Protocol for the Systematic Review on Inequalities in Access to Postnatal Care Services in Low- and Middle-Income Countries

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Abstract

**Background:** Each year, 287 000 women die from complications related to pregnancy or childbirth, and 3.8 million newborns decease before reaching 28 days of life. The near totality (99 %) of maternal and neonatal deaths occur in low- and middle-income countries (LMIC). Access to and utilization of obstetrical care services including postnatal care (PNC) largely contribute to the reduction of maternal and neonatal mortality and morbidity. There is a strong need to evaluate the evidence on inequalities in utilization of PNC services, to inform health policy planning. Our objective is to systematically assess the socioeconomic,
geographic, and demographic inequalities in the use of PNC interventions in developing countries.

**Methods/Design:** The current protocol adopts the framework of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Our systematic review will identify studies in English, French or Spanish from 1960 onwards by searching MEDLINE (PubMed interface), EMBASE (OVID interface), and Cochrane Central (OVID interface) and the grey literature. Study selection criteria include research setting, study design, reported outcomes and determinants of interest. We will include experimental, quasi-experimental and observational studies. Our primary outcome is postnatal care services utilization, and determinants of concern are: 1. socioeconomic status (e.g. income, education), 2. location (e.g. distance to a health center, rural vs. urban residence), 3. sociodemographic determinants (e.g. ethnicity, immigration status). Screening, data abstraction and scientific quality assessment will be conducted independently by two reviewers using standardized forms, and we will compute inter-rater agreement. Results of the systematic review will be grouped and analysed according to the determinants of PNC services utilization.

**Discussion:** Our review will inform policy making with the aim of decreasing inequalities in utilization of postnatal care services. This research will provide evidence on unmet needs for PNC services in LMIC, knowledge gaps, and recommendations to health policy planners. Our research will help promote universal coverage of quality PNC services as an integral part of the continuum of maternal and child health care.

**Keywords:** Postnatal care, Health service accessibility, Inequalities, Unmet needs, Developing countries, Systematic review, Protocol
Background

Each year, 287 000 women die while pregnant, during childbirth or within 42 days of termination of pregnancy [1]. Maternal mortality mostly occurs within childbirth and the first week postpartum [2], and more than half (56 %) of the world’s maternal deaths are recorded annually in Sub-Saharan Africa [3-5]. The annual toll of losses resulting from poor pregnancy outcomes further include more than three million stillbirths - of whom at least one million die during labour - and 3.8 million neonatal deaths (decease of the live newborn within 28 days) [6]. 99 % of maternal deaths and the same percentage of neonatal deaths occur in low- and middle-income countries (LMIC), where a large proportion of births take place at home and where postnatal care for mothers and neonates is either not available or is of poor quality [1, 7]. Sub-Saharan Africa accounts for 38 % of global neonatal deaths and records the highest neonatal mortality rate in the world (34 deaths per 1,000 live births in 2011) [8].

It is largely acknowledged that utilization of obstetrical care services - including antenatal care, skilled attendance at birth, and postnatal care - contribute to the reduction of maternal and neonatal mortality and morbidity in low-resource settings [9, 10]. The 5th UN Millennium Development Goal (MDG) aims to achieve universal access to reproductive health services by 2015, including coverage of obstetrical care services [11]. In this context, policy makers, development agencies and researchers are showing increased interest in access to and utilization of postnatal care (PNC) services provided by skilled health professionals.

The World Health Organization (WHO, 2010) stated that the postnatal period begins
immediately after the birth of the baby and extends up to six weeks (42 days) after birth [12]. The principal objectives of postnatal care are to evaluate, maintain and promote the health of the birthing woman and the newborn, and to foster an environment that offers help and support for diverse health and social needs. Follow-up visits entitle the evaluation of the parturient’s health status including diagnosis and treatment of various conditions: tuberculosis, malaria, vaginal infections, anaemia or malnutrition [13]. PNC services are also of the utmost importance for the adequate management of eclamptic women and their newborns [14].

