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Care seeking at time of childbirth, and maternal and perinatal mortality in Matlab, Bangladesh

Carine Ronsmans,1 Mahbub Elahi Chowdhury,2 Marge Koblinsky,3 & Anisuddin Ahmed4

Objective To examine the nature of the relationship between the use of skilled attendance around the time of delivery and maternal and perinatal mortality.

Methods We analysed health and demographic surveillance system data collected between 1987 and 2005 by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) in Matlab, Bangladesh.

Findings The study recorded 59 165 pregnancies, 173 maternal deaths, 1661 stillbirths and 1418 early neonatal deaths in its service area over the study period. During that time, the use of skilled attendance during childbirth increased from 5.2% to 52.6%. More than half (57.8%) of the women who died and one-third (33.7%) of those who experienced a perinatal death (i.e. a stillbirth or early neonatal death) had sought skilled attendance. Maternal mortality was low among women who did not seek skilled care (160 per 100 000 pregnancies) and was nearly 32 times higher (adjusted odds ratio, OR: 31.66; 95% confidence interval, CI: 22.03–45.48) among women who came into contact with comprehensive emergency obstetric care. Over time, the strength of the association between skilled obstetric care and maternal mortality declined as more women sought such care. Perinatal death rates were also higher for those who sought skilled care than for those who did not, although the strength of association was much weaker.

Conclusion Given the high maternal mortality ratio and perinatal mortality rate among women who sought obstetric care, more work is needed to ensure that women and their neonates receive timely and effective obstetric care. Reductions in perinatal mortality will require strategies such as early detection and management of health problems during pregnancy.

Introduction

The United Nation’s fourth and fifth Millennium Development Goals set targets for reducing child and maternal mortality by 2015.1 Child survival has shown some improvement globally, but progress has been slow for maternal, perinatal and neonatal health.2–5 Better monitoring and management of labour, delivery and the immediate postpartum period are thought to be critical to reducing rates of maternal mortality and perinatal mortality (i.e. a stillbirth or early neonatal death).2–4 Ensuring that labour and the first 24 hours postpartum are managed by a skilled care provider is one of the keys to achieving this aim.5–6

There have been few rigorous studies of the effects on maternal or perinatal mortality of various levels and configurations of skilled care or of the size of the effect on maternal or perinatal mortality that could be achieved by such care.5–9 Ecological studies have shown that populations with a greater per cent of births attended by a skilled professional also have higher maternal and perinatal mortality,10–12 but causal inferences cannot be robustly drawn.13 Few studies have assessed whether the use of a skilled provider reduces the risk of maternal or perinatal death for individual women and their offspring.13,14

This paper examines whether skilled attendance around the time of birth is associated with the risk of maternal and perinatal death for individual women and neonates. The Matlab study area in rural Bangladesh offers a unique opportunity to examine this relationship because the uptake of skilled care at birth improved dramatically over the study period and prospective surveillance through the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) ensures high-quality data on maternal and perinatal mortality.15–17 By separating basic from comprehensive obstetric care and by examining the outcomes for both mother and neonate, we provide insights into the nature of the relationship between skilled birth attendance and health outcomes around the time of birth.

Methods

Study population

The study was conducted in Matlab, a rural area in Bangladesh, south-east of the capital Dhaka. In this predominantly Muslim society, women are traditionally restricted from seeking care outside their home, although dramatic changes occurred over the study period.18–19 The study took place in the ICDDR,B service area, which has a population of about 110 000.20

Safe motherhood programme

In 1987, a safe motherhood programme was introduced in the ICDDR,B surveillance area.15 The programme aimed to increase the coverage of home births involving a skilled professional. Eight trained midwives were posted in the area, and transport was provided for the women who were referred to a basic obstetric care facility in Matlab town, or to a private or public comprehensive obstetric care facility in a town outside the ICDDR,B area. The midwives provided antenatal care, basic obstetric care and neonatal care, including monitoring the progress of labour, drying and wrapping the baby, placing the baby on the mother’s breast to facilitate immediate breastfeeding, providing antibiotic pro-

