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## REVIEW ARTICLE

## A systematic review and thematic synthesis of qualitative studies on maternal emergency transport in low- and middle-income countries

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## ABSTRACT

**Background:** Most maternal deaths are preventable with emergency obstetric care; therefore, ensuring access is essential. There is little focused information on emergency transport of pregnant women. **Objectives:** The literature on emergency transport of pregnant women in low- and middle-income countries (LMICs) was systematically reviewed and synthesized to explore current practices, barriers, and facilitators for transport utilization. **Search strategy:** MEDLINE, EMBASE, BNI, Cochrane Library, CINAHL, African Index Medicus, ASSIA, QUALIDATA, RHL, and Science Citation Index (inception to April 2012) were searched without language restriction. **Selection criteria:** Studies using qualitative methodology and reporting on emergency transportation in LMICs were included. **Data collection and analysis:** Thematic framework and synthesis through examination and translation of common elements were used to analyze and synthesize the data. **Main results:** Twenty-nine articles were included. Eight major themes were identified: time for transport; transport options; geography; local support; autonomy; culture; finance; and ergonomics. Key issues were transport availability; transport speed; terrain; meteorology; support; dependence for decision making; cultural issues; cost; and lack of safe, comfortable positioning during transport. **Conclusion:** Themes should be appreciated within local contexts to illuminate barriers and facilitators. Potential solutions include motorcycle ambulance programs, collaboration with taxi services, community education, subsidies, and vehicle maintenance.

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## 1. Introduction

Transport and health are inextricably linked, with transport services relating to numerous aspects of healthcare. Transport systems ensure attendance of healthcare providers and adequate medical supplies. Numerous reports have suggested mobility and transport as key requirements and determinants for health [1].

In many low-income countries, less than 1% of the population has access to conventional emergency transport (e.g. ambulance) [2]. A shortage of vehicles means that few people have access to transport for work or health purposes, even though transport systems were recognized as a fundamental human need 3 decades ago. For many, access to transport is not within easy reach; in Ethiopia, approximately

half of rural households were reported to travel distances greater than 15 km for public transport [3].

Most births in low-income countries occur outside of health facilities [1] and, as most obstetric complications are unpredictable, timely access to emergency care is essential for reducing deaths. Transport has a critical role in achieving Millennium Development Goals 4 and 5 (which include reducing child and maternal mortality, and achieving access to healthcare), targeting the second delay of “reaching care.” Research on transport in low- and middle-income countries (LMICs) often relates to pollution or the spread of communicable diseases. There is little focused and rigorously evaluated research on emergency transport of pregnant women [4], as well as limited synthesis and insight [3,4].

The aim of the present systematic review was to examine qualitative literature on maternal emergency transport to explore people’s experiences of using transport, the options available, and the barriers and facilitators encountered. There was a focus on qualitative studies to elicit insights on how transport systems work and what might be done to improve the acceptability and availability of different transport modalities, in order to enhance policy and program interventions relating to transport.

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## 2. Materials and methods

### 2.1. Data sources and searches

Databases were systematically searched for qualitative studies on emergency transport in LMICs (Supplementary Material S1). MEDLINE, EMBASE, BNI, Cochrane Library, CINAHL, African Index Medicus, ASSIA, QUALIDATA, Reproductive Health Library, and Science Citation Index (inception to April 2012) were searched without language restriction. Hand searching complemented electronic searches. The search terms were “ambulance,” “motorbike ambulance,” “bicycle ambulance,” “emergency referral,” “emergency access,” “emergency transport,” and “ambulance emergency.” These terms were selected iteratively through scoping searches. Qualitative filters refined the search (“focus group,” “qualitative,” “observational methods,” “interview,” and “narrative”). Studies were included if they contained qualitative data alone or both qualitative and quantitative data.

### 2.2. Study selection and data extraction

Studies presenting primary data and involving qualitative data collection methods (interviews, focus groups) were included if they reported the processes and experiences of emergency transportation to a place of emergency care in LMICs. Studies that had no information on emergency transport, no qualitative data, or no primary data were excluded. Studies from countries not classified by the World Bank as low- or middle-income were excluded [5]. Titles and abstracts were

scrutinized by 2 authors (A.W. and S.H.) and full manuscripts of studies meeting the inclusion criteria were acquired; disagreements were resolved by discussion with a third author (A.C.). Studies that did not address maternal transport exclusively but had relevant qualitative information were included.

