> examined the impact of severe maternal invasive group A streptococcal (iGAS) disease in women from England (97.8% postpartum) between 2010 and 2016. A total of 134 maternal iGAS cases were identified,



**Figure 5: Proportion of postpartum maternal mortality on day 1, days 2–7, and days 8–42 due to (a) postpartum hemorrhage (n = 6 studies, 1561 deaths); (b) embolism (n = 3 studies, 408 deaths); (c) postpartum eclampsia/hypertensive disorders (n = 4 studies, 338 deaths); and (d) infection (n = 6 studies, 840 deaths); see Appendix IV for confidence intervals**

of which 87% occurred in the first week postpartum, 30.0% on the day of birth, 57.0% between days 2 and 7, and 13% between 8 and 28 days postpartum. Median onset time occurred two days after birth with an IQR of 0–5 days.

Galambosi and colleagues<sup>49</sup> explored the incidence of venous thromboembolism (VTE), including deep vein thrombosis, portal vein thrombosis, and pulmonary embolism, in postpartum women from Finland over a 10-year period (2001–2011). This study included a mixed sample of women, with some identified as high-risk for having pre-existing conditions, or pregnancy or intrapartum complications. The study reported the timing of VTE diagnosis as an aggregate of the entire sample. A total of 1169 VTEs out of 634,292 deliveries were found in postpartum women (age range: 15–49 years), of which 16.4% had a cesarean birth. VTE was reported weekly, with 425 diagnoses noted in week 1 (36.4%), 29 in week 2 (2.5%), 44 in week 3 (3.8%), 37 in week 4 and 5 (3.2%), and 33 in week 6 (2.8%). Tepper and colleagues<sup>55</sup> examined postpartum VTE incidence from the United States in 2005–2011, comparing women with private insurance ( $n = 1,540,026$ ) versus Medicaid ( $n = 1,002,536$ ). Timing data related to VTEs was reported overall, with a total of 4169 diagnoses across both groups (35.4% cesarean birth). There were 2359 diagnoses reported in week 1 (56.6%), 621 in week 2 (14.9%), 382 in week 3 (9.2%), 245 in week 4 (5.9%), 154 in week 5 (4.0%), and 92 in week 6 (2.2%). Tepper and colleagues<sup>55</sup> noted that increased age was found to be a risk factor only in early diagnoses of VTE (eg, first week).

Dossou and colleagues<sup>47</sup> reported on postpartum hemorrhage (PPH) over a nine-year period (2004–2013) in women from a level-III health facility in France, and in particular, secondary PPH, which is defined as severe bleeding after 24 hours of birth and up to 42 days. Women included in the sample were 30.4 years of age on average ( $SD = 5.7$ ), and modes of birth included 66.7% spontaneous vaginal, 8.3% operative vaginal (eg, forceps), and 25% cesarean birth. The average onset of PPH was 13.4 days postpartum ( $SD = 10.8$ ), ranging from 1–39 days after birth, with 86.7% of PPH occurring at home and requiring readmission.<sup>47</sup> Ferdousy and colleagues<sup>41</sup> also reported on secondary PPH among women in Bangladesh readmitted to the hospital. The mean age of women was 25.2 years ( $SD = 2.8$ ), and 56% gave birth through a cesarean delivery. The

mean time of presentation for secondary PPH was 13.5 days ( $SD = 2.8$ ), with 47% of cases occurring during the second week and 34% occurring during the third week.<sup>41</sup>

Tang and colleagues<sup>53</sup> reported on cases of stroke (hemorrhagic and ischemic) in postpartum Taiwanese women between 1999 and 2003. During the study period, 1,136,477 live births were recorded, of which there were 243 stroke cases (15.6% prenatal; one pregnancy-related hypertension). In the first 3 days postpartum, 32 cases of stroke were identified, and another 34 cases were reported between days 4 and 42 postpartum. Among the population who had a stroke, postpartum hemorrhage occurred within 3 days after birth ( $n = 2$ ) and between 4 days and 6 weeks postpartum ( $n = 1$ ). Pre-eclampsia diagnoses were also found in women experiencing postpartum stroke ( $n = 47$  within 3 days;  $n = 3$  between days 4 and 42).

## Discussion

The objective of this review was to determine the timing of overall and cause-specific maternal mortality and severe morbidity in women during the postpartum period (days 1 through 42 after childbirth). Overall, we found that day 1 has the largest proportion of postpartum maternal deaths (48.9%), with 24.5% of deaths occurring between days 2 and 7, and 24.9% between days 8 and 42. This remained consistent when exploring data published before 2010 or after. In consideration of the timing of women's death during the postpartum period, the first day is a critical period for women's survival, which may be influenced by causes that originated during the antenatal or intrapartum period. However, one-fourth of women die between days 8 and 42, suggesting continued care throughout the first 42 days after childbirth is important for improving maternal outcomes. In terms of causes, hemorrhage and embolism remain of great concern on the first day, with postpartum eclampsia and hypertension also causing concerns in the first week. Infection was the leading cause of death for days 8–42. Due to heterogeneity, no specific conclusions could be drawn related to timing of severe maternal morbidity.

This is the first review to our knowledge that examined the timing of maternal mortality and severe morbidity in the postpartum period worldwide using both population and facility-based studies.



Much of the previous work has focused on projections or mortality within the postpartum period as a whole, without any specific analysis of timing in the postpartum period or focused on timing across the perinatal period broadly (ie, mortality during pregnancy, intrapartum, and postpartum). Our work seeks to fill the gap in mortality and severe morbidity timing during the postpartum period.

### *Overall postpartum maternal mortality*

The highest mortality rate was on the first day postpartum for women living in low-income, lower-middle-income, and upper-middle-income countries. However, the country income classification analysis needs to be interpreted with caution because of the small number of studies in uppermiddle- and high-income countries, and scarce data on timing of cause-specific mortality, with less than half of deaths having an associated cause. Previous work has shown that the least developed countries have a higher overall maternal absolute mortality ratio than more developed countries.<sup>1</sup> Additionally, Merdad and Ali<sup>56</sup> examined maternal mortality during the entire perinatal period in 34 sub-Saharan African countries and found significant variability between countries; however, it has been estimated that sub-Saharan Africa accounts for 66% of maternal mortality.<sup>1</sup> This is why it is important to consider the country income classification analysis, as an overall proportion may not reflect the variation of timing in different countries, particularly in low- income and lower-middle-income countries, where the predominant burden of maternal mortality exists.<sup>57</sup>

HICs had the lowest proportion of deaths on the first day but had the highest pooled incidence of mortality between days 8 and 42, suggesting that women in HICs are more likely to die later in the postpartum period compared with the first week. This may be related to the likelihood that first-day deaths could be highly correlated with intrapartum causes.<sup>56</sup> Women in HICs are more likely to have access to high-quality antenatal care and to give birth at a health facility or in the presence of skilled health care providers,<sup>58</sup> thus they are able to receive the lifesaving care they need during pregnancy and on the first day postpartum. Women in HICs also have access to intensive care units where they are able to get rapid care and may be able to survive longer than in lower-resource settings. However, because data are limited relating to when the

condition was diagnosed, when death occurred, and when each women had antenatal and postnatal contacts, it is difficult to delineate the true reasons. Additionally, because the data are from only a few studies, this review was unable to compare cause-specific analysis at the country income level to allow investigation of potential differences in causes of death. Nevertheless, high-quality, continued care throughout the postpartum period is necessary to reduce maternal mortality, regardless of country.

### *Cause-specific postpartum maternal mortality*

Out of a range of potential causes of maternal mortality in women during the postpartum period, postpartum hemorrhage, embolism, and postpartum eclampsia/hypertensive disorders remain of great concern in the first week, as well as infection between days 8 and 42 postpartum period. In the interpretation of cause-specific maternal mortality, it is important to consider that women may have other morbidities or mortalities that were not reported if no study on timing was identified. Additionally, some of the causes of mortality may be the result of events that occurred during pregnancy or childbirth, but the death occurred during the postpartum period. Thus, it is important to consider the women throughout the perinatal period in order to improve outcomes during the postpartum period.

Consistent with our review, a recent evaluation of cause-specific maternal mortality globally found hemorrhage to be the most common cause of death, of which two-thirds of hemorrhage-related deaths occurred postpartum.<sup>4</sup> Hemorrhage has steadily been recognized as a leading contributor to maternal mortality<sup>56</sup> despite the advancement of clinical interventions to manage this complication.<sup>4</sup> While the number of hemorrhagic deaths was reported to vary globally, with greatest incidence of death noted in northern Africa,<sup>4</sup> our review was not able to conduct this level of analysis with the available data. However, hemorrhage remains the leading cause of death across all regions,<sup>4</sup> thus warranting attention worldwide. Greater prevention and management strategies in the postnatal period and improved reporting of implementation strategies to evaluate the effectiveness of interventions are needed.<sup>3</sup>

Additionally, postpartum eclampsia was in the top three causes of mortality across the entire postpartum period. Pre-eclampsia and eclampsia during pregnancy are common yet serious diagnoses, with

these also being leading causes of maternal death globally.<sup>4,59,60</sup> Matthys and colleagues<sup>61</sup> evaluated all pre-eclampsia and eclampsia diagnoses over a 10-year period, finding that 5.7% of diagnoses occurred during the postpartum period. They also noted that women readmitted with postpartum pre-eclampsia and eclampsia presented symptoms that were easily attributed to normal postpartum physical adjustment symptoms, such as headache or abdominal pain, for which they did not seek timely medical care.<sup>61</sup> Signs and symptoms of postpartum preeclampsia present similarly to pre-eclampsia during pregnancy and require prompt treatment,<sup>61,62</sup> yet the frequency of monitoring and access to quality care is greatly reduced in the postpartum period.<sup>10</sup> Thus, improved discharge education for families regarding self-monitoring of symptoms<sup>62</sup> and enhanced access to quality health care from birth up to 42 weeks postpartum is necessary.

Between days 8 and 42 postpartum, causes of mortality shifted to infection as the main cause. Although timing was not specified in previous findings, sepsis in the postpartum period was documented as a leading cause of death, ranking third globally<sup>4</sup> and second throughout 34 sub-Saharan African countries.<sup>56</sup> Say and colleagues<sup>4</sup> noted that most sepsis-related death occurred in LMICs, but recent evaluations found that postpartum infections were concerning in HICs including the United States<sup>63</sup> and the United Kingdom.<sup>44</sup> Contributing factors related to postpartum infection include cesarean or operative vaginal births,<sup>64,65</sup> limited knowledge of signs of infection,<sup>66</sup> barriers to timely access to health care providers,<sup>66</sup> and appropriate use of antibiotics.<sup>67</sup> Given the worldwide rise in cesarean deliveries,<sup>68</sup> we can anticipate there may be a corresponding increase in the number of postpartum infections. Although cesarean birth may be a necessary intervention for both the woman and her newborn, the associated risk of infection must be taken into account and anticipated.<sup>69</sup> Access to quality postpartum services with appropriate treatment specific to the source of infection is essential in reducing postpartum mortality between days 8 and 42.

### *Severe postpartum maternal morbidity*

In our review, seven studies reported on a range of morbidity outcomes, which limited our ability to synthesize the findings. However, across all morbidity conditions, the predominant onset across all

morbidity conditions reported tends to occur in week 1, followed by week 2. For instance, in this review, we found that VTE occurred within the first week between 36.4%<sup>49</sup> and 56.6%<sup>55</sup> of the time, and secondary PPH had an average onset of 13 days.<sup>41,47</sup> Previous work has found that severe maternal morbidity trends are similar to maternal mortality trends, with higher rates in LMICs compared with HICs.<sup>70</sup> In a recent multi-site cohort study on maternal morbidity of 735,000 women, 32.7% of pregnancies had at least one experience of maternal morbidity, with women in South Asia experiencing higher morbidities (43.9%) than women in sub-Saharan Africa (23.7%).<sup>71</sup> In addition, previous work has suggested that 8% of hospital deliveries in LMICs are complicated by a severe morbidity, caused mostly by hemorrhage, hypertension, and sepsis.<sup>17,70-72</sup> While the first day was also found to be of high incidence for morbidity, concerns continued beyond the postpartum period with infections being identified within two to three days after birth.<sup>44,54</sup> All of the data points in this review represent only one study in one location, and thus must be interpreted with caution. However, the combined data show that the first two weeks pose a high potential for maternal postpartum morbidity outcomes, with the first week and first day being a particularly vulnerable time, depending on the morbidity identified.

It is important for women to know the danger signs of potential severe morbidity and have access to health services. Additionally, discharge and postpartum education and counseling should focus on potential risks and symptoms so that women can monitor their physical health after birth, understand what is normal or abnormal, and seek help in a timely manner. Previous work has identified barriers to the uptake of postpartum health service; these barriers are linked to low awareness by women and family members regarding signs of postpartum complications as well as a hesitancy to contact health workers due to concerns around trust and poor-quality care.<sup>73,74</sup> Previous work also has identified challenges of accessing quality postnatal care, including health care provider competencies, low quality of care, and inability of the health care system to provide adequate postnatal care.<sup>10</sup> Thus, providing discharge education targeting women and their families related to the importance of postnatal health care utilization may be an approach to enhance

usage, as well as improving the training and support for health care providers to enhance the quality of postnatal care for women and their newborns.

### *Limitations*

While this review is the first to our knowledge to examine specifically when women die or experience severe morbidity in the postpartum period worldwide, there are several limitations. First, we only used data as provided in identified studies. Although this adds strength in that no estimation or projection is used on the data, there may be over- or underestimation of mortality based on the country and type of study published. There is also high heterogeneity across the studies, which could be attributed to many factors, including study type as well as variation in geographical locations, measurement approaches, or access to health facilities. Additionally, we included both population- and facility-based studies in this review, which may result in bias in terms of incomplete follow-up; however, all included studies must have reported that they followed all participants up to 42 days, likely limiting this potential source of bias in the analysis. These limitations should be taken into consideration when interpreting these results.

A second limitation is the difficulty associated with reporting maternal mortality, both in timing and causes, with many deaths being uncounted and many countries experiencing challenges reporting mortality, both in terms of completeness and misclassification.<sup>1</sup> When women die at home, which is often the case in the postpartum period, particularly in low-resource settings, it is difficult to capture the exact timing and cause, and the use of verbal autopsy has limitations for data collection.<sup>2</sup> Given that almost all of the included studies were population-based, this is reflected in our data. Reporting of timing in relation to cause of death is a limitation found in our synthesis, with only 7 studies providing this data. Studies may have difficulty determining mortality causes or specific timing in low-resource areas where there is limited ability to conduct follow-up evaluation (eg, autopsies)<sup>22</sup> and inaccurate reporting of causes.<sup>4</sup>

A third limitation of this review is our focus only on physical severe morbidities, which excludes the mental health complications as well as incidental causes, such as intimate partner violence and other factors that have been associated with negative health outcomes for women post-birth.<sup>17,75</sup>

There is emerging evidence of the role that non-communicable diseases and maternal suicide has in maternal mortality and morbidity rates.<sup>76,77</sup> We also included mortality and morbidity outcomes only within the first 42 days but did not examine late maternal mortality outcomes (43 days to one year postpartum).

A final limitation is that we were not able to explore differences in mortality and morbidity due to differences in type of birth (eg, vaginal vs cesarean delivery) or parity, as this was not reported at this level in the identified studies. However, it is possible that differences exist in mortality and morbidity estimates based on these factors. Future work should consider reporting on timing of maternal mortality and morbidity based on these factors.

### **Conclusions**

Women are at risk of mortality across the entire postpartum period, with the highest mortality rate on the first day. Enhancing the frequency and quality of postpartum contacts during the first 42 days may improve maternal outcomes while reducing maternal mortality and severity of morbidities during this time period.

### *Recommendations for practice*

Given the maternal and severe morbidity incidence for women over 42 days postpartum, and in particular, during the first day postpartum, this review supports the need for postpartum contacts across the entire period. Existing guidelines recommend a minimum of 4 postnatal care contacts.<sup>14</sup> Because of the critical nature of the outcomes and significant number of deaths occurring across the entire postpartum period in both absolute and relative terms, increasing frequency and quality of postpartum visits for healthy women should be considered. Government support and training of health care providers related to postnatal care for women and their newborn is important, including the ongoing assessment of competencies, a healthy work environment, and the resources necessary to provide quality postnatal care.

### *Recommendations for research*

Further research should focus on collecting time-specific data on maternal mortality and severe morbidity, particularly in low-income countries, reporting both overall and cause-specific daily and

weekly deaths. While this is notoriously harder to do as a result of reporting challenges in health facilities and when women die at home, it is important that future research and registration data attempt to capture this information to truly understand when women are dying during the postpartum period. Additionally, it would be important to map the timing of mortality and morbidity against postnatal contact coverage in different countries across the postnatal period. More specific reporting of morbidity onset is recommended to help identify the greatest risk factor in terms of timing for healthy, low-risk women in the postpartum period.

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## Appendix I: Search strategy

### Ovid MEDLINE

Search conducted on December 12, 2019 with 8442 studies identified; updated on May 10, 2021 with 1289 studies identified

| #  | Searches  |
|----|---|
| 1  | ((After or following) adj2 (birth* or deliver*) adj2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or sepsis or septic)).ti,ab,kf,kw.                        |
| 2  | ((Postnatal* or post natal* or post partum or postpartum or puerperal) adj2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or septic or sepsis)).ti,ab,kf,kw. |
| 3  | ((Perinatal or neonat* or newborn or new born) adj2 (mortalit* or death* or infection* or sepsis or septic or asphyxia or jaundice or fever* or hypothermi* or anaemi* or anemi*)).ti,ab,kf,kw.   |
| 4  | Perinatal mortality/  |
| 5  | Perinatal death/  |
| 6  | Eclampsia/  |
| 7  | Pre-eclampsia/  |
| 8  | Postpartum hemorrhage/  |
| 9  | Maternal death/   |
| 10 | Maternal mortality/   |
| 11 | Puerperal Infection/  |
| 12 | ((Maternal or mother* or pregnan*) adj2 (mortalit* or death*)).ti,ab,kf,kw.   |
| 13 | ((emergency or unplanned) adj2 (caesarean or cesarean or c-section)).ti,ab,kf,kw.   |
| 14 | Puerperal Disorders/  |
| 15 | Asphyxia Neonatorum/  |
| 16 | exp Anemia, Neonatal/   |
| 17 | exp Jaundice, Neonatal/   |
| 18 | Neonatal Sepsis/  |
| 19 | or/1-18   |
| 20 | Time factors/   |
| 21 | (Time or timing).ti,ab,kf,kw.   |
| 22 | 20 or 21  |
| 23 | 19 and 22   |
| 24 | (incidence or prevalence or epidemiolog* or cohort* or survey* or cross-section* or population or observational or quantitative).ti,ab,kf,kw.   |
| 25 | exp epidemiologic methods/  |
| 26 | exp Epidemiologic Studies/  |
| 27 | or/24-26  |
| 28 | 23 and 27   |
| 29 | exp animals/ not humans/  |
| 30 | (comment or editorial or letter).pt.  |
| 31 | 29 or 30  |
| 32 | 28 not 31   |
| 33 | limit 32 to yr = "2000 -Current"  |



*Embase*

Search conducted on December 20, 2019 with 3400 studies identified; updated on May 10, 2021 with 842 studies identified.

|     |  |
|-----|--|
| S37 | S36 Limiters - Published Date: 20000101-   |
| S36 | S35 AND NOT S33  |
| S35 | S25 AND S34  |
| S34 | S28 OR S29 OR S30  |
| S33 | S31 AND NOT S32  |
| S32 | (MH "Human")   |
| S31 | (MH "Animals+") OR (MH "Mammals+")   |
| S30 | (MH "Empirical Research") OR (MH "Case Control Studies+") OR (MH "Correlational Studies") OR (MH "Cross Sectional Studies") OR (MH "Prospective Studies+") OR (MH "Retrospective Design") OR (MH "Quasi-Experimental Studies+") OR (MH "Repeated Measures")  |
| S29 | (MH "Epidemiological Research") OR (MH "Descriptive Research") OR (MH "Health Services Research+") OR (MH "Administrative Research") OR (MH "Analytic Research") OR (MH "Applied Research") OR (MH "Clinical Research") OR (MH "Survey Research") OR (MH "Secondary Analysis") OR (MH "Trend Studies") OR (MH "Predictive Research") |
| S28 | S26 OR S27   |
| S27 | AB incidence or prevalence or epidemiolog* or cohort* or survey* or cross-section* or population or observational or quantitative  |
| S26 | TI incidence or prevalence or epidemiolog* or cohort* or survey* or cross-section* or population or observational or quantitative  |
| S25 | (S23 AND S24)  |
| S24 | (MH "Time Factors") OR TI (time OR timing) OR AB (time or timing)  |
| S23 | S3 OR S6 OR S9 OR S12 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22  |
| S22 | (MH "Jaundice, Neonatal")  |
| S21 | (MH "Anemia, Neonatal") OR (MH "Neonatal Sepsis") OR (MH "Asphyxia Neonatorum")  |
| S20 | (MH "Eclampsia") OR (MH "Pre-Eclampsia")   |
| S19 | (MH "Puerperal Disorders") OR (MH "Postpartum Hemorrhage") OR (MH "Puerperal Infection")   |
| S18 | (MH "Infant Death") OR (MH "Perinatal Death")  |
| S17 | (MH "Infant Mortality")  |
| S16 | (MH "Maternal Mortality")  |
| S15 | S13 OR S14   |
| S14 | AB ((emergency or unplanned) N2 (caesarean or cesarean or c-section))  |
| S13 | TI ((emergency or unplanned) N2 (caesarean or cesarean or c-section))  |
| S12 | S10 OR S11   |
| S11 | AB ((Maternal or mother* or pregnan*) N2 (mortalit* or death*))  |
| S10 | TI ((Maternal or mother* or pregnan*) N2 (mortalit* or death*))  |
| S9  | S7 OR S8   |
| S8  | AB ((Perinatal or neonat* or newborn or new born) N2 (mortalit* or death* or infection* or sepsis or septic or asphyxia or jaundice or fever* or hypothermi* or anaemi* or anemi*)).   |
| S7  | TI ((Perinatal or neonat* or newborn or new born) N2 (mortalit* or death* or infection* or sepsis or septic or asphyxia or jaundice or fever* or hypothermi* or anaemi* or anemi*)).   |
| S6  | S4 OR S5   |

|    |   |
|----|---|
| S5 | AB ((Postnatal* or post natal* or post partum or postpartum or puerperal) N2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or septic or sepsis)) |
| S4 | TI ((Postnatal* or post natal* or post partum or postpartum or puerperal) N2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or septic or sepsis)) |
| S3 | S1 OR S2  |
| S2 | AB ((After or following) N2 (birth* or deliver*) N2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or sepsis or septic))                          |
| S1 | TI (((After or following) N2 (birth* or deliver*) N2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or sepsis or septic))                         |

### Web of Science

Search conducted on December 20, 2019 with 6151 studies identified; updated on May 10, 2021 with 512 studies identified.

|      |   |
|------|---|
| # 10 | #9 AND #8<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 9  | TS=(incidence or prevalence or epidemiolog* or cohort* or survey* or cross-section* or population or observational or quantitative or longitudinal OR prospective OR retrospective)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 8  | #7 AND #6<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 7  | TS=(time OR timing)<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 6  | #5 OR #4 OR #3 OR #2 OR #1<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019  |
| # 5  | TS=((Perinatal or neonat* or newborn or "new born") NEAR/2 (mortalit* or death* or infection* or sepsis or septic or asphyxia or jaundice or fever* or hypothermi* or anaemi* or anemi*))<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 4  | TS=((Postnatal* or "post natal*" or "post partum" or postpartum or puerperal) NEAR/2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or septic or sepsis))<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019 |
| # 3  | TS=((emergency or unplanned) NEAR/2 (caesarean or cesarean or "c-section"))<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 2  | TS=((Maternal or mother* or pregnan*) NEAR/2 (mortalit* or death*))<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019   |
| # 1  | TS=((After or following) NEAR/2 (birth* or deliver*)) NEAR/2 (complication* or morbidit* or mortalit* or death* or hemorrhag* or haemorrhag* or bleed* or anaemi* or anemi* or infected or infection* or sepsis or septic))<br>Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=2000-2019                         |

*CINAHL (EBSCO)*

Search conducted on December 20, 2019 with 4058 studies identified; updated on May 10, 2021 with 217 studies identified.

(((((TI (((After OR following) N2 (birth\* OR deliver\*)) N2 (complication\* OR morbidit\* OR mortalit\* OR death\* OR hemorrhag\* OR haemorrhag\* OR bleed\* OR anaemi\* OR anemi\* OR infected OR infection\* OR sepsis OR septic))) OR (AB (((After OR following) N2 (birth\* OR deliver\*) N2 (complication\* OR morbidit\* OR mortalit\* OR death\* OR hemorrhag\* OR haemorrhag\* OR bleed\* OR anaemi\* OR anemi\* OR infected OR infection\* OR sepsis OR septic)))))) OR ((TI (((Postnatal\* OR post natal\* OR post partum OR postpartum OR puerperal) N2 (complication\* OR morbidit\* OR mortalit\* OR death\* OR hemorrhag\* OR haemorrhag\* OR bleed\* OR anaemi\* OR anemi\* OR infected OR infection\* OR septic OR sepsis)))) OR (AB (((Postnatal\* OR post natal\* OR post partum OR postpartum OR puerperal) N2 (complication\* OR morbidit\* OR mortalit\* OR death\* OR hemorrhag\* OR haemorrhag\* OR bleed\* OR anaemi\* OR anemi\* OR infected OR infection\* OR septic OR sepsis)))))) OR ((TI (((Perinatal OR neonat\* OR newborn OR new born) N2 (mortalit\* OR death\* OR infection\* OR sepsis OR septic OR asphyxia OR jaundice OR fever\* OR hypothermi\* OR anaemi\* OR anemi\*))) OR (AB (((Perinatal OR neonat\* OR newborn OR new born) N2 (mortalit\* OR death\* OR infection\* OR sepsis OR septic OR asphyxia OR jaundice OR fever\* OR hypothermi\* OR anaemi\* OR anemi\*))) OR ((TI (((Maternal OR mother\* OR pregnan\*) N2 (mortalit\* OR death\*))) OR (AB (((Maternal OR mother\* OR pregnan\*) N2 (mortalit\* OR death\*)))))) OR ((TI (((emergency OR unplanned) N2 (caesarean OR cesarean OR c-section))) OR (AB (((emergency OR unplanned) N2 (caesarean OR cesarean OR c-section)))))) OR ((MH "Maternal Mortality") OR ((MH "Infant Mortality") OR ((MH "Infant Death") OR (MH "Perinatal Death") OR ((MH "Puerperal Disorders") OR (MH "Postpartum Hemorrhage") OR (MH "Puerperal Infection") OR ((MH "Eclampsia") OR (MH "Pre-Eclampsia") OR ((MH "Anemia, Neonatal") OR (MH "Neonatal Sepsis") OR (MH "Asphyxia Neonatorum") OR ((MH "Jaundice, Neonatal") AND (((MH "Time Factors") OR (TI (time OR timing)) OR (AB (time OR timing)))))) AND (((TI (incidence OR prevalence OR epidemiolog\* OR cohort\* OR survey\* OR cross-section\* OR population OR observational OR quantitative)) OR (AB (incidence OR prevalence OR epidemiolog\* OR cohort\* OR survey\* OR cross-section\* OR population OR observational OR quantitative))) OR ((MH "Epidemiological Research") OR (MH "Descriptive Research") OR (MH "Health Services Research+") OR (MH "Administrative Research") OR (MH "Analytic Research") OR (MH "Applied Research") OR (MH "Clinical Research") OR (MH "Survey Research") OR (MH "Secondary Analysis") OR (MH "Trend Studies") OR (MH "Predictive Research") OR ((MH "Empirical Research") OR (MH "Case Control Studies+") OR (MH "Correlational Studies") OR (MH "Cross Sectional Studies") OR (MH "Prospective Studies+") OR (MH "Retrospective Design") OR (MH "Quasi-Experimental Studies+") OR (MH "Repeated Measures")))) "AND" "NOT" (((MH "Animals+") OR (MH "Mammals+")) "AND" "NOT" ((MH "Human"))))

