

EFFECT OF ANTENATAL CARE ON INSTITUTIONAL DELIVERY IN DEVELOPING COUNTRIES: A SYSTEMATIC REVIEW

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Review Questions/Objectives

Aim of this review is to systematically search, appraise, and synthesize the best available evidence on the effectiveness of antenatal care on institutional delivery in developing countries.

Specific Review Objectives

- To provide comprehensive and summarized evidence on effects of antenatal care on institutional delivery.
- To generate relevant recommendations that will give directions to policy makers and program planners to improve practice of institutional delivery.

Background

According to estimates¹ presented for 172 countries and territories in the inter-agency report, approximately 358, 000 maternal deaths occurred worldwide in 2008, developing countries accounted for almost all of these deaths. The maternal mortality ratio is a measure which relates the number of maternal deaths to the number of live births. There was much variability between countries in 2008, with a maternal mortality ratio of 290 deaths (per 100,000 live births) in developing regions as compared to 14 deaths (per 100,000 live births) in developed regions. There has however, been a steady decline in the maternal mortality ratio over the last 20 years, and at the global level, the maternal mortality ratio fell by 34% from 1990 to 2008¹. The biggest declines in this ratio were seen in eastern Asia and northern Africa (63% and 59%, respectively)¹.

Analysis of trends at global level shows that maternal mortality has decreased at an average of 2.3% annually between 1990 and 2008¹ – far below the 5.5% annual decline, which is necessary to achieve the fifth MDG (Millennium Development Goal), concerning maternal mortality reduction. To achieve that goal, MMRs (Maternal Mortality Rate) will need to decrease at a much faster rate in the future – especially in sub-Saharan Africa, where the highest maternal mortality is reported and where the annual decline has so far been about 1.7 % only¹. Achieving this goal requires increased attention to improved health care for women, including prevention of

unplanned pregnancies and unsafe abortions and provision of high-quality pregnancy and delivery care, including emergency obstetric care².

One of the process indicators used to measure progress towards the goal of maternal mortality reduction in the context of MDG 5 is whether there is skilled attendance at birth³. At the turn of the millennium, the SMI (Safe Motherhood Initiative) of 1987 was followed by the initiative to promote skilled attendance. This required professionally skilled birth attendants, who could function within an 'enabling environment', identify and manage complications or appropriately refer these women⁴.

However, World-wide, only 65.7% of births were attended by a skilled health worker⁵ Although nearly all births were attended by skilled health personnel in developed country settings, this proportion is 61.9% in less developed countries and only 35.3% in the least developed countries. In Africa and Asia, only 46.5% and 65.4%, respectively, of women gave birth with professional assistance. In less developed regions, the lowest levels of skilled attendant at birth were in Eastern Africa (33.7%), followed by Western Africa (41.2%) and South central Asia (46.9%) with the highest levels in Polynesia (99.8%), Eastern Asia (98%) and South America (92.7%). Africa and Asia are lagging behind in terms of the ICPD + 5 (International Conference on Population and Development + 5) target of 85% for 2010. Special and intensive efforts are needed to accelerate progress in these regions⁵.

Antenatal care (ANC) visits constitute one of the few times women in many resource-poor settings seek care for their own health⁶, and, represent an important opportunity to help women best prepare for birth, as well as inform them about pregnancy -related complications, and the advantages of skilled delivery care^{7,8}.

The skilled provider interviews and examines the woman to detect problems that might affect the women's pregnancy and require additional care. Conditions that could severely affect the mother or baby if they are left untreated include HIV, syphilis and other sexually transmitted diseases, malnutrition and tuberculosis (especially in populations where HIV is common). Also, conditions such as severe anemia, vaginal bleeding, pre-eclampsia /eclampsia, fetal distress and abnormal fetal position after 36 weeks may cause or be indicative of a life-threatening

complication. Early treatment of these conditions can mean the difference between death and survival for the woman and her newborn⁹.

The World Health Organization(WHO) recommends four antenatal care visits for women whose pregnancies are progressing normally, with the first visit in the first trimester (ideally before 12 weeks but not later than 16 weeks), and at 24-28 weeks , 32 weeks and 36 weeks^{10,11}. Each visit should include care that is appropriate to the woman's overall condition and stage of pregnancy, and help her prepare for birth and care of newborn. If problems or potential problems that will affect the pregnancy and newborn are detected, the frequency and scope of visits are increased. Focused antenatal care visits generally include health promotion and disease prevention, early detection and treatment of complications and existing disease and birth preparedness and complication readiness¹².