In LMIC context, postnatal services include health education on early and exclusive breastfeeding along with promotion of lifesaving interventions such as Kangaroo Mother Care (KMC) for low birth weight and premature babies, or using insecticide-treated bednets to prevent malaria [15]. Postnatal care of the newborn cover screening and treating infections (fever, respiratory distress, lethargy), jaundice and postnatal growth restriction, as well as dispensing immunization services and umbilical cord care [16]. PNC visits entitle education of the mothers and families on seeking care for the baby upon noticing dangers signs such as persistent vomiting, convulsions or not sucking. PNC services offer assessment of postnatal factors predisposing to anaemia in infants and young children [17], and promote utilization of child health cards, inherently favouring infant health and compliance to the immunization schedule [18]. Furthermore, assuring high nutritional intake (iron and calcium fortified diets) during the postpartum period counteracts anaemia and provides calories for adequate milk production [19]. PNC services also include counselling on available contraception, birth spacing and family planning options, along with diagnosing postpartum depression, much often neglected in LMIC.
The number and timeliness of postnatal consultations are being studied at present by WHO to update clinical guidelines [12]. Some suggest a minimum of three PNC visits, one in the immediate postnatal period (first 24 hours from birth), another in the early postnatal period (days 2 through 7) and a third PNC in the late postnatal period (days 8 through 42) [12]. Different practice of PNC is observed, Uganda for instance is promoting follow-up of the mother and her baby by a skilled health worker at 6 hours, 6 days and six weeks [20].

There are important unmet needs in postnatal care in developing countries, where over 70 % of all babies born outside the hospital do not receive any postnatal care [21]. In a study conducted in 30 LMIC involving home and facility deliveries, an average of 40 % of all women with a live birth in the previous five years did not receive any postpartum care check-ups [12, 22]. In the absence of postnatal follow-up, numerous cases of puerperal infections go undiagnosed and unreported [23, 24]. Most postpartum infections take place after hospital discharge, which is usually 24 hours after an institutional delivery.

Furthermore, rates of provision of skilled care are lower during the postnatal period than during pregnancy or childbirth. Among all women who did receive postnatal care, health professionals reportedly provided 57 % of postnatal care. The remainder received postnatal care from traditional birth attendants (TBA) (36 %) and others (7 %) [22].

Important inequalities exist in accessibility and utilization of obstetrical care services across socioeconomic status [9, 25], education [26, 27], distance to a health center [9, 28], and households located in urban vs. rural areas [10, 29]. Scientific evidence exists on inequalities in the use of antenatal care (ANC), location of childbirth (home or facility delivery) and skilled birth attendant (SBA) at delivery [10, 30]. Health seeking behaviour for ANC and SBA services are stronger amongst educated, urban and higher SES status
women, along with households living within 5 km of a health center [9, 10, 28, 30, 31]. However, knowledge is limited on the determinants of postnatal care services utilization. There is a strong need to systematically evaluate the existing evidence on inequalities in access to PNC services, on which to base health policy planning.

**Objectives and research questions**

Our objectives are to 1) systematically identify and assess studies and reports on postnatal care services access and utilization in low- and middle- income countries; 2) analyze and synthetize evidence on the determinants of postnatal care services, and inequalities in the use of PNC interventions in developing countries; and 3) provide evidence to policy planners in order to address unmet needs in PNC services in resource-strained settings.

This systematic review is guided by the following research questions: are postnatal care services utilization patterns associated with 1) socioeconomic determinants, 2) sociodemographic attributes, and 3) geographical characteristics?

**Methods**

The current protocol outlines a strategy informed by the guidelines from The Cochrane Collaboration [32], yet our systematic review will adopt the standardized analytical framework put forth by Moher et al. (2009) under the auspices of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement) [33]. The PRISMA Statement includes a 27-item checklist (see Additional file 1) and a four-phase flow diagram (Figure 1).
Information sources and literature search

Literature search strategies will be implemented by the research team (EVL, MM, MVZ) of the Research Centre of the University of Montreal Hospital Centre (CRCHUM), and an expert librarian (DZ) of the Documentation Center of the University of Montreal Hospital Centre (CHUM). Filters for bibliographic research will include languages, with consideration of English, French and Spanish articles; and publication date, from 1960 onwards. We will use specific medical subject headings (MeSH) and text words to identify studies by searching MEDLINE (PubMed interface), EMBASE (OVID interface), and Cochrane Central (OVID interface). We will search the grey literature, namely the following sources: Social Care Online; National Institute for Health and Clinical Excellence (NICE); System for information on Grey Literature in Europe (OpenSigle); National Guideline Clearing House; Health Development Agency; National Institutes of Health; Research Service Delivery and Organisation Programme (SDO); Research Register for Social Care; Google Scholar and OpenGrey, the two latest precisely for grey literature in the Spanish language. Furthermore, we will search official Websites of institutions active in the fields of maternal & child health and obstetrical services, along with bibliographic references of retrieved articles and relevant reviews.