## Appendix II: Studies ineligible following full-text review

| Title   | Authors                        | Year | Journal  | Reason for exclusion |
|---|--------------------------------|------|--|----------------------|
| Risk factors for readmission for phototherapy due to jaundice in healthy newborns: a retrospective, observational study   | Blumovich A <i>et al.</i>      | 2021 | Neonatal Intensive Care                            | Duplicate            |
| A one year review of eclampsia in an Ethiopian tertiary care center (Saint Paul's hospital millennium medical college)  | Abdulkadir A                   | 2017 | Journal of Perinatal Medicine                      | Duplicate            |
| Post-caesarean surgical site infections according   | Opoien HK <i>et al.</i>        | 2007 | Acta Obstetrica et Gynecologica Scandinavia        | Duplicate            |
| Timing of elective repeat cesarean delivery at term and neonatal outcomes   | Tita ATN <i>et al.</i>         | 2009 | New England Journal of Medicine                    | Duplicate            |
| Neonatal outcome following primary elective caesarean section beyond 37 weeks of gestation: a 7-year retrospective analysis of a national registry                      | Wilmink FA <i>et al.</i>       | 2009 | American Journal of Obstetrics and Gynecology      | Duplicate            |
| Maternal near-miss and death among women with postpartum haemorrhage: a secondary analysis of the Nigeria Near-miss and Maternal Death Survey                           | Sotunsa JO <i>et al.</i>       | 2019 | BJOG   | Duplicate            |
| Early-onset neonatal infections in Australia and New Zealand, 2002-2012   | Singh T <i>et al.</i>          | 2019 | Archives of Disease in Childhood                   | Duplicate            |
| Eclampsia: still a dreadful situation   | Memon RAD                      | 2012 | International Journal of Gynecology and Obstetrics | Duplicate            |
| Infant mortality in three population-based cohorts in Southern Brazil: trends and differentials   | Santos IS <i>et al.</i>        | 2008 | Cadernos de saude publica                          | Duplicate            |
| The impact of postpartum hemorrhage on hospital length of stay and inpatient mortality: a National Inpatient Sample-based analysis                                      | Marshall AL <i>et al.</i>      | 2017 | American Journal of Obstetrics and Gynecology      | Duplicate            |
| The impact of postpartum haemorrhage (PPH) on maternal morbidity  | Mackeen A and Khong SY         | 2012 | BJOG   | Duplicate            |
| Survey of care environment and mortality in a tertiary neonatal intensive care unit   | Lee Y and Chou Y               | 2005 | Clinical Neonatology                               | Duplicate            |
| Eclampsia: still a dreadful situation   | Memon RAD <i>et al.</i>        | 2011 | Medical Forum Monthly                              | Duplicate            |
| Severe group A streptococcal infections in mothers and their newborns in London and the South East, 2010-2016: assessment of risk and audit of public health management | Leonard A <i>et al.</i>        | 2018 | BJOG   | Duplicate            |
| Global, regional, and national levels and causes of maternal mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013              | Kassebaum NJ <i>et al.</i>     | 2014 | Lancet   | Duplicate            |
| Monitoring maternal and newborn health outcomes in Bauchi state, Nigeria: an evaluation of a standards based quality improvement intervention                           | Kabo I <i>et al.</i>           | 2015 | International Journal of Gynecology and Obstetrics | Duplicate            |
| Trends in severe adverse outcomes following postpartum haemorrhage, 2003-2011   | Ford JB <i>et al.</i>          | 2015 | BJOG   | Duplicate            |
| Severe secondary postpartum hemorrhage: a historical cohort study   | Debost-Legrand A <i>et al.</i> | 2015 | International Journal of Gynecology and Obstetrics | Duplicate            |
| A 3-year retrospective review of neonatal morbidity and mortality data at the hospital national guido valadares (HNGV), Dili, Timor-Leste                               | Bucens IK <i>et al.</i>        | 2012 | Journal of Paediatrics and Child Health            | Duplicate            |
| Should delivery timing for repeat cesarean be reconsidered based on pregnancy dating criteria?  | Brookfield K <i>et al.</i>     | 2016 | American Journal of Obstetrics and Gynecology      | Duplicate            |
| Trends in perinatal deaths from 2010 to 2013 in the Guatemalan Western Highlands  | Garces A <i>et al.</i>         | 2015 | Reproductive Health                                | Duplicate            |

| <i>(Continued)</i>   |                                 |      |   |                      |
|--|---------------------------------|------|---|----------------------|
| Title  | Authors                         | Year | Journal   | Reason for exclusion |
| [Epidemiology of maternal mortality in France, 2010-2012]  | Deneux-Tharaux, C and Saucedo M | 2017 | Gynecologie, obstetrique, fertilité and senologie         | Duplicate            |
| Emergency Department Visits for Postpartum Complications   | Brousseau EC <i>et al.</i>      | 2018 | Journal of Women's Health                                 | Duplicate            |
| Risk factors for maternal death and trends in maternal mortality in low- and middle-income countries: a prospective longitudinal cohort analysis                               | Bauseman, M <i>et al.</i>       | 2015 | Reproductive Health                                       | Duplicate            |
| Identification of bacterial pathogens and their antimicrobial susceptibility of culture proven early onset neonatal sepsis   | Bystricka A <i>et al.</i>       | 2016 | Journal of Maternal-Fetal and Neonatal Medicine           | Duplicate            |
| Effect of timing of first postnatal care home visit on neonatal mortality in Bangladesh: a prospective cohort study  | Baqui AH <i>et al.</i>          | 2009 | BMJ   | Duplicate            |
| Causes of neonatal and child mortality in India: a nationally representative mortality survey  | Bassani DG <i>et al.</i>        | 2010 | Lancet  | Duplicate            |
| Population-based rates, timing, and causes of maternal deaths, stillbirths, and neonatal deaths in south Asia and sub-Saharan Africa: a multi-country prospective cohort study | Baqui AH <i>et al.</i>          | 2018 | Lancet Global Health                                      | Duplicate            |
| A 5-year review of maternal mortality in FMH   | Ambreen A <i>et al.</i>         | 2015 | BJOG  | Duplicate            |
| Incidence and risk factors of sepsis mortality in labor, delivery and postpartum: a population-based study on 5 million births   | Al-Ostad G <i>et al.</i>        | 2015 | American Journal of Obstetrics and Gynecology             | Duplicate            |
| Incidence of and risk factors for sepsis mortality in labor, delivery, and postpartum  | Al-Ostad G <i>et al.</i>        | 2015 | Obstetrics and Gynecology                                 | Duplicate            |
| Emergency peripartum hysterectomy: a multicenter study of incidence, indications and outcomes in Southwestern Nigeria  | Akintayo A <i>et al.</i>        | 2015 | International Journal of Gynecology and Obstetrics        | Duplicate            |
| Non-obstetric causes of severe maternal complications: a secondary analysis of the Nigeria Near-miss and Maternal Death Survey   | Adeniran AS <i>et al.</i>       | 2019 | BJOG  | Duplicate            |
| [On perinatal and infant mortality in the Arkhangelsk Region]  | Ul'ianovskaia SA <i>et al.</i>  | 2013 | Arkhir Patologii  | Ineligible language  |
| [Epidemiological analysis of maternal death in Beijing from 1995 to 2010]  | Yang, H <i>et al.</i>           | 2011 | Chinese Journal of Preventive Medicine                    | Ineligible language  |
| [Study on maternal deaths in Beijing, from 1996 to 2010]   | Yang, H <i>et al.</i>           | 2011 | Zhonghua liu xing bing xue za zhi                         | Ineligible language  |
| Eclampsia and perinatal outcome: a retrospective study in a teaching hospital  | Yaliwal RG <i>et al.</i>        | 2011 | Journal of Clinical and Diagnostic Research               | Ineligible language  |
| [Clinical features of neonatal enterovirus infection]  | Shen X-X <i>et al.</i>          | 2020 | Chinese Journal of Contemporary Pediatrics                | Ineligible language  |
| [An investigation of severe neonatal hyperbilirubinemia in 13 hospitals of Jiangsu Province, China]  | Li Q-Q <i>et al.</i>            | 2020 | Chinese Journal of Contemporary Pediatrics                | Ineligible language  |
| [Maternal deaths at a public maternity Hospital in Fortaleza: an epidemiological study]  | Herculano MMS <i>et al.</i>     | 2012 | Revista da Escola de Enfermagem da U S P                  | Ineligible language  |
| [Hospital-acquired infections after caesarean delivery in selected hospitals in the southern Poland]   | Wojkowska-Mach J <i>et al.</i>  | 2008 | Ginekologia Polska  | Ineligible language  |
| Evaluation of maternal and neonatal complications of HELLP syndrome and its risk factors   | Sohrabi N <i>et al.</i>         | 2010 | Iranian Journal of Obstetrics, Gynecology and Infertility | Ineligible language  |
| [Maternal mortality due to pre-eclampsia/eclampsia in a state in southern Brazil]  | Soares VMN <i>et al.</i>        | 2009 | Revista brasileira de ginecologia e obstetricia           | Ineligible language  |
| [Early neonatal mortality in the Russian Federation in 2010]   | Shchegolev AI <i>et al.</i>     | 2013 | Arkhir Patologii  | Ineligible language  |
| [Nosocomial infections in a neonatology department, 1995-2002]   | Rudnicki J <i>et al.</i>        | 2003 | Ginekologia Polska  | Ineligible language  |

| <i>(Continued)</i>  |                                     |      |   |                      |
|---|-------------------------------------|------|---|----------------------|
| Title   | Authors                             | Year | Journal   | Reason for exclusion |
| Hospitalizations due to complications of pregnancy and maternal and perinatal outcomes in a cohort of pregnant women in the Brazilian Unified National Health System in Sao Paulo, Brazil | Moura BLA <i>et al.</i>             | 2018 | Cadernos de Saude Publica   | Ineligible language  |
| [Trends of maternal mortality ratio during 1996-2010 in China]  | Zhou Y-Y <i>et al.</i>              | 2011 | Chinese Journal of Preventive Medicine                              | Ineligible language  |
| [Analysis of maternal deaths in Shanghai from 1996 to 2015]   | Qin M                               | 2017 | Zhonghua fu chan ke za zhi  | Ineligible language  |
| [Neonatal mortality in campania region: analysis of causes of death by current data]  | Pugliese A <i>et al.</i>            | 2007 | Epidemiologia e prevenzione   | Ineligible language  |
| [The analysis of neonatal deaths based on autopsy protocols of the Department of Forensic Medicine in Bialystok in the years 1955-2009]   | Ptaszynska-Sarosiek I <i>et al.</i> | 2011 | Archiwum medycyny sadowej i kryminologii                            | Ineligible language  |
| [Determinants of neonatal mortality: a case-control study in Fortaleza, Ceara State, Brazil]  | Nascimento RM <i>et al.</i>         | 2012 | Cadernos de saude publica   | Ineligible language  |
| [The perinatal mortality in the Omskaya Oblast]   | Lopushanskii VG and Kravchenko EN   | 2008 | Problemy sotsial'noi gigieny, zdravookhraneniia i istorii meditsiny | Ineligible language  |
| [Neonatal mortality in the Czech Republic 1998-1999]  | Plavka R                            | 2000 | Ceska gynekologie   | Ineligible language  |
| Maternal deaths in forensic autopsies   | Karayel F <i>et al.</i>             | 2005 | Jinekoloji ve Obstetrik Dergisi                                     | Ineligible language  |
| Evaluation of causes and therapeutic methods of controlling of postpartum hemorrhage in two governmental hospital of Mashhad, Iran  | Lotfalizadeh M <i>et al.</i>        | 2013 | Iranian Journal of Obstetrics, Gynecology and Infertility           | Ineligible language  |
| [Characteristics of maternal mortality in the university hospital of Pleven for the period of 1977-2001 years]  | Markova S <i>et al.</i>             | 2004 | Akusherstvo i ginekologija  | Ineligible language  |
| [Peculiarities of maternal mortality in the University Hospital of Pleven for period 1977-2001]   | Markova S <i>et al.</i>             | 2007 | Akusherstvo i ginekologija  | Ineligible language  |
| Causes of death in neonates and children in 17-Shahrivar Training Hospital of Rasht   | Hashemian H <i>et al.</i>           | 2014 | Journal of Guilan University of Medical Sciences                    | Ineligible language  |
| [Impact of vaginal delivery after a previous cesarean section on perinatal outcomes]  | Madi JM <i>et al.</i>               | 2013 | Revista brasileira de ginecologia e obstetricia                     | Ineligible language  |
| Incidence and clinical significance of neonatal nosocomial infections   | Christova E <i>et al.</i>           | 2001 | Pediatriya  | Ineligible language  |
| Analysis of influencing factors for pregnancy induced hypertension retinopathy and its influence on pregnancy outcome of mothers and infants  | Huang C-M and Yang J-D              | 2018 | International Eye Science   | Ineligible language  |
| [Maternal mortality in Sweden underestimated. Registry study of death in connection with pregnancy, delivery and postpartum]  | Grunewald C <i>et al.</i>           | 2008 | Lakartidningen  | Ineligible language  |
| [Perinatal morbidity and mortality in children born to mothers with gestational hypertension]   | Galanti B <i>et al.</i>             | 2000 | Acta bio-medica de L'Ateneo parmense                                | Ineligible language  |
| [Causes of neonatal death in the Xiaogan region of Hubei Province between 2007 and 2010]  | Fu H-D <i>et al.</i>                | 2012 | Chinese Journal of Contemporary Pediatrics                          | Ineligible language  |
| The causes of perinatal deaths in Croatia in the year 2005  | Drazancic A <i>et al.</i>           | 2007 | Gynaecologia et Perinatologia                                       | Ineligible language  |
| [Epidemiological profile of maternal deaths in Rio Grande do Sul, Brazil: 2004-2007]  | Carreno I <i>et al.</i>             | 2012 | Brazilian Journal of Epidemiology                                   | Ineligible language  |
| Evaluation of infant mortality rate in Sakarya Province in 2008: a cross-sectional study  | Demir F <i>et al.</i>               | 2015 | Nobel Medicus   | Ineligible language  |
| [Epidemiological features of maternal deaths occurred in Recife, PE, Brazil (2000-2006)]  | Correia RA <i>et al.</i>            | 2011 | Revista brasileira de enfermagem                                    | Ineligible language  |

| <i>(Continued)</i>  |                             |      |   |                      |
|---|-----------------------------|------|---|----------------------|
| Title   | Authors                     | Year | Journal   | Reason for exclusion |
| Incidence of the hypothermia in neonates  | Palyzyan P <i>et al.</i>    | 2004 | HAYAT   | Ineligible language  |
| [Dynamics of perinatal and neonatal mortality rate in the period 1990-2005 in Bulgaria]   | Zhekova N <i>et al.</i>     | 2007 | Akusherstvo i ginekologija  | Ineligible language  |
| [Clinical characteristics and outcomes of cerebral venous sinus thrombosis during pregnancy and puerperium]   | Zhou Q <i>et al.</i>        | 2010 | Zhonghua fu chan ke za zhi  | Ineligible language  |
| Evaluation of the causes of neonatal jaundice, based on the infant, Aô's age at disease onset and age at hospital admission   | Boskabadi H <i>et al.</i>   | 2016 | Tehran University Medical Journal                                 | Ineligible language  |
| [Severe maternal morbidity in an obstetric ICU in Recife, Northeast of Brasil]  | Dr Amorim MMR <i>et al.</i> | 2008 | Revista da Associacao Medica Brasileira                           | Ineligible language  |
| [Spatial analysis of neonatal mortality in the state of Sao Paulo, 2006-2010]   | Almeida MCS <i>et al.</i>   | 2014 | Revista paulista de pediatria                                     | Ineligible language  |
| [Epidemiology of postpartum hemorrhages in the Umbrian population in the years 2006-2017]   | Abraha I <i>et al.</i>      | 2019 | Recenti progressi in medicina                                     | Ineligible language  |
| Determinants of neonatal jaundice among neonates admitted to five referral hospitals in Amhara region, Northern Ethiopia: an unmatched case-control study   | Bizuneh AD <i>et al.</i>    | 2020 | BMJ Paediatrics Open  | Ineligible objective |
| Risk factors for readmission for phototherapy due to jaundice in healthy newborns: a retrospective, observational study   | Blumovich A                 | 2020 | BMC Pediatrics  | Ineligible objective |
| Changes in infant and neonatal mortality and associated factors in eight cohorts from three Brazilian cCities   | Carvalho CA <i>et al.</i>   | 2020 | Scientific Reports  | Ineligible objective |
| Maternal mortality in an Iraqi tertiary hospital: lessons from the years of the crisis  | Obeid RS <i>et al.</i>      | 2020 | International Journal of Women's Health and Reproduction Sciences | Ineligible objective |
| Pobreza y Mortalidad Materna en Chuquisaca Poverty and maternal mortality in Chuquisaca   | De La A and Murillo G       | 2009 | Cuadernos del Hospital de Clínicas                                | Ineligible objective |
| Two year audit of perinatal mortality at Kathmandu Medical College Teaching Hospital  | Shrestha M <i>et al.</i>    | 2006 | Kathmandu University Medical Journal (KUMJ)                       | Ineligible objective |
| [Omission of causes of maternal death in death certificates in Argentina: nationwide observational studyOmissao do registro de causas maternas de morte na Argentina: estudo observacional de alcance nacional] | Abalos E <i>et al.</i>      | 2019 | Pan American Journal of Public Health                             | Ineligible objective |
| Delivery care utilisation and care-seeking in the neonatal period: a population-based study in Vietnam  | Malqvist, M <i>et al.</i>   | 2008 | Annals of Tropical Paediatrics                                    | Ineligible objective |
| Effect of timing of first postnatal care home visit on neonatal mortality in Bangladesh: a observational cohort study   | Baqi AH <i>et al.</i>       | 2009 | BMJ   | Ineligible objective |
| Root causes for late presentation of severe neonatal hyperbilirubinaemia in Egypt   | Iskander I <i>et al.</i>    | 2012 | Eastern Mediterranean Health Journal                              | Ineligible objective |
| Care seeking for fatal illness episodes in neonates: a population-based study in rural Bangladesh   | Chowdhury HR <i>et al.</i>  | 2011 | BMC Pediatrics  | Ineligible objective |
| The effects of standardised protocols of obstetric and neonatal care on perinatal and early neonatal mortality at a rural hospital in Tanzania  | Kruger C <i>et al.</i>      | 2012 | International Health  | Ineligible objective |
| Early onset perinatal infection due to group B streptococcus (GBS) in Thessaly Greece during 2003-2008  | Kalaitzi A <i>et al.</i>    | 2010 | Journal of Maternal-Fetal and Neonatal Medicine                   | Ineligible objective |
| Early discharge of Alberta mothers post-delivery and the relationship to potentially preventable newborn readmissions   | Johnson D <i>et al.</i>     | 2002 | Canadian Journal of Public Health                                 | Ineligible objective |
| Predictive factors of hyperbilirubinemia in newborns at University hospital in northern Iran  | Jalali SZ <i>et al.</i>     | 2017 | Indian Journal of Experimental Biology                            | Ineligible objective |
| Duration and magnitude of mortality after pregnancy in rural Bangladesh   | Hurt LS <i>et al.</i>       | 2008 | International Journal of Epidemiology                             | Ineligible objective |

| <i>(Continued)</i>   |                                   |      |  |                      |
|--|-----------------------------------|------|--|----------------------|
| Title  | Authors                           | Year | Journal  | Reason for exclusion |
| Clinical characteristics of women captured by extending the definition of severe postpartum haemorrhage with 'refractoriness to treatment': a cohort study   | Henriquez DDCA <i>et al.</i>      | 2019 | BMC Pregnancy and Childbirth   | Ineligible objective |
| Trends in postpartum haemorrhage   | Cameron CA <i>et al.</i>          | 2006 | Australian and New Zealand Journal of Public Health                      | Ineligible objective |
| Transfers to hospital in planned home birth in four Nordic countries - a prospective cohort study  | Blix E <i>et al.</i>              | 2016 | Acta obstetrica et gynecologica Scandinavica                             | Ineligible objective |
| Maternal and neonatal outcomes after caesarean delivery in the African Surgical Outcomes Study: a 7-day prospective observational cohort study   | Bishop D <i>et al.</i>            | 2019 | Lancet Global Health   | Ineligible objective |
| Trends in all-cause mortality across gestational age in days for children born at term   | Wu CS <i>et al.</i>               | 2015 | PLoS One   | Ineligible objective |
| Is there a difference in the maternal and neonatal outcomes between patients discharged after 24 h versus 72 h following cesarean section? A prospective randomized observational study on 2998 patients | Bayoumi YA <i>et al.</i>          | 2016 | Journal of Maternal-Fetal and Neonatal Medicine                          | Ineligible objective |
| Risk factors for maternal death and trends in maternal mortality in low- and middle-income countries: a prospective longitudinal cohort analysis   | Bauserman M <i>et al.</i>         | 2015 | Reproductive Health  | Ineligible objective |
| A study of maternal mortality in 8 principal hospitals in Pakistan in 2009   | Bano N <i>et al.</i>              | 2011 | International Journal of Gynaecology and Obstetrics                      | Ineligible objective |
| Obstetric admissions to the intensive care unit: a 10-year review  | Valgeirsdottir I <i>et al.</i>    | 2012 | Acta Obstetrica et Gynecologica Scandinavica                             | Ineligible objective |
| Maternal and neonatal outcome in deliveries complicated by intrapartum fever-does time to delivery matter?   | Salman L <i>et al.</i>            | 2017 | American Journal of Obstetrics and Gynecology                            | Ineligible objective |
| Pattern, causes and outcome of neonatal admissions in a teaching hospital, Multan, Pakistan  | Rasheed J <i>et al.</i>           | 2018 | Rawal Medical Journal  | Ineligible objective |
| Clinical course and prognosis of hemolytic jaundice in neonates in North East of Iran  | Boskabadi H <i>et al.</i>         | 2011 | Macedonian Journal of Medical Sciences                                   | Ineligible objective |
| Epidemiological, clinical and delaying characteristics in the process of attention of maternal death in Lambayeque. 2011 - 2016  | Verona-Balcazar M <i>et al.</i>   | 2019 | Revista Del Cuerpo Medico Del Hospital Nacional Almanzor Aguinaga Asenjo | Ineligible objective |
| Travel time from home to hospital and adverse perinatal outcomes in women at term in the Netherlands   | Ravelli ACJ <i>et al.</i>         | 2011 | BJOG   | Ineligible objective |
| [Analysis of neonatal mortality in the University Hospital La Fe Valencia. Years 1971-2009]  | Morcillo Sopena F <i>et al.</i>   | 2012 | Anales de pediatria  | Ineligible objective |
| Vaginal breech delivery at term and neonatal morbidity and mortality - a population-based cohort study in Sweden   | Ekeus C <i>et al.</i>             | 2019 | Journal of Maternal-Fetal and Neonatal Medicine                          | Ineligible objective |
| The effect of timing of cord clamping on neonatal venous hematocrit values and clinical outcome at term: a randomized, controlled trial  | Ceriani Cernadas JM <i>et al.</i> | 2006 | Pediatrics   | Ineligible objective |
| Mortality among Guarani Indians in Southeastern and Southern Brazil  | Cardoso AM <i>et al.</i>          | 2011 | Cadernos de Saude Publica  | Ineligible objective |
| Maternal morbidity associated with cesarean section  | Anaya-Prado R <i>et al.</i>       | 2008 | Cirugia y Cirujanos  | Ineligible objective |
| An opportunity to reduce morbidity in delayed postpartum hemorrhage: multicentre analysis of tranexamic utilization in the emergency department  | Amat C <i>et al.</i>              | 2019 | Canadian Journal of Emergency Medicine                                   | Ineligible objective |



| <i>(Continued)</i>   |                               |      |   |                      |
|--|-------------------------------|------|---|----------------------|
| Title  | Authors                       | Year | Journal   | Reason for exclusion |
| Surgical site infection after caesarean section in relation to operative time  | Alkadhim HK and Albdairi AAH. | 2019 | Indian Journal of Forensic Medicine and Toxicology  | Ineligible objective |
| Assessment of coagulation profile, fibrinogen, protein c, protein s, antithrombin, and vitamin K levels among sudanese neonates with proven sepsis in omdurman maternity hospital, sudan | Ahmed A <i>et al.</i>         | 2017 | Leukemia Research                                   | Ineligible objective |
| Assessment of maternal near-miss and quality of care in a hospital-based study in Accra, Ghana   | Tuncalp O <i>et al.</i>       | 2013 | International Journal of Gynaecology and Obstetrics | Ineligible objective |
| Maternal near-miss and death among women with postpartum haemorrhage: a secondary analysis of the Nigeria Near-miss and Maternal Death Survey  | Sotunsa JO <i>et al.</i>      | 2019 | BJOB  | Ineligible objective |
| Integration of maternal postpartum services in maternal and child health services in Kaya health district (Burkina Faso): An intervention time trend analysis                            | Yugbare Belemsaga D           | 2017 | Tropical Medicine and International Health          | Ineligible objective |
| Self-reported pregnancy-related health problems and self-rated health status in Rwandan women postpartum: a populationbased cross-sectional study  | Semasaka JPS <i>et al.</i>    | 2016 | BMC Pregnancy and Childbirth                        | Ineligible objective |
| Mortality related to caesarean section in rural Matebeleland North Province, Zimbabwe  | Rutgers RAK <i>et al.</i>     | 2008 | The Central African Journal of Medicine             | Ineligible objective |
| Time of birth and risk of neonatal death at term: retrospective cohort study   | Pasupathy D <i>et al.</i>     | 2010 | BMJ   | Ineligible objective |
| Maternal deaths from hypertensive disorders: lessons learnt  | Nyfløt T <i>et al.</i>        | 2018 | Acta Obstetrica et Gynecologica Scandinavica        | Ineligible objective |
| Risk of mortality subsequent to umbilical cord infection among newborns of southern Nepal: cord infection and mortality  | Mullany LC <i>et al.</i>      | 2009 | Pediatric Infectious Disease Journal                | Ineligible objective |
| Perinatal mortality by gestational week and size at birth in singleton pregnancies at and beyond term: a nationwide population-based cohort study  | Morken N-H <i>et al.</i>      | 2014 | BMC Pregnancy and Childbirth                        | Ineligible objective |
| Second-stage vs first-stage caesarean delivery: comparison of maternal and perinatal outcomes  | Asicioglu O <i>et al.</i>     | 2014 | Journal of Obstetrics and Gynaecology               | Ineligible objective |
| Rates of intrauterine fetal demise and respiratory morbidity at term: determining optimal timing of delivery   | Alimena S <i>et al.</i>       | 2016 | Obstetrics and Gynecology                           | Ineligible objective |
| Pertussis in the newborn: certainties and uncertainties in 2014  | Rocha G <i>et al.</i>         | 2015 | Paediatric Respiratory Reviews                      | Ineligible objective |
| Maternal mortality secondary to acute respiratory failure in Colombia: a population-based analysis   | Rojas-Suarez J <i>et al.</i>  | 2015 | Lung  | Ineligible objective |
| Hypothermia in Iranian newborns. Incidence, risk factors and related complications   | Zayeri F <i>et al.</i>        | 2005 | Saudi Medical Journal                               | Ineligible objective |
| Causes of maternal deaths in a tertiary care hospital in Larkana, Pakistan   | Soomro S <i>et al.</i>        | 2013 | Rawal Medical Journal                               | Ineligible objective |
| Determinants and causes of maternal mortality in Iran based on ICD-MM: a systematic review   | Zalvand R <i>et al.</i>       | 2019 | Reproductive Health                                 | Ineligible objective |
| [The puerperal infection in a delivery center: occurrence and predisposing factors]  | Machado NXdS <i>et al.</i>    | 2005 | Revista brasileira de enfermagem                    | Ineligible objective |
| Eclampsia in Dar es Salaam, Tanzania - incidence, outcome, and the role of antenatal care  | Urassa DP <i>et al.</i>       | 2006 | Acta obstetrica et gynecologica Scandinavica        | Ineligible objective |
| Primary post partum hemorrhage an obstetric catastrophe: a review of 270 cases   | Usmani I and Bakhsh FM        | 2013 | Medical Forum Monthly                               | Ineligible objective |
| Neonatal bacteremia and early onset sepsis-frequency, spectrum of organisms and correlation between clinical symptoms and laboratory abnormalities                                       | Vakrilova L <i>et al.</i>     | 2013 | Journal of Perinatal Medicine                       | Ineligible objective |