#### 2.2.1. Comprehensiveness of reporting

Independent assessment of the reporting criteria was performed by 2 authors (A.W. and S.H.) using the consolidated criteria for reporting qualitative research framework. This framework assesses the trustworthiness and transparency of studies within their settings by focusing on the research team, reflexivity, study design, analysis, and reporting [6] (Table 1).

#### 2.2.2. Synthesis of findings

Information was extracted on study characteristics, quality, and outcome data (Tables 1, 2). Thematic synthesis was used for analysis through examination and translation of common elements across the studies that explored transport for emergency obstetric care. Quotations from respondents and relevant texts were analyzed by 2 authors (A.W. and S.H.). Both authors read and re-read texts. The data were then labeled to develop a code. Initial codes closely reflected the quotations from the manuscript. Codes were continuously refined as more quotations were added. Codes then led to the development of themes and, subsequently, a thematic framework. The thematic framework was developed in Excel (Microsoft Redmond, WA, USA) and agreed between 2 authors (A.W. and S.H.). Having applied the thematic framework to

**Table 1**  
Quality assessment of included studies using the COREQ framework.

Reporting criteria	No. (%)	Studies reporting each criterion
Characteristics of research team		
Interviewer or facilitator identified	11/29 (37.9)	[2,7,10,17,21,27,28,30–32,35]
Credentials	7/29 (24.1)	[7,10,21,27,28,31,32]
Occupation	10/29 (34.5)	[2,7,9,10,18,19,21,26,28,32]
Sex	8/29 (27.6)	[2,3,8,15,18,27,30,31]
Experience and training	11/29 (37.9)	[2,7,10,13,15,21,26,27,30,31,35]
Relationship with participants		
Relationship established	6/29 (20.7)	[2,7,10,26,27,34]
Participant knowledge of the interviewer	3/29 (10.3)	[2,9,18]
Interviewer characteristics	6/29 (20.7)	[7,8,10,18,20,26]
Theoretical framework		
Methodological orientation and theory	7/29 (24.1)	[4,7,11,20–22,30]
Participant selection		
Sampling	24/29 (82.8)	[2,3,7–13,15,17–20,22,26,27,30–35]
Method of approach	12/29 (41.4)	[2,7,9,10,12,13,19–21,26,32,35]
Sample size	17/29 (58.6)	[2,4,7–10,12,13,15,18–20,22,26–28,30–35]
Non-participation	6/29 (20.7)	[9,13,18,20,31,35]
Setting		
Setting of data collection	16/29 (55.2)	[2–4,7,9–13,18,19,24,28,30,31,35]
Presence of non-participants	4/29 (13.8)	[7,22,26]
Description of sample	18/29 (62.1)	[2,7–9,12,13,15,17–22,26–28,31,35]
Data collection		
Interview guide	13/29 (44.8)	[2,3,7,9,12,17,20,22,27,28,31,34,35]
Repeat interviews	0/29 (0.0)	–
Audio/visual recording	10/29 (34.5)	[2,7–11,13,18,26,28]
Field notes	4/29 (13.8)	[9,10,28,34]
Duration	7/29 (24.1)	[2,8–10,21,26,28]
Data saturation	1/29 (3.4)	[10]
Transcripts returned	0/29 (0.0)	–
Data analysis		
Number of data coders	1/29 (3.4)	[4]
Description of the coding tree	1/29 (3.4)	[9]
Derivation of themes	19/29 (65.5)	[4,7–13,15,18,19,21,26,27,30,31,33–35]
Software	15/29 (51.7)	[2,4,7–9,12,13,15,17–20,31,33]
Participant checking	4/29 (13.8)	[4,15,20,34]
Reporting		
Quotations presented	19/29 (65.5)	[2,4,7–13,15,17,18,21,22,27,30,31,33]
Data and findings consistent	29/29 (100.0)	[2–4,7–16,18–22,26–28,30–35]
Clarity of major themes	25/29 (86.2)	[2–4,7–13,15,17–21,26–28,30,31,33–35]
Clarity of minor themes	12/29 (41.4)	[2–4,7,8,10,18,19,26,27,30,31]

Abbreviation: COREQ, consolidated criteria for reporting qualitative research.

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