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phylaxis for eye infections, and adminis-
tering succion to clear the neonate’s airway
when necessary. The home-birth strategy
continued until 1996, after which it was
redesigned to be facility based.18 Between
1996 and 2001, all four health centres
were upgraded and equipped to perform
basic obstetric care; home births with
midwives were no longer offered.16 In
the health centres, midwives routinely used
the partograph (a tool for assessing the
progress of labour and identifying when
intervention is necessary) for delivery,
actively managed the third stage of labour
to prevent postpartum haemorrhage, and
administered sedatives for management of
pre-eclampsia and eclampsia and antibiot-
ic for infection control. At the Matlab
clinic during the same period, care was
more advanced; it included magnesium
sulfate for pre-eclampsia and eclampsia,
assisted deliveries, manual removal of the
placenta and blood transfusion.

Data collection
We used multiple data sources collected by
the ICDDR,B between 1987 and 2005; these included the routine health
and demographic surveillance system (HDSS), periodic censuses, special stud-
ies on maternal mortality, a geographic
information system and the safe mother-
hood programme.

The HDSS maintains data on all
births, deaths, marriages and migrations
since 1966, and each individual has a
unique identifier.20 From the HDSS
we extracted data on all stillbirths and
live births, birth order and maternal
age. Information on maternal deaths
was available from studies that involved
detailed verbal autopsies of all deaths in
women of reproductive age.15,16 Data on
asset ownership and maternal education
were obtained from the 1996 and 2005
censuses. Wealth was measured by an asset
index.16 Linear distance from the health
centre to the woman’s home was obtained
from the geographic information system.

Data on care seeking around the time
of pregnancy termination, birth or death
were obtained from programme records.
For each pregnancy, the midwives main-
tain a record (in the form of a card) of
all visits performed. Between 1987 and
1993, this card was given only to women
who had seen a midwife at any time during
or after pregnancy. From 1996 onwards,
community workers completed a card
for all pregnant women in their area and,
if contacted, the midwife completed
relevant sections. The cards included in-
formation on the place of birth, attendant
at delivery and referral. Service use infor-

dation from the cards was supplemented
by data available from registers kept in
the Matlab clinic (1987–2005) and by the
midwives (1996–2005) and from a
study on met need for life-saving surgery
conducted between 1990 and 2001.20 For
maternal deaths, additional information
on care seeking before death was available
from verbal autopsies.20

Definitions
Women were classified as having received
basic obstetric care if the ICDDR,B
midwife was present at any time during
pregnancy termination, labour, delivery
or the immediate postpartum period, or
near the time of death, whether or not
they actually assisted with the termination
or birth. Similarly, women were classified
as having received care from a comprehen-
sive obstetric care facility if they received
care from private or public hospitals
outside the ICDDR,B surveillance area
near the time of pregnancy termination,
labour, delivery or the immediate post-
partum period, or near the time of death.
For maternal mortality we repeated the
analysis, restricting the sample to women
who had given birth.

A maternal death was defined as
the death of a woman while pregnant or
within 90 days of pregnancy termina-
tion, irrespective of pregnancy duration
or termination method. A stillbirth was
defined as a death of a fetus after 28 weeks’
gestation but before delivery of the baby’s
head. An early neonatal death was defined
as the death of a live born infant within
one week (seven complete days) after
birth. Perinatal deaths included stillbirths
and early neonatal deaths.

Data analysis
Denominators for the maternal mortality
ratio, stillbirth rate and early neonatal
mortality rate included all pregnancies,
all births and all live births, respectively,
between 1987 and 2005. Multiple births
were recorded as a single pregnancy, and
the outcome was considered a perinatal
dead if one or more of the neonates was
stillborn or died within one week of birth.
We estimated odds ratios (ORs) by logis-
tic regression, using Stata version 10 (Stata
Corporation, College Station, TX, USA).
We present crude and adjusted ORs, ad-
justed for year of birth, distance to basic
obstetric facility, asset quintile, maternal
education, maternal age and birth order.
For stillbirths and early neonatal mortal-
ity, we adjusted the analysis for clustering
of births in one woman. We also examined
whether the relationship between skilled
care and mortality changed over time by
introducing an interaction term between
skilled care and time of pregnancy termi-
nation or birth.