| <i>(Continued)</i>   |                                     |      |  |                      |
|--|-------------------------------------|------|--|----------------------|
| Title  | Authors                             | Year | Journal  | Reason for exclusion |
| Maternal mortality 1991-007. Why mothers die in a third level hospital   | Valle L <i>et al.</i>               | 2010 | Clinica e Investigacion en Ginecologia y Obstetricia                 | Ineligible objective |
| Timing of elective repeat cesarean delivery at term and neonatal outcomes  | Tita ATN <i>et al.</i>              | 2009 | Obstetrical and Gynecological Survey                                 | Ineligible objective |
| A comparison of morbidity rates attributable to conditions originating in the perinatal period among newborns discharged from United States hospitals, 1989-90 and 1999-2000 | Tomashek KM <i>et al.</i>           | 2006 | Paediatric and Perinatal Epidemiology                                | Ineligible objective |
| The prevalence of maternal near miss: a systematic review  | Tuncalp O <i>et al.</i>             | 2012 | BJOG   | Ineligible objective |
| Pregnancy outcomes of multiple repeated cesarean sections in King Chulalongkorn Memorial Hospital  | Wuttikonsammakit P and Sukcharoen N | 2006 | Journal of the Medical Association of Thailand                       | Ineligible objective |
| Maternal and fetal outcome in patients with eclampsia at Murtala Muhammad specialist Hospital Kano, Nigeria  | Yakasai IA and Gaya SA              | 2011 | Annals of African Medicine   | Ineligible objective |
| Progress on the maternal mortality ratio reduction in Wuhan, China in 2001-2012  | Yang S <i>et al.</i>                | 2014 | PLoS One   | Ineligible objective |
| Perinatal outcome in women with severe chronic hypertension during the second half of pregnancy  | Vigil-De Gracia P <i>et al.</i>     | 2004 | International Journal of Gynaecology and Obstetrics                  | Ineligible objective |
| A community based case control study on determinants of perinatal mortality in a tribal population of southern India   | Viswanath K <i>et al.</i>           | 2015 | Rural and Remote Health  | Ineligible objective |
| Epidemiological characterization of patients with Neonatal Sepsis in a Hospital of Cali city (Colombia), 2014  | Vivas MC <i>et al.</i>              | 2017 | Arch. Med.   | Ineligible objective |
| The burden of severe maternal outcomes and indicators of quality of maternal care in Nigerian hospitals: a secondary analysis comparing two large facility-based surveys     | Vogel JP <i>et al.</i>              | 2019 | BJOG   | Ineligible objective |
| Viral infections: contributions to late fetal death, stillbirth, and infant death  | Williams EJ <i>et al.</i>           | 2013 | Journal of Pediatrics  | Ineligible objective |
| Antibiotic treatment of suspected and confirmed neonatal sepsis within 28 days of birth: a retrospective analysis  | Wagstaff JS <i>et al.</i>           | 2019 | Frontiers in Pharmacology  | Ineligible objective |
| Clinical study on the factors affecting the post-partum recovery of patients with hypertensive pregnancy disorders at a Chinese hospital                                     | Wei J <i>et al.</i>                 | 2017 | Journal of Obstetrics and Gynaecology Research                       | Ineligible objective |
| The changing profile of infant mortality from bacterial, viral and fungal infection over two decades   | Williams EJ <i>et al.</i>           | 2013 | Acta Paediatrica   | Ineligible objective |
| Maternal near miss: a cross-sectional study in a tertiary hospital in the state of Goias   | Wachholz A <i>et al.</i>            | 2018 | International Journal of Gynecology and Obstetrics                   | Ineligible objective |
| Uterine rupture: trends over 40 years  | Al-Zirqi I <i>et al.</i>            | 2016 | BJOG   | Ineligible objective |
| Early imaging and adverse neurodevelopmental outcome in asphyxiated newborns treated with hypothermia  | Al Amrani F <i>et al.</i>           | 2017 | Pediatric Neurology  | Ineligible objective |
| Maternal and fetal outcome of eclamptic patients in a tertiary hospital  | Akhtar R <i>et al.</i>              | 2011 | Bangladesh Journal of Obstetrics and Gynecology                      | Ineligible objective |
| Public-private differences in short-term neonatal outcomes following birth by prelabour caesarean section at early and full term   | Adams N <i>et al.</i>               | 2017 | The Australian and New Zealand Journal of Obstetrics and Gynaecology | Ineligible objective |
| Time trends of neonatal mortality by causes of death in Shenyang, 1997-2014  | Wu Q-J <i>et al.</i>                | 2016 | Oncotarget   | Ineligible objective |
| Epidemiology of obstetric-related ICU admissions in Maryland: 1999-2008*   | Wanderer JP <i>et al.</i>           | 2013 | Critical Care Medicine   | Ineligible objective |

| <i>(Continued)</i>   |                                  |      |  |                      |
|--|----------------------------------|------|--|----------------------|
| Title  | Authors                          | Year | Journal  | Reason for exclusion |
| Trends of preeclampsia/eclampsia and maternal and neonatal outcomes among women delivering in Addis Ababa selected government hospitals, Ethiopia: a retrospective cross-sectional study | Wagnew M <i>et al.</i>           | 2016 | The Pan African Medical Journal                          | Ineligible objective |
| Increasing neonatal mortality among Palestine refugees in the Gaza strip   | van den Berg MM <i>et al.</i>    | 2015 | PLoS One   | Ineligible objective |
| Obstetric critical care in south-west Uganda: an 18-month survey of maternal critical care admissions and outcomes   | Webster K <i>et al.</i>          | 2012 | International Journal of Obstetric Anesthesia            | Ineligible objective |
| Prevalence of concomitant acute bacterial meningitis in neonates with febrile urinary tract infection: a retrospective cross-sectional study   | Wallace SS <i>et al.</i>         | 2017 | The Journal of Pediatrics                                | Ineligible objective |
| The burden of severe maternal outcomes and indicators of quality of maternal care in Nigerian hospitals: a secondary analysis comparing two large facility-based surveys                 | Vogel JP <i>et al.</i>           | 2019 | BJOG   | Ineligible objective |
| [Jaundice and urinary tract infection in neonates: simple coincidence or real consequence?]  | Abourazzak S <i>et al.</i>       | 2013 | Archives de pediatrie                                    | Ineligible objective |
| Changes in cause of neonatal death over a decade   | Wong A <i>et al.</i>             | 2008 | The New Zealand Medical Journal                          | Ineligible objective |
| Validating the WHO maternal near miss tool: comparing high- and low-resource settings  | Witteveen T <i>et al.</i>        | 2017 | BMC Pregnancy and Childbirth                             | Ineligible objective |
| Missed Opportunities in Neonatal Deaths in Rwanda: Applying the Three Delays Model in a Cross-Sectional Analysis of Neonatal Death   | Wilmot, E <i>et al.</i>          | 2017 | Maternal and Child Health Journal                        | Ineligible objective |
| Effects of caesarean section on maternal health in low risk nulliparous women: a prospective matched cohort study in Shanghai, China   | Wang BS <i>et al.</i>            | 2010 | BMC Pregnancy and Childbirth                             | Ineligible objective |
| Neonatal outcome of singleton term breech deliveries in Norway from 1991 to 2011   | Vistad I <i>et al.</i>           | 2015 | Acta obstetrica et gynecologica Scandinavica             | Ineligible objective |
| Maternal and neonatal individual risks and benefits associated with caesarean delivery: multicentre prospective study  | Villar J <i>et al.</i>           | 2007 | BMJ  | Ineligible objective |
| Risk of neonatal mortality according to gestational age after elective repeat cesarean delivery  | Vilchez G <i>et al.</i>          | 2016 | Archives of Gynecology and Obstetrics                    | Ineligible objective |
| Multi-country measurement of maternal morbidity  | Van Den Broek N                  | 2015 | International Journal of Gynecology and Obstetrics       | Ineligible objective |
| [Inequality regarding maternal mortality in Colombian departments in 2000-2001, 2005-2006 and 2008-2009]   | Sandoval-Vargas YG <i>et al.</i> | 2013 | Revista de salud publica                                 | Ineligible objective |
| Determinant factors of maternal mortality from 2016 to 2017 a case-control study in Banjar regency   | Palimbo A <i>et al.</i>          | 2019 | Indian Journal of Public Health Research and Development | Ineligible objective |
| Female mortality in reproductive age in Piauí, Brazil, 2008-2012: causes of deaths and associated factors  | Madeiro AP <i>et al.</i>         | 2018 | Revista de Epidemiologia e Controle de Infecção          | Ineligible objective |
| [Medical audit of neonatal deaths with the "three delay" model in a pediatric hospital in Ouagadougou]   | Koueta F <i>et al.</i>           | 2011 | Sante  | Ineligible objective |
| [Situation of maternal mortality in Peru, 2000 - 2012]   | dl Carpio Ancaya L               | 2013 | Revista peruana de medicina experimental y salud publica | Ineligible objective |
| Impact of the new guidelines for management of newborns at risk of early sepsis due to Group B streptococcus   | Diaz MFG <i>et al.</i>           | 2017 | Boletin de Pediatria                                     | Ineligible objective |
| Severe preeclampsia: characteristics and consequences  | Alvarez A <i>et al.</i>          | 2015 | Finlay   | Ineligible objective |

| <i>(Continued)</i>  |                            |      |  |                      |
|---|----------------------------|------|--|----------------------|
| Title   | Authors                    | Year | Journal  | Reason for exclusion |
| Incidence and risk factors of neonatal hypothermia at referral hospitals in Tehran, Islamic Republic of Iran  | Zayeri F <i>et al.</i>     | 2007 | Eastern Mediterranean Health Journal                   | Ineligible objective |
| Hospital-acquired neonatal infections in developing countries   | Zaidi AKM <i>et al.</i>    | 2005 | Lancet   | Ineligible objective |
| Time trends and regional differences in maternal mortality in China from 2000 to 2005   | Yanqiu G <i>et al.</i>     | 2009 | Bulletin of the World Health Organization              | Ineligible objective |
| Intrapartum interventions that affect maternal and neonatal outcomes for vaginal birth after cesarean section   | Wu SW <i>et al.</i>        | 2020 | Journal of International Medical Research              | Ineligible objective |
| Trends in maternal mortality in medical college Jabalpur, India in the last 15 years  | Tiwari P <i>et al.</i>     | 2017 | Journal of SAFOG                                       | Ineligible objective |
| Maternal sepsis during pregnancy or the postpartum period requiring intensive care admission  | Timezguid N <i>et al.</i>  | 2012 | International Journal of Obstetric Anesthesia          | Ineligible objective |
| Are we increasing serious maternal morbidity by postponing termination of pregnancy in severe pre-eclampsia/eclampsia?  | Thomas T <i>et al.</i>     | 2005 | Journal of Obstetrics and Gynaecology                  | Ineligible objective |
| Prevalence of postpartum urinary incontinence: a systematic review  | Thom DH and Rortveit G     | 2010 | Acta obstetrica et gynecologica Scandinavica           | Ineligible objective |
| The relationship between the five minute Apgar score, mode of birth and neonatal outcomes   | Thavarajah H <i>et al.</i> | 2018 | Journal of Maternal-Fetal and Neonatal Medicine        | Ineligible objective |
| Assessment and comparison of bacterial load levels determined by quantitative amplifications in blood culture-positive and negative neonatal sepsis                     | Stranieri I <i>et al.</i>  | 2018 | Revista do Instituto de Medicina Tropical de Sao Paulo | Ineligible objective |
| Improvements in US maternal obstetrical outcomes from 1992 to 2006  | Srinivas SK <i>et al.</i>  | 2010 | Medical Care   | Ineligible objective |
| Maternal and perinatal mortality and complications associated with caesarean section in low-income and middle-income countries: a systematic review and meta-analysis   | Sobhy S <i>et al.</i>      | 2019 | Lancet   | Ineligible objective |
| Nature of socioeconomic inequalities in neonatal mortality: population based study  | Smith LK <i>et al.</i>     | 2010 | BMJ  | Ineligible objective |
| Community based maternal death review: lessons learned from ten districts in Andhra Pradesh, India  | Singh S <i>et al.</i>      | 2015 | Maternal and Child Health Journal                      | Ineligible objective |
| The incidence of deep vein thrombosis in women undergoing cesarean delivery   | Sia WW <i>et al.</i>       | 2009 | Thrombosis Research                                    | Ineligible objective |
| Perinatal mortality in Eastern Uganda: a community based prospective cohort study   | Nankabirwa V <i>et al.</i> | 2011 | PLoS One   | Ineligible objective |
| Retrospective review on obstetric cases of critically ill and dead patients in Dongguan   | Shen L-H <i>et al.</i>     | 2015 | Cell Biochemistry and Biophysics                       | Ineligible objective |
| Postpartum haemorrhage management, risks, and maternal outcomes: findings from the World Health Organization Multicountry Survey on Maternal and Newborn Health         | Sheldon WR <i>et al.</i>   | 2014 | BJOG   | Ineligible objective |
| Risk factors for postpartum emergency department visits in an urban population  | Sheen J-J <i>et al.</i>    | 2019 | Maternal and Child Health Journal                      | Ineligible objective |
| Infant outcomes after elective early-term delivery compared with expectant management   | Salemi JL <i>et al.</i>    | 2016 | Obstetrics and Gynecology                              | Ineligible objective |
| Hospital transmission of community-acquired methicillin-resistant <i>Staphylococcus aureus</i> among postpartum women   | Saiman L <i>et al.</i>     | 2003 | Clinical Infectious Diseases                           | Ineligible objective |
| Ethnic disparity in maternal and infant mortality and its healthsystem determinants in Sichuan province, China, 2002-14: an observational study of cross-sectional data | Ren Y <i>et al.</i>        | 2017 | Lancet   | Ineligible objective |
| Obstetric patients in a surgical intensive care unit: prognostic factors and outcome  | Mjahed K <i>et al.</i>     | 2006 | Journal of Obstetrics and Gynaecology                  | Ineligible objective |

| <i>(Continued)</i>  |                               |      |   |                      |
|---|-------------------------------|------|---|----------------------|
| Title   | Authors                       | Year | Journal   | Reason for exclusion |
| Neonatal herpes morbidity and mortality in California, 1995-2003  | Morris SR <i>et al.</i>       | 2008 | Sexually Transmitted Diseases                   | Ineligible objective |
| Emergency peripartum hysterectomy: frequency, indications and maternal outcome  | Nisar N <i>et al.</i>         | 2009 | Journal of Ayub Medical College                 | Ineligible objective |
| Post-cesarean surgical site infections according to CDC standards: rates and risk factors. A prospective cohort study   | Opoien HK <i>et al.</i>       | 2007 | Acta obstetrica et gynecologica Scandinavica    | Ineligible objective |
| Contemporary trends of reported sepsis among maternal decedents in Texas: a population-based study  | Oud L                         | 2015 | Infectious Diseases and Therapy                 | Ineligible objective |
| Severe maternal morbidity and the mode of delivery  | Pallasmaa N <i>et al.</i>     | 2008 | Acta obstetrica et gynecologica Scandinavica    | Ineligible objective |
| Eclampsia-scenario in a hospital—a ten years study  | Pal A <i>et al.</i>           | 2011 | Bangladesh Medical Research Council Bulletin    | Ineligible objective |
| Avoidable maternal mortality in Enugu, Nigeria  | Ozumba BC <i>et al.</i>       | 2008 | Public Health                                   | Ineligible objective |
| Associated factors and quality of care received among maternal deaths at a regional hospital in Ghana: maternal death audit review  | Owusu-Sarpong A <i>et al.</i> | 2017 | African Journal of Reproductive Health          | Ineligible objective |
| Adverse neonatal and maternal outcome following vacuum-assisted vaginal delivery: does indication matter?   | Salman L <i>et al.</i>        | 2017 | Archives of Gynecology and Obstetrics           | Ineligible objective |
| Women receiving massive transfusion due to postpartum hemorrhage: a comparison over time between two nationwide cohort studies  | Ramler PI <i>et al.</i>       | 2019 | Acta obstetrica et gynecologica Scandinavica    | Ineligible objective |
| The role of infection and sepsis in the Brazilian Network for Surveillance of Severe Maternal Morbidity   | Pfischer LC <i>et al.</i>     | 2016 | Tropical Medicine and International Health      | Ineligible objective |
| A prospective cause of death classification system for maternal deaths in low and middle-income countries: results from the Global Network Maternal Newborn Health Registry | Pasha O <i>et al.</i>         | 2018 | BJOG  | Ineligible objective |
| Timing of prophylactic antibiotic administration in term cesarean section: a randomized clinical trial  | Nokiani FA <i>et al.</i>      | 2009 | Iranian Journal of Clinical Infectious Diseases | Ineligible objective |
| Emergency obstetric hysterectomy: a five year review  | Verma A <i>et al.</i>         | 2017 | JK Science                                      | Ineligible objective |
| Comparison of in-hospital maternal mortality between hospital systems in Queensland, Australia and Louisiana, United States   | Morong JJ <i>et al.</i>       | 2017 | The Ochsner Journal                             | Ineligible objective |
| Maternal and fetal death on weekends  | Moaddab A <i>et al.</i>       | 2019 | American Journal of Perinatology                | Ineligible objective |
| Postpartum hemorrhage following vaginal delivery: risk factors and maternal outcomes  | Miller CM <i>et al.</i>       | 2017 | Journal of Perinatology                         | Ineligible objective |
| The impact of obstetric unit closures on maternal and infant pregnancy outcomes   | Lorch SA <i>et al.</i>        | 2013 | Health Services Research                        | Ineligible objective |
| Elective cesarean section or not? Maternal age and risk of adverse outcomes at term: a population-based registry study of low-risk primiparous women                        | Herstad L <i>et al.</i>       | 2016 | BMC Pregnancy and Childbirth                    | Ineligible objective |
| Maternal mortality in Brazil from 2001 to 2012: time trends and regional differences  | Da Silva BGC <i>et al.</i>    | 2016 | Brazilian Journal of Epidemiology               | Ineligible objective |
| Audit on management of eclampsia at Sultan Abdul Halim Hospital   | Suan MAM <i>et al.</i>        | 2015 | Medical Journal of Malaysia                     | Ineligible objective |
| Causes of maternal death in the callao region, Peru. Descriptive study, 2000-2015   | Tarqui-Mamani C <i>et al.</i> | 2019 | Revista colombiana de obstetricia y ginecologia | Ineligible objective |
| An analysis of direct causes of maternal mortality  | Rahim R <i>et al.</i>         | 2006 | Journal of Postgraduate Medical Institute       | Ineligible objective |

| <i>(Continued)</i>  |                            |      |  |                      |
|---|----------------------------|------|--|----------------------|
| Title   | Authors                    | Year | Journal  | Reason for exclusion |
| Infection remains a leading cause of neonatal mortality among infants delivered at a tertiary hospital in Karachi, Pakistan   | Mustufa MA <i>et al.</i>   | 2014 | Journal of Infection in Developing Countries                         | Ineligible objective |
| Severe maternal morbidity for 2004-2005 in the three Dublin maternity hospitals   | Murphy CM <i>et al.</i>    | 2009 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible objective |
| Impact of different antiseptics on umbilical cord colonization and cord separation time   | Ozdemir H <i>et al.</i>    | 2017 | The Journal of Infection in Developing Countries                     | Ineligible objective |
| The impact of postpartum hemorrhage on hospital length of stay and inpatient mortality: a nationwide inpatient sample (NIS)-based analysis                          | Marshall AL <i>et al.</i>  | 2017 | Thrombosis Research  | Ineligible objective |
| Stillbirth, newborn and infant mortality: trends and inequalities in four population-based birth cohorts in Pelotas, Brazil, 1982-2015                              | Menezes AMB <i>et al.</i>  | 2019 | International Journal of Epidemiology                                | Ineligible objective |
| Deliveries, mothers and newborn infants in Sweden, 1973-2000. Trends in obstetrics as reported to the Swedish Medical Birth Register                                | Odland V <i>et al.</i>     | 2003 | Acta obstetrica et gynecologica Scandinavica                         | Ineligible objective |
| Births should not cause deaths: a retrospective analysis of maternal mortality at a tertiary care hospital in Eastern India   | Lal R <i>et al.</i>        | 2015 | International Journal of Scientific Study                            | Ineligible objective |
| 248: Leading causes of maternal mortality at an inner-city Hospital, 1949-2017  | Manley C <i>et al.</i>     | 2019 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Systemic inflammatory response syndrome in home delivered neonates: a prospective observational study   | Mathur NB <i>et al.</i>    | 2010 | Indian Journal of Pediatrics   | Ineligible objective |
| Perinatal audit using the 3-delays model in western Tanzania  | Mbaruku G <i>et al.</i>    | 2009 | International Journal of Gynaecology and Obstetrics                  | Ineligible objective |
| Postpartum hemorrhage in low risk population  | Malabarey O <i>et al.</i>  | 2011 | Journal of Perinatal Medicine  | Ineligible objective |
| Trends in maternal mortality by sociodemographic characteristics and cause of death in 27 states and the District of Columbia                                       | MacDorman MF <i>et al.</i> | 2017 | Obstetrics and Gynecology  | Ineligible objective |
| Optimal timing for elective cesarean delivery in a Chinese population   | Liu X <i>et al.</i>        | 2016 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Maternal and newborn outcomes of care from community midwives in Pakistan: a retrospective analysis of routine maternity data                                       | Mubeen K <i>et al.</i>     | 2019 | Midwifery  | Ineligible objective |
| Preeclampsia in Jordan: incidence, risk factors, and its associated maternal and neonatal outcomes  | Khader YS <i>et al.</i>    | 2018 | Journal of Maternal-Fetal and Neonatal Medicine                      | Ineligible objective |
| Maternal mortality: a ten year review in a tertiary care setup  | Khan B <i>et al.</i>       | 2012 | Journal of Ayub Medical College                                      | Ineligible objective |
| Maternal mortality in a tertiary care hospital a continuing tragedy   | Khanum F <i>et al.</i>     | 2013 | Journal of Medical Sciences  | Ineligible objective |
| Preventable maternal mortality: geographic/rural-urban differences and associated factors from the population-based maternal mortality surveillance system in China | Liang J <i>et al.</i>      | 2011 | BMC Public Health  | Ineligible objective |
| Trends in pregnancy hospitalizations that included a stroke in the United States from 1994 to 2007 reasons for concern?   | Kuklina EV <i>et al.</i>   | 2011 | Stroke   | Ineligible objective |
| Maternal near-miss and death incidences - frequencies, causes and the referral chain in Somaliland: a pilot study using the WHO near-miss approach                  | Kiruja J <i>et al.</i>     | 2017 | Sexual and Reproductive Healthcare                                   | Ineligible objective |
| Bio-social characteristics as determinants of maternal death: a community based case-control study  | Khanna D <i>et al.</i>     | 2019 | Indian Journal of Public Health Research and Development             | Ineligible objective |

| <i>(Continued)</i>  |                           |       |   |                      |
|---|---------------------------|-------|---|----------------------|
| Title   | Authors                   | Year  | Journal   | Reason for exclusion |
| Clinical course and complications of HELLP syndrome according to time of onset  | Gulec UK <i>et al.</i>    | 2012  | Clinical and Experimental Obstetrics and Gynecology | Ineligible objective |
| Maternal mortality in France: epidemiological study, prevalence and characteristics   | Bouvier-Colle M-H         | 2007  | Reanimation   | Ineligible objective |
| Pattern of neonatal sepsis in Dubai hospital  | Khan A                    | 2016  | Journal of Maternal-Fetal and Neonatal Medicine     | Ineligible objective |
| The role of intrapartum fever in identifying asymptomatic term neonates with early-onset neonatal sepsis  | Chen KT <i>et al.</i>     | 2002  | Journal of Perinatology                             | Ineligible objective |
| Delayed cord clamping during elective cesarean deliveries: results of a pilot safety trial  | Chantry CJ <i>et al.</i>  | 2018  | Maternal Health, Neonatology and Perinatology       | Ineligible objective |
| Infectious diseases are a larger contributor than obstetric causes to maternal mortality in rural western Kenya   | Desai M <i>et al.</i>     | 2012  | American Journal of Tropical Medicine and Hygiene   | Ineligible objective |
| Length of postnatal stay in healthy newborns and re-hospitalization following their early discharge   | Gupta P <i>et al.</i>     | 2006  | Indian Journal of Pediatrics                        | Ineligible objective |
| Association of mode of delivery with urinary incontinence and changes in urinary incontinence over the first year postpartum  | Chang S-R <i>et al.</i>   | 2014  | Obstetrics and Gynecology                           | Ineligible objective |
| Emergency peripartum hysterectomies: an Australian audit  | Balaba K <i>et al.</i>    | 2015  | BJOG  | Ineligible objective |
| Association of Maternal Age With Severe Maternal Morbidity and Mortality in Canada  | Aoyama K <i>et al.</i>    | 2019  | JAMA Network Open                                   | Ineligible objective |
| The effectiveness and safety of introducing condom-catheter uterine balloon tamponade for postpartum haemorrhage at secondary level hospitals in Uganda, Egypt and Senegal: a stepped wedge, cluster-randomised trial | Anger HA <i>et al.</i>    | 2019  | BJOG  | Ineligible objective |
| The WHO application of ICD-10 to deaths during the perinatal period (ICD-PM): results from pilot database testing in South Africa and United Kingdom  | Allanson ER <i>et al.</i> | 2016  | BJOG  | Ineligible objective |
| Maternal outcomes of cesarean deliveries at different gestational ages  | Zhou CG <i>et al.</i>     | 2018  | American Journal of Obstetrics and Gynecology       | Ineligible objective |
| Presence of obstetric risk factors in a late preterm newborn group compared to full-term newborn  | Veiga AJMO <i>et al.</i>  | 2017  | European Journal of Pediatrics                      | Ineligible objective |
| Maternal and newborn outcomes at a tertiary care hospital in Lusaka, Zambia, 2008-2012  | Vwalika B <i>et al.</i>   | 2017n | International Journal of Gynaecology and Obstetrics | Ineligible objective |
| Intrapartum fetal deaths and unexpected neonatal deaths in the Republic of Ireland: 2011 - 2014; a descriptive study  | McNamara K <i>et al.</i>  | 2018  | BMC Pregnancy and Childbirth                        | Ineligible objective |
| Neonatal outcomes in early term birth   | Parikh LI <i>et al.</i>   | 2014  | American Journal of Obstetrics and Gynecology       | Ineligible objective |
| Moving beyond essential interventions for reduction of maternal mortality (the WHO Multicountry Survey on Maternal and Newborn Health): a cross-sectional study   | Souza JP <i>et al.</i>    | 2013  | Lancet  | Ineligible objective |
| Mortality after near-miss obstetric complications in Burkina Faso: medical, social and health-care factors  | Storeng KT <i>et al.</i>  | 2012  | Bulletin of the World Health Organization           | Ineligible objective |
| Magnitude, trends and causes of maternal mortality among reproductive aged women in Kersa health and demographic surveillance system, eastern Ethiopia  | Tesfaye G <i>et al.</i>   | 2018  | BMC Women's Health                                  | Ineligible objective |
| Maternal Near Miss and quality of care in a rural Rwandan hospital  | Kalisa R <i>et al.</i>    | 2016  | BMC Pregnancy and Childbirth                        | Ineligible objective |

| <i>(Continued)</i>  |                            |      |  |                      |
|---|----------------------------|------|--|----------------------|
| Title   | Authors                    | Year | Journal  | Reason for exclusion |
| Neonatal hypothermia levels and risk factors for mortality in a tropical country  | Kambarami R and Chidede O  | 2003 | The Central African Journal of Medicine                              | Ineligible objective |
| Trends in maternal mortality ratio in a tertiary referral hospital and the effects of various maternity schemes on it   | Kaur H <i>et al.</i>       | 2015 | Journal of Family and Reproductive Health                            | Ineligible objective |
| Obstetrical trauma to the genital tract following vaginal delivery  | Khaskheli M <i>et al.</i>  | 2012 | Journal of the College of Physicians and Surgeons                    | Ineligible objective |
| Unplanned out-of-hospital birth and risk factors of adverse perinatal outcome: findings from a prospective cohort   | Javaudin F <i>et al.</i>   | 2019 | Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine | Ineligible objective |
| Maternal risk factors in early neonatal sepsis at a tertiary care teaching hospital   | Javed M <i>et al.</i>      | 2009 | Saudi Medical Journal  | Ineligible objective |
| Population-based surveillance of neonatal herpes simplex virus infection in Australia, 1997-2011  | Jones CA <i>et al.</i>     | 2014 | Clinical Infectious Diseases   | Ineligible objective |
| Essential ten life-saving skills preventing maternal death  | Jesmin Z                   | 2017 | BJOG   | Ineligible objective |
| The maternal mortality rate in Al-Diwaniyah province in Iraq: retrospective data retrieval of four years  | Jabir HH <i>et al.</i>     | 2018 | International Journal of Research in Pharmaceutical Sciences         | Ineligible objective |
| Obstetric admissions to tertiary level intensive care unit - Prevalence, clinical characteristics and outcomes  | Joseph CM <i>et al.</i>    | 2018 | Indian Journal of Anaesthesia  | Ineligible objective |
| Incidence of death from congenital toxoplasmosis in 0-4-year-old children in Japan  | Hoshino T <i>et al.</i>    | 2014 | Pediatrics International   | Ineligible objective |
| Severe maternal morbidity and comorbid risk in hospitals performing <1000 deliveries per year   | Hehir MP <i>et al.</i>     | 2017 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Peripartum bacteremia in the era of group B streptococcus prophylaxis   | Cape A <i>et al.</i>       | 2013 | Obstetrics and Gynecology  | Ineligible objective |
| The tip of the iceberg: evidence of seasonality in institutional maternal mortality and implications for health resources management in Burkina Faso                        | Hounton SH <i>et al.</i>   | 2008 | Scandinavian Journal of Public Health                                | Ineligible objective |
| Perinatal health outcomes and care among asylum seekers and refugees: a systematic review of systematic reviews   | Heslehurst N <i>et al.</i> | 2018 | BMC Medicine   | Ineligible objective |
| Reducing maternal deaths in a low resource setting in Nigeria   | Ezugwu EC <i>et al.</i>    | 2014 | Nigerian Journal of Clinical Practice                                | Ineligible objective |
| Time of delivery and neonatal morbidity and mortality   | Caughey AB <i>et al.</i>   | 2008 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Prevalence of respiratory pathogens during two consecutive respiratory syncytial virus seasons at a tertiary medical care center  | Celik K <i>et al.</i>      | 2019 | Archivos Argentinos de Pediatría                                     | Ineligible objective |
| Trends in maternal mortality in resident vs. migrant women in Shanghai, China, 2000-2009: a register-based analysis   | Du L <i>et al.</i>         | 2012 | Reproductive Health Matters  | Ineligible objective |
| Maternal and neonatal outcomes of adolescent pregnancy  | Karatasli V <i>et al.</i>  | 2019 | Journal of Gynecology Obstetrics and Human Reproduction              | Ineligible objective |
| Disparities and trends in birth outcomes, perinatal and infant mortality in aboriginal vs. non-aboriginal populations: a population-based study in Quebec, Canada 1996-2010 | Chen L <i>et al.</i>       | 2015 | PLoS One   | Ineligible objective |
| Maternal and fetal morbidity and mortality following multiple caesarean sections in northern Jordan   | Hatamleh R <i>et al.</i>   | 2017 | Evidence Based Midwifery   | Ineligible objective |
| Revisit of risk factors for major obstetric hemorrhage: insights from a large medical center  | Helman S <i>et al.</i>     | 2015 | Archives of Gynecology and Obstetrics                                | Ineligible objective |
| The relationship between timing of postpartum hemorrhage interventions and adverse outcomes   | Howard TF <i>et al.</i>    | 2015 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |



| <i>(Continued)</i>  |                               |      |   |                      |
|---|-------------------------------|------|---|----------------------|
| Title   | Authors                       | Year | Journal   | Reason for exclusion |
| Timing of planned caesarean section and the morbidities of the newborn  | Hourani M <i>et al.</i>       | 2011 | North American Journal of Medical Sciences          | Ineligible objective |
| Misoprostol for prevention of postpartum hemorrhage at home birth in Afghanistan: program expansion experience  | Haver J <i>et al.</i>         | 2016 | Journal of Midwifery and Women's Health             | Ineligible objective |
| Application effect of sterile normal saline ice for post-partum hemorrhage at the time of cesarean delivery: a retrospective review   | Cheng W <i>et al.</i>         | 2016 | Journal of Obstetrics and Gynaecology Research      | Ineligible objective |
| Early discharge and readmission to hospital in first six days of life   | Dizdarevic J <i>et al.</i>    | 2011 | HealthMED   | Ineligible objective |
| Outcomes of patients admitted to the intensive care unit for complications of hypertensive disorders of pregnancy at a South African tertiary hospital - a 4-year retrospective review    | Gama S <i>et al.</i>          | 2019 | Southern African Journal of Critical Care           | Ineligible objective |
| Neonatal outcomes following elective caesarean delivery at term: a hospital-based cohort study  | Finn D <i>et al.</i>          | 2016 | Journal of Maternal-Fetal and Neonatal Medicine     | Ineligible objective |
| Maternity wards or emergency obstetric rooms? Incidence of near-miss events in African hospitals  | Filippi V <i>et al.</i>       | 2005 | Acta obstetrica et gynecologica Scandinavica        | Ineligible objective |
| Maternal mortality due to hemorrhage in Brazil  | de Souza MdL <i>et al.</i>    | 2013 | Revista latino-americana de enfermagem              | Ineligible objective |
| Outcomes of second-line therapies for stage 3 postpartum hemorrhage at a tertiary care center   | Clure C <i>et al.</i>         | 2018 | Obstetrics and Gynecology                           | Ineligible objective |
| Maternal death in the 21st century: causes, prevention, and relationship to cesarean delivery   | Clark SL <i>et al.</i>        | 2008 | American Journal of Obstetrics and Gynecology       | Ineligible objective |
| Trends in maternal mortality over 29 years in a Kuwait tertiary teaching hospital: signs of progress?   | Chibber R <i>et al.</i>       | 2012 | Journal of Maternal-Fetal and Neonatal Medicine     | Ineligible objective |
| Duplex ultrasound screening for deep vein thrombosis in Chinese after cesarean section  | Chan LY-S <i>et al.</i>       | 2005 | Acta obstetrica et gynecologica Scandinavica        | Ineligible objective |
| Shock progression and survival after use of a condom uterine balloon tamponade package in women with uncontrolled postpartum hemorrhage   | Burke TF <i>et al.</i>        | 2017 | International Journal of Gynaecology and Obstetrics | Ineligible objective |
| Maternal mortality in the Gaza strip: a look at causes and solutions  | Bottcher B <i>et al.</i>      | 2018 | BMC Pregnancy and Childbirth                        | Ineligible objective |
| Ranitidine and late-onset sepsis in the neonatal intensive care unit  | Bianconi S <i>et al.</i>      | 2007 | Journal of Perinatal Medicine                       | Ineligible objective |
| Blood glucose levels in neonatal sepsis and probable sepsis and its association with mortality  | Ahmad S and Khalid R          | 2012 | Journal of the College of Physicians and Surgeons   | Ineligible objective |
| Experience of maternal and perinatal death surveillance response in Nigeria using an e-platform   | Galadanci <i>et al.</i>       | 2018 | International Journal of Gynecology and Obstetrics  | Ineligible objective |
| Trends and outcomes of postpartum haemorrhage, 2003-2011  | Ford JB <i>et al.</i>         | 2015 | BMC Pregnancy and Childbirth                        | Ineligible objective |
| Increased postpartum hemorrhage rates in Australia  | Ford JB <i>et al.</i>         | 2007 | International Journal of Gynaecology and Obstetrics | Ineligible objective |
| Thirty seven weeks and beyond maternal and foetal outcome by week of gestation  | Doppa GJ <i>et al.</i>        | 2016 | Journal of Evolution of Medical and Dental Sciences | Ineligible objective |
| Birth in Brazil: national survey into labour and birth  | do Carmo Leal M <i>et al.</i> | 2012 | Reproductive Health                                 | Ineligible objective |
| Antibiotic prophylaxis for caesarean section at a Ugandan hospital: a randomised clinical trial evaluating the effect of administration time on the incidence of postoperative infections | Dlamini LD <i>et al.</i>      | 2015 | BMC Pregnancy and Childbirth                        | Ineligible objective |

| <i>(Continued)</i>   |                            |      |  |                      |
|--|----------------------------|------|--|----------------------|
| Title  | Authors                    | Year | Journal  | Reason for exclusion |
| Trends in maternal and newborn health characteristics and obstetric interventions among Aboriginal and Torres Strait Islander mothers in Western Australia from 1986 to 2009                                       | Diouf I <i>et al.</i>      | 2016 | Australian and New Zealand Journal of Obstetrics and Gynaecology | Ineligible objective |
| Rapid diagnosis of sepsis and bacterial meningitis in children with real-time fluorescent quantitative polymerase chain reaction amplification in the bacterial 16S rRNA gene                                      | Chen L <i>et al.</i>       | 2009 | Clinical Pediatrics  | Ineligible objective |
| Timing of delivery and adverse outcomes in term singleton repeat cesarean deliveries   | Chiossi G <i>et al.</i>    | 2013 | Obstetrics and Gynecology  | Ineligible objective |
| Mapping of research on maternal health interventions in low- and middle-income countries: a review of 2292 publications between 2000 and 2012  | Chersich M <i>et al.</i>   | 2016 | Globalization and Health   | Ineligible objective |
| Can a mortality excess in remote areas of Australia be explained by indigenous status? A case study using neonatal mortality in Queensland   | Coory M                    | 2003 | Australian and New Zealand Journal of Public Health              | Ineligible objective |
| Maternal mortality trends at the Princess Marina and Nyangabwe referral hospitals in Botswana  | Nkhwalume L and Mashalla Y | 2019 | African Health Sciences  | Ineligible objective |
| Changing risks of stillbirth and neonatal mortality associated with maternal age in Western Australia 1984-2003  | O'Leary CM <i>et al.</i>   | 2007 | Paediatric and Perinatal Epidemiology                            | Ineligible objective |
| Maternal and newborn outcomes in Pakistan compared to other low and middle income countries in the Global Network's Maternal Newborn Health Registry: an active, community-based, pregnancy surveillance mechanism | Pasha O <i>et al.</i>      | 2015 | Reproductive Health  | Ineligible objective |
| Perinatal mortality at Frontier Hospital, Queenstown - A 6-year audit using the Perinatal Problem Identification Programme [PPIP]  | Patrick ME                 | 2007 | South African Journal of Obstetrics and Gynaecology              | Ineligible objective |
| Maternal mortality at Muhimbili National Hospital in Dar-es-Salaam, Tanzania in the year 2011  | Pembe AB <i>et al.</i>     | 2014 | BMC Pregnancy and Childbirth                                     | Ineligible objective |
| Timing of initiation of breastfeeding and early-newborn sepsis: evidence from rural Bangladesh   | Raihana S <i>et al.</i>    | 2017 | Annals of Nutrition and Metabolism                               | Ineligible objective |
| Early initiation of breastfeeding and severe illness in the early newborn period: an observational study in rural Bangladesh   | Raihana S <i>et al.</i>    | 2019 | PLoS Medicine  | Ineligible objective |
| A comprehensive assessment of maternal deaths in Argentina: translating multicentre collaborative research into action   | Ramos S <i>et al.</i>      | 2007 | Bulletin of the World Health Organization                        | Ineligible objective |
| Maternal mortality over the last decade: a changing pattern of death due to alarming rise in hepatitis in the latter five-year period  | Rana A <i>et al.</i>       | 2009 | Journal of Obstetrics and Gynaecology Research                   | Ineligible objective |
| Somali women's use of maternity health services and the outcome of their pregnancies: a descriptive study comparing Somali immigrants with native-born Swedish women   | Rassjo EV <i>et al.</i>    | 2013 | Sexual and Reproductive Healthcare                               | Ineligible objective |
| Surgical management of postpartum hemorrhage at in a tertiary hospital, Karnataka-a retrospective study  | Ravipati P <i>et al.</i>   | 2014 | BJOG   | Ineligible objective |
| Eclampsia: a neurological perspective  | Shah AK <i>et al.</i>      | 2008 | Journal of the Neurological Sciences                             | Ineligible objective |
| Maternal and infant mortality in Mahottari district of Nepal   | Shah R and Maskey MK       | 2010 | Journal of Nepal Health Research Council                         | Ineligible objective |
| Frequency and outcome of eclampsia   | Shaikh F <i>et al.</i>     | 2016 | Gomal Journal of Medical Sciences                                | Ineligible objective |
| Maternal deaths associated with hypertension in South Africa: lessons to learn from the Saving Mothers report, 2005-2007   | Moodley J <i>et al.</i>    | 2011 | Cardiovascular Journal of Africa                                 | Ineligible objective |
| When getting there is not enough: a nationwide cross-sectional study of 998 maternal deaths and 1451 near-misses in public tertiary hospitals in a low-income country  | Oladapo OT <i>et al.</i>   | 2016 | BJOG   | Ineligible objective |

| <i>(Continued)</i>  |                                   |      |  |                      |
|---|-----------------------------------|------|--|----------------------|
| Title   | Authors                           | Year | Journal  | Reason for exclusion |
| Implementation of the alliance for innovation on maternal health program to reduce maternal mortality in Malawi   | Chang OH <i>et al.</i>            | 2019 | Obstetrics and Gynecology  | Ineligible objective |
| Automated determination of neutrophil VCS parameters in diagnosis and treatment efficacy of neonatal sepsis   | Celik IH <i>et al.</i>            | 2012 | Pediatric Research   | Ineligible objective |
| Hypertensive disorders in pregnancy and maternal and neonatal outcomes in Haiti: the importance of surveillance and data collection                           | Bridwell M <i>et al.</i>          | 2019 | BMC Pregnancy and Childbirth   | Ineligible objective |
| Higher rate of serious perinatal events in non-Western women in Denmark   | Brehm Christensen M <i>et al.</i> | 2016 | Danish Medical Journal   | Ineligible objective |
| A postpartum hemorrhage package with uterine balloon tamponade: A prospective multi-center case series in Kenya, Sierra Leone, Senegal, and Nepal             | Burke T <i>et al.</i>             | 2015 | International Journal of Gynecology and Obstetrics                   | Ineligible objective |
| Comparison of subcuticular suture type in post-cesarean wound complications: a randomized controlled trial  | Buresch A <i>et al.</i>           | 2017 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Should delivery timing for repeat cesarean be reconsidered based on dating criteria?  | Brookfield KF <i>et al.</i>       | 2019 | Journal of Maternal-Fetal and Neonatal Medicine                      | Ineligible objective |
| A systems approach for neonatal hyperbilirubinemia in term and near-term newborns   | Bhutani VK <i>et al.</i>          | 2006 | Journal of Obstetric, Gynecologic and Neonatal Nursing               | Ineligible objective |
| Impact of syndrome evaluation system (SES) on outcomes of neonatal sepsis-a randomized-controlled trial   | Bhat V <i>et al.</i>              | 2015 | Indian Journal of Critical Care Medicine                             | Ineligible objective |
| Effect of community-based newborn care on cause-specific neonatal mortality in Sylhet district, Bangladesh: findings of a cluster-randomized controlled trial | Baqui AH <i>et al.</i>            | 2016 | Journal of Perinatology  | Ineligible objective |
| 966: Cesarean delivery skin closure technique: comparison between staples and antibacterial knotless suture   | Bleicher I <i>et al.</i>          | 2019 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| 563: AFLP versus HELLP syndrome: Pregnancy outcomes and recovery  | Byrne JJ <i>et al.</i>            | 2019 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Maternal mortality in New York City 1995-2003: Disparities and risk factors   | Campbell KH <i>et al.</i>         | 2012 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Maternal mortality at time of delivery hospitalization in large university-based hospitals in England, Australia, and the United States, 2007-2013            | Campbell KH <i>et al.</i>         | 2016 | American Journal of Obstetrics and Gynecology                        | Ineligible objective |
| Maternal morbidity and risk of death at delivery hospitalization  | Campbell KH <i>et al.</i>         | 2013 | Obstetrics and Gynecology  | Ineligible objective |
| Trends in maternal mortality in Switzerland among Swiss and foreign nationals, 1969-2006  | Bollini P <i>et al.</i>           | 2011 | International Journal of Public Health                               | Ineligible objective |
| Prevalence and severity of thrombocytopenia in blood culture proven neonatal sepsis: A prospective study  | Bhat YR <i>et al.</i>             | 2018 | Archives of Pediatric Infectious Diseases                            | Ineligible objective |
| Dehydration and hypernatremia in breast-fed term healthy neonates   | Bhat SR <i>et al.</i>             | 2006 | Indian Journal of Pediatrics   | Ineligible objective |
| Prevalence and risk factors for early postpartum anemia   | Bergmann RL <i>et al.</i>         | 2010 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible objective |
| Review of maternal mortality in Ethiopia: a story of the past 30 years  | Berhan Y and Berhan A             | 2014 | Ethiopian Journal of Health Sciences                                 | Ineligible objective |
| Uterine compression sutures for postpartum hemorrhage: efficacy, morbidity, and subsequent pregnancy  | Baskett TF                        | 2007 | Obstetrics and Gynecology  | Ineligible objective |
| Magnitude of maternal and neonatal mortality in Tanzania: a systematic review   | Armstrong CE                      | 2015 | International Journal of Gynaecology and Obstetrics                  | Ineligible objective |

| <i>(Continued)</i>  |                                   |      |  |                      |
|---|-----------------------------------|------|--|----------------------|
| Title   | Authors                           | Year | Journal  | Reason for exclusion |
| Evaluation of measured postpartum blood loss after vaginal delivery using a collector bag in relation to postpartum hemorrhage management strategies: a prospective observational study | Bamberg C                         | 2016 | Journal of Perinatal Medicine                      | Ineligible objective |
| Secular trends in preeclampsia incidence and outcomes in a large Canada Database: a longitudinal study over 24 years  | Auger N <i>et al.</i>             | 2016 | The Canadian Journal of Cardiology                 | Ineligible objective |
| Results from the helping mothers survive study in Tanzania and Uganda   | Baleke SA                         | 2018 | International Journal of Gynecology and Obstetrics | Ineligible objective |
| Near miss maternal morbidity - Experience at a tertiary referral centre   | Anandakrishnan S <i>et al.</i>    | 2010 | International Journal of Obstetric Anesthesia      | Ineligible objective |
| Transporting newborns with subgaleal haemorrhage-the NSW experience   | Amanda D <i>et al.</i>            | 2016 | Journal of Paediatrics and Child Health            | Ineligible objective |
| Effects of delayed compared with early umbilical cord clamping on maternal postpartum hemorrhage and cord blood gas sampling: a randomized trial  | Andersson O <i>et al.</i>         | 2013 | Acta obstetrica et gynecologica Scandinavica       | Ineligible objective |
| Lowered national cesarean section rates after a concerted action  | Ayres-De-Campos D <i>et al.</i>   | 2015 | Acta obstetrica et gynecologica Scandinavica       | Ineligible objective |
| A retrospective comparison of waterbirth outcomes in two United States hospital settings  | Bailey JM <i>et al.</i>           | 2019 | Birth  | Ineligible objective |
| Vaginal birth after cesarean section  | Bangal VB <i>et al.</i>           | 2013 | North American Journal of Medical Sciences         | Ineligible objective |
| Effect of predelivery vaginal antiseptics on maternal and neonatal morbidity and mortality in Egypt   | Bakr AF and Karkour T             | 2005 | Journal of Women's Health                          | Ineligible objective |
| The effect of house staff working hours on the quality of obstetric and gynecologic care  | Bailit JL and Blanchard MH        | 2004 | Obstetrics and Gynecology                          | Ineligible objective |
| A randomised controlled trial of antibiotic prophylaxis in elective caesarean delivery  | Bagratee JS <i>et al.</i>         | 2001 | BJOG   | Ineligible objective |
| Identifying maternal deaths in texas using an enhanced method, 2012   | Baeva S <i>et al.</i>             | 2018 | Obstetrics and Gynecology                          | Ineligible objective |
| Short-course postpartum (6-h) magnesium sulfate therapy in severe preeclampsia  | Anjum S <i>et al.</i>             | 2016 | Archives of Gynecology and Obstetrics              | Ineligible objective |
| A nationwide descriptive study of obstetric claims for compensation in Norway   | Andreassen S <i>et al.</i>        | 2012 | Acta obstetrica et gynecologica Scandinavica       | Ineligible objective |
| Intra-hospital mortality among neonates transported by ambulance in Colombia  | Alvarado-Socarras J <i>et al.</i> | 2014 | Pediatrics International                           | Ineligible objective |
| Maternal outcomes in birth centers: an integrative review of the literature   | Alliman J and Phillippi JC        | 2016 | Journal of Midwifery and Women's Health            | Ineligible objective |
| Obstetric and perinatal outcome of women para > or = 5 including one lower segment cesarean section   | Ali AM and Abu-Heija AT           | 2002 | The Journal of Obstetrics and Gynaecology Research | Ineligible objective |
| Maternal and perinatal outcomes with increasing duration of the second stage of labor   | Allen VM <i>et al.</i>            | 2009 | Obstetrics and Gynecology                          | Ineligible objective |
| Comparison of maternal and infant outcomes from primary cesarean delivery during the second compared with first stage of labor  | Alexander JM <i>et al.</i>        | 2007 | Obstetrics and Gynecology                          | Ineligible objective |
| Prevalence and risk factors of severe obstetric haemorrhage   | Al-Zirqi I <i>et al.</i>          | 2008 | BJOG   | Ineligible objective |
| Liver enzyme patterns in maternal deaths due to eclampsia: a South African cohort   | Alese OM <i>et al.</i>            | 2019 | Pregnancy Hypertension                             | Ineligible objective |
| The neighbourhood method for measuring differences in maternal mortality, infant mortality and other rare demographic events  | Alam N and Townend J              | 2014 | PLoS One   | Ineligible objective |

| <i>(Continued)</i>  |  |      |  |                      |
|---|--|------|--|----------------------|
| Title   | Authors                                    | Year | Journal  | Reason for exclusion |
| Epidemiological characterization of serotype group B Streptococci neonatal infections associated with interleukin-6 level as a sensitive parameter for the early diagnosis  | Al Hazzani AA <i>et al.</i>                | 2018 | Saudi Journal of Biological Sciences                                 | Ineligible objective |
| Monitoring maternal, newborn, and child health interventions using lot quality assurance sampling in Sokoto State of northern Nigeria                                       | Abegunde D <i>et al.</i>                   | 2015 | Global Health Action   | Ineligible objective |
| Maternal near miss: a valuable contribution in maternal care  | Abha S <i>et al.</i>                       | 2016 | Journal of Obstetrics and Gynaecology of India                       | Ineligible objective |
| Pelvic floor distress symptoms within 9 weeks of childbirth among Nigerian women  | Adaji SE and Olajide FM                    | 2014 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible objective |
| Disparities between Aboriginal and non-Aboriginal perinatal mortality rates in Western Australia from 1980 to 2015  | Adane AA <i>et al.</i>                     | 2019 | Paediatric and Perinatal Epidemiology                                | Ineligible objective |
| An hour-specific transcutaneous bilirubin nomogram for Mongolian neonates   | Akahira-Azuma M <i>et al.</i>              | 2015 | European Journal of Pediatrics                                       | Ineligible objective |
| Multiple organ dysfunction score is superior to the obstetrics-specific sepsis in obstetrics score in predicting mortality in septic obstetric patients                     | Aarvold ABR <i>et al.</i>                  | 2017 | Critical Care Medicine   | Ineligible objective |
| Neonatal mortality in a referral hospital in Cameroon over a seven year period: trends, associated factors and causes   | Mah EM <i>et al.</i>                       | 2014 | African Health Sciences  | Ineligible outcome   |
| [Neonatal and perinatal mortality in hospitals of the Basque Country-Navarre Neonatal Study Group (GEN-VN) during the period 2000-2006]                                     | Rada Fernandez de Jauregui D <i>et al.</i> | 2009 | Anales de pediatria  | Ineligible outcome   |
| Assessment of incidence and factors associated with severe maternal morbidity after delivery discharge among women in the US  | Chen J <i>et al.</i>                       | 2021 | JAMA Network Open  | Ineligible outcome   |
| Near miss and maternal mortality at the Jos University Teaching Hospital  | Samuels E <i>et al.</i>                    | 2020 | Nigerian Medical Journal   | Ineligible outcome   |
| Adverse maternal and neonatal outcomes among low-risk women with obesity at 37-41 weeks gestation   | Bicocca, MJ <i>et al.</i>                  | 2020 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible outcome   |
| Pregnancy outcomes in facility deliveries in Kenya and Uganda: a large cross-sectional analysis of maternity registers illuminating opportunities for mortality prevention. | Waiswa P <i>et al.</i>                     | 2020 | PLoS One   | Ineligible outcome   |
| [Early neonatal mortality and its determinants in a Level 1 maternity in Yaounde, Cameroon]   | Chelo D <i>et al.</i>                      | 2012 | Pan African Medical Journal  | Ineligible outcome   |
| [The perinatal mortality in a general hospital]   | Castaneda-Casale G <i>et al.</i>           | 2010 | Revista medica del Instituto Mexicano del Seguro Social              | Ineligible outcome   |
| Maternal and perinatal outcomes by mode of delivery in Senegal and Mali: a cross-sectional epidemiological survey   | Briand V <i>et al.</i>                     | 2012 | PLoS One   | Ineligible outcome   |
| Maternal mortality in the main referral hospital in Angola, 2010-2014: understanding the context for maternal deaths amidst poor documentation                              | Umar A                                     | 2016 | International Journal of MCH and AIDS                                | Ineligible outcome   |
| Emergency department visits for postpartum complications  | Brousseau EC <i>et al.</i>                 | 2016 | Obstetrics and Gynecology  | Ineligible outcome   |
| Maternal mortality at the Central Hospital, Benin City Nigeria: a ten year review   | Abe E and Omo-Aghoja LO                    | 2008 | African Journal of Reproductive Health                               | Ineligible outcome   |
| Postpartum venous thromboembolism readmissions in the United States   | Wen T <i>et al.</i>                        | 2018 | American Journal of Obstetrics and Gynecology                        | Ineligible outcome   |
| 280: Timing of postpartum readmissions and risk for severe maternal morbidity   | Wen T <i>et al.</i>                        | 2019 | American Journal of Obstetrics and Gynecology                        | Ineligible outcome   |

| <i>(Continued)</i>  |                                  |      |  |                      |
|---|----------------------------------|------|--|----------------------|
| Title   | Authors                          | Year | Journal  | Reason for exclusion |
| Timing and risk factors of postpartum stroke  | Too G <i>et al.</i>              | 2018 | Obstetrics and Gynecology  | Ineligible outcome   |
| Incidence of neonatal hyperbilirubinemia: a population-based prospective study in Pakistan  | Tikmani SS <i>et al.</i>         | 2010 | Tropical Medicine and International Health                       | Ineligible outcome   |
| The incidence and outcome of bilirubin encephalopathy in Nigeria: a bi-centre study   | Ogunlesi TA <i>et al.</i>        | 2007 | Nigerian Journal of Medicine                                     | Ineligible outcome   |
| Delayed postpartum preeclampsia: an experience of 151 cases   | Matthys LA <i>et al.</i>         | 2004 | American Journal of Obstetrics and Gynecology                    | Ineligible outcome   |
| Prospective surveillance study of severe hyperbilirubinaemia in the newborn in the UK and Ireland   | Manning D <i>et al.</i>          | 2007 | Archives of Disease in Childhood                                 | Ineligible outcome   |
| Study of changing trend in maternal mortality   | Jyothi GS <i>et al.</i>          | 2012 | Perinatology   | Ineligible outcome   |
| Maternal and neonatal survival and mortality in the upper west region of Ghana  | Issah K <i>et al.</i>            | 2011 | International Journal of Gynecology and Obstetrics               | Ineligible outcome   |
| Severe neonatal hyperbilirubinemia and adverse short-term consequences in Baghdad, Iraq   | Hameed NN <i>et al.</i>          | 2011 | Neonatology  | Ineligible outcome   |
| Impact of discharge timings of healthy newborns on the rates and etiology of neonatal hospital readmissions                                 | Habib HS                         | 2013 | Journal of the College of Physicians and Surgeons                | Ineligible outcome   |
| A multi-state analysis of postpartum readmissions in the United States  | Clapp MA <i>et al.</i>           | 2016 | American Journal of Obstetrics and Gynecology                    | Ineligible outcome   |
| Delayed postpartum preeclampsia and eclampsia: demographics, clinical course, and complications   | Al-Safi Z <i>et al.</i>          | 2011 | Obstetrics and Gynecology  | Ineligible outcome   |
| Maternal mortality at a referral centre: a five year study  | Purandare N <i>et al.</i>        | 2007 | Journal of Obstetrics and Gynaecology of India                   | Ineligible outcome   |
| Grim face of maternal mortality at tertiary care hospital of rural India: a 16 years study  | Bangal Vidyadhar B <i>et al.</i> | 2013 | Indian Journal of Public Health Research and Development         | Ineligible outcome   |
| Severe maternal morbidity in Canada, 1991-2001  | Wen SW <i>et al.</i>             | 2005 | CMAJ   | Ineligible outcome   |
| Maternal death reviews at a rural hospital in Malawi  | Vink NM <i>et al.</i>            | 2013 | International Journal of Gynaecology and Obstetrics              | Ineligible outcome   |
| Incidence of immediate postpartum hemorrhages in French maternity units: a prospective observational study (HERA study)                     | Vendittelli F <i>et al.</i>      | 2016 | BMC Pregnancy and Childbirth                                     | Ineligible outcome   |
| Changing trends in the causes of maternal mortality over the past 4 years in a tertiary care centre   | Uma D <i>et al.</i>              | 2017 | Journal of Evolution of Medical and Dental Sciences              | Ineligible outcome   |
| Incidence and outcomes of eclampsia: a single-center 30-year study  | Uludag SZ <i>et al.</i>          | 2019 | Hypertension in Pregnancy  | Ineligible outcome   |
| A five year retrospective study of maternal mortality at Rajendra Institute of Medical Sciences, Ranchi, Jharkhand in the Year 2011 to 2015 | Trivedi K and Prakash R          | 2016 | Journal of Evolution of Medical and Dental Sciences              | Ineligible outcome   |
| Birth outcomes among First Nations, Inuit and Metis populations   | Sheppard AJ <i>et al.</i>        | 2017 | Public Health Reports  | Ineligible outcome   |
| Venous thromboembolism during pregnancy and the postpartum period: incidence and risk factors in a large Victorian health service           | Sharma S and Monga D             | 2008 | Australian and New Zealand Journal of Obstetrics and Gynaecology | Ineligible outcome   |
| Puerperal sepsis-still a major threat for parturient  | Shamshad <i>et al.</i>           | 2010 | Journal of Ayub Medical College                                  | Ineligible outcome   |

