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Collaborative survey of perinatal loss in planned and unplanned home births

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Abstract

Objective—To document the outcome of planned and unplanned births outside hospital.

Design—Confidential review of every pregnancy ending in stillbirth or neonatal death in which plans had been made for home delivery, irrespective of where delivery eventually occurred. The review was part of a sustained collaborative survey of all perinatal deaths.

Setting—Northern Regional Health Authority area.

Subjects—All 558 691 registered births to women normally resident in the former Northern Regional Health Authority area during 1981-94.

Main outcome measure—Perinatal death.

Results—The estimated perinatal mortality during 1981-94 among women booked for a home birth was 14 deaths in 2888 births. This was less than half that among all women in the region. Only three of the 14 women delivered outside hospital. Independent review suggested that two of the 14 deaths might have been averted by different management. Both births occurred in hospital, and in only one was management before admission of the mother judged inappropriate. Perinatal loss to the 64 women who booked for hospital delivery but delivered outside and to the 67 women who delivered outside hospital without ever making arrangements to receive professional care during labour accounted for the high perinatal mortality (134 deaths in 3466 deliveries) among all births outside hospital.

Conclusions—The perinatal hazard associated with planned home birth in the few women who exercised this option (<1%) was low and mostly unavoidable. Health authorities purchasing maternity care need to address the much greater hazard associated with unplanned delivery outside hospital.

Introduction

Home birth is uncommon in the United Kingdom and uncertainty exists about its safety.^{1,2} Almost all mortality figures available nationally¹ provide merely a single global figure for planned and unplanned home births, though the constituent rates differ greatly.³ The only recent figures for planned home birth in England and Wales relating to 1979⁴ and 1993⁵ provide an inaccurately low estimate of risk because it was not possible to account for those mothers who originally booked to have a home delivery but ended up delivering in hospital. This report records the outcome of planned and unplanned births outside hospital to residents in the former Northern Regional Health Authority area between 1981 and 1994.

Methods

Records have been kept of every stillbirth and neonatal death to a woman normally resident in the Northern region, irrespective of where delivery took place, since clinicians in the area served by the former Northern Regional Health Authority launched their collaborative maternity survey in the second half of 1980.⁶ Information was collected on where every woman had initially booked for delivery as well as where delivery took place. Notifications were cross validated against birth and death registration data compiled by the Office of Population Censuses and Surveys (now the Office for National Statistics) and 70 perinatal deaths identified between 1981 and 1994 that did not seem to have been registered as such by local registrars of births, marriages, and deaths; eight were concealed births to women who were never traced. This report uses the pre-1993 definition of stillbirth throughout and is concerned with the pre-1994 regional health authority boundary.

A total of 134 perinatal deaths occurred to women delivering outside hospital between 1981 and 1994 and all were treated as "home" births, though five actually took place in an ambulance, three in another person's house, and two in a general practitioner's surgery; 13 others were to women who were never traced. Additional information was collected on each death, including details of antenatal, intranatal, and postnatal care and results of any necropsy. Every stillbirth or neonatal death to a woman booked for home delivery at any time during pregnancy (irrespective of where delivery actually occurred) was also subjected to independent confidential review by clinicians from a different health district with access to copies of all the relevant unanonymised case records. Using the same approach as currently used in the United Kingdom confidential enquiries into maternal deaths, panels decided whether any aspect of the woman's professional care was substandard and whether any avoidable factor was present (that is, whether the pregnancy might have had a different outcome if a different strategy had been adopted).

DENOMINATOR DATA

Whereas detailed, contemporaneously collected information was available on every death, denominator data were harder to assemble. Information on the total number of births outside hospital was available each year from the Office of Population Censuses and Surveys but it was not known how many of these were planned home births.

Information had been collected retrospectively on a random sample of 100 women delivered outside hospital in 1983 and on all women delivered outside hospital in the region in 1988.⁷ Contemporaneous data were also collected on every delivery outside hospital during

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Northern Region Perinatal Mortality Survey Coordinating Group

Members of the coordinating group who have served over the past 15 years are listed at the end of this report.

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1993.⁸ In these three studies only 53%, 55% (132/240), and 44% (142/324) of women delivered outside hospital were actually booked for a home birth when labour began. Women who had not received any medical or midwifery antenatal care and who had made no arrangements for professional care during delivery accounted for 15%, 13% (31/240), and 10% (34/324) of all births outside hospital. The Office of Population Censuses and Surveys recorded a near static proportion of all the region's births as occurring outside hospital in the years covered by the study (average 0.62% compared with 1.2% for the whole of England and Wales).