Our search strategy will combine terms related to the following categories: i) postpartum or postnatal care; ii) accessibility or utilization; iii) inequalities or determinants; and iv) low- or middle-income countries. The search strategy for MEDLINE (PubMed interface) can be found in Additional file 2. We will combine in a complete Endnote file all the scientific articles and reports retrieved through the identification phase, and then extract duplicates.
Study inclusion criteria

Setting We will retrieve studies implemented in low- and middle-income countries, as defined by The World Bank Group’s classification [34], and studying the use or access to postnatal services by birthing women living in resource-strained settings.

Design Our systematic review will include experimental studies covering randomized controlled trials (RCTs) and cluster-randomized trials (CRTs); quasi-experimental studies including quasi-randomized trials, controlled before-after studies (CBAs) and interrupted time series studies (ITSs); and observational studies including cohort, case-control and cross-sectional studies.

Outcomes We will include studies reporting outcomes of utilization and access to postnatal/postpartum care. Although some studies underline that “postpartum” refers to issues pertaining to the mother and “postnatal” refers to those concerning the newborn or the baby, we will use the terms interchangeably, in accordance with the World Health Organization’s conceptualization (WHO, 2010) [12]. In a recent WHO Technical Consultation on Postpartum and Postnatal Care (2010), a scientific panel agreed that adopting the single term “postnatal” would aid clarity and should be used for all issues pertaining to the mother and the baby after birth [12]. Our primary outcome is postnatal care services utilization. Secondary outcomes include 1) number of PNC visits, 2) timeliness of PNC services, 3) PNC location, and 4) nature, qualification and competence of PNC attendant.

Determinants. To study inequalities in PNC services utilization, determinants of concern are: 1) socioeconomic status - assessed by income, expenditure, household characteristics and/or assets, occupational or contractual status [9, 25, 35, 36] – and education (highest
level of education completed, years of schooling, literacy) [37, 38]; 2) sociodemographic determinants: ethnicity, marital status, immigration status [36, 37, 39]; and 3) location (euclidian distance – km - to a health center, travel time, or rural versus urban residence) [10, 28]. This list of determinants is retrieved from relevant scientific literature in obstetrical services utilization in LMIC including original studies, systematic reviews and meta-analyses [9, 10].

**Results.** We will consider quantitative results of the association between potential determinants and postnatal care services utilization. Published results have to include an association measure, frequency ratio or statistical test comparing access to postpartum care across two or more groups. If these results are not explicit, we have to be able to estimate them with the information provided in the paper. Studies strictly reporting qualitative results on access to postpartum care are thus excluded. Within the same publication, results for the most recent year will be appraised if information exists for consecutive years. In the case of secondary analyses from national representative surveys such as the *Demographic and Health Surveys* (DHS) for consecutive years in the same country, we will only consider the most recent [10].

**Study selection procedure**

**Screening** A team of researchers, MM (Epidemiologist, PhD) and EVL (PhDc), will identify articles by first analysing titles and abstracts for relevance and respect of the selection criteria, based on research setting, study design, reported outcomes and determinants of interest. Relevant articles will be classified as i) *included*, ii) *excluded* or iii) *uncertain*. After exclusion of records irrelevant to the systematic review, full texts of selected abstracts
(records categorized as *included or uncertain*) will systematically be extracted for further eligibility analysis.

**Eligibility** Full-text screening will be conducted independently by the reviewers (MM and EVL) using a standardized form with explicit inclusion and exclusion criteria. Discrepancies will be resolved by discussion between the two reviewers, and persisting disagreement will be analyzed with a senior Epidemiologist and Researcher (MVZ). We will compute the inter-rater agreement using the intraclass correlation coefficient (ICC)[40].

**Data collection process**

Reviewers will use an explicit data collection form to abstract data items including but not limited to study characteristics (country, setting, year of publication, study design, sample size); participants' characteristics (mean age ± SD, parity, health literacy, women’s decision making power); outcomes (postnatal care utilization); and results of the association between PNC services and potential determinants. In cases where numerous publications report data originating from the same study, the latest outcomes of interest will be assessed. We will contact study authors when relevant data is not explicitly or clearly reported. Reviewers will systematically use a standardized data abstraction form. To increase the reliability of data abstraction by the reviewers, a pilot test of the standardized form will be performed on a random sample, and the tool will be refined upon necessary. MM and EVL will independently abstract the data, and discrepancies will be discussed with a third reviewer (MVZ).
Scientific quality assessment