Results
The study sample consisted of 59 165
pregnancies, 173 maternal deaths, 1661
stillbirths and 1418 early neonatal deaths
between 1987 and 2005. The stillbirth
rate (3074 per 100 000 births) and
early neonatal mortality rate (2707 per
100 000 live births) were much higher
than the maternal mortality ratio (292 per
100 000 pregnancies). Nearly two-thirds
of the women who died (63.0%) did so af-
ter giving birth, and more than one-third
(41.3%) of those who gave birth and died
had a perinatal death (stillbirth in 30.3%
and early neonatal death in 11.0%).

Uptake of skilled care at birth in-
creased dramatically over the study
period, from 5.2% in 1987 to 52.6% in
2005 (Fig. 1). Most contacts with a skilled
professional were at the basic obstetric
care level, but birth in a comprehensive
obstetric care facility also increased
considerably over the study period, from
0.5% in 1987 to 11.7% in 2005. The pro-
portion of women who sought care from a
comprehensive obstetric care facility
without prior contact at the basic obstet-
ric care level also increased significantly,
from 35.3% in 1987 to 71.3% in 2005
(P = 0.002).

The proportion of women seeking
skilled care around the time of preg-
nancy termination, birth or death was
much higher among those who suffered
a maternal death than among those who
experienced a perinatal death. More than
half (57.8%) of the women who died had
sought care from a skilled professional
(37.0% from a comprehensive obstetric
care facility and 20.8% from a basic
obstetric care facility only), compared to
only one-third (33.7%) of women who ex-
perienced a perinatal death (13.3% from
a comprehensive obstetric care facility
and 20.5% from a basic obstetric care facility
only). The proportions seeking care were
higher for women who had a stillbirth
(37.3%) than for women who experienced
an early neonatal death (29.6%) (P =
0.000) and differed somewhat by cause
of maternal death (Fig. 2). Skilled care
seeking before death was lowest among women dying after a pregnancy termination (45.0%) or injury (43.5%), and highest among those dying from indirect causes (71.7%) \( (P = 0.073) \) (Fig. 2).

As shown in Table 1, maternal mortality was remarkably low among women who did not seek skilled care (160 per 100 000 pregnancies) but was extremely high among those seeking care from a comprehensive obstetric care facility (2188 per 100 000 pregnancies; crude OR: 13.97 (95% CI: 9.97–19.59)). Stillbirth and early neonatal death rates also varied depending on where care was sought, although the gap between those seeking care from a comprehensive obstetric care facility and those not seeking skilled care was relatively small (OR: 5.07 for stillbirths and 2.08 for early neonatal deaths). These patterns became more pronounced after adjusting the analysis for year of birth, distance to basic obstetric facility, asset quintile, maternal education, maternal age and birth order (Table 1).

Restricting the analysis of maternal mortality to women who died after giving birth did not change the findings (crude OR: 1.96 95% CI: 1.19–3.23 for women seeking basic obstetric care; crude OR: 13.66; 95% CI: 8.92–20.93 for women seeking comprehensive obstetric care).

The associations between maternal mortality and early neonatal mortality and care seeking around pregnancy termination, birth or death differed by year of birth (interaction between care seeking and year of birth; \( P = 0.0642 \)). In the period 1987–91, when few women sought skilled care around the time of labour and delivery, mortality among those seeking care from a comprehensive obstetric care facility was extremely high (maternal mortality 7263 per 100 000 pregnancies and early neonatal mortality 8389 per 100 000 live births) (Table 2, Table 3, Fig. 3). As more women sought care at these facilities, mortality among those seeking care from a comprehensive obstetric care facility gradually declined, but it was still high in the later years of the programme (maternal mortality 653 per 100 000 pregnancies and early neonatal mortality 3398 per 100 000 live births) (Table 2, Table 3, Fig. 3). In 2002–2005, there were low levels of maternal mortality (68 per 100 000 pregnancies) among women giving birth at home without a skilled professional, but stillbirths and early neonatal mortality remained high (stillbirths 1766 per 100 000 births; early neonatal mortality 2101 per 100 000 live births) (Table 4, Table 3).