Estimates of the numbers of women booked for home birth but delivering in hospital were even more difficult to obtain because hospital records do not always specify this information accurately and no national estimate exists.¹⁻⁴ Data collected in this region in 1983 suggested that 35% of these women changed to hospital based care either before or during labour, and a more detailed prospective study of all planned home births in 1993 found a total transfer rate of 43%.⁸ Women were classified as having booked for a home birth when a community midwife had accepted a woman for home delivery and had this arrangement accepted by her manager and supervisor of midwives at any stage in pregnancy, irrespective of any later change of plan. Reverse transfers (women arranging to have a home birth after initially making confirmed plans for hospital delivery) were uncommon. The one transfer of this nature associated with perinatal death was grouped with the other booked home births. Perinatal mortality associated with planned home births was calculated with an assumed predelivery transfer rate of 40%. Ford *et al* found a transfer rate of 19% in one inner city practice that provided substantial medical support for women requesting home birth between 1977 and 1989.⁹

Spot checks on data provided by the Office of Population Censuses and Surveys showed that official figures underestimated the number of live births and stillbirths outside hospital. Whereas all women who had planned a home birth registered that event as a home delivery, 14% of women who had booked a hospital birth but delivered at home, or before admission, in 1993 registered the birth as occurring in the hospital to which

Table 3—Rates for intrapartum stillbirth and neonatal death in babies of 2500 g or more without lethal malformation in Northern region, 1981-94

Group	No	Rate†
Women booked for home delivery	5/2689‡	1.86
All other births in region	642/520 280	1.23

† Deaths per 1000 registered births of babies of 2500 g or more without lethal malformation.

‡ With the assumption (for lack of accurate data) that the same proportion of these babies weighed ≥ 2500 g and had no lethal malformation as in the region as a whole (93.1%).

they were admitted after delivery. This happened to some women who had made no delivery plans. No correction was made for this or for other transcribing errors⁵ (whose net effect would be to lower the estimate of mortality for all women delivered outside hospital in table 1 by 6%) because it was not clear whether a similar degree of underascertainment operated throughout the 14 year study period.

Babies classified as born "elsewhere" by the Office of Population Censuses and Surveys were included in the totals recorded as born outside hospital. Most of the mothers had delivered on their way to hospital, and a few had delivered at the house of a friend or relative. None had delivered in a private maternity unit or in a psychiatric, remand, or penal institution.

Results

Between 1981 and 1994 inclusive 3466 births and 134 perinatal deaths were reported as having occurred outside hospital. Mortality was four times as high as for all registered births (38.7 v 9.7 deaths/1000 births). An estimate of the contribution made by unbooked and hospital booked births confirmed that these were much more hazardous than planned home births (table 1).

Table 2 shows the estimated perinatal mortality for the women booked for home delivery. Reviews that ignore antepartum and intrapartum transfer seriously underestimate the risk of perinatal loss. Such an analysis does not, however, establish how many of these deaths could relate to the management of delivery itself.⁵⁻¹⁰ For this the analysis shown in table 3 is more appropriate. Over the whole 14 years the risk of death during delivery or in the first four weeks of life in a baby of normal birth weight and without a lethal malformation was higher in those born to the small group of women who had booked for home delivery. However, during the last 10 years of that period, when the midwife was always the community lead professional, mortality in this subgroup was lower in those booking for home delivery (1/1890 v 410/370 722). Neither difference was statistically significant.

No such analysis can establish how many of these deaths were potentially avoidable. Details of the deaths are summarised in table 4. Confidential inquiry identified three deaths in which issues of substandard care were raised and two in which a different line of management might have produced a different outcome. In one case this entailed aspects of care before hospital admission. There were also two home births in which more regular intrapartum monitoring might have shown some heart rate abnormality in the absence of any other sign of trouble. Both deliveries occurred before 1984. Delays occasioned by the need to arrange and effect transfer probably contributed to only one death. No fault was found with midwifery care in any death.

Discussion

The debate about planned home birth centres not on whether it is safe but on whether it is less safe than hospital birth. That issue is now almost unaddressable in

Table 1—Perinatal mortality among 3466 women delivering outside hospital in Northern region, 1981-94

Category	Percentage of all births (95% confidence interval)†	No of stillbirths and deaths at 0-6 days	Estimated perinatal mortality (deaths/1000 births)‡
Women booked for home delivery	50 (46 to 53)	3	1.6-1.9
Women booked for hospital delivery	38 (34 to 41)	64	45.0-54.3
Unbooked	13 (10 to 15)	67	128.8-193.1
All deliveries outside hospital	100	134	38.7

† With the 3466 women registered by the Office of Population Censuses and Surveys as having delivered outside hospital allocated between the three subgroups as described in methods.