| <i>(Continued)</i>  |   |      |  |                      |
|---|---|------|--|----------------------|
| Title   | Authors                                 | Year | Journal  | Reason for exclusion |
| Population-based study of early-onset neonatal sepsis in Canada   | Sgro M <i>et al.</i>                    | 2019 | Paediatrics and Child Health                                     | Ineligible outcome   |
| A cross sectional study of maternal near miss and mortality at a rural tertiary centre in southern Nigeria  | Mbachu II <i>et al.</i>                 | 2017 | BMC Pregnancy and Childbirth                                     | Ineligible outcome   |
| Quantifying severe maternal morbidity in Scotland: a continuous audit since 2003  | Marr L <i>et al.</i>                    | 2014 | Current opinion in anaesthesiology                               | Ineligible outcome   |
| Severe acute maternal morbidity: use of the Brazilian Hospital Information System   | Magalhaes MD and Bustamante-Teixeira MT | 2012 | Rev. Saude Publica   | Ineligible outcome   |
| Incidence and determinants of severe maternal morbidity: a transversal study in a referral hospital in Teresina, Piaui, Brazil  | Madeiro AP <i>et al.</i>                | 2015 | BMC Pregnancy and Childbirth                                     | Ineligible outcome   |
| A critical analysis of maternal morbidity and mortality in Liberia, West Africa   | Lori JR and Starke AE                   | 2012 | Midwifery  | Ineligible outcome   |
| Maternal near-miss and death and their association with caesarean section complications: a cross-sectional study at a university hospital and a regional hospital in Tanzania           | Litorp H <i>et al.</i>                  | 2014 | BMC Pregnancy and Childbirth                                     | Ineligible outcome   |
| [A survey of neonatal births in maternity departments in urban China in 2005]   | Li J <i>et al.</i>                      | 2012 | Chinese Journal of Contemporary Pediatrics                       | Ineligible outcome   |
| Incidence and causes of maternal mortality in the USA   | Kuriya A <i>et al.</i>                  | 2016 | Journal of Obstetrics and Gynaecology Research                   | Ineligible outcome   |
| Maternal mortality ratio and its causes in a district headquarter hospital of NWFP  | Jabeen M <i>et al.</i>                  | 2005 | Journal of Postgraduate Medical Institute                        | Ineligible outcome   |
| [Analysis of death maternal cases during a 10-year period]  | Hernandez Penafiel JA <i>et al.</i>     | 2007 | Ginecologia y obstetricia de Mexico                              | Ineligible outcome   |
| Trends in caesarean section rates between 2007 and 2013 in obstetric risk groups inspired by the Robson classification: results from population-based surveys in a low-resource setting | Hanson C <i>et al.</i>                  | 2019 | BJOG   | Ineligible outcome   |
| Maternal death: audit in a tertiary hospital  | Guha K and Ashraf F                     | 2019 | Mymensingh Medical Journal                                       | Ineligible outcome   |
| Incidence, trends and severity of primary postpartum haemorrhage in Australia: a population-based study using Victorian Perinatal Data Collection data for 764 244 births               | Flood M <i>et al.</i>                   | 2019 | Australian and New Zealand Journal of Obstetrics and Gynaecology | Ineligible outcome   |
| [Analysis of trends in maternal mortality during a 10 year-follow up in a urban region]   | Ferrer Arreola L <i>et al.</i>          | 2005 | Ginecologia y obstetricia de Mexico                              | Ineligible outcome   |
| Maternal mortality in Italy: a record-linkage study   | Donati S <i>et al.</i>                  | 2011 | BJOG   | Ineligible outcome   |
| Causes of neonatal and child mortality in India: a nationally representative mortality survey   | Bassani DG <i>et al.</i>                | 2010 | Lancet   | Ineligible outcome   |
| Maternal morbidity and mortality in San Carlos, Cojedes-Venezuela. 2001-2008  | Aure N <i>et al.</i>                    | 2011 | Salus  | Ineligible outcome   |
| Incidence and risk factors of sepsis mortality in labor, delivery and after birth: population-based study in the USA  | Al-Ostad G <i>et al.</i>                | 2015 | Journal of Obstetrics and Gynaecology Research                   | Ineligible outcome   |
| Emergency peripartum hysterectomy: a multicenter study of incidence, indications and outcomes in southwestern Nigeria   | Akintayo AA <i>et al.</i>               | 2016 | Maternal and Child Health Journal                                | Ineligible outcome   |
| Health in Myanmar 2008  | Suvedi BK <i>et al.</i>                 | 2009 | Ministry of Health Report  | Ineligible outcome   |
| Trends and causes of maternal mortality in Eastern province of Turkey   | Cim N <i>et al.</i>                     | 2017 | Eastern Journal of Medicine                                      | Ineligible outcome   |
| Causes of stillbirths and early neonatal deaths: Data from 7993 pregnancies in six developing countries   | Ngoc NTN <i>et al.</i>                  | 2006 | Bulletin of the World Health Organization                        | Ineligible outcome   |
| Comparison of microbial pattern in early and late onset neonatal sepsis in referral center Haji Adam Malik hospital Medan Indonesia   | Hasibuan BS                             | 2018 | IOP Science  | Ineligible outcome   |

| <i>(Continued)</i>   |                                   |      |  |                      |
|--|-----------------------------------|------|--|----------------------|
| Title  | Authors                           | Year | Journal                                  | Reason for exclusion |
| The most common causative bacteria in maternal sepsis-related deaths in Japan were group A <i>Streptococcus</i> : a nationwide survey  | Tanaka H <i>et al.</i>            | 2019 | Journal of Infection and Chemotherapy    | Ineligible outcome   |
| Infant mortality in the Federal District, Brazil: time trend and socioeconomic inequalities  | Monteiro RA <i>et al.</i>         | 2007 | Cadernos de saude publica                | Ineligible outcome   |
| Causes of child deaths in India, 1985-2008: a systematic review of literature  | Lahariya C <i>et al.</i>          | 2010 | Indian Journal of Pediatrics             | Ineligible outcome   |
| Sudden unexpected postnatal collapse of newborn infants: a review of cases, definitions, risks, and preventive measures  | Herlenius E and Kuhn P            | 2013 | Translational Stroke Research            | Ineligible outcome   |
| When do newborns die? A systematic review of timing of overall and cause-specific neonatal deaths in developing countries  | Sankar MJ <i>et al.</i>           | 2016 | Journal of Perinatology                  | Ineligible outcome   |
| Still births, neonatal deaths and neonatal near miss cases attributable to severe obstetric complications: a prospective cohort study in two referral hospitals in Uganda        | Nakimuli A <i>et al.</i>          | 2015 | BMC Pediatrics                           | Ineligible outcome   |
| Early discharge of infants and risk of readmission for jaundice  | Lain SJ <i>et al.</i>             | 2015 | Pediatrics                               | Ineligible outcome   |
| Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer: 2006-2008. The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom | Cantwell R <i>et al.</i>          | 2011 | BJOG                                     | Ineligible outcome   |
| Neonatal sepsis in rural India: timing, microbiology and antibiotic resistance in a population-based prospective study in the community setting                                  | Panigrahi P <i>et al.</i>         | 2017 | Journal of Perinatology                  | Ineligible outcome   |
| A prospective study of maternal mortality rate in tertiary care centre from 2010 to 2013 (a three year study)  | Jabeen F <i>et al.</i>            | 2016 | BJOG                                     | Ineligible outcome   |
| Severe maternal morbidity at delivery and risk of hospital encounters within 6 weeks and 1 year postpartum   | Harvey EM <i>et al.</i>           | 2018 | Journal of Women's Health                | Ineligible outcome   |
| Late-onset neonatal sepsis-a 10-year review from North Queensland, Australia   | Gowda H <i>et al.</i>             | 2017 | Pediatric Infectious Disease Journal     | Ineligible outcome   |
| Neonatal hypothermia in Uganda: prevalence and risk factors  | Byaruhanga R <i>et al.</i>        | 2005 | Journal of Tropical Pediatrics           | Ineligible outcome   |
| Causes, timing and place of neonatal deaths in rural Bangladesh  | Azad K <i>et al.</i>              | 2012 | Journal of Paediatrics and Child Health  | Ineligible outcome   |
| Impact of risk factors on the timing of first postpartum venous thromboembolism: a population-based cohort study from England  | Abdul Sultan A <i>et al.</i>      | 2014 | Blood                                    | Ineligible outcome   |
| The change of perinatal mortality over three decades in a reference centre in the Aegean Region: neonatal mortality has decreased but foetal mortality remains unchanged         | Kultursay N <i>et al.</i>         | 2017 | Balkan Medical Journal                   | Ineligible outcome   |
| [Perinatal mortality in the municipality of Salvador, Northeastern Brazil: evolution from 2000 to 2009]  | Jacinto E <i>et al.</i>           | 2013 | Revista de saude publica                 | Ineligible outcome   |
| Prevalence, serotype distribution and mortality risk associated with Group B <i>Streptococcus</i> colonization of newborns in rural Bangladesh                                   | Islam MS <i>et al.</i>            | 2016 | The Pediatric Infectious Disease Journal | Ineligible outcome   |
| Thrombocytopenia in neonates: causes and outcomes  | Ulusoy E <i>et al.</i>            | 2013 | Annals of Hematology                     | Ineligible outcome   |
| Eclampsia in the period from 1983-2000: clinical aspects and maternal-perinatal health   | Rodríguez Barredo M and Miguel JR | 2003 | Acta Ginecologica                        | Ineligible outcome   |
| Neonatal sepsis: mortality in a municipality in southern Brazil, 2000 TO 2013  | Alves JB <i>et al.</i>            | 2018 | Revista paulista de pediatria            | Ineligible outcome   |
| Incidence of neonatal sepsis in a sample of Iraqi newborns   | Al-Mayah QS <i>et al.</i>         | 2017 | Pakistan Journal of Biotechnology        | Ineligible outcome   |
| Epidemiology of maternal mortality in France, 2010-2012  | Deneux-tharoux C and Saucedo M    | 2018 | Anesthesie et Reanimation                | Ineligible outcome   |



| <i>(Continued)</i>   |                                      |      |   |                      |
|--|--------------------------------------|------|---|----------------------|
| Title  | Authors                              | Year | Journal   | Reason for exclusion |
| Towards an inclusive and evidence-based definition of the maternal mortality ratio: an analysis of the distribution of time after delivery of maternal deaths in Mexico, 2010-2013 | Lamadrid-Figueroa H <i>et al.</i>    | 2016 | PLoS One  | Ineligible outcome   |
| Incidence and risk factors for neonatal tetanus in admissions to Kilifi County Hospital, Kenya   | Ibinda F <i>et al.</i>               | 2015 | PLoS One  | Ineligible outcome   |
| Factors associated with maternal deaths in district and Upazila hospitals of Bangladesh  | Halim A <i>et al.</i>                | 2016 | Bangladesh Journal of Obstetrics and Gynecology         | Ineligible outcome   |
| Neonatal mortality and its risk factors in Eastern Ethiopia: a prospective cohort study in Kersa Health and Demographic Surveillance System (Kersa HDSS)                           | Desta BN <i>et al.</i>               | 2016 | Epidemiology Biostatistics and Public Health            | Ineligible outcome   |
| Bacteriological profile of neonatal sepsis in neonatal intermediate care unit of central paediatric referral hospital in Nepal   | Chapagain RH <i>et al.</i>           | 2015 | Journal of Nepal Health Research Council                | Ineligible outcome   |
| Changes in fetal and neonatal mortality during 40 years by offspring sex: a national registry-based study in Norway  | Carlsen F <i>et al.</i>              | 2013 | BMC Pregnancy and Childbirth                            | Ineligible outcome   |
| Temporal variations in incidence and outcomes of critical illness among pregnant and postpartum women in Canada: a population-based observational study                            | Aoyama K <i>et al.</i>               | 2019 | Journal of Obstetrics and Gynaecology Canada            | Ineligible outcome   |
| Skilled attendant at birth and newborn survival in Sub-Saharan Africa  | Amouzou A <i>et al.</i>              | 2017 | Journal of Global Health                                | Ineligible outcome   |
| Place of birth or place of death: an evaluation of 1139 maternal deaths in Nigeria   | Adegoke AA <i>et al.</i>             | 2013 | Midwifery   | Ineligible outcome   |
| An investigation of maternal mortality at a tertiary hospital of the Limpopo province of South Africa  | Ntuli ST <i>et al.</i>               | 2017 | Southern African Journal of Infectious Diseases         | Ineligible outcome   |
| Verbal autopsy of neonatal deaths in Khatauli Block of District Muzaffarnagar, Uttar Pradesh, India  | Muzammil K <i>et al.</i>             | 2014 | Nepal Journal of Epidemiology                           | Ineligible outcome   |
| Maternal mortality in Central Province, Kenya, 2009-2010   | Muchemi OM <i>et al.</i>             | 2014 | Pan African Medical Journal                             | Ineligible outcome   |
| Characteristics and outcomes of patients with eclampsia and severe pre-eclampsia in a rural hospital in Western Tanzania: a retrospective medical record study                     | Mooij R <i>et al.</i>                | 2015 | BMC Pregnancy and Childbirth                            | Ineligible outcome   |
| [Maternal mortality in Libreville, Gabon: assessment and challenges]   | Mayi-Tsonga S <i>et al.</i>          | 2008 | Sante   | Ineligible outcome   |
| Neonatal bacteraemia among 112,360 live births   | Huggard D <i>et al.</i>              | 2016 | Irish Medical Journal                                   | Ineligible outcome   |
| Maternal mortality and derivations from the WHO near-miss tool: An institutional experience over a decade in Southern India  | Halder A <i>et al.</i>               | 2014 | Journal of the Turkish-German Gynecological Association | Ineligible outcome   |
| Maternal mortality in Herat Province, Afghanistan, in 2002: an indicator of women's human rights   | Amowitz LL <i>et al.</i>             | 2002 | JAMA  | Ineligible outcome   |
| Pre-eclampsia-eclampsia admitted to critical care unit   | Rojas-Suarez J and Vigil-De Gracia P | 2012 | Journal of Maternal-Fetal and Neonatal Medicine         | Ineligible outcome   |
| The obstetric outcomes in women with preeclampsia and superimposed preeclampsia  | Simsek A <i>et al.</i>               | 2017 | Turkiye Klinikleri Jinekoloji Obstetrik                 | Ineligible outcome   |
| [Analysis of maternal deaths in Mexico occurred during 2009]   | Fajardo-Dolci G <i>et al.</i>        | 2013 | Revista medica del Instituto Mexicano del Seguro Social | Ineligible outcome   |
| Surveillance for incidence and etiology of early-onset neonatal sepsis in Soweto, South Africa   | Velaphi SC <i>et al.</i>             | 2019 | PLoS One  | Ineligible outcome   |
| [Maternal Mortality At The Centre De Sante Roi Baudouin (Dakar - Senegal): About 308 Cases]  | Thiam O <i>et al.</i>                | 2014 | Le Mali medical   | Ineligible outcome   |

| <i>(Continued)</i>   |                              |      |  |                      |
|--|------------------------------|------|--|----------------------|
| Title  | Authors                      | Year | Journal  | Reason for exclusion |
| Fetal, neonatal, and post-neonatal mortality in the 2015 Pelotas (Brazil) birth cohort and associated factors  | Varela AR <i>et al.</i>      | 2019 | Cadernos De Saude Publica  | Ineligible outcome   |
| Intraventricular hemorrhage in asphyxiated newborns treated with hypothermia: a look into incidence, timing and risk factors                                     | Al Yazidi G <i>et al.</i>    | 2015 | BMC Pediatrics   | Ineligible outcome   |
| Early-onset neonatal infections in Australia and New Zealand, 2002-2012  | Singh T <i>et al.</i>        | 2019 | Archives of Disease in Childhood. Fetal and Neonatal Edition       | Ineligible outcome   |
| Infant mortality in three population-based cohorts in Southern Brazil: trends and differentials  | Santos IS <i>et al.</i>      | 2008 | Cadernos de Saude Publica  | Ineligible outcome   |
| Prevalence of maternal morbidity and its association with socio-economic factors: a population-based survey of a city in northeastern Brazil                     | Rosendo TS <i>et al.</i>     | 2017 | Revista Brasileira de Ginecologia e Obstetrícia                    | Ineligible outcome   |
| Descriptive epidemiology of neonatal mortality in Gowa District 2015   | Putri AR <i>et al.</i>       | 2018 | International Conference on Healthcare Service Management          | Ineligible outcome   |
| Incidence, causes and correlates of maternal near-miss morbidity: a multi-centre cross-sectional study   | Oppong, SA <i>et al.</i>     | 2019 | BJOG   | Ineligible outcome   |
| Primary postpartum haemorrhage in federal medical centre, Owerri, Nigeria: a six year review   | Onyema OA <i>et al.</i>      | 2015 | Nigerian Journal of Medicine                                       | Ineligible outcome   |
| Postpartum hemorrhage: incidence, risk factors, and outcomes in a low-resource setting   | Ngwenya S                    | 2016 | International Journal of Women's Health                            | Ineligible outcome   |
| Maternal deaths due to hypertensive disorders of pregnancy: data from the 2014-2016 Saving Mothers' Report   | Moodley J                    | 2018 | Obstetrics and Gynaecology Forum                                   | Ineligible outcome   |
| Infant mortality trends in the State of Rio Grande do Sul, Brazil, 1994-2004: a multilevel analysis of individual and community risk factors                     | Zanini RR <i>et al.</i>      | 2009 | Cadernos de Saude Publica  | Ineligible outcome   |
| Perinatal outcomes of severe preeclampsia/eclampsia and associated factors among mothers admitted in Amhara Region referral hospitals, North West Ethiopia, 2018 | Melese MF <i>et al.</i>      | 2019 | BMC Research Notes   | Ineligible outcome   |
| A one year review of eclampsia in an Ethiopian Tertiary Care Center (Saint Paul's Hospital Millennium Medical College, SPHMMC)                                   | Mekuria T and Abdosh A       | 2017 | Journal of Perinatal Medicine                                      | Ineligible outcome   |
| Trends in postpartum hemorrhage from 2000 to 2009: a population-based study  | Mehrabadi A <i>et al.</i>    | 2012 | BMC Pregnancy and Childbirth                                       | Ineligible outcome   |
| Maternal death audit in Rwanda 2009-2013: a nationwide facility-based retrospective cohort study   | Sayinzoga F <i>et al.</i>    | 2016 | BMJ Open   | Ineligible outcome   |
| Serious bacterial infections in neonates presenting afebrile with history of fever   | Ramgopal S <i>et al.</i>     | 2019 | Pediatrics   | Ineligible outcome   |
| Early neonatal streptococcal infection   | Niduvaje K <i>et al.</i>     | 2006 | Indian Journal of Pediatrics                                       | Ineligible outcome   |
| Changing trends in maternal mortality in a developing country  | Onakewhor JUE and Gharoro EP | 2008 | Nigerian Journal of Clinical Practice                              | Ineligible outcome   |
| Frequency and timing of symptoms in infants screened for sepsis: effectiveness of a sepsis-screening pathway   | Madan A <i>et al.</i>        | 2003 | Clinical Pediatrics  | Ineligible outcome   |
| [Time-course of neonatal precocious mortality between 1994 and 2003 at the Dakar University Teaching Hospital]   | Cisse CT <i>et al.</i>       | 2006 | Journal de gynecologie, obstetrique et biologie de la reproduction | Ineligible outcome   |
| Trends and causes of maternal mortality in Jimma University specialized hospital, southwest Ethiopia: a matched case-control study                               | Legesse T <i>et al.</i>      | 2017 | International Journal of Women's Health                            | Ineligible outcome   |

| <i>(Continued)</i>   |                                 |      |  |                      |
|--|---------------------------------|------|--|----------------------|
| Title  | Authors                         | Year | Journal  | Reason for exclusion |
| Epidemiological analysis of maternal deaths in Hunan province in China between 2009 and 2014   | Lili X <i>et al.</i>            | 2018 | PLoS One   | Ineligible outcome   |
| [Maternal mortality. Experience of five years in Northern Veracruz IMSS Delegation]  | Leal LAC <i>et al.</i>          | 2009 | Ginecologia y obstetricia de Mexico                                    | Ineligible outcome   |
| Impact and risk factors for early-onset group B streptococcal morbidity: analysis of a national, population-based cohort in Sweden 1997-2001 | Hakansson S <i>et al.</i>       | 2006 | BJOG   | Ineligible outcome   |
| Maternal mortality after cesarean section in the Netherlands   | Kallianidis AF <i>et al.</i>    | 2018 | European Journal of Obstetrics and Gynecology and Reproductive Biology | Ineligible outcome   |
| High maternal and neonatal mortality rates in northern Nigeria: an 8-month observational study   | Guerrier G <i>et al.</i>        | 2013 | International Journal of Women's Health                                | Ineligible outcome   |
| Trends in the modes of delivery and their impact on perinatal mortality rates  | Duarte G <i>et al.</i>          | 2004 | Revista de saude publica   | Ineligible outcome   |
| Maternal mortality at a teaching hospital of rural India: a retrospective study  | Das R and Mukherjee A           | 2014 | BJOG   | Ineligible outcome   |
| Anesthetic management as a risk factor for postpartum hemorrhage after cesarean deliveries   | Chang CC <i>et al.</i>          | 2011 | American Journal of Obstetrics and Gynecology                          | Ineligible outcome   |
| Three years of neonatal morbidity and mortality at the national hospital in Dili, East Timor   | Bucens IK <i>et al.</i>         | 2013 | Journal of Paediatrics and Child Health                                | Ineligible outcome   |
| What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe                   | Bouvier-Colle M-H <i>et al.</i> | 2012 | BJOG   | Ineligible outcome   |
| Venous thromboembolism during pregnancy, postpartum or during contraceptive use findings from the RIETE Registry                             | Blanco-Molina A <i>et al.</i>   | 2010 | Journal of Thrombosis and Haemostasis                                  | Ineligible outcome   |
| Rate and time trend of perinatal, infant, maternal mortality, natality and natural population growth in Kosovo                               | Azemi M <i>et al.</i>           | 2012 | Materia socio-medica   | Ineligible outcome   |
| Cesarean section with relative indications versus spontaneous vaginal delivery: short-term outcomes of maternofetal health                   | Arikan I <i>et al.</i>          | 2012 | Clinical and Experimental Obstetrics and Gynecology                    | Ineligible outcome   |
| Prevalence and associated factors of neonatal mortality in North Gondar Zone, Northwest Ethiopia   | Kebede B <i>et al.</i>          | 2012 | The Ethiopian Journal of Health Development                            | Ineligible outcome   |
| A glance into the hidden burden of maternal morbidity and patterns of management in a Palestinian governmental referral hospital             | Hassan SJ <i>et al.</i>         | 2015 | Women and Birth  | Ineligible outcome   |
| Maternal mortality in Pakistan-compilation of available data   | Jafarey SN                      | 2002 | Journal of the Pakistan Medical Association                            | Ineligible outcome   |
| Prevalence and etiology of perinatal period mortality rates in hospitals, Iran   | Jahani MA <i>et al.</i>         | 2016 | Research Journal of Medical Sciences                                   | Ineligible outcome   |
| Eclampsia: ten-years of experience in a rural tertiary hospital in the Niger delta, Nigeria  | Igberase GO and Ebeigbe PN      | 2006 | Journal of Obstetrics and Gynaecology                                  | Ineligible outcome   |
| Incidence, indications, and predictors of adverse outcomes of postpartum hysterectomies: 20-year experience in a tertiary care centre        | Ibrahim M <i>et al.</i>         | 2014 | Journal of Obstetrics and Gynaecology Canada                           | Ineligible outcome   |
| Trends and determinants of perinatal mortality in Bangladesh   | Hossain MB <i>et al.</i>        | 2019 | PLoS One   | Ineligible outcome   |
| Prevalence of neutropenia in cases of neonatal sepsis  | Ahmad MS <i>et al.</i>          | 2017 | Pakistan Paediatric Journal  | Ineligible outcome   |
| Trends in perinatal deaths from 2010 to 2013 in the Guatemalan Western Highlands   | Garces A <i>et al.</i>          | 2015 | Reproductive Health  | Ineligible outcome   |
| Autopsy-certified maternal mortality at Ile-Ife, Nigeria   | Dinyain A <i>et al.</i>         | 2013 | International Journal of Women's Health                                | Ineligible outcome   |

| <i>(Continued)</i>   |                                   |      |   |                       |
|--|-----------------------------------|------|---|-----------------------|
| Title  | Authors                           | Year | Journal                                       | Reason for exclusion  |
| The clinical and bacteriological spectrum of neonatal sepsis in a tertiary hospital in Yaounde, Cameroon   | Chiabi A <i>et al.</i>            | 2011 | Iranian Journal of Pediatrics                 | Ineligible outcome    |
| Eclampsia: the major cause of maternal mortality in Eastern India  | Das R and Biswas S                | 2015 | Ethiopian Journal of Health Sciences          | Ineligible outcome    |
| Rates of obstetric intervention and associated perinatal mortality and morbidity among low-risk women giving birth in private and public hospitals in NSW (2000-2008): a linked data population-based cohort study | Dahlen HG <i>et al.</i>           | 2014 | BMJ Open                                      | Ineligible outcome    |
| The etiology of maternal mortality in developed countries: a systematic review of literature   | Cristina Rossi A and Mullin P     | 2012 | Archives of Gynecology and Obstetrics         | Ineligible outcome    |
| Ten years of confidential inquiries into maternal deaths in France, 1998-2007  | Saucedo M <i>et al.</i>           | 2013 | Obstetrics and Gynecology                     | Ineligible outcome    |
| Changing epidemiology of maternal mortality in rural India: time to reset strategies for MDG-5   | Shah P <i>et al.</i>              | 2014 | Tropical Medicine and International Health    | Ineligible outcome    |
| Maternal mortality in Andaman and Nicobar group of islands: 10 years retrospective study   | Chawla I <i>et al.</i>            | 2014 | Indian Journal of Community Medicine          | Ineligible outcome    |
| Maternal morbidity associated with cesarean delivery without labor compared with spontaneous onset of labor at term  | Allen VM <i>et al.</i>            | 2003 | Obstetrics and Gynecology                     | Ineligible outcome    |
| Non-obstetric causes of severe maternal complications: a secondary analysis of the Nigeria Near-miss and Maternal Death Survey   | Adeniran AS <i>et al.</i>         | 2019 | BJOG  | Ineligible outcome    |
| Pre- eclampsia, eclampsia and adverse maternal and perinatal outcomes: a secondary analysis of the World Health Organization Multicountry Survey on Maternal and Newborn Health                                    | Abalos E <i>et al.</i>            | 2014 | BJOG  | Ineligible outcome    |
| The Spanish National Network "Grupo Castrillo": 22 Years of Nationwide Neonatal Infection Surveillance   | Fernandez Colomer B <i>et al.</i> | 2020 | American Journal of Perinatology              | Ineligible population |
| Maternal and neonatal characteristics in obstetric intensive care unit admissions  | Seppanen PM <i>et al.</i>         | 2020 | International Journal of Obstetric Anesthesia | Ineligible population |
| Mortality at the pediatric emergency unit of the Mohammed VI teaching hospital of Marrakech  | Lahmini W and Bourrous M          | 2020 | BMC Emergency Medicine                        | Ineligible population |
| Causes of neonatal death in Aayder Comprehensive Specialized Hospital, Ethiopia  | Hadgu FB and Gebrekidan GB        | 2020 | Iranian Journal of Neonatology                | Ineligible population |
| Neonatal near-misses in Ghana: a prospective, observational, multi-center study  | Bakari A <i>et al.</i>            | 2019 | BMC Pediatrics                                | Ineligible population |
| Timing and causes of neonatal mortality in Tamale Teaching Hospital, Ghana: A retrospective study  | Abdul-Mumin A <i>et al.</i>       | 2021 | PLoS One                                      | Ineligible population |
| [Eclampsia: epidemiological aspects and management of 28 patients]   | Boudaya F <i>et al.</i>           | 2008 | La Tunisie medicale                           | Ineligible population |
| [Nine cases of HELLP syndrome (hemolysis, elevated liver enzymes and low platelets)]   | Capellino MF <i>et al.</i>        | 2003 | Medicina                                      | Ineligible population |
| Etiology, antibiotic resistance and risk factors for neonatal sepsis in a large referral center in Zambia  | Kabwe M <i>et al.</i>             | 2016 | Pediatric Infectious Disease Journal          | Ineligible population |
| Eclampsia in Finland; 2006 to 2010   | Jaatinen N and Ekholm E           | 2016 | Acta obstetrica et gynecologica Scandinavica  | Ineligible population |
| Overview of maternal morbidity during hospitalization for labor and delivery in the United States: 1993-1997 and 2001-2005   | Berg CJ <i>et al.</i>             | 2009 | Obstetrics and Gynecology                     | Ineligible population |
| Emergency department care in the postpartum period: California births, 2009-2011   | Batra P <i>et al.</i>             | 2017 | Obstetrics and Gynecology                     | Ineligible population |
| Abdominal massage: another cause of maternal mortality   | Ugboma HAA and Akani CI           | 2004 | Nigerian Journal of Medicine                  | Ineligible population |

