Title: Why so late? Distant health facility, woman's low status, or man's lack of resources? A study of women with life-threatening obstetric complications (near-miss) at admission in a maternity hospital in Afghanistan

Authors: A. Hirose and V. Filippi

Institution: London School of Hygiene & Tropical Medicine, UK

Introduction:
Over 30 years of wars and conflicts have adversely affected the healthcare system of Afghanistan, and Afghan women's health has suffered greatly. The Maternal Mortality Ratio (MMR) of the country is one of the highest in the world, estimated at 1800 per 100,000 live births in 2005[1].

The current recommendation for safe motherhood programmes is to provide skilled attendance for every birth, backed up by transport in case emergency referral is required. Since 2002, the Afghan Ministry of Public Health in partnership with non-governmental organisations (NGOs) has built the country's healthcare system based on the principle of primary healthcare through provision of Basic Package of Health Services (BPHS)[2]. Individuals are provided with entry access to the healthcare system, including access to maternity care, at health posts or health centres, where cases that cannot be managed at these levels are further referred to higher levels. Although the healthcare system has gradually strengthened and a large number of maternal deaths are expected to be averted, multi-level referrals may delay treatment and increase the risk of death for women who have developed severe obstetric complications [3].

Moreover, a well-functioning maternity care system is difficult to establish in Afghanistan because the majority of women prefer to give births at home[4]. Financial constraints, difficult access to healthcare and gender restrictions are barriers to putting the safe motherhood recommendations into practice. Women who develop complications during home birth may have to go through many tiers of referrals to obtain appropriate care, or they may experience delay in deciding to seek care before referring themselves to a health facility. As a result, many women are often in a moribund condition when they reach the final treatment facility.

Those women in life-threatening condition who would need immediate intervention for survival are often called 'near-miss'[5]. Audits of these near-miss cases have become an effective alternative to examine quality of obstetric care in developing countries[6, 7]. Investigations of near-miss cases have also brought to attention problems associated with care-seeking and failure in healthcare system since many near-miss cases are already in a critical condition upon arrival in health facilities. Studies conducted in African countries have shown that the proportion of women who had near-miss complications upon arrival was on average 83% among all near-miss cases identified in health facilities (ranging between54-90%) [8]. Despite apparent causality, there is a lack of studies examining care-seeking and referral

patterns of near-miss cases. Evidence is even scarcer regarding the ways and the extent to which particular care-seeking and referral patterns affect the survival of babies of women with complications. Studies based on the 'three delay' approach [9] have attempted to look at the problems but have been limited in their study designs, eg investigating maternal death cases only, and usually of qualitative, and case studies without any comparison group.

In the current study, we examine the care-seeking and referral delays of near-miss cases on arrival in a cross sectional study design. We postulate that the care-seeking and referral patterns of near-miss women vary according to the levels of financial and social resources of family members and characteristics of women in addition to accessibility to healthcare. The paper will report findings from a study conducted in a large maternity hospital in the western part of Afghanistan during a 12-months study period from February 2007 to January 2008.

Objectives:
The study was designed to understand the extent of, the reasons behind and the patterns of the occurrence of delays before arrival in an emergency obstetric care facility for women who had near-miss conditions on arrival, and to propose action points to facilitate the access to care based on the women's experiences. The objective of the paper is to document the timings and durations of care-seeking and referral delays of near-miss women and to present factors influencing each of the different delays as well as the magnitude of their effects on neonatal survival from epidemiological analyses.

Methods:
Study Setting and Population
Afghanistan is situated at the cross-roads of South, Central and West Asia. Because of its unique geo-strategic location, the long history of the country has seen many invaders coming into the country, most recently Soviet-invasion in the 1970's and US-coalition force in 2001. The on-going conflicts extending over three decades have pushed the country near the bottom of Human Development Index, and the country is ranked at the 174th out of 178 countries in 2005. The MMR is high at 1800 per 100,000 live births and the life time risk of maternal death is estimated to be 1 in 8[1] .

The study took place in the maternity ward of Herat Regional Hospital, located in Herat City, the socio-economic centre of the western Afghanistan. The hospital is a major referral hospital in the region with a comprehensive EmOC capacity. The study population is comprised of women who were admitted at the maternity ward in near-miss conditions during their pregnancy or within 42 days after termination of pregnancy from the 1st of February 2007 to the 31st of January 2008.

Survey methodology:
Women were recruited at the maternity ward of Herat Regional Hospital on a daily basis during the twelve-months study period. Three doctors from the maternity

ward were specifically trained to recruit near-miss women. In a three-day rotation, a doctor checked admission records of all suspected near-miss women and determined whether the women met the clinical criteria of near-miss at admission by checking individual medical records and discussing with other doctors when necessary. If a woman met the criteria, she was asked to participate in the study. Each woman was interviewed by a female interviewer in the hospital after the woman recovered from near-miss event before discharge. The woman's husband was also asked to participate in the study and interviewed by a male interviewer at the hospital before discharge. If the woman did not recover from the life-threatening event and died in the hospital, male and female interviewers visited the woman's residence, if security permitting, after a mourning period was over, and interviews were conducted at their residence with her husband and a female family member who was attending the woman during her illness. If the security in their area of residence or the roads to their residence was questionable, interviews were conducted in the hospital before the families left for home after consent was obtained.

Instruments:
Two structured questionnaires were used, one for women and another for husbands to obtain information related to timings of illness, care-seeking and referral processes and the level and type of woman and husband's social resources in addition to basic socio-demographic variables. Wherever possible, standard questions were adapted and/or modified from survey questionnaires that have been proven adequate elsewhere (ie. DHS questionnaires[10], Pakistan Reproductive Health and Family Planning Surveys [11], Medical Outcome Studies on social support [12] and Social Capital Questionnaire[13]). Questions for which there were no standard version available were written with assistance of a local research assistant. Data extraction forms were used to extract data related to timings of admission and of delivery of foetus in addition to data related to complication type.

Modelling in Geographic Information System (GIS) was employed to prepare data related to travel times from women's residence to the study hospital. In order to obtain input data for the model, information related to the locations of women's residences were collected during male interviews and they were matched to geographical coordinates prepared by Afghanistan Information Management Services, which were then entered into the model.

Analysis:
Regression models will be used to obtain coefficients of simple linear regression models predicting delays after necessary data processing. Multivariate linear regressions will be used in order to control important confounding variables.

Implications:
Although all the women were in life-threatening conditions at admission and therefore experienced some 'delays', we expect that their experiences of care-seeking and referral delays vary according to women's intra-household status,

men's social resources, access to healthcare in addition to healthcare utilisation during pregnancy which may be mediated by complication types. The study results will inform local policy-makers of areas of activities that need to be promoted in order to improve the access to care for reduction of maternal and neonatal mortality.

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