Antenatal care is arguably more important in developing countries because of the risks of malaria and anemia in poorly nourished women, and risks of tetanus. Though studies on risk factors of maternal mortality have shown that the lack of antenatal care increases the risk of maternal mortality¹³, risk assessment through antenatal care is not however by itself sufficient to reduce maternal mortality. Recent evidence has shown that maternal deaths could be reduced by promoting the availability, access and utilization of basic and comprehensive emergency obstetric care services for women with complications of pregnancy and childbirth¹⁴.

Several studies have examined the association between ANC utilization and institutional delivery¹⁵⁻¹⁸, but none has systematically summarized the effect of ANC utilization on institutional delivery in developing countries. Therefore, this review will systematically search, appraise and synthesize the best available evidence on the effectiveness of ANC on institutional delivery.

For this systematic review the following definitions will be used:

- **Maternal death:** the death of a woman while pregnant or within 42 days of child birth, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management.
- **Antenatal care:** the care that a woman receives during pregnancy.

- **Institutional delivery:** giving birth at health institutions under the attention of health professionals.
- **Health care institution:** institution providing acute and long term medical and nursing care for people with the need which includes hospitals, clinics and health centers.
- **Developing countries:** according to World Bank classification developing countries are those low income and middle income economies constituting a total of 144 countries¹⁹.

We have conducted a preliminary search using the MEDLINE, BIOLINE, MEDNAR databases, as well as the Cochrane Library of systematic reviews using a wide range of terms (“Antenatal care services”, “Institutional delivery”, “determinants of institutional delivery” “Antenatal care service utilization and institutional delivery” including the term “systematic review” along with each term), determine whether previously published systematic reviews exist on our topic. The search did not identify any systematic reviews.

For this review, the following inclusion criteria will be used:

Inclusion Criteria

Studies that will be included in the review must contain the following elements:

Types of Participants

Women in developing countries aged between 15-49 years of age, who have had at least one birth in a health care institution.

Types of intervention

Antenatal care visits according to WHO recommendation: with visits in the first trimester (ideally before 12 weeks but not later than 16 weeks), and at 24-28 weeks, 32 weeks and 36 weeks^{10, 11}.

Comparator

No formal antenatal care

Types of outcomes

Maternal outcomes of women who give birth in a health care institution, such as mortality during childbirth or resulting from birth complications and positive outcomes such as live births and safe delivery without any complications.

- Maternal mortality ratio- defined as number of maternal deaths per 100,000 live births.
- Proportion of women who develop any complications associated with pregnancy.
- Proportion of live births.

Also of interest to the review is the number of women who give birth in health care institutions, compared with the number of women who do not.

- Proportions of women who gave birth at least once in health facilities.
- Proportions of women with or without previous history of antenatal care.

Types of studies:

Quantitative studies conducted in developing countries with cross sectional, case –control or cohort, experimental or quasi experimental study designs.

Setting

Developing countries: including urban and rural settings.

Exclusion criteria

This is a review of effects, therefore qualitative studies and textual opinion papers, together with quantitative studies published before January 1990 will be excluded.

Search strategy

The review will consider both unpublished and published studies in the English language between January 1990 and December 2010. Study identification will include both manual and electronic search strategies. Electronic searches will involve the electronic databases and search terms listed below. The initial selection criteria will be broad to ensure that as many studies as possible are assessed for their relevance to the review objective. Any articles that are obviously unsuitable, based on relevance to the review question will be excluded in the early stages of the search (for example, on the basis of abstracts and titles presented in electronic databases). The

decision to exclude or include other articles will be made following retrieval of the full text article and assessment of methodological quality. The number of articles included and excluded at the various stages will be recorded.

The search will focus on key elements of PICO (participants, intervention, comparator, and outcome) and a thorough search strategy will be undertaken as per the following three steps:

1. An initial search of MEDLINE and, CINAHL will be performed followed by analysis of the text words contained in the title and abstract, and of the index terms used to describe the article,.
2. A second search using all identified keywords and index terms will be conducted across all of the included databases; MEDLINE, CINAHL, BIOLINE, CINAHL, MEDNAR and POPLINE
3. The third step will be to search the reference lists of included studies for further potential studies.