| <i>(Continued)</i>   |                           |      |  |                       |
|--|---------------------------|------|--|-----------------------|
| Title  | Authors                   | Year | Journal  | Reason for exclusion  |
| Clinical evaluation of severe neonatal hyperbilirubinaemia in a resource-limited setting: a 4-year longitudinal study in southeast Nigeria                                     | Osuorah CDI <i>et al.</i> | 2018 | BMC Pediatrics   | Ineligible population |
| Maternal morbidity associated with early-onset and late-onset preeclampsia   | Lisonkova S <i>et al.</i> | 2014 | Obstetrics and Gynecology  | Ineligible population |
| Infant outcome after complete uterine rupture  | Al-Zirqi I <i>et al.</i>  | 2018 | American Journal of Obstetrics and Gynecology                        | Ineligible population |
| Neonatal nosocomial infections in Bahrami Children Hospital  | Salamati P <i>et al.</i>  | 2006 | Indian Journal of Pediatrics   | Ineligible population |
| A survey of the incidence of neonatal sepsis by group B Streptococcus during a decade in a Brazilian maternity hospital  | Vaciloto E <i>et al.</i>  | 2002 | Brazilian Journal of Infectious Diseases                             | Ineligible population |
| Length of rupture of membranes in the setting of premature rupture of membranes at term and infectious maternal morbidity  | Tran SH <i>et al.</i>     | 2008 | American Journal of Obstetrics and Gynecology                        | Ineligible population |
| Neonatal infections in England: the NeonIN surveillance network  | Vergnano S <i>et al.</i>  | 2011 | Archives of Disease in Childhood                                     | Ineligible population |
| Neonatal outcome following elective cesarean section beyond 37 weeks of gestation: a 7-year retrospective analysis of a national registry                                      | Wilmink FA <i>et al.</i>  | 2010 | American Journal of Obstetrics and Gynecology                        | Ineligible population |
| Role of vascularization in determining the time of hypoxic-ischemic encephalopathy in the neonate  | Aktas EO <i>et al.</i>    | 2003 | Analytical and Quantitative Cytology and Histology                   | Ineligible population |
| Admissions to a sick new born care unit in a secondary care hospital: profile and outcomes   | Sinha RS <i>et al.</i>    | 2019 | Indian Journal of Public Health                                      | Ineligible population |
| Patients with high-risk pregnancies and complicated deliveries have an increased risk of maternal postpartum readmissions  | Sharvit M <i>et al.</i>   | 2014 | Archives of Gynecology and Obstetrics                                | Ineligible population |
| A cohort analysis of neonatal hospital mortality rate and predictors of neonatal mortality in a suburban hospital of Cameroon  | Ndombo PK <i>et al.</i>   | 2017 | Italian Journal of Pediatrics  | Ineligible population |
| Outcome of neonates with meconium aspiration syndrome at the University Hospital of the West Indies, Jamaica: a resource-limited setting                                       | Panton L and Trotman H    | 2017 | American Journal of Perinatology                                     | Ineligible population |
| Post-operative management in uncomplicated caesarean delivery: a randomised trial of short-stay versus traditional protocol at the Lagos University Teaching Hospital, Nigeria | Oyeyemi N <i>et al.</i>   | 2019 | Nigerian Postgraduate Medical Journal                                | Ineligible population |
| Pattern and outcome of obstetric admissions into the intensive care unit of a southeast Nigerian hospital  | Ozumba BC <i>et al.</i>   | 2018 | Indian Journal of Critical Care Medicine                             | Ineligible population |
| Early-onset neonatal sepsis: rate and organism pattern between 2003 and 2008   | Sgro M <i>et al.</i>      | 2011 | Journal of Perinatology  | Ineligible population |
| The burden of maternal morbidity and mortality attributable to hypertensive disorders in pregnancy: a prospective cohort study from Uganda                                     | Nakimuli A <i>et al.</i>  | 2016 | BMC Pregnancy and Childbirth   | Ineligible population |
| Teenage pregnancy: incidence and outcomes in a rural Shropshire district general hospital trust  | Moore KL <i>et al.</i>    | 2015 | BJOG   | Ineligible population |
| Duration of passive and active phases of the second stage of labour and risk of severe postpartum haemorrhage in low-risk nulliparous women                                    | Le Ray C <i>et al.</i>    | 2011 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible population |
| Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: an updated systematic analysis                           | Liu L <i>et al.</i>       | 2015 | Lancet   | Ineligible population |
| Clinical sepsis in neonates and young infants, United States, 1988-2006  | Lukacs SL and Schrag SJ   | 2012 | Journal of Pediatrics  | Ineligible population |

| <i>(Continued)</i>   |                                 |      |  |                       |
|--|---------------------------------|------|--|-----------------------|
| Title  | Authors                         | Year | Journal  | Reason for exclusion  |
| Severe maternal morbidity during childbirth hospitalisation: a comparative analysis between the Republic of Ireland and Australia                                    | Lutomski JE <i>et al.</i>       | 2012 | The European Journal of Obstetrics and Gynecology and Reproductive Biology | Ineligible population |
| Comparison of clinical and perinatal outcomes in early- and late-onset preeclampsia  | Madazli R <i>et al.</i>         | 2014 | Archives of Gynecology and Obstetrics                                      | Ineligible population |
| Pregnancy-related mortality in California: causes, characteristics, and improvement opportunities  | Main EK <i>et al.</i>           | 2015 | Obstetrics and Gynecology  | Ineligible population |
| Treatment patterns and short-term outcomes in ischemic stroke in pregnancy or postpartum period  | Leffert LR <i>et al.</i>        | 2016 | American Journal of Obstetrics and Gynecology                              | Ineligible population |
| A comparative study between the pioneer cohort of waterbirths and conventional vaginal deliveries in an obstetrician-led unit in Singapore                           | Lim KMX <i>et al.</i>           | 2016 | Taiwanese Journal of Obstetrics and Gynecology                             | Ineligible population |
| Survey of care environment and mortality in a tertiary neonatal intensive care unit  | Lee Y-S and Chou Y-H            | 2005 | Clinical Neonatology   | Ineligible population |
| Cause of death among infants in rural western China: a community-based study using verbal autopsy  | Ma Y <i>et al.</i>              | 2014 | The Journal of Pediatrics  | Ineligible population |
| Evaluation of infants with neonatal cholestasis: experience of a tertiary referral center in Turkey  | Gürlek Gokcebay D <i>et al.</i> | 2015 | Türkiye Klinikleri Tıp Bilimleri Dergisi                                   | Ineligible population |
| Early onset neonatal sepsis  | Chacko B <i>et al.</i>          | 2005 | Indian Journal of Pediatrics   | Ineligible population |
| Causes of perinatal mortality and associated maternal complications in a South African province: challenges in predicting poor outcomes                              | Allanson EM <i>et al.</i>       | 2015 | BMC Pregnancy and Childbirth   | Ineligible population |
| Pattern of admissions to neonatal unit   | Parkash J and Das N             | 2005 | Journal of the College of Physicians and Surgeons                          | Ineligible population |
| Emergency peripartum hysterectomy: a 10-year review at the Royal Hospital for Women, Sydney  | Awan N <i>et al.</i>            | 2011 | Australian and New Zealand Journal of Obstetrics and Gynaecology           | Ineligible population |
| Neonatal septic arthritis in a tertiary care hospital: a descriptive study   | Sreenivas T <i>et al.</i>       | 2016 | European Journal of Orthopaedic Surgery and Traumatology                   | Ineligible population |
| Vasa Previa Diagnosis, Clinical Practice, and Outcomes in Australia  | Sullivan EA <i>et al.</i>       | 2017 | Obstetrics and Gynecology  | Ineligible population |
| Maternal mortality and associated near-misses among emergency intrapartum obstetric referrals in Mulago Hospital, Kampala, Uganda                                    | Kaye D <i>et al.</i>            | 2003 | East African Medical Journal   | Ineligible population |
| Diurnal variation in decision-to-delivery intervals and correlation with adverse outcomes at emergency caesarean section in urban Uganda: a prospective cohort study | Hughes N <i>et al.</i>          | 2019 | BJOG   | Ineligible population |
| Monitoring maternal and newborn health outcomes in Bauchi State, Nigeria: an evaluation of a standards-based quality improvement intervention                        | Kabo I <i>et al.</i>            | 2016 | International Journal for Quality in Health Care                           | Ineligible population |
| The chasm in neonatal outcomes in relation to time of birth in Lebanon   | Badr LK <i>et al.</i>           | 2007 | Neonatal Network   | Ineligible population |
| Abnormal bleeding associated with preeclampsia: a population study of 315,085 pregnancies  | Eskild A and Vatten LJ          | 2009 | Acta obstetrica et gynecologica Scandinavica                               | Ineligible population |
| WHO systematic review of randomised controlled trials of routine antenatal care  | Carroll G <i>et al.</i>         | 2001 | Lancet   | Ineligible population |
| The timing of elective caesarean deliveries and early neonatal outcomes in singleton infants born 37-41 weeks' gestation   | Doan E <i>et al.</i>            | 2014 | Australian and New Zealand Journal of Obstetrics and Gynaecology           | Ineligible population |

| <i>(Continued)</i>  |                                   |      |   |                       |
|---|-----------------------------------|------|---|-----------------------|
| Title   | Authors                           | Year | Journal   | Reason for exclusion  |
| Neonatal nosocomial bloodstream infections at a referral hospital in a middle-income country: burden, pathogens, antimicrobial resistance and mortality                               | Dramowski A <i>et al.</i>         | 2015 | Paediatrics and International Child Health      | Ineligible population |
| Balloon catheter for induction of labor in women with one previous cesarean and an unfavorable cervix   | Huisman CMA <i>et al.</i>         | 2019 | Acta obstetrica et gynecologica Scandinavica    | Ineligible population |
| Neonatal complications in women with premature rupture of membranes (PROM) at term and near term and its correlation with time lapsed since PROM to delivery                          | Gupta S <i>et al.</i>             | 2019 | Tropical Doctor                                 | Ineligible population |
| The evaluation of reasons for early or late onset neonatal thrombocytopenia   | Guzoglu N <i>et al.</i>           | 2015 | Journal of Perinatal Medicine                   | Ineligible population |
| Incidence and organism pattern in early onset neonatal sepsis   | Hajnal Avramovic LZ <i>et al.</i> | 2012 | Archives of Disease in Childhood                | Ineligible population |
| Eclampsia: feto-maternal outcomes in a tertiary care centre in Eastern Nepal  | Ghimire S                         | 2016 | Journal of the Nepal Medical Association        | Ineligible population |
| Patterns of Infant Mortality from 1993 to 2007 in Belgrade (Serbia)   | Gazibara T <i>et al.</i>          | 2013 | Maternal and Child Health Journal               | Ineligible population |
| Neonatal hypoxic-ischaemic encephalopathy: most deaths followed end-of-life decisions within three days of birth  | Garcia-Alix A <i>et al.</i>       | 2013 | Acta paediatrica                                | Ineligible population |
| Patterns of admission and factors associated with neonatal mortality among neonates admitted to the neonatal intensive care unit of University of Gondar Hospital, Northwest Ethiopia | Demisse AG <i>et al.</i>          | 2017 | Pediatric Health, Medicine and Therapeutics     | Ineligible population |
| Causes and risk factors for infant mortality in Nunavut, Canada 1999-2011   | Collins SA <i>et al.</i>          | 2012 | BMC Pediatrics                                  | Ineligible population |
| The burden of indirect causes of maternal morbidity and mortality in the process of obstetric transition: a cross-sectional multicenter study   | Cirelli JF <i>et al.</i>          | 2018 | Revista Brasileira de Ginecologia e Obstetricia | Ineligible population |
| Incidence of maternal near miss in the public health sector of Harare, Zimbabwe: a prospective descriptive study  | Chikadaya H <i>et al.</i>         | 2018 | BMC Pregnancy and Childbirth                    | Ineligible population |
| Maternal morbidity in the first year after childbirth in Mombasa Kenya; a needs assessment  | Chersich MF <i>et al.</i>         | 2009 | BMC Pregnancy and Childbirth                    | Ineligible population |
| Clinical analysis of emergency exploratory laparotomy in patients with intractable postpartum hemorrhage  | Chen LC <i>et al.</i>             | 2020 | Journal of International Medical Research       | Ineligible population |
| Maternal death and delays in accessing emergency obstetric care in Mozambique   | Chavane LA <i>et al.</i>          | 2018 | BMC Pregnancy and Childbirth                    | Ineligible population |
| Maternal deaths: a 22-year forensic retrospective study (1987-2009)   | Charlier P <i>et al.</i>          | 2011 | Revue de Medecine Legale                        | Ineligible population |
| The assessment of time-dependent myocardial changes in infants with perinatal hypoxia   | Cetin I <i>et al.</i>             | 2012 | Journal of Maternal-Fetal and Neonatal Medicine | Ineligible population |
| Neonatal outcomes after introduction of a national intrapartum fetal surveillance education program: a retrospective cohort study   | Brown LD <i>et al.</i>            | 2017 | Journal of Maternal-Fetal and Neonatal Medicine | Ineligible population |
| Eclampsia: still a problem in Bangladesh  | Begum MR <i>et al.</i>            | 2004 | MedGenMed                                       | Ineligible population |
| Post operative neonatal survival a real challenge in a setup with no intensive care unit!   | Akhter N <i>et al.</i>            | 2016 | Rawal Medical Journal                           | Ineligible population |
| Epidemiology and microbiology of sepsis in mainland China in the first decade of the 21st century   | Chen X-C <i>et al.</i>            | 2015 | International Journal of Infectious Diseases    | Ineligible population |
| Adherence to hypothermia guidelines: a French multicenter study of fullterm neonates  | Chevallier M <i>et al.</i>        | 2013 | PLoS One  | Ineligible population |
| Incidence of catheter-related bloodstream infections in neonates following removal of peripherally inserted central venous catheters  | Casner M <i>et al.</i>            | 2014 | Pediatric Critical Care Medicine                | Ineligible population |

| <i>(Continued)</i>  |                                  |      |  |                       |
|---|----------------------------------|------|--|-----------------------|
| Title   | Authors                          | Year | Journal  | Reason for exclusion  |
| The epidemiology of methicillin-susceptible and methicillin-resistant <i>Staphylococcus aureus</i> in a neonatal intensive care unit, 2000-2007   | Carey AJ <i>et al.</i>           | 2010 | Journal of Perinatology                              | Ineligible population |
| New insights into <i>Citrobacter freundii</i> sepsis in neonates  | Chen D and Ji Y                  | 2019 | Pediatrics International                             | Ineligible population |
| Timing of neonatal seizures and intrapartum obstetrical factors   | Scher MS <i>et al.</i>           | 2008 | Journal of Child Neurology                           | Ineligible population |
| Planned early birth versus expectant management (waiting) for prelabour rupture of membranes at term (37 weeks or more)   | Middleton P <i>et al.</i>        | 2017 | Cochrane Database of Systematic Reviews              | Ineligible population |
| Factors associated with maternal death in women admitted to an intensive care unit with severe maternal morbidity   | Oliveira Neto AF <i>et al.</i>   | 2009 | International Journal of Gynaecology and Obstetric   | Ineligible population |
| Maternal and perinatal complications with uterine rupture in 142,075 patients who attempted vaginal birth after cesarean delivery: a review of the literature                             | Chauhan SP <i>et al.</i>         | 2003 | American Journal of Obstetrics and Gynecology        | Ineligible population |
| Ventilator-associated pneumonia in newborn infants diagnosed with an invasive bronchoalveolar lavage technique: a prospective observational study   | Cernada, M <i>et al.</i>         | 2013 | Pediatric Critical Care Medicine                     | Ineligible population |
| Nosocomial infections in a Brazilian neonatal intensive care unit: a 4-year surveillance study  | Brito DV <i>et al.</i>           | 2010 | Revista da Sociedade Brasileira de Medicina Tropical | Ineligible population |
| Maternal and neonatal outcome after failed ventouse delivery: comparison of forceps versus cesarean section   | Bhide A <i>et al.</i>            | 2007 | The Journal of Maternal-Fetal and Neonatal Medicine  | Ineligible population |
| A multicentre, randomised controlled trial of position during the late stages of labour in nulliparous women with an epidural: clinical effectiveness and an economic evaluation (BUMPES) | Bick D <i>et al.</i>             | 2017 | Health Technology Assessment                         | Ineligible population |
| Changing patterns in neonatal <i>Escherichia coli</i> sepsis and ampicillin resistance in the era of intrapartum antibiotic prophylaxis   | Bizzarro MJ <i>et al.</i>        | 2008 | Pediatrics   | Ineligible population |
| Seventy-five years of neonatal sepsis at Yale: 1928-2003  | Bizzarro MJ <i>et al.</i>        | 2005 | Pediatrics   | Ineligible population |
| Neonatal sepsis 2004-2013: the rise and fall of coagulase-negative staphylococci  | Bizzarro MA <i>et al.</i>        | 2015 | Journal of Pediatrics                                | Ineligible population |
| Approach to an obstetric prognosis scale: The modified SOFA scale   | Blanco Esquivel LA <i>et al.</i> | 2016 | Ghana Medical Journal                                | Ineligible population |
| Epidemiology of UK neonatal infections: the neonIN infection surveillance network   | Cailles B <i>et al.</i>          | 2018 | Archives of Disease in Childhood                     | Ineligible population |
| Isolated proteinuria in Chinese pregnant women with preeclampsia: results of retrospective observational study  | Cai J <i>et al.</i>              | 2017 | Biomedical Research                                  | Ineligible population |
| Catheter-related infections in neonatal intensive care units: a prospective multicentre surveillance  | Bellemin K <i>et al.</i>         | 2011 | BMC Proceedings                                      | Ineligible population |
| A population-based study of perinatal infection risk in women with and without systemic lupus erythematosus and their infants   | Bender Ignacio RA <i>et al.</i>  | 2018 | Paediatric and Perinatal Epidemiology                | Ineligible population |
| Trends in mortality in a regional neonatal unit over 21 years demonstrate a halving of neonatal deaths  | Benham VJ and Richards GJ        | 2014 | Archives of Disease in Childhood                     | Ineligible population |
| Complications and maternal mortality from severe pre-eclampsia during the first 48 hours in an intensive care unit in Morocco   | Bentata Y <i>et al.</i>          | 2015 | International Journal of Gynaecology and Obstetrics  | Ineligible population |
| Epinephrine versus dopamine in neonatal septic shock: a double-blind randomized controlled trial  | Baske K <i>et al.</i>            | 2018 | European Journal of Pediatrics                       | Ineligible population |



| <i>(Continued)</i>   |                                  |      |  |                       |
|--|----------------------------------|------|--|-----------------------|
| Title  | Authors                          | Year | Journal  | Reason for exclusion  |
| Maternal and perinatal outcomes of eclampsia with and without HELLP syndrome in a teaching hospital in western Turkey  | Ascioglu O <i>et al.</i>         | 2014 | Journal of Obstetrics and Gynaecology            | Ineligible population |
| Determinants of nosocomial infection in 6 neonatal intensive care units: an Italian multicenter prospective cohort study   | Auriti C <i>et al.</i>           | 2010 | Infection Control and Hospital Epidemiology      | Ineligible population |
| Neonatal coronary artery thrombosis in the era of delayed umbilical cord clamping category: pediatric  | Aljohani O <i>et al.</i>         | 2018 | Catheterization and Cardiovascular Interventions | Ineligible population |
| Impact of cesarean section in a private health service in Brazil: indications and neonatal morbidity and mortality rates   | Almeida MA <i>et al.</i>         | 2018 | Ceska gynekologie                                | Ineligible population |
| The correlation between invasive care procedures and the occurrence of neonatal sepsis   | Andrade Medeiros F <i>et al.</i> | 2016 | Acta Paulista de Enfermagem                      | Ineligible population |
| Neonatal hypothermia among hospitalized high risk newborns in a developing country   | Ali R <i>et al.</i>              | 2012 | Pakistan Journal of Medical Sciences             | Ineligible population |
| MR imaging and outcome of term neonates with perinatal asphyxia: value of diffusion-weighted MR imaging and H-1 MR spectroscopy  | Alderliesten T <i>et al.</i>     | 2011 | Radiology  | Ineligible population |
| Feto-maternal risk factor associated to the moderately and extremely obese pregnant woman in comparison to the normal weighted pregnant cases (primigravida and multigravida cases): a comparative cohort research | Alamgir S <i>et al.</i>          | 2018 | Indo American Journal of Pharmaceutical Sciences | Ineligible population |
| Early onset conjugated hyperbilirubinemia in newborn infants   | Tiker F <i>et al.</i>            | 2006 | Indian Journal of Pediatrics                     | Ineligible setting    |
| Neonatal mortality at Olabisi Onabanjo University Teaching Hospital, Sagamu  | Ogunlesi TA <i>et al.</i>        | 2008 | Nigerian Journal of Paediatrics                  | Ineligible setting    |
| Epidemiology and antimicrobial susceptibility of invasive Escherichia coli infection in neonates from 2012 to 2019 in Xiamen, China  | Lai J <i>et al.</i>              | 2021 | BMC Infectious Diseases                          | Ineligible setting    |
| Determinants de la mortality neonatale, dans une population tunisienne   | Nouaili Hamida EB <i>et al.</i>  | 2020 | La tenisie Medicale                              | Ineligible setting    |
| [Evolution of neonatal mortality at the Blida University Teaching Hospital (Algeria) between 1999 and 2006]  | Bezzaoucha A <i>et al.</i>       | 2010 | Bulletin de la Societe de Pathologie Exotique    | Ineligible setting    |
| Morbidities & outcomes of a neonatal intensive care unit in a complex humanitarian conflict setting, Hajjah Yemen: 2017-2018   | Eze P <i>et al.</i>              | 2020 | Conflict and Health                              | Ineligible setting    |
| Time to death and its predictors among neonates admitted in the intensive care unit of the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia   | Gudayu TW <i>et al.</i>          | 2020 | Research and Reports in Neonatology              | Ineligible setting    |
| Risk factors for neonatal mortality at St Camille Hospital in Ouagadougou, Burkina Faso  | Ouedraogo P <i>et al.</i>        | 2020 | International Journal of Pediatrics (Mashhad)    | Ineligible setting    |
| Incidence and predictors of neonatal mortality among neonates admitted in Amhara regional state referral hospitals, Ethiopia: prospective follow up study  | Mengistu BA <i>et al.</i>        | 2020 | BMC Pediatrics                                   | Ineligible setting    |
| Survival status and predictors of mortality among newborns admitted with neonatal sepsis at public Hospitals in Ethiopia   | Dessu S <i>et al.</i>            | 2020 | International Journal of Pediatrics              | Ineligible setting    |
| When do newborns die? Timing and cause-specific neonatal death in neonatal intensive care unit at referral hospital in Gedeo Zone: a prospective cohort study  | Eshete A and Abiy S              | 2020 | International Journal of Pediatrics              | Ineligible setting    |
| Neonatal morbidity and mortality in Calabara, Nigeria: a hospital-based study  | Udo JJ <i>et al.</i>             | 2008 | Nigerian Journal of Clinical Practice            | Ineligible setting    |
| Morbidity et mortalite neonatales au CHU Kara (Togo)   | Azoumah K <i>et al.</i>          | 2010 | Medecine d'Afrique noire                         | Ineligible setting    |
| [Ten years morbidity and mortality of newborns hospitalized at the Clinic El-Fateh Suka (Ouagadougou, Burkina Faso)]   | Nagalo K <i>et al.</i>           | 2013 | Pan African Medical Journal                      | Ineligible setting    |

| <b>(Continued)</b>   |                                  |             |  |                             |
|--|----------------------------------|-------------|--|-----------------------------|
| <b>Title</b>   | <b>Authors</b>                   | <b>Year</b> | <b>Journal</b>   | <b>Reason for exclusion</b> |
| [Neonatal morbidity and mortality in 2002-2006 at the Charles de Gaulle pediatric hospital in Ouagadougou (Burkina Faso)]  | Koueta F <i>et al.</i>           | 2007        | Sante  | Ineligible setting          |
| [National reference unit of neonatology: state of play]  | Dicko-Traore F <i>et al.</i>     | 2014        | Sante publique   | Ineligible setting          |
| Clinico-aetiological profile of neonatal seizures and their outcomes in a tertiary care hospital   | Babu MC <i>et al.</i>            | 2018        | Journal of Evolution of Medical and Dental Sciences        | Ineligible setting          |
| Bacteriological profiles of septicaemia in neonates at tertiary care hospital, Gujarat, India  | Assudani HJ <i>et al.</i>        | 2015        | Journal of Evolution of Medical and Dental Sciences        | Ineligible setting          |
| Characteristics of neonatal sepsis at a tertiary care hospital in Saudi Arabia   | Al-Matary A <i>et al.</i>        | 2019        | Journal of Infection and Public Health                     | Ineligible setting          |
| Trends in cause-specific mortality at a Canadian outborn NICU  | Simpson CDA <i>et al.</i>        | 2010        | Pediatrics   | Ineligible setting          |
| Hypoglycaemia in the newborn   | Stomnaroska O <i>et al.</i>      | 2017        | Prilozi  | Ineligible setting          |
| Dynamics and structure of the neonatal mortality rate during 2001-2003 in specialized maternity hospital "Maichin Dom"   | Jekova N and Kalajieva M         | 2005        | Pediatriciya   | Ineligible setting          |
| Identification of bacterial pathogens and their antimicrobial susceptibility of early onset neonatal sepsis  | Bystricka A <i>et al.</i>        | 2014        | Journal of Maternal-Fetal and Neonatal Medicine            | Ineligible setting          |
| Competing risk survival analysis of time to in-hospital death or discharge in a large urban neonatal unit in Kenya   | Aluvaala J <i>et al.</i>         | 2019        | Wellcome Open Research                                     | Ineligible setting          |
| Perinatal mortality and severe morbidity in low and high risk term pregnancies in the Netherlands: prospective cohort study  | Evers ACC <i>et al.</i>          | 2010        | BMJ  | Ineligible setting          |
| Risk factors of mortality in neonatal illness  | Gandhi J and Varadarajan P       | 2016        | Journal of Evolution of Medical and Dental Sciences        | Ineligible setting          |
| Later rather than sooner: the impact of clinical management on timing and modes of death in the last decade  | Dupont-Thibodeau A <i>et al.</i> | 2014        | Acta paediatrica   | Ineligible setting          |
| Group B Streptococcus and Escherichia coli infections in the intensive care nursery in the era of intrapartum antibiotic prophylaxis                               | Bauserman MS <i>et al.</i>       | 2013        | Pediatric Infectious Disease Journal                       | Ineligible setting          |
| Intravenous lines-related sepsis in newborn babies admitted to NICU in a developing country  | Bakr AF                          | 2003        | Journal of Tropical Pediatrics                             | Ineligible setting          |
| Neonatal respiratory distress in Misan: causes, risk factors, and outcomes   | Aljawadi HFM and Ali EA          | 2019        | Iranian Journal of Neonatology                             | Ineligible setting          |
| Comparison study of causes and neonatal mortality rates of newborns admitted in neonatal intensive care unit of Al-Sadder Teaching Hospital in Al-Amara City, Iraq | Al-Sadi EK                       | 2017        | International Journal of Pediatrics (Mashhad)              | Ineligible setting          |
| Epidemiology and outcomes of maternal sepsis in the US   | Hensley M and Prescott HC        | 2019        | American Journal of Respiratory and Critical Care Medicine | Ineligible study design     |
| 490: Maternal mortality at a referral hospital in south western Uganda: a 5 year descriptive analysis  | Lugobe HM <i>et al.</i>          | 2021        | American Journal of Obstetrics and Gynecology              | Ineligible study design     |
| 834: The timing of eclampsia in the postpartum period using the nationwide readmission database  | Yoselevsky E <i>et al.</i>       | 2020        | American Journal of Obstetrics and Gynecology              | Ineligible study design     |
| The relationship between severe maternal morbidity and a risk of postpartum readmission among Korean women: a nationwide population-based cohort study             | Nam JY and Park EC               | 2020        | BMC Pregnancy and Childbirth                               | Ineligible study design     |