Discussion

In this study, maternal and perinatal mortality were higher among women seeking skilled obstetric care around the time of pregnancy termination, birth or death than among women who did not seek such care. Mortality among those seeking care was particularly high in the early years of the safe motherhood programme, when few women sought skilled obstetric care. At that time, 7% of the women who sought care from a hospital died, and 21% had a stillbirth or lost their child within seven days of birth. As uptake of skilled obstetric care increased, more women and neonates survived, though maternal and perinatal mortality remained high among those seeking care from a hospital.

The high levels of maternal or perinatal mortality among those receiving skilled care is perhaps not surprising in settings where few births are managed by a skilled birth attendant. Similar patterns of high maternal mortality among those seeking care were seen in Nepal and Indonesia, where births involving a skilled birth attendant were only 8% and 33%, respectively. When uptake of skilled birth attendance or comprehensive obstetric care is low, women will only seek...
skilled care when they are ill, and they may do so too late for a midwife or doctor to be able to save the lives of the mothers or neonates. As coverage increases, more women who are less at risk will seek care; thus, average mortality in those seeking care will decrease.

Lack of timely and adequate care once women reach the health facility may also explain the high mortality among those seeking skilled obstetric care. In the last five years of the programme, when more than half of women sought care from a skilled professional, maternal mortality among those seeking care from hospitals was still over 600 per 100,000 pregnancies and more than 10% of the women lost their baby. This suggests that they may have received substandard care.

Little is known about the quality of obstetric care in hospitals in Bangladesh, but

### Table 1. Maternal mortality, stillbirth and early neonatal mortality, in rates and absolute figures, and corresponding odds ratios for highest level of care at pregnancy termination, birth or death, Matlab, Bangladesh, 1987–2005

<table>
<thead>
<tr>
<th></th>
<th>No skilled obstetric care</th>
<th>Basic obstetric care only</th>
<th>Comprehensive obstetric care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal mortality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal mortality ratio(^a) (no. of deaths)</td>
<td>160 (73)</td>
<td>340 (36)</td>
<td>2188 (64)</td>
</tr>
<tr>
<td>Crude OR (95% CI)</td>
<td>1.00</td>
<td>2.13 (1.43–3.18)</td>
<td>13.97 (9.97–19.59)</td>
</tr>
<tr>
<td>Adjusted OR (95% CI)(^b)</td>
<td>1.00</td>
<td>3.92 (2.63–6.01)</td>
<td>31.66 (22.03–45.48)</td>
</tr>
<tr>
<td><strong>Stillbirth</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stillbirth rate(^a) (no. of deaths)</td>
<td>2528 (1042)</td>
<td>3143 (323)</td>
<td>11 653 (296)</td>
</tr>
<tr>
<td>Crude OR (95% CI)</td>
<td>1.00</td>
<td>1.25 (1.09–1.42)</td>
<td>5.07 (4.42–5.81)</td>
</tr>
<tr>
<td>Adjusted OR (95% CI)(^b)</td>
<td>1.00</td>
<td>1.51 (1.31–1.73)</td>
<td>6.61 (5.62–7.79)</td>
</tr>
<tr>
<td><strong>Early neonatal mortality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early neonatal mortality rate(^a) (no. of deaths)</td>
<td>2484 (998)</td>
<td>3084 (307)</td>
<td>5036 (113)</td>
</tr>
<tr>
<td>Crude OR (95% CI)</td>
<td>1.00</td>
<td>1.25 (1.10–1.42)</td>
<td>2.08 (1.70–2.55)</td>
</tr>
<tr>
<td>Adjusted OR (95% CI)(^b)</td>
<td>1.00</td>
<td>1.47 (1.27–1.69)</td>
<td>2.69 (2.16–3.37)</td>
</tr>
</tbody>
</table>

CI, confidence interval; OR, odds ratio.

\(^a\) Maternal deaths per 100,000 pregnancies.

\(^b\) Adjusted for year of birth, distance to basic obstetric facility, asset quintile, maternal education, maternal age and birth order.