Finally, a panel of expert contacts will be formed from people with a specialist interest in public health. These experts will be asked to help identify a relevant ongoing research.

Search Terms for Electronic Databases.

The following terms will be used when devising search strategies for electronic databases. The exact search terms and their results will be recorded as the search strategy is refined. Non American spellings will also be considered.

["Antenatal visit" OR "Prenatal care" OR " Role of Prenatal care for Promoting institutional delivery " OR "Promoting institutional delivery" OR "Institutional delivery" OR "Determinant factors for institutional delivery" OR "Maternal health service utilization" OR "skilled birth attendance"].

Assessment of methodological quality

All papers selected for potential inclusion in the review will be subjected to a rigorous, independent appraisal by two critical reviewers. Regardless of their score we will discuss their

individual limitations and exclude those that are considered to be unfit, thus decreasing the risk of bias from including the results in this review.

Papers selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using JBI Meta Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI). Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer. Critical appraisal tools are attached as Appendix I.

Data Collection

Quantitative data will be extracted from papers included in the review using the standardized data extraction tool from JBI-MAStARI. The data extracted will include specific details about the interventions, populations, study methods and outcomes significant to the review question and specific objectives. The data extraction tools are attached as Appendix II.

Data Synthesis

Quantitative papers will be pooled in statistical meta-analysis using the JBI-MAStARI. Odds ratio (for categorical data) and weighted mean differences (for continuous data) and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed using the standard Chi-square. Where statistical pooling is not possible the findings will be presented in narrative form.

Conflicts of Interest

None

Acknowledgements

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Appendix I JBI critical appraisal tools

JBI Critical Appraisal Checklist for Experimental Studies

Reviewer _____ Date _____
Author _____ Year _____ Record Number _____

Yes No Unclear

1. Was the assignment to treatment groups truly random?

2. Were participants blinded to treatment allocation?

3. Was allocation to treatment groups concealed from the

Yes No Unclear
 allocator?

4. Were the outcomes of people who withdrew described and included in the analysis?

Yes No Unclear

5. Were those assessing outcomes blind to the treatment allocation?

Yes No Unclear

6. Were the control and treatment groups comparable at entry?

Yes No Unclear

7. Were groups treated identically other than for the named interventions

8. Were outcomes measured in the same way for all groups?

9. Were outcomes measured in a reliable way?

10. Was appropriate statistical analysis used?

Overall appraisal: Include Exclude Seek further info.

Comments (Including reasons for exclusion)

JBI Critical Appraisal Checklist for Comparable Cohort/ Case Control

Reviewer _____ Date _____
Author _____ Year _____ Record Number _____

	Yes	No	Unclear
1. Is sample representative of patients in the population as a whole?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are the patients at a similar point in the course of their condition/illness?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Has bias been minimised in relation to selection of cases and of controls?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Are confounding factors identified and strategies to deal with them stated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are outcomes assessed using objective criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Was follow up carried out over a sufficient time period?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

JBI Critical Appraisal Checklist for Descriptive/ Case Series

Reviewer _____ Date _____
Author _____ Year _____ Record Number _____

Yes No Unclear

1. Was study based on a random or pseudo-random sample?
2. Were the criteria for inclusion in the sample clearly defined?
3. Were confounding factors identified and strategies to deal with them stated?
4. Were outcomes assessed using objective criteria?
5. If comparisons are being made, was there sufficient descriptions of the groups?
6. Was follow up carried out over a sufficient time period?
7. Were the outcomes of people who withdrew described and included in the analysis?
8. Were outcomes measured in a reliable way?
9. Was appropriate statistical analysis used?

Overall appraisal: Include Exclude Seek further info

Comments (Including reason for exclusion)

Appendix II JBI data extraction tools

JBI Data Extraction Form for Experimental/Observational Studies

Reviewer _____ Date _____
 Author _____ Year _____
 Journal _____ Record Number _____

Study Method RCT Quasi-RCT Longitudinal
 Retrospective Observational Other

Participants

Setting

Population

Sample size

Intervention 1 _____ Intervention 2 _____ Intervention 3 _____

Interventions

Intervention 1 _____

Intervention 2 _____

Intervention 3 _____

Clinical outcome measures

Outcome Description	Scale/measure

Study results

Dichotomous data

Outcome	Intervention () number / total number	Intervention () number / total number

Continuous data

Outcome	Intervention () number / total number	Intervention () number / total number

Authors conclusions

Comments