| <i>(Continued)</i>  |                                 |      |   |                         |
|---|---------------------------------|------|---|-------------------------|
| Title   | Authors                         | Year | Journal   | Reason for exclusion    |
| Obstetric critical care in Victoria, Australia  | Duke G <i>et al.</i>            | 2018 | Anaesthesia and Intensive Care                                    | Ineligible study design |
| The WOMAN Trial: clinical and contextual factors surrounding the deaths of 483 women following post-partum hemorrhage in developing countries COMMENT | .                               | 2020 | Obstetrical and Gynecological Survey                              | Ineligible study design |
| Obstetric critical care admissions in Australia and New Zealand   | Maiden M <i>et al.</i>          | 2018 | Anaesthesia and Intensive Care                                    | Ineligible study design |
| Timing of death and rates of IVH, RDS, and NEC among infants with neonatal sepsis   | Birch MN <i>et al.</i>          | 2019 | Obstetrics and Gynecology   | Ineligible study design |
| Características epidemiológicas de la mortalidad neonatal en el Perú, 2011-2012   | Avila J <i>et al.</i>           | 2015 | Revista Peruana de Medicina Experimental y Salud Pública          | Ineligible study design |
| Postpartum fever: Study of cases in a tertiary hospital   | Mejia Jimenez I <i>et al.</i>   | 2016 | Journal of Maternal-Fetal and Neonatal Medicine                   | Ineligible study design |
| Early complications and management of newborns during the first month of life   | Gascoin G                       | 2015 | Journal de Gynecologie Obstetrique et Biologie de la Reproduction | Ineligible study design |
| Burden, differentials, and causes of child deaths in India  | Lahariya C and Paul, VK         | 2010 | Indian Journal of Pediatrics                                      | Ineligible study design |
| Audit on intrapartum and postpartum sepsis  | Tan MY <i>et al.</i>            | 2014 | BJOG  | Ineligible study design |
| Incidence and risk factors of pregnancy-associated venous thromboembolism in Singhealth, a major healthcare cluster in Singapore                      | Jaya-Bodestyne SL <i>et al.</i> | 2017 | Research and Practice in Thrombosis and Haemostasis               | Ineligible study design |
| Maternal mortality in a rural referral hospital in the Niger Delta, Nigeria   | Igberase GO and Ebeigbe PN      | 2007 | Journal of Obstetrics and Gynaecology                             | Ineligible study design |
| Timing of elective repeat cesarean delivery at term and maternal outcomes   | Tita A                          | 2009 | American Journal of Obstetrics and Gynecology                     | Ineligible study design |
| Overview of eclampsia at paropakar maternity and women's hospital, Kathmandu, Nepal   | Shakya B and Vaidya A           | 2012 | International Journal of Gynecology and Obstetrics                | Ineligible study design |
| Maternal near-miss and quality of care in a rural Rwandan hospital  | Richard K <i>et al.</i>         | 2016 | BJOG  | Ineligible study design |
| Initiation of breastfeeding and mortality risk for newborn in rural Bangladesh  | Rahman MM <i>et al.</i>         | 2017 | Annals of Nutrition and Metabolism                                | Ineligible study design |
| How fast did newborns die in Nigeria from 2009-2013: a time-to-death analysis using verbal/social autopsy data  | Koffi AK <i>et al.</i>          | 2019 | Journal of Global Health  | Ineligible study design |
| Rapid deterioration after the first symptom in maternal death   | Katsuragi S <i>et al.</i>       | 2014 | American Journal of Obstetrics and Gynecology                     | Ineligible study design |

| <i>(Continued)</i>  |                                |      |   |                         |
|---|--------------------------------|------|---|-------------------------|
| Title   | Authors                        | Year | Journal   | Reason for exclusion    |
| Trends in maternal mortality in a Gambian tertiary health centre  | Idoko P <i>et al.</i>          | 2015 | International Journal of Gynecology and Obstetrics        | Ineligible study design |
| Risk for postpartum venous thromboembolism readmissions   | Wen T <i>et al.</i>            | 2018 | American Journal of Obstetrics and Gynecology             | Ineligible study design |
| Neonatal morbidity associated with duration of labor induction  | Teal EN <i>et al.</i>          | 2018 | Obstetrics and Gynecology                                 | Ineligible study design |
| Early-onset neonatal infection in Lithuania   | Tameliene R <i>et al.</i>      | 2015 | Journal of Pediatric and Neonatal Individualized Medicine | Ineligible study design |
| Risk and benefits of a natural cesarean section e a retrospective cohort study                                    | Posthuma S <i>et al.</i>       | 2015 | American Journal of Obstetrics and Gynecology             | Ineligible study design |
| Perinatal asphyxia in term infants and presence of changes in the serial cranial ultrasound: 1, 3 and 28 days old | Orozco Vargas NS <i>et al.</i> | 2011 | Journal of Perinatal Medicine                             | Ineligible study design |
| The impact of postpartum haemorrhage (PPH) on maternal morbidity  | Mackeen A and Khong SY         | 2013 | Journal of Health and Translational Medicine              | Ineligible study design |
| Epidemiological trends of neonatal sepsis in a county referral hospital in central Kenya                          | Le Geyt J and Hauck S          | 2016 | Archives of Disease in Childhood                          | Ineligible study design |
| Neonatal and maternal outcomes with prolonged second stage of labor   | Laughon SK <i>et al.</i>       | 2013 | American Journal of Obstetrics and Gynecology             | Ineligible study design |
| Obstetric admissions to critical care: a retrospective audit  | Lane S <i>et al.</i>           | 2019 | Journal of the Intensive Care Society                     | Ineligible study design |
| Neonatal jaundice and its main risk factors - a cross-sectional study   | Reis E Melo A <i>et al.</i>    | 2017 | Cogent Medicine   | Ineligible study design |
| An analysis of the obstetric admissions to the intensive care unit [ICU] in a large teaching hospital in the UK   | Saiq Z <i>et al.</i>           | 2012 | International Journal of Gynecology and Obstetrics        | Ineligible study design |
| High maternal mortality in Jigawa State, Northern Nigeria estimated using the sisterhood method                   | Sharma V <i>et al.</i>         | 2017 | BMC Pregnancy and Childbirth                              | Ineligible study design |
| Differences in infant and child mortality in 7 counties in North-rhein-Westfalia                                  | Shmuilovich N <i>et al.</i>    | 2011 | Rechtsmedizin   | Ineligible study design |
| Autopsy review of neonatal deaths by disseminated herpesvirus infection   | Sloan EA <i>et al.</i>         | 2016 | Laboratory Investigation                                  | Ineligible study design |
| A study of a clinical profile of secondary postpartum haemorrhage in Central Women Hospital (Yangon)              | Soe S <i>et al.</i>            | 2012 | BJOG  | Ineligible study design |
| Maternal mortality factors: a cross sectional study in 8 leading tertiary care hospitals of Lahore, Pakistan      | Zareen S and Mursalin SM       | 2015 | International Journal of Gynecology and Obstetrics        | Ineligible study design |

| <i>(Continued)</i>   |                                  |      |  |                         |
|--|----------------------------------|------|--|-------------------------|
| Title  | Authors                          | Year | Journal  | Reason for exclusion    |
| Maternal deaths due to amniotic fluid embolism. Results from the French confidential enquiry into maternal deaths, 2010-2012   | Morau E <i>et al.</i>            | 2018 | Anesthésie et Réanimation                          | Ineligible study design |
| Timing of delivery and pregnancy outcomes among laboring nulliparous women   | Tita A                           | 2010 | Reproductive Sciences                              | Ineligible study design |
| Maternal mortality in Ethiopia: most recent national MDSR data   | Usmael A <i>et al.</i>           | 2017 | BJOG   | Ineligible study design |
| Comparison of epidemiology and clinical characteristics of enterovirus and parechovirus central nervous system infections in infants during the first three weeks of life: a 6-year single-center retrospective study from 2011-2016 | Vaidyanathan V and Selvarangan R | 2017 | Annals of Neurology                                | Ineligible study design |
| Human fetal growth is constrained below optimal for perinatal survival   | Vasak B <i>et al.</i>            | 2015 | Ultrasound in Obstetrics and Gynecology            | Ineligible study design |
| Hypertension and pregnancy in Africa: a real challenge for the doctors with a great burden for the mothers and the newborns in Africa  | Toure IA                         | 2018 | Journal of Hypertension                            | Ineligible study design |
| Saving mother and newborns in Morropon Chulucanas, health region of Piura, Peru  | Trelles J <i>et al.</i>          | 2009 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Neonatal jaundice surveillance - are we winning?   | Yasmeen T <i>et al.</i>          | 2019 | Archives of Disease in Childhood                   | Ineligible study design |
| Clinical characteristics and outcomes of infants with group B streptococcus (GBS) infection in New South Wales (NSW)   | Yeo KT <i>et al.</i>             | 2015 | Journal of Paediatrics and Child Health            | Ineligible study design |
| Risk factors for venous thromboembolism during pregnancy and the puerperal period. A national cohort study including 900,000 pregnancies in Denmark 1995-2009  | Virkus R <i>et al.</i>           | 2012 | Acta Obstetrica et Gynecologica Scandinavica       | Ineligible study design |
| Etiologic and clinical features of bacterial meningitis in infants   | Vixüan CA <i>et al.</i>          | 2016 | BMC Infectious Diseases                            | Ineligible study design |
| Initial death notification results from the child health and mortality prevention surveillance (champs) Sierra Leone pilot phase, October 2017 to February 2018  | Worrell MC <i>et al.</i>         | 2018 | American Journal of Tropical Medicine and Hygiene  | Ineligible study design |
| Peripartum hemorrhage: Risk for readmission and costs  | Wen T <i>et al.</i>              | 2018 | Reproductive Sciences                              | Ineligible study design |
| The use of verbal autopsy to determine leading causes of neonatal death in rural Tibet   | Westmoreland K <i>et al.</i>     | 2011 | Journal of Investigative Medicine                  | Ineligible study design |
| Late maternal deaths: a neglected responsibility   | Sliwa K and Anthony J            | 2016 | Lancet   | Ineligible study design |
| Maternal near miss in a tertiary care hospital   | Sheriar Z and Patil S            | 2018 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Perinatal mortality in suba, bogota, colombia. For the year 2008   | Restrepo C <i>et al.</i>         | 2011 | Journal of Perinatal Medicine                      | Ineligible study design |

| <i>(Continued)</i>  |                             |      |  |                         |
|---|-----------------------------|------|--|-------------------------|
| Title   | Authors                     | Year | Journal  | Reason for exclusion    |
| Timing of maternal death: levels, trends, and ecological correlates using sibling data from 34 sub-Saharan African countries                        | Merdad L and Ali, MM        | 2018 | PLoS One   | Ineligible study design |
| The effect of timing of removal of wound dressing on surgical site infection rate after cesarean delivery   | Nesrallah M <i>et al.</i>   | 2017 | Obstetrics and Gynecology                          | Ineligible study design |
| Eclampsia: Incidence, effectiveness of magnesium sulphate and perinatal outcomes at Mpilo Central Hospital, Bulawayo, Zimbabwe                      | Ngwenya S                   | 2017 | BJOG   | Ineligible study design |
| Neonatal cause-of-death estimates for the early and late neonatal periods for 194 countries: 2000-2013  | Oza S <i>et al.</i>         | 2015 | Bulletin of the World Health Organization          | Ineligible study design |
| The burden of maternal critical care in 365 days at the university of portharcourt teaching hospital Nigeria  | Otokwala J                  | 2019 | Journal of the Intensive Care Society              | Ineligible study design |
| Maternal and perinatal post-cesarean morbidity and mortality in Benin in 2013   | Mongbo V <i>et al.</i>      | 2015 | Tropical Medicine and International Health         | Ineligible study design |
| Implementation and outcomes of a national maternal mortality monitoring system in Morocco 2008-2009   | Rachid B <i>et al.</i>      | 2011 | Tropical Medicine and International Health         | Ineligible study design |
| Maternal and perinatal outcomes in patients with acute pulmonary edema hospitalized in an intensive care unit                                       | Pordeus ACB <i>et al.</i>   | 2016 | Obstetrics and Gynecology                          | Ineligible study design |
| Evaluation of intensive care management on maternal and fetal outcome of severe preeclampsia and eclampsia (El-Minia maternity hospital experience) | Noreldin N <i>et al.</i>    | 2015 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Eclampsia in a third level Tunisian hospital: from January 2004 to December 2016  | Mouna K <i>et al.</i>       | 2018 | Annals of Intensive Care                           | Ineligible study design |
| Impact of hypertensive disorders of pregnancy on adverse outcomes: a 10-year retrospective double cohort study in Shanghai, China                   | Miaomiao Z and Li J         | 2016 | Journal of the American College of Cardiology      | Ineligible study design |
| Maternal mortality in an academic hospital in Sao Paulo, Brazil: 10 years experience  | Lopes C <i>et al.</i>       | 2009 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Estimation of daily risk of neonatal death, including the day of birth, in 186 countries in 2013: a vital-registration and modelling-based study    | Oza S <i>et al.</i>         | 2014 | Lancet Global health                               | Ineligible study design |
| Obstetric intensive care admissions in a London district general hospital between 2005-2011   | Ma L <i>et al.</i>          | 2014 | Journal of the Intensive Care Society              | Ineligible study design |
| Description of factors cause indirect death maternal in the district Lebak Banten Province in 2012  | Mariana A and Saefuddin H   | 2017 | Journal of Obstetrics and Gynaecology Research     | Ineligible study design |
| Early and late puerperal complications associated with the mode of delivery in a cohort in Brazil   | Mascarello KC <i>et al.</i> | 2018 | Brazilian Journal of Epidemiology                  | Ineligible study design |
| A review of postnatal readmissions to a busy obstetrics unit  | McClellan S <i>et al.</i>   | 2017 | BJOG   | Ineligible study design |

| <i>(Continued)</i>  |                             |      |  |                         |
|---|-----------------------------|------|--|-------------------------|
| Title   | Authors                     | Year | Journal  | Reason for exclusion    |
| Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000                             | Liu L <i>et al.</i>         | 2012 | Lancet   | Ineligible study design |
| Maternal safety in South East Asia  | Morris J                    | 2012 | Journal of Paediatrics and Child Health            | Ineligible study design |
| Causes of mortality in a Sierra Leonean district hospital neonatal unit   | Kirolos S and Sesay J       | 2018 | Archives of Disease in Childhood                   | Ineligible study design |
| Preeclampsia and the risk of renal disease  | Kristensen J <i>et al.</i>  | 2018 | Nephrology Dialysis Transplantation                | Ineligible study design |
| Caesarean sections in a national referral hospital in Ethiopia: Trends, predictors and outcomes   | Kuzma T                     | 2018 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Implementing Statewide Severe Maternal Morbidity Review: the Illinois Experience  | Koch AR <i>et al.</i>       | 2018 | Journal of Public Health Management and Practice   | Ineligible study design |
| Maternal and neonatal outcomes of American Indian and Alaskan Native women living on vs off-reservations in Washington state, 2003-2012                   | Lai J <i>et al.</i>         | 2015 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Risk factors for neonatal sepsis  | Lekic E <i>et al.</i>       | 2017 | Journal of Perinatal Medicine                      | Ineligible study design |
| A view from the UK: the UK and Ireland confidential enquiry into maternal deaths and morbidity  | Knight M and Tuffnell D     | 2018 | Clinical Obstetrics and Gynecology                 | Ineligible study design |
| Trends in postpartum hemorrhage in high resource countries: a review and recommendations from the International Postpartum Hemorrhage Collaborative Group | Knight M <i>et al.</i>      | 2009 | BMC Pregnancy and Childbirth                       | Ineligible study design |
| Obstetric hemorrhage management and maternal morbidity among non-Hispanic black women   | Jayaprakash P <i>et al.</i> | 2018 | Obstetrics and Gynecology                          | Ineligible study design |
| Perinatal mortality of the last twenty years in a tertiary Greek hospital   | Goudeli C <i>et al.</i>     | 2014 | Journal of Maternal-Fetal and Neonatal Medicine    | Ineligible study design |
| Evaluation of community maternal death surveillance and response in saving mothers, giving lives districts-Uganda, 2012-2013                              | Petersen E <i>et al.</i>    | 2015 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Medical complications associated with sepsis in obstetric patients  | Wood A <i>et al.</i>        | 2016 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Incidence and clinical presentation of invasive neonatal group B streptococcal infections in Germany  | Fluegge K <i>et al.</i>     | 2006 | Pediatrics   | Ineligible study design |
| Survival analysis in an obstetric intensive care unit, according diagnosis at admission   | Lopes AP <i>et al.</i>      | 2011 | Journal of Perinatal Medicine                      | Ineligible study design |
| Acute admission for neonatal jaundice screens: time for a rethink?  | Mirza M <i>et al.</i>       | 2017 | Archives of Disease in Childhood                   | Ineligible study design |

| <i>(Continued)</i>   |                               |      |  |                         |
|--|-------------------------------|------|--|-------------------------|
| Title  | Authors                       | Year | Journal  | Reason for exclusion    |
| Bangladesh's matlab safe motherhood programme-does it reduce stillbirths, early neonatal deaths and late neonatal deaths?  | Roy S and Ronsmans C          | 2012 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Severe maternal morbidity and mortality due to postpartum infection: a cross-sectional analysis from Rwanda  | Rulisa S <i>et al.</i>        | 2015 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Assessing maternal death causes in developing countries; comparing internal death audit to external confidential enquiries into maternal deaths at a referral hospital in tanzania | Sorensen BL                   | 2012 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| 138: Contemporary trends in adverse neonatal outcomes  | Stahl C-LV <i>et al.</i>      | 2019 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Time from diagnosis to hospitalization for preeclampsia (PE): Patient characteristics and outcomes in a multicenter nulliparous cohort   | Tita A                        | 2016 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Risk factors for readmission due to infection after cesarean delivery  | Kawakita T and Tefera E       | 2018 | Obstetrics and Gynecology                          | Ineligible study design |
| Maternal mortality in central India: where are we lacking?   | Kedar K                       | 2018 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Global, regional, and national levels of maternal mortality, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015  | Kassebaum NJ <i>et al.</i>    | 2016 | Lancet   | Ineligible study design |
| Maternal 'near miss' at Hospital Nacional Guido Valadares (HNGV) - An audit of maternal mortality and morbidity at a tertiary hospital in Timor-Leste                              | Jayaratanam S <i>et al.</i>   | 2017 | Journal of Obstetrics and Gynaecology Research     | Ineligible study design |
| Prognosis score and maternal outcome of eclampsia in a teaching hospital   | Jesmin Z                      | 2015 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| National, regional, and global levels and trends in neonatal mortality between 1990 and 2017, with scenario-based projections to 2030: a systematic analysis                       | Hug L <i>et al.</i>           | 2019 | Lancet Global Health                               | Ineligible study design |
| Stillbirths and neonatal deaths among women with postpartum haemorrhage: an analysis of rates and risks in the WOMAN trial   | Hough A <i>et al.</i>         | 2019 | BJOG   | Ineligible study design |
| Intentional search for maternal deaths in Mexico: sociodemographic disparities between indirect and direct obstetric deaths  | Hogan MC <i>et al.</i>        | 2015 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Publicly funded homebirth in Australia: a review of maternal and neonatal outcomes over 6 years  | Catling-Paull C <i>et al.</i> | 2013 | Medical Journal of Australia                       | Ineligible study design |
| 617: Predictors of maternal sepsis: a population-based cohort study  | Cassidy AG <i>et al.</i>      | 2019 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Delivery approach from 37 weeks of gestation in preeclampsia without gravity signals: Maternal and Neonatal Outcomes   | Ferreira L <i>et al.</i>      | 2018 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| Escaped maternal deaths in a remote district of Sri Lanka  | Fernando TRN                  | 2012 | BJOG   | Ineligible study design |



| <i>(Continued)</i>   |  |      |  |                         |
|--|--|------|--|-------------------------|
| Title  | Authors  | Year | Journal  | Reason for exclusion    |
| Glucose-6-phosphate dehydrogenase deficiency in neonatal hyperbilirubinemia: Hacettepe University experience                     | Celik HT <i>et al.</i>                         | 2010 | Early Human Development                                      | Ineligible study design |
| Time trends and causes of maternal mortality in Ceara State, Brazil from 2010 to 2014: necropsy study and lessons from pathology | CarneiroMelo J <i>et al.</i>                   | 2017 | Virchows Archiv  | Ineligible study design |
| Parto-analgesia and post-partum blood loss   | Driul L <i>et al.</i>                          | 2011 | Zeitschrift fur Geburtshilfe und Neonatologie                | Ineligible study design |
| Neonatal pneumonia in developing countries   | Duke T   | 2005 | Archives of Disease in Childhood                             | Ineligible study design |
| Induction of labor for gestational hypertension at term: a look at outcomes  | Durst J <i>et al.</i>                          | 2015 | American Journal of Obstetrics and Gynecology                | Ineligible study design |
| Timing of uterine tamponade and associated morbidity in patients with stage 3 postpartum hemorrhage                              | Ernst A <i>et al.</i>                          | 2018 | Obstetrics and Gynecology                                    | Ineligible study design |
| Postpartum readmission and severe maternal morbidity in California   | Girsen AI <i>et al.</i>                        | 2017 | American Journal of Obstetrics and Gynecology                | Ineligible study design |
| 258: Impact of implementing an obstetric hemorrhage consensus bundle in a large health system                                    | Hacker FM <i>et al.</i>                        | 2019 | American Journal of Obstetrics and Gynecology                | Ineligible study design |
| Maternal and neonatal complications of severe preeclampsia: Preliminary prospective study  | Garcia Garcia C <i>et al.</i>                  | 2012 | European Journal of Anaesthesiology                          | Ineligible study design |
| Maternal death audit reviews at three hospitals in Uganda  | Frank K <i>et al.</i>                          | 2012 | International Journal of Gynecology and Obstetrics           | Ineligible study design |
| Fetal and neonatal deaths-evaluation of prevention, quality and shortcomings in newborn and maternal health care                 | Fonseca C <i>et al.</i>                        | 2016 | European Journal of Pediatrics                               | Ineligible study design |
| Incidence and causes of maternal mortality in Montenegro   | Colakovic-Popovic V <i>et al.</i>              | 2011 | Journal of Perinatal Medicine                                | Ineligible study design |
| Unprecedented rates of PPH: a prospective observational cohort study of blood loss in childbirth (the stop study)                | Briley A <i>et al.</i>                         | 2012 | Archives of Disease in Childhood: Fetal and Neonatal Edition | Ineligible study design |
| Serious peripartum complications needing admission in obstetrical ICU: retrospective study about 127 cases                       | Brahim A <i>et al.</i>                         | 2016 | Annals of Intensive Care                                     | Ineligible study design |
| Does an increasing elective caesarean section rate protect against hypoxic ischaemic encephalopathy?                             | Battersby AH and Morris SA                     | 2015 | Journal of Paediatrics and Child Health                      | Ineligible study design |
| Prolonged jaundice in infants  | Cartledge P and McClean P                      | 2009 | Community Practitioner                                       | Ineligible study design |
| Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions               | Countdown Coverage Writing Group <i>et al.</i> | 2008 | Lancet   | Ineligible study design |

| <i>(Continued)</i>   |                              |      |  |                         |
|--|------------------------------|------|--|-------------------------|
| Title  | Authors                      | Year | Journal  | Reason for exclusion    |
| Impact of maternal age and parity in management and outcome of major obstetric haemorrhage   | Oconnor H <i>et al.</i>      | 2012 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Maternal mortality in tertiary care centre-3-year study  | Sangabathula H <i>et al.</i> | 2014 | BJOG   | Ineligible study design |
| Cause-specific mortality at INDEPTH Health and Demographic Surveillance System Sites in Africa and Asia: concluding synthesis                    | Sankoh O and Byass P         | 2014 | Global Health Action                               | Ineligible study design |
| Obstetric admissions to the intensive care unit: the role of preeclampsia  | Sass N <i>et al.</i>         | 2010 | Pregnancy Hypertension                             | Ineligible study design |
| Maternal death surveillance and response: opportunities to reduce maternal mortality in Uganda   | Serbanescu F <i>et al.</i>   | 2018 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| An audit of primary postpartum haemorrhage at tertiary care hospital   | Shafi F <i>et al.</i>        | 2013 | BJOG   | Ineligible study design |
| Maternal admissions to critical care - A 10 year review  | Anderson FJ and Joss JA      | 2011 | International Journal of Obstetric Anesthesia      | Ineligible study design |
| National audit of maternal morbidity in Scotland   | Cameron A                    | 2013 | Journal of Perinatal Medicine                      | Ineligible study design |
| What is the most appropriate timing for prophylactic antibiotics during caesarean section? A literature review                                   | Baker H <i>et al.</i>        | 2018 | BJOG   | Ineligible study design |
| Incidence, characteristics and outcomes of pregnancy-related critical illness over time in Canada  | Aoyama K <i>et al.</i>       | 2012 | Intensive Care Medicine                            | Ineligible study design |
| Induction for nonmedical indications compared with expectant management  | Bailit J                     | 2014 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Biochemical changes in eclampsia patients in a tertiary level hospital of Bangladesh   | Banu L                       | 2009 | International Journal of Gynecology and Obstetrics | Ineligible study design |
| A 5 years review of maternal mortality in FMH  | Ambreen A <i>et al.</i>      | 2015 | BJOG   | Ineligible study design |
| Perinatal mortality rate of Kutahya province and the analysis of etiological factors, Turkey   | Aksaz Z <i>et al.</i>        | 2010 | Journal of Maternal-Fetal and Neonatal Medicine    | Ineligible study design |
| Reduction of maternal and fetal mortality and morbidity in hospitals in Nigeria by quality management in obstetrics - Results of a pilot project | Adams S <i>et al.</i>        | 2012 | Journal of Maternal-Fetal and Neonatal Medicine    | Ineligible study design |
| 283: Maternal sepsis and associated mortality: a populationbased cohort of 13 million births   | Akim V <i>et al.</i>         | 2019 | American Journal of Obstetrics and Gynecology      | Ineligible study design |
| Rates of postpartum hemorrhage and related interventions: United States, 2000-2012   | Ahmadzia HK <i>et al.</i>    | 2016 | American Journal of Obstetrics and Gynecology      | Ineligible study design |

| <i>(Continued)</i>   |   |      |  |                         |
|--|---|------|--|-------------------------|
| Title  | Authors                                 | Year | Journal  | Reason for exclusion    |
| Hypoxic ischaemic encephalopathy in a tertiary obstetric unit: a review of the obstetric, anaesthetic and neonatal factors   | Agarwal DK <i>et al.</i>                | 2015 | International Journal of Obstetric Anesthesia      | Ineligible study design |
| Clinical and epidemiological aspects of stroke associated with pregnancy and the puerperium  | Abassova G <i>et al.</i>                | 2017 | Journal of the Neurological Sciences               | Ineligible study design |
| Epidemiology of neonatal jaundice at the University Hospital of the West Indies  | Henny-Harry C and Trotman H             | 2012 | West Indian Medical Journal                        | Ineligible time frame   |
| Changes in incidence and etiology of early-onset neonatal infections 1997-2017 - a retrospective cohort study in western Sweden  | Johansson Gudjonsdottir M <i>et al.</i> | 2019 | BMC Pediatrics                                     | Ineligible time frame   |
| Verbal autopsy to ascertain causes of neonatal deaths in a community setting: a study from Morang, Nepal   | Khana S <i>et al.</i>                   | 2011 | Journal of the Nepal Medical Association           | Ineligible time frame   |
| Determinants of neonatal mortality in Pakistan: secondary analysis of Pakistan Demographic and Health Survey 2006-07   | Nisar YB <i>et al.</i>                  | 2014 | BMC Public Health                                  | Ineligible time frame   |
| Determinants of neonatal mortality in Indonesia  | Titaley CR <i>et al.</i>                | 2008 | BMC Public Health                                  | Ineligible time frame   |
| Association of unexpected newborn deaths with changes in obstetric and neonatal process of care  | Han D <i>et al.</i>                     | 2020 | JAMA Network Open                                  | Ineligible time frame   |
| Screening for early-onset invasive group B Streptococcal disease in neonates in an Irish hospital (2001-2014): a retrospective audit   | Nielsen M <i>et al.</i>                 | 2017 | Infectious Diseases                                | Ineligible time frame   |
| Challenge of reducing perinatal mortality in rural Congo: findings of a prospective, population-based study  | Matendo RM <i>et al.</i>                | 2011 | Journal of Health, Population and Nutrition        | Ineligible time frame   |
| Causes of community stillbirths and early neonatal deaths in low-income countries using  | Engmann C <i>et al.</i>                 | 2012 | Journal of Perinatology                            | Ineligible time frame   |
| Stillbirths and early neonatal mortality in rural Northern Ghana   | Engmann C <i>et al.</i>                 | 2012 | Tropical Medicine and International Health         | Ineligible time frame   |
| Surveillance of surgical site infection after cesarean section and time of notification  | Lima J <i>et al.</i>                    | 2016 | American Journal of Infection Control              | Ineligible time frame   |
| Maternal and obstetric factors associated with delayed postpartum eclampsia: a national study population   | Kayem G <i>et al.</i>                   | 2011 | Acta obstetrica et gynecologica Scandinavica       | Ineligible time frame   |
| Clinical course, associated factors, and blood pressure profile of delayed-onset postpartum preeclampsia   | Redman EK <i>et al.</i>                 | 2019 | Obstetrics and Gynecology                          | Ineligible time frame   |
| Early post partum discharge: is it possible?   | Sadeh-Mestechkin D <i>et al.</i>        | 2007 | Archives of Gynecology and Obstetrics              | Ineligible time frame   |
| Les morts maternelles en France: mieux comprendre pour mieux prévenir  | INSERM Sante Publique France            | 2017 | INSERM Sante Publique France                       | Ineligible time frame   |
| Causes and timing of maternal death in Mizan, Āi Tepi university teaching and Bonga general hospital from 2011-2015: a case control study and using propensity score matching analysis | Dadi TL <i>et al.</i>                   | 2017 | Open Public Health Journal                         | Ineligible time frame   |
| Saving lives, improving mother's care report   | Knight M <i>et al.</i>                  | 2015 | Midwifery  | Ineligible time frame   |
| The WOMAN trial: clinical and contextual factors surrounding the deaths of 483 women following post-partum haemorrhage in developing countries   | Picetti R <i>et al.</i>                 | 2020 | BMC Pregnancy and Childbirth                       | Ineligible time frame   |
| Have maternal mortalities been decreased since last decade with improving maternity care?  | Işık H <i>et al.</i>                    | 2016 | Journal of Clinical and Analytical Medicine        | Ineligible time frame   |
| Epidemiology of pregnancy-associated pulmonary embolism in South Asian multi-ethnic country: mortality trends over the last four decades   | Tan TC <i>et al.</i>                    | 2021 | The Journal of Obstetrics and Gynaecology Research | Ineligible time frame   |
| Review of causes of maternal deaths in Botswana in 2010  | Ray S <i>et al.</i>                     | 2013 | South African Medical Journal                      | Ineligible time frame   |