### Table 2. Maternal mortality by year of birth and highest level of care at pregnancy termination, birth or death, Matlab, Bangladesh, 1987–2005

<table>
<thead>
<tr>
<th>Year of birth</th>
<th>No skilled obstetric care</th>
<th>Basic obstetric care only</th>
<th>Comprehensive obstetric care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of pregnancies</td>
<td>% of pregnancies</td>
<td>% of pregnancies</td>
</tr>
<tr>
<td></td>
<td>Maternal mortality ratio(^a) (95% CI)</td>
<td>Maternal mortality ratio(^a) (95% CI)</td>
<td>Maternal mortality ratio(^a) (95% CI)</td>
</tr>
<tr>
<td>1987–1991</td>
<td>89.5</td>
<td>8.3</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>207 (141–294)</td>
<td>644 (295–1223)</td>
<td>7263 (4745–10 641)</td>
</tr>
<tr>
<td>1992–1996</td>
<td>81.8</td>
<td>14.1</td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>219 (143–321)</td>
<td>538 (288–962)</td>
<td>2707 (1548–4396)</td>
</tr>
<tr>
<td>1997–2001</td>
<td>75.9</td>
<td>20.2</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>96 (48–172)</td>
<td>296 (136–563)</td>
<td>2174 (1158–3717)</td>
</tr>
<tr>
<td>2002–2005</td>
<td>57.4</td>
<td>31.9</td>
<td>10.7</td>
</tr>
<tr>
<td></td>
<td>68 (22–158)</td>
<td>171 (69–352)</td>
<td>653 (299–1240)</td>
</tr>
<tr>
<td>Yearly trend</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>0.92 (0.88–0.96)</td>
<td>0.90 (0.85–0.96)</td>
<td>0.85 (0.81–0.89)</td>
</tr>
</tbody>
</table>

CI, confidence interval.

\(^a\) Maternal deaths per 100,000 pregnancies.

### Table 3. Early neonatal mortality by year of birth and highest level of care at pregnancy termination, birth or death, Matlab, Bangladesh, 1987–2005

<table>
<thead>
<tr>
<th>Year of birth</th>
<th>No skilled obstetric care</th>
<th>Basic obstetric care only</th>
<th>Comprehensive obstetric care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% of live births</td>
<td>% of live births</td>
<td>% of live births</td>
</tr>
<tr>
<td></td>
<td>Early neonatal mortality rate(^a) (95% CI)</td>
<td>Early neonatal mortality rate(^a) (95% CI)</td>
<td>Early neonatal mortality rate(^a) (95% CI)</td>
</tr>
<tr>
<td>1987–1991</td>
<td>89.1</td>
<td>8.9</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>2869 (2592–3167)</td>
<td>3901 (2927–5084)</td>
<td>3839 (5503–1213)</td>
</tr>
<tr>
<td>1992–1996</td>
<td>81.1</td>
<td>15.1</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>2602 (2306–2924)</td>
<td>3359 (2607–4253)</td>
<td>6804 (4730–9423)</td>
</tr>
<tr>
<td>1997–2001</td>
<td>74.6</td>
<td>21.8</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>2090 (1819–2389)</td>
<td>2932 (2352–3609)</td>
<td>4490 (2835–6719)</td>
</tr>
<tr>
<td>2002–2005</td>
<td>57.2</td>
<td>33.9</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>2101 (1761–2486)</td>
<td>2766 (2263–3344)</td>
<td>3398 (2351–4740)</td>
</tr>
<tr>
<td>Yearly trend</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>0.97 (0.96–0.99)</td>
<td>0.97 (0.95–0.99)</td>
<td>0.93 (0.90–0.96)</td>
</tr>
</tbody>
</table>

CI, confidence interval.

\(^a\) Early neonatal deaths per 100,000 live births.
there is some evidence of substandard care within public facilities. There are substantial constraints on human resources, and some staffing positions may be left unfilled. The costs of care to patients are high; patients invariably have to buy some medicines – particularly for obstetric surgery – and evidence-based practices, such as the use of magnesium sulfate or the partograph, are far from universal. The quality of care in private hospitals is not known, even though an increasing share of comprehensive obstetric care is covered by the private sector.