We will assess scientific quality of selected studies to ensure internal validity of reported results and avoid analyzing spurious associations - confounded or biased - or type I statistical errors. We will use standardized quality assessment tools for specific types of designs to determine the methodological quality and the risk of bias of the included studies. To assess the quality of randomized controlled trials (RCT) we will use the Cochrane Collaboration’s Risk of Bias Tool (CCRBT) [32]; for quasi-experimental designs such as interrupted time series and controlled before-after studies we will use the Cochrane Effective Practice and Organization of Practice (EPOC) Risk of Bias Tool [41]; for cohort and case control studies and cross-sectional studies, we will use the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies, adapted to extend the criteria for selection bias assessment [42]. The latter instrument previously showed excellent inter-rater agreement for the final grade of studies [43], as well as adequate construct and content validity [44]. The EPHPP quality tool largely encompasses the principal quality items identified by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement [45]. Special attention will be provided to precise study objectives, explicit identification of the population studied, clear definitions of outcomes, independent factors, potential confounders and effect modifiers [46, 47]. MM and EVL will independently appraise the scientific quality of the studies, and we will compute the inter-reviewer agreement using the intraclass correlation coefficient (ICC) [40]. Discrepancies or uncertainties will be resolved through discussions with MVZ. According to the methodological characteristics appraised, we will classify the studies’ scientific quality as either 1. Strong, 2. Moderate or 3. Weak.
**Data analysis and synthesis**

Results of the systematic review will be grouped and analyzed according to the different determinants of postnatal care services utilization. Evidence tables will be generated to descriptively summarize the included studies and results: 1. authors, 2. study design, 3. scientific quality, 4. research setting, 5. objectives, 6. population, 7. outcomes assessed, 8. determinant / predictor, and 9. results. We will analyze inequality patterns in postnatal services using relative risks (odds ratio, risk ratio, incidence rate ratio) and prevalence ratios as a measures of association.

**Discussion**

This systematic review will provide 1) knowledge on existing inequalities and unmet needs for postnatal care services in LMIC; 2) pragmatic recommendations to health policy planners in improving access and utilization of quality postnatal care in developing countries; 3) overview of knowledge gaps and future research needs. Results of the systematic review will be published in a peer-reviewed international journal, and presented in conferences and symposiums in relevant fields (e.g. global health, health policy and planning, health systems, healthcare equity). Further knowledge dissemination will involve communicating results to LMIC governments, and organizations active in promoting access to maternal and child health services (e.g. World Health Organization, Family Care international). The utmost relevance of systematic reviews to inform health systems policymaking is increasingly recognized [48]. Our review will hence supply evidence to health policy planning with the objective of decreasing inequalities in maternal and child health indicators, and promoting universal coverage of obstetrical services. Knowledge thus
created may help promote equitable access to postnatal services as a fundamental element of the continuum of care essential to reduce maternal and neonatal mortality and morbidity.

Figures

**Figure 1. PRISMA Flow Diagram** *Source:* Moher, D., et al., *Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement.* BMJ, 2009. 339: p. b2535

Additional files

*Additional file 1.* (File format: PDF / .pdf) (Title: PRISMA checklist) (Description: Checklist of the *Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement*)

*Additional file 2.* (File format: .docx) (Title: Search strategy for MEDLINE (PubMed interface, 1960 onwards))

List of abbreviations

ANC: Antenatal care; DHS: Demographic and Health Surveys; EPHPP: Effective Public Health Practice Project; ICC: Intraclass correlation coefficient; LMIC: Low- and middle-income countries; MDG: Millennium Development Goal; MeSH: Medical subject headings; PNC: Postnatal care; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; SBA: Skilled birth attendant; TBA: Traditional birth attendant; WHO: World Health Organization.
Competing interests

The authors declare that they have no competing interests.

Author’s contribution

EVL, MM and MVZ contributed to the conception and design of the review. EVL and DZ developed the search strategies. EVL drafted the manuscript. MM and MVZ were actively involved in critically revising the protocol for important intellectual content. DZ made a substantial contribution to the Information sources and literature search section, and to Additional file 2. All authors read and approved the final protocol.

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Identification

No of records identified through database searching

No of additional records identified through other sources

Screening

No of records after duplicates removed

No of records screened

No of records excluded

Eligibility

No of full-text articles assessed for eligibility

No of full-text articles excluded, with reasons

Included

No of studies included in qualitative synthesis

No of studies included in quantitative synthesis (meta-analysis)