| <i>(Continued)</i>  |                                    |      |  |                       |
|---|------------------------------------|------|--|-----------------------|
| Title   | Authors                            | Year | Journal  | Reason for exclusion  |
| Effect of training traditional birth attendants on neonatal mortality (Lufwanyama Neonatal Survival Project): randomised controlled study   | Gill CJ <i>et al.</i>              | 2011 | BMJ  | Ineligible time frame |
| Etiologies and contributing factors of perinatal mortality: a report from southeast of Iran   | Hadavi M <i>et al.</i>             | 2011 | Taiwanese Journal of Obstetrics and Gynecology         | Ineligible time frame |
| [Application of the international classification of diseases for perinatal mortality (icd-pm) to vital statistics records for the purpose of classifying perinatal deaths in Antioquia, Colombia]           | Salazar-Barrientos M <i>et al.</i> | 2019 | Revista colombiana de obstetricia y ginecologia        | Ineligible time frame |
| Risk factors and isolated microorganisms in patients with neonatal sepsis   | Morales LP <i>et al.</i>           | 2021 | Medisur Revista de Ciencias Médicas en Cienfuegos      | Ineligible time frame |
| Neonatal mortality within 24 hours of birth in six low- and lower-middle-income countries   | Baqui AH <i>et al.</i>             | 2016 | Bulletin of the World Health Organization              | Ineligible time frame |
| Maternal and perinatal outcomes by planned place of birth in Australia 2000-2012: a linked population data study  | Homer CSE <i>et al.</i>            | 2019 | BMJ Open   | Ineligible time frame |
| Trend in infant mortality rate caused by sepsis in Brazil from 2009 to 2018   | Rodrigues LDS <i>et al.</i>        | 2021 | Revista do Instituto de Medicina Tropical de Sao Paulo | Ineligible time frame |
| The impact of implementing the 2016 WHO Recommendations on Antenatal Care for a Positive Pregnancy Experience on perinatal deaths: an interrupted time-series analysis in Mpumalanga province, South Africa | Lavin T <i>et al.</i>              | 2020 | BMJ Global Health                                      | Ineligible time frame |
| The application of WHO ICD-PM: Feasibility for the classification of timing and causes of perinatal deaths in a busy birth centre in a low-income country   | Housseine N <i>et al.</i>          | 2021 | PLoS One   | Ineligible time frame |
| Trends, patterns and cause-specific neonatal mortality in Tanzania: a hospital-based retrospective survey   | Mangu CD <i>et al.</i>             | 2020 | International Health                                   | Ineligible time frame |
| Neonatal mortality in the urban and rural China between 1996 and 2013: a retrospective study  | Lu R <i>et al.</i>                 | 2016 | Pediatric Research                                     | Ineligible time frame |
| Neonatal mortality and causes of death in Kersa Health and Demographic Surveillance System (Kersa HDSS), Ethiopia, 2008-2013  | Assefa N <i>et al.</i>             | 2016 | Maternal Health, Neonatology and Perinatology          | Ineligible time frame |
| Trend and causes of neonatal mortality in the Kassena-Nankana district of northern Ghana, 1995-2002   | Baiden F <i>et al.</i>             | 2006 | Tropical Medicine and International Health             | Ineligible time frame |
| [Perinatal mortality at Hospital de Ginecoobstetricia No. 23 of Monterrey, Nuevo Leon, 2002-2006 period]  | Gutierrez Saucedo ME <i>et al.</i> | 2008 | Ginecologia y obstetricia de Mexico                    | Ineligible time frame |
| A case series study of perinatal deaths at one referral center in rural post-conflict Liberia   | Lori JR <i>et al.</i>              | 2014 | Maternal and Child Health Journal                      | Ineligible time frame |
| Neonatal mortality in Argentina. Situation analysis from 2005 to 2014   | Finkelstein JZ <i>et al.</i>       | 2017 | Archivos argentinos de pediatria                       | Ineligible time frame |
| Tracking progress on the health status and service delivery outcomes for neonates and children in the metro west geographic service area of the cape metropole, 2010 - 2015                                 | Hendricks MK <i>et al.</i>         | 2019 | South African Journal of Child Health                  | Ineligible time frame |
| Prospective community-based cluster census and case-control study of stillbirths and neonatal deaths in the West Bank and Gaza Strip  | Kalter HD <i>et al.</i>            | 2008 | Paediatric and Perinatal Epidemiology                  | Ineligible time frame |
| Maldives Health Statistics 2015-16  | Ministry of Health                 | 2019 | Ministry of Health Report                              | Ineligible time frame |
| The study of etiological and demographic characteristics of neonatal mortality and morbidity - a consecutive case series study from Pakistan  | Manzar N <i>et al.</i>             | 2012 | BMC Pediatrics   | Ineligible time frame |

| <i>(Continued)</i>  |                              |      |  |                       |
|---|------------------------------|------|--|-----------------------|
| Title   | Authors                      | Year | Journal  | Reason for exclusion  |
| Differences in mortality between late-preterm and term singleton infants in the United States, 1995-2002  | Tomashek KM <i>et al.</i>    | 2007 | Journal of Pediatrics  | Ineligible time frame |
| Neonatal mortality in Sri Lanka: timing, causes and distribution  | Rajindrajith S <i>et al.</i> | 2009 | Journal of Maternal-Fetal and Neonatal Medicine                    | Ineligible time frame |
| Neonatal mortality in rural Bangladesh: an exploratory study  | Chowdhury ME <i>et al.</i>   | 2005 | Journal of Health, Population and Nutrition                        | Ineligible time frame |
| Why do neonates die in rural Gadchiroli, India? (Part I): Primary causes of death assigned by neonatologist based on prospectively observed records | Bang AT <i>et al.</i>        | 2005 | Journal of Perinatology  | Ineligible time frame |
| The Egypt national perinatal/neonatal mortality study 2000  | Campbell O <i>et al.</i>     | 2004 | Journal of Perinatology  | Ineligible time frame |
| [Verbal autopsy to measure maternal mortality in rural Senegal]   | Ba MG <i>et al.</i>          | 2003 | Journal de gynecologie, obstetrique et biologie de la reproduction | Ineligible time frame |
| Postpartum invasive group A streptococcal disease in the modern era   | Aronoff DM and Mulla ZD      | 2008 | Infectious Diseases in Obstetrics and Gynecology                   | Ineligible time frame |
| Postpartum stroke: a twenty-year experience   | Witlin AG <i>et al.</i>      | 2000 | American Journal of Obstetrics and Gynecology                      | Ineligible time frame |
| Jaundice noted in the first 24 hours after birth in a managed care organization   | Newman TB <i>et al.</i>      | 2002 | Archives of Pediatrics and Adolescent Medicine                     | Ineligible time frame |
| Expectant management of early onset, severe pre-eclampsia: maternal outcome   | Hall DR <i>et al.</i>        | 2000 | BJOG   | Ineligible time frame |
| Risk of death following pregnancy in rural Nepal  | Pradhan EK <i>et al.</i>     | 2002 | Bulletin of the World Health Organization                          | Ineligible time frame |
| Maternal and fetal risks associated with prolonged latent phase of labour   | Maghoma J and Buchmann EJ    | 2002 | Journal of Obstetrics and Gynaecology                              | Ineligible time frame |
| Maternal mortality in a tertiary care teaching hospital   | Akbar N <i>et al.</i>        | 2002 | Journal of the College of Physicians and Surgeons Pakistan         | Ineligible time frame |
| One year survey of maternal mortality associated with eclampsia in Dhaka Medical College Hospital   | Hussain F <i>et al.</i>      | 2000 | Journal of Obstetrics and Gynaecology                              | Ineligible time frame |
| Can improvements in breast-feeding practices reduce neonatal mortality in developing countries?   | Huffman SL <i>et al.</i>     | 2001 | Midwifery  | Ineligible time frame |
| Maternal mortality: only 42 days?   | Hoj L <i>et al.</i>          | 2003 | BJOG   | Ineligible time frame |
| Association between duration of neonatal hospital stay and morbidity in the first month of life   | Hatzidaki EG <i>et al.</i>   | 2001 | Clinical and Experimental Obstetrics and Gynecology                | Ineligible time frame |
| No increase in rates of early-onset neonatal sepsis by antibiotic-resistant group B Streptococcus in the era of intrapartum antibiotic prophylaxis  | Chen KT <i>et al.</i>        | 2005 | American Journal of Obstetrics and Gynecology                      | Ineligible time frame |
| An epidemiological survey on neonatal jaundice in China   | Ding G <i>et al.</i>         | 2001 | Chinese Medical Journal  | Ineligible time frame |
| Factors affecting perinatal mortality in India (perinatal audit)  | Shah D <i>et al.</i>         | 2000 | Prenatal and Neonatal Medicine                                     | Ineligible time frame |
| Follow-up interviews after eclampsia  | Andersgaard AB <i>et al.</i> | 2009 | Gynecologic and Obstetric Investigation                            | Ineligible time frame |
| Neonatal sepsis: an etiological study   | Anwer SK <i>et al.</i>       | 2000 | Journal of the Pakistan Medical Association                        | Ineligible time frame |

| <i>(Continued)</i>  |                            |      |  |                               |
|---|----------------------------|------|--|-------------------------------|
| Title   | Authors                    | Year | Journal  | Reason for exclusion          |
| Postpartum haemorrhage in nulliparous women: incidence and risk factors in low and high risk women. A Dutch populationbased cohort study on standard (> or = 500 ml) and severe (> or = 1000 ml) postpartum haemorrhage | Bais MJM <i>et al.</i>     | 2004 | European Journal of Obstetrics, Gynecology, and Reproductive Biology | Ineligible time frame         |
| Incidence and risk factors of neonatal infections in a rural Bangladeshi population: a community-based prospective study  | Mitra DK <i>et al.</i>     | 2018 | Journal of Health, Population and Nutrition                          | Reported on neonatal outcomes |
| When, where, and why are babies dying? Neonatal death surveillance and review in Bangladesh   | Halim A <i>et al.</i>      | 2016 | PLoS One   | Reported on neonatal outcomes |
| Infant mortality in Cabinda, Angola: challenge to health public policies  | Simao R and Gallo PR       | 2013 | Brazilian Journal of Epidemiology                                    | Reported on neonatal outcomes |
| Rate, risk factors, and causes of neonatal deaths in Jordan: analysis of data from Jordan Stillbirth and Neonatal Surveillance System (JSANDS)  | Al-Sheyab NA <i>et al.</i> | 2020 | Frontiers in Public Health   | Reported on neonatal outcomes |
| Dangers of death on the first day of life by the minute   | Auger N <i>et al.</i>      | 2015 | Journal of Perinatology  | Reported on neonatal outcomes |
| Stillbirths and newborn deaths in slum settlements in Mumbai, India: a prospective verbal autopsy study   | Bapat U <i>et al.</i>      | 2012 | BMC Pregnancy and Childbirth   | Reported on neonatal outcomes |
| Rates, timing and causes of neonatal deaths in rural India: implications for neonatal health programmes   | Baqui AH <i>et al.</i>     | 2006 | Bulletin of the World Health Organization                            | Reported on neonatal outcomes |
| Level, causes and risk factors of neonatal mortality, in Jordan: results of a National Prospective Study  | Batieha AM <i>et al.</i>   | 2016 | Maternal and Child Health Journal                                    | Reported on neonatal outcomes |
| Neonatal death in low- to middle-income countries: a global network study   | Belizan JM <i>et al.</i>   | 2012 | American Journal of Perinatology                                     | Reported on neonatal outcomes |
| Why gone too soon? Examining social determinants of neonatal deaths in northwest Ethiopia using the three delay model approach  | Bogale TN <i>et al.</i>    | 2017 | BMC Pediatrics   | Reported on neonatal outcomes |
| Causes of neonatal deaths in a rural subdistrict of Bangladesh: implications for intervention   | Chowdhury HR <i>et al.</i> | 2010 | Journal of Health, Population, and Nutrition                         | Reported on neonatal outcomes |
| Neonatal group B streptococcal infection: a 7-year experience   | Chung M-Y <i>et al.</i>    | 2004 | Chang Gung Medical Journal   | Reported on neonatal outcomes |
| A prospective study on neonatal mortality and its predictors in a rural area in Burkina Faso: can MDG-4 be met by 2015  | Diallo AH <i>et al.</i>    | 2011 | Journal of Perinatology  | Reported on neonatal outcomes |
| Aetiology of stillbirths and neonatal deaths in rural Ghana: implications for health programming in developing countries  | Edmond K <i>et al.</i>     | 2008 | Paediatric and Perinatal Epidemiology                                | Reported on neonatal outcomes |
| Cause-specific neonatal mortality: analysis of 3772 neonatal deaths in Nepal, Bangladesh, Malawi and India  | Fottrell E <i>et al.</i>   | 2015 | Archives of Disease in Childhood                                     | Reported on neonatal outcomes |
| Trends and risk factors for neonatal mortality in Butajira District, South Central Ethiopia, (1987-2008): a prospective cohort study  | Gizaw M <i>et al.</i>      | 2014 | BMC Pregnancy and Childbirth   | Reported on neonatal outcomes |

| <i>(Continued)</i>  |                                |      |   |                               |
|---|--------------------------------|------|---|-------------------------------|
| Title   | Authors                        | Year | Journal                                   | Reason for exclusion          |
| Annual trend of neonatal mortality and its underlying causes: population-based study - Sao Paulo State, Brazil, 2004-2013   | Guinsburg R <i>et al.</i>      | 2021 | BMC Pediatrics                            | Reported on neonatal outcomes |
| Neonatal mortality trend at the University Clinic of Gynecology and Obstetrics-SKOPJE in the period of 2011-2017  | Ivanova GB and Bushinoska J    | 2020 | Journal of Dental and Medical Sciences    | Reported on neonatal outcomes |
| Neonatal mortality, risk factors and causes: a prospective population-based cohort study in urban Pakistan  | Jehan I <i>et al.</i>          | 2009 | Bulletin of the World Health Organization | Reported on neonatal outcomes |
| Causes of neonatal and maternal deaths in Dhaka slums: Implications for service delivery  | Khatun F <i>et al.</i>         | 2012 | BMC Public Health                         | Reported on neonatal outcomes |
| Investigating causes of perinatal mortality by verbal autopsy in Maharashtra, India   | Kulkarni R <i>et al.</i>       | 2007 | Indian Journal of Community Medicine      | Reported on neonatal outcomes |
| Neonatal survival and determinants of mortality in Aroresa district, Southern Ethiopia: a prospective cohort study  | Limaso AA <i>et al.</i>        | 2020 | BMC Pediatrics                            | Reported on neonatal outcomes |
| Survival of neonates and predictors of their mortality in Tigray region, Northern Ethiopia: prospective cohort study  | Mengesha HG <i>et al.</i>      | 2016 | BMC Pregnancy and Childbirth              | Reported on neonatal outcomes |
| Neonatal mortality and its determinates in public hospitals of Gamo and Gofa zones, southern Ethiopia: prospective follow up study  | Mersha A <i>et al.</i>         | 2019 | BMC Pediatrics                            | Reported on neonatal outcomes |
| Incidence and risk factors for newborn umbilical cord infections on Pemba Island, Zanzibar, Tanzania  | Mullany LC <i>et al.</i>       | 2009 | Pediatric Infectious Disease Journal      | Reported on neonatal outcomes |
| Fetal and Infant Deaths 2008 and 2009   | New Zealand Ministry of Health | 2012 | Ministry of Health Report                 | Reported on neonatal outcomes |
| Causes of neonatal death: results from NeokIP communitybased trial in Quang Ninh province, Vietnam  | Nga NT <i>et al.</i>           | 2012 | Acta paediatrica                          | Reported on neonatal outcomes |
| Neonatal morbidity and mortality in tribal and rural communities in Central India   | Niswade A <i>et al.</i>        | 2011 | Indian Journal of Community Medicine      | Reported on neonatal outcomes |
| Verbal autopsy to determine the timing and causes of infant deaths in the northern state of India   | Parashar A <i>et al.</i>       | 2017 | Current Pediatric Research                | Reported on neonatal outcomes |
| Maternal and Perinatal Mortality Study 2007   | Muchinsky PM                   | 2009 | Ministry of Health Report                 | Reported on neonatal outcomes |
| Prevalence of clinical signs of possible serious bacterial infection and mortality associated with them from population-based surveillance of young infants from birth to 2 months of age | Puri D <i>et al.</i>           | 2021 | PLoS One                                  | Reported on neonatal outcomes |
| Age profile of neonatal deaths  | Rasaily R                      | 2008 | Indian Pediatrics                         | Reported on neonatal outcomes |
| A prospective study of maternal, fetal and neonatal deaths in low- and middle-income countries  | Saleem S <i>et al.</i>         | 2014 | Bulletin of the World Health Organization | Reported on neonatal outcomes |

| <i>(Continued)</i>   |                             |      |   |                                       |
|--|-----------------------------|------|---|---------------------------------------|
| Title  | Authors                     | Year | Journal   | Reason for exclusion                  |
| Neonatal deaths in infants born weighing $\geq$ 2500 g in low and middle-income countries                                | Saleem S <i>et al.</i>      | 2020 | Reproductive Health                             | Reported on neonatal outcomes         |
| Using three delays model to understand the social factors responsible for neonatal deaths in rural Haryana, India        | Upadhyay RP <i>et al.</i>   | 2013 | Journal of Tropical Pediatrics                  | Reported on neonatal outcomes         |
| Using the three delays model to understand why newborn babies die in eastern Uganda                                      | Waiswa P <i>et al.</i>      | 2010 | Tropical Medicine and International Health      | Reported on neonatal outcomes         |
| Why are babies dying in the first month after birth? A 7-year study of neonatal mortality in northern Ghana              | Welaga P <i>et al.</i>      | 2013 | PLoS One  | Reported on neonatal outcomes         |
| Perinatal mortality audit: North Macedonia 2019  | World Health Organization   | 2021 | Report  | Reported on neonatal outcomes         |
| Maternal and neonatal mortality in South-West Ethiopia: estimates and socio-economic inequality                          | Yaya Y <i>et al.</i>        | 2014 | PLoS One  | Reported on neonatal outcomes         |
| Neonatal mortality of Inborns in the neonatal unit of a tertiary centre in Lagos, Nigeria                                | Ekure E <i>et al.</i>       | 2008 | Nigerian Quarterly Journal of Hospital Medicine | Reports not retrieved                 |
| Risk factors associated with mortality in the neonatal nosocomial infection  | Coria Lorenzo <i>et al.</i> | 2005 | Saludarte                                       | Reports not retrieved                 |
| Medical audit for the neonatal unit of Dhaka Medical College Hospital  | Afroza S <i>et al.</i>      | 2001 | Perinatology                                    | Reports not retrieved                 |
| Risk factors for neonatal sepsis   | Qureshi D <i>et al.</i>     | 2010 | Medical Forum Monthly                           | Reports not retrieved                 |
| Timing and risk factors of maternal complications of cesarean section  | Hadar E <i>et al.</i>       | 2011 | Archives of Gynecology and Obstetrics           | Unclear data, no response from author |
| Cerebrovascular complications during pregnancy and postpartum: clinical and prognosis observations in 240 Hispanic women | Cantu-Brito C <i>et al.</i> | 2011 | European Journal of Neurology                   | Unclear data, no response from author |



**Appendix III: Data extraction form**

**Section 1: Overview**

Research assistant: \_\_\_\_\_ Date: \_\_\_\_\_  
 Title of paper: \_\_\_\_\_  
 Year of paper: \_\_\_\_\_  
 Authors: \_\_\_\_\_  
 Journal: \_\_\_\_\_

**Section 2: Study description**

Study objective: \_\_\_\_\_  
 Study design: \_\_\_\_\_  
 Time period of data collection: \_\_\_\_\_  
 Country: \_\_\_\_\_ Sub-location (if applicable): \_\_\_\_\_  
 Data sources (please provide details from study for selected sources, copy/paste details):  
 Hospital/health center data:  
 Verbal autopsy:  
 National data:  
 Other:  
 Not reported  
 Maternal inclusion criteria  Not reported  
 Setting description (eg, rural/urban)  Not reported

Demographic information

*Please provide information on the following items as described in the study, if available. Use text box to enter data as reported in the study.*

|  |                                       |                               |                                       |                                       |
|--|---------------------------------------|-------------------------------|---------------------------------------|---------------------------------------|
| Gestational age                              | Mean                                  | SD                            | Range                                 |                                       |
| <input type="checkbox"/> Not reported        |                                       |                               |                                       |                                       |
| Age of mother                                | Mean                                  | Median                        | SD                                    | Range                                 |
| <input type="checkbox"/> Not reported        |                                       |                               |                                       |                                       |
| % of birth type                              | Vaginal                               | Caesarean section             | <input type="checkbox"/> Not reported |                                       |
| Location of birth                            | <input type="checkbox"/> Hospital     | <input type="checkbox"/> Home | <input type="checkbox"/> Both         | <input type="checkbox"/> Not reported |
| Frequency of antenatal visits                | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Total number of live births/deliveries       | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Total number of newborn deaths               | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Total number of maternal deaths              | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Length of time in hospital/time to discharge | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Was discharge education provided?            | <input type="checkbox"/> Yes          | <input type="checkbox"/> No   | <input type="checkbox"/> Not reported |                                       |
| If Yes/No, provide details:                  |                                       |                               |                                       |                                       |
| Readmission timing                           | <input type="checkbox"/> Not reported |                               |                                       |                                       |
| Study reported recommendations/conclusions   |                                       |                               |                                       |                                       |

**Section 3: Maternal mortality**

Is maternal mortality reported?  Yes  No (if no, skip to section 4)

Maternal mortality definition:  Not reported

Is reporting overall or cause specific:  Overall  Cause-specific  Both

**Overall timing:**

Please report this outcome only if information is provided specifically on overall total mortality (could be either overall or summary of specific causes if reported by study).

Not reported

| Timing                             | n/N | % |
|------------------------------------|-----|---|
| 0-1 day (first day)                |     |   |
| 1-7 days (first week)              |     |   |
| 7-28 days (first month)            |     |   |
| 8-42 days (late postpartum period) |     |   |

Mean =            SD =            Range =  
 Timing =        Hourly            Daily            Weekly

If study reports data differently than above, please provide additional details or information reported in the study that does not fit into above table:

**Cause-specific timing:**

Please enter data as study reports (ie, n/N, %, mean/standard deviation, etc). Please provide additional details in text box below if necessary. If study does not report on first day/early/late breakdown, please provide information in text box below instead. If study does not report on a specific outcome for a timing (ie, first day), please put NR in that column.

Not reported

| Direct cause                    | First day | First week<br>(1-7 days) | First month<br>(8-28 days) | Late postpartum<br>(8-42) |
|---------------------------------|-----------|--------------------------|----------------------------|---------------------------|
| Sepsis                          |           |                          |                            |                           |
| Postpartum hemorrhage           |           |                          |                            |                           |
| Postpartum preeclampsia         |           |                          |                            |                           |
| Stroke                          |           |                          |                            |                           |
| Venous thromboembolism<br>(VTE) |           |                          |                            |                           |
| Fever                           |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |

If study reports data differently than above, please provide additional details or information reported in the study that does not fit into above table:

If there is any additional relevant information, please include it here:

**Section 4: Maternal morbidity**

- Is maternal morbidity reported?  Yes  No (if no, complete)
- Maternal morbidity definition:  Not reported
- Is reporting overall or cause specific:  Overall  Cause-specific  Both

Overall timing:

*Please report this outcome only if information is provided specifically on overall total mortality (could be either overall or summary of specific causes if reported by study).*

Not reported

| Timing                             | n/N    | %       |
|------------------------------------|--------|---------|
| 0-1 day (first day)                |        |         |
| 1-7 days (first week)              |        |         |
| 8-28 days (first month)            |        |         |
| 8-42 days (late postpartum period) |        |         |
| Mean =                             | SD =   | Range = |
| Timing =                           | Hourly | Daily   |
|                                    |        | Weekly  |

If study reports data differently than above, please provide additional details or information reported in the study that does not fit into above table:

Cause-specific timing:

*Please enter data as study reports (ie, n/N, %, mean/standard deviation, etc). Please provide additional details in text box below if necessary. If study does not report on first day/early/late breakdown, please provide information in text box below instead. If study does not report on a specific outcome for a timing (ie, first day), please put NR in that column.*

Not reported

| Direct cause                    | First day | First week<br>(1-7 days) | First month<br>(8-28 days) | Late postpartum<br>(8-42) |
|---------------------------------|-----------|--------------------------|----------------------------|---------------------------|
| Sepsis                          |           |                          |                            |                           |
| Postpartum hemorrhage           |           |                          |                            |                           |
| Postpartum preeclampsia         |           |                          |                            |                           |
| Stroke                          |           |                          |                            |                           |
| Venous thromboembolism<br>(VTE) |           |                          |                            |                           |
| Fever                           |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |
| Other:                          |           |                          |                            |                           |

If study reports data differently than above, please provide additional details or information reported in the study that does not fit into above table:

If there is any additional relevant information, please include it here:

### Appendix IV: Timing of overall postpartum maternal mortality and timing of cause-specific maternal mortality

Timing of overall maternal mortality with 95% confidence intervals (corresponds to Figure 2)

| Timing    | Incidence        |
|-----------|------------------|
| Day 1     | 48.9 (40.8-56.9) |
| Days 2-7  | 24.5 (20.5-28.7) |
| Days 8-42 | 24.9 (19.8-30.1) |

Timing of overall maternal mortality before 2010 and after 2011 with 95% confidence intervals (corresponds to Figure 3)

| Timing    | Incidence before 2010 (n = 5) | Incidence after 2011 (n = 20) |
|-----------|-------------------------------|-------------------------------|
| Day 1     | 48.0 (33.1-63.0)              | 49.1 (41.1-57.1)              |
| Days 2-7  | 25.2 (18.5-32.6)              | 24.2 (20.0-28.8)              |
| Days 8-42 | 24.1 (15.8-32.3)              | 25.2 (18.3-32.1)              |

Timing of overall maternal mortality by country income classification with 95% confidence intervals (corresponds to Figure 4)

| Timing    | Incidence in low-income countries (n = 8) | Incidence on lower-middle-income countries (n = 14) | Incidence in upper-middle-income countries (n = 2) | Incidence in high-income countries (n = 2) |
|-----------|---|---|--|--|
| Day 1     | 49.9 (37.3-62.5)                          | 50.9 (43.6-58.3)                                    | 66.1 (64.3-68.0)                                   | 29.8 (27.7-31.9)                           |
| Days 2-7  | 33.5 (26.5-40.9)                          | 19.8 (15.6-24.3)                                    | 17.9 (16.4-19.4)                                   | 31.9 (29.8-34.0)                           |
| Days 8-42 | 15.2 (9.2-21.3)                           | 27.6 (21.1-34.1)                                    | 15.5 (14.0-16.9)                                   | 38.2 (35.9-40.4)                           |

Timing of cause-specific maternal mortality with 95% confidence intervals (corresponds to Figure 5)

| Timing    | Postpartum (n = 6) | Embolism (n = 3) | Postpartum eclampsia/hypertensive disorders (n = 4) | Infection (n = 6) |
|-----------|--------------------|------------------|---|-------------------|
| Day 1     | 79.1 (60.3-93.2)   | 58.2 (18.5-92.5) | 44.3 (23.9-65.6)                                    | 5.5 (0.8-12.7)    |
| Days 2-7  | 14.7 (4.1-29.7)    | 22.6 (12.9-34.2) | 37.1 (19.1-57.2)                                    | 30.6 (18.8-43.7)  |
| Days 8-42 | 4.3 (0.8-9.8)      | 14.1 (0.0-50.9)  | 18.1 (11.4-25.9)                                    | 61.3 (45.5-77.1)  |