Most stillbirths and early neonatal deaths occurred at home, without a skilled birth attendant. Since many such deaths are experienced by apparently healthy women, this raises important questions about how to best organize care for mothers, to ensure perinatal survival. The causes of stillbirths are largely unknown, while early neonatal deaths are mostly related to birth asphyxia, premature birth and low birth weight. Stillbirth and early neonatal mortality rates are falling in Matlab, but there is little evidence that this is related to the safe motherhood programme. Lack of antenatal care may be associated with stillbirths, although it is not clear which antenatal interventions are effective in preventing such deaths in a community setting. Although it seems plausible that nutritional interventions would be effective in reducing perinatal mortality in malnourished populations, robust studies of the effect of such interventions are lacking. Interventions known to be effective, such as malaria prophylaxis or treatment of maternal syphilis, do not apply to the population in Matlab because there is no malaria and the prevalence of sexually transmitted infections is low. Prevention of early neonatal deaths and stillbirths clearly represents an important area for research.

Observational data are susceptible to bias. However, the demographic surveillance data we used are likely to be accurate because of in-built rigorous supervision to ensure data quality. Stillbirths are notoriously difficult to quantify and thus may have been underreported; however, the prospective ascertainment of pregnancies (discussed below) will have helped to limit the underreporting. The rates of stillbirth, early and late neonatal death also match those reported in the region. We are confident that the study identified most pregnancy-related deaths because pregnancies are ascertained prospectively in Matlab and the families of all deceased women of reproductive age are interviewed; thus, few pregnancies are missed.

We may have missed some data on women who gave birth in health facilities, particularly if the facility was far away from the surveillance area. In addition, not all private and public hospitals provided comprehensive obstetric care, particularly in the early years of the safe motherhood programme. Blood transfusion and Caesarean sections may be unavailable in some hospitals, and this may in part explain the high mortality rate seen. Moreover, private facilities often refuse to accept patients who are in a critical condition and instead refer them to public facilities, thereby further delaying care.

Lastly, the ICDDR,B services receive greater funding and supervision than parallel government services; thus, the findings may not be generalizable. However, a recent review of the literature found little evidence that giving birth with a skilled birth attendant reduces a woman’s risk of dying. In fact, in settings where access to care is low, birth with a skilled attendant appears to be associated with an increased risk of death, largely because the sickest women seek professional care.

ICDDR,B midwives were trained and equipped to use parenteral antibiotics, oxytocic drugs and sedatives for eclampsia; they were also trained to manually remove the placenta or retained...
The concurrent analysis of maternal and perinatal mortality has several advantages. First, it corroborates the fact that unborn infants and neonates are always at greater risk of dying than pregnant women or women who have just given birth, and that the combined burden of maternal and perinatal mortality is extremely high in Matlab, Bangladesh. Overall, 5% of pregnancies resulted in either the mother or the neonate dying, although this proportion declined over time (from 6% in 1987–91 to 4% in 2002–05; data not shown). Second, monitoring the mother and the neonate in a health facility for at least 24 hours after birth – as has been recommended for maternal health – will benefit both the mother and the neonate, provided the skilled birth attendants are knowledgeable and skilled in early neonatal care. Third, the concurrent analysis of maternal and perinatal mortality draws attention to the important role of antenatal care, which may be overlooked if only maternal outcomes are examined.

Mothers and their neonates are at greatest risk of death in late pregnancy, during childbirth and within the first 24 hours after birth. Offspring of mothers who die are also at greatest risk of stillbirth and early neonatal death and need to be managed by a skilled health professional in a health facility. Many women with life-threatening conditions seek professional care from a health facility, even when skilled-care seeking for birth is low. On the other hand, women whose babies died often do not seek skilled obstetric care. Thus, to achieve a healthy outcome for both mothers and neonates, efforts to ensure timely access to adequate emergency obstetric care will have to be supported by early detection and management of problems during pregnancy.

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Competing interests: None declared.
Maternal and perinatal mortality and care seeking in Bangladesh

**Résumé**

Recours aux soins au moment de l’accouchement et mortalité maternelle et périnatale à Matlab, au Bangladesh

**Objectif** Étudier la nature de la relation entre le recours à une assistance qualifiée et la mortalité maternelle et périmaternelle.

**Méthodes** Nous avons analysé les données de surveillance sanitaire et démographique recueillies entre 1987 et 2005 par le Centre international de recherche sur les maladies diarrhéiques (ICDDR, B) de Matlab, au Bangladesh.

**Résultats** Sur la période étudiée, l’étude a enregistré 59 165 grossesses, 173 décès maternels, 1661 mortinaissances et 1418 décès néonatals précoces dans sa zone de desserte. Pendant cette période, la fréquence du recours à une assistance qualifiée est passée de 5,2 à 52,6 %. Plus de la moitié (57,8 %) des femmes décédées en couche et un tiers (33,7 %) de celles ayant subi un décès périnatal (mortinaissance ou décès néonatal précoce) avaient sollicité une assistance qualifiée. La mortalité maternelle était faible parmi les femmes n’ayant pas recouru à des soins qualifiés (160 pour 100 000 grossesses) et était près de 32 fois supérieure (Odds ratio ajusté, OR : 31,66 ; intervalle de confiance à 95 %, IC : 22,03-45,48) chez les femmes ayant reçu des soins obstétricaux d’urgence complets. Au cours du temps, la force de l’association entre soins obstétricaux qualifiés et mortalité maternelle a diminué car davantage de femmes sollicitaient de tels soins. Les taux de mortalité périmaternelle étaient également plus élevés pour les femmes qui avaient bénéficié de ces soins que pour celles qui n’en n’avaient pas reçu, même si la force de cette association était nettement plus faible.

**Conclusion** Compte tenu des niveaux élevés du ratio de mortalité maternelle et du taux de mortalité périmaternelle pour les femmes ayant sollicité des soins obstétricaux, il faut œuvrer davantage pour s’assurer que les femmes et leurs nouveau-nés bénéficient de soins obstétricaux efficaces et administrés en temps utile. Réduire la mortalité périmaternelle nécessitera l’application de stratégies telles que la détection et la prise en charge précoces des problèmes de santé pendant la grossesse.

**Resumen**

Búsqueda de atención para el parto y mortalidad materna y perinatal en Matlab, Bangladesh

**Objetivo** Estudiar la naturaleza de la relación entre el recurso a asistencia calificada en torno al momento del parto y la mortalidad materna y perinatal.

**Métodos** Analizamos datos del sistema de vigilancia sanitaria y demográfica reunidos entre 1987 y 2005 por el Centro Internacional de Investigación de Enfermedades Diarreicas de Bangladesh en Matlab, Bangladesh.

**Resultados** El estudio registró 59 165 embarazos, 173 muertes maternas, 1661 defunciones prenatales y 1418 muertes neonatales tempranas en su zona de influencia a lo largo del periodo de estudio. Durante ese tiempo, el recurso a asistencia calificada durante el parto aumentó del 5,2% al 52,6%. Más de la mitad (57,8%) de las mujeres que murieron y una tercera parte (33,7%) de las que tuvieron un problema de mortalidad perinatal (esto es, de los casos de mortalidad materna o mortalidad neonatal precoz) habían buscado asistencia especializada. La mortalidad materna fue baja entre las mujeres que no buscaron atención especializada (160 por 100 000 embarazos) y unas 32 veces superior (razón de posibilidades ajustada, OR: 31,66; intervalo de confianza del 95%: 22,03-45,48) entre las que entraron en contacto con servicios de atención obstétrica integral de emergencia. A lo largo del tiempo, la solidez de la relación entre atención obstétrica calificada y mortalidad materna disminuyó paralelamente al aumento del número de mujeres que buscaban atención. La mortalidad perinatal fue también más alta entre las mujeres que buscaron atención especializada que entre las que no lo hicieron, aunque en este caso la asociación fue mucho más débil.

**Conclusion** Considerando los elevados valores de las razones de mortalidad materna y las tasas de mortalidad perinatal entre las mujeres que buscaron atención obstétrica, es necesario hacer un mayor esfuerzo para lograr que las mujeres y sus recién nacidos reciban una atención obstétrica eficaz a su debido tiempo. Para reducir la mortalidad perinatal se requerirán estrategias como la detección y el tratamiento tempranos de los problemas de salud durante el embarazo.

**References**