‡ Lowest and highest likely rates with the quoted 95% confidence intervals.

Table 2—Perinatal mortality among mothers booked for home confinement in Northern Region, 1981-94

Category	No	Perinatal mortality (deaths/1000 births)
Mothers booked for home birth and delivered at home	3/1733	1.7
Mothers booked for home birth wherever delivered	14/2888†	4.8
All births in region	5405/558 691	9.7

† With an assumed total predelivery transfer rate of 40% (see methods); the rate would be 5.7 if the actual transfer rate was only 30% and 6.5 if it was 20%.

Table 4—Stillbirths and neonatal deaths to mothers booked for home birth in Northern region, 1981–94

Case No	Gestation (weeks)	Outcome (Including arrangements for hospital transfer, if any)
1	41	General practitioner supervised labour. Transferred in first stage after sudden onset of fetal distress, but fetus dead on admission
2	41	Booked for hospital delivery. Requested home birth at 38 weeks when all well. No fetal heart audible when midwife arrived to supervise labour. Primiparous mother. Macerated home stillbirth
3	40	Midwife managed labour. Primiparous mother transferred during 90 minute second stage (10 minute journey) because of slow descent. Baby looked well after assisted vaginal delivery but died with subaponeurotic haematoma and suspected hypovolaemia at 8 hours. Coroner waived need for necropsy
4	40	Midwife managed labour. Fetal heart sound lost in second stage. Spontaneous stillbirth. Cord entanglement and true knot
5	40	Unexplained antepartum death. Induced hospital labour. True knot in cord at delivery
6	40	Midwife managed labour. Primiparous mother. Forceps "lift out" by general practitioner after sudden loss of fetal heart sound in second stage. Baby stillborn
7	39	General practitioner supervised early labour. Transferred to hospital care with meconium in liquor. Unassisted delivery but death at 25 minutes with unsuspected tentorial tear
8	39	Unexplained antepartum death. Induced hospital labour. Necropsy uninformative
9	39	Unexplained antepartum death. Induced hospital labour. Necropsy uninformative
10	38	Antepartum abruption. Fetus dead on admission despite immediate transfer
11	34	Booked for general practitioner supervised delivery but transferred in early labour at 34 weeks. Fetal heart sound lost soon after admission
12	34	Scan for hydramnios at 34 weeks showed anencephaly. Induced hospital labour. Baby registered as stillborn
13	33	Antepartum abruption. Fetus dead on admission despite rapid "flying squad" transfer
14	23	Transferred at 23 weeks in early labour. Primiparous mother. Unassisted delivery. Baby died at 36 hours

Britain because those women booking for home birth are not comparable with those booking for hospital delivery. Any matching process is fraught with uncertainty^{2 11} and any formal comparative trial impracticable.¹² Even if a trial was done it could not give a generalisable outcome—that is, the result would not necessarily be the same in a different setting. All we can say with certainty is that, of the 1890 women who were estimated to have booked for home delivery in this region in the last 10 years of the study period, only five lost a baby and intrapartum events were implicated in only one of those deaths.

During that time the death rate in labour or the neonatal period in non-malformed babies of normal birth weight born to women booked for a home delivery (those deaths most capable of reduction by high quality care during labour) was as low as the regional figure for all other such losses (0.05% *v* 0.11%). This contrasts with the outcome of a national analysis of such births,⁵ in which some women resisted intrapartum transfer when problems arose (but in which some deaths may have gone unanalysed). Studies in Australia,¹³ Canada,¹⁴ and the United States^{15 16} have concluded that in some settings midwife managed home birth can be associated with as low a perinatal mortality as hospital birth for low risk women, reviving the debate over the need to allow women genuine choice.^{17 18}

Perinatal loss is only one issue that needs to be taken into account when considering home birth, and the fact that very few babies died does not of itself show that arrangements for home birth were necessarily safe. Nevertheless, women wanting a home birth will take heart from these figures. Such results were achieved only by vigilance, ready access to hospital services, appropriate and timely transfer when problems arose during either pregnancy or labour, and by the readiness of both midwives and mothers to contemplate transfer promptly once problems were identified.⁸

That half the women delivered outside hospital in this region between 1981 and 1994 had not booked to have a home delivery underlines the importance of accepting that maternity services have to be planned on the assumption that some women will deliver in the community whether we (or they) like it or not. A service geared to cope with these unplanned events ought to be able to deal with a proportion of planned low risk deliveries. The estimates in table 1 are a sobering reflection of the perinatal hazards that these women face,^{3 4} even if the exact rates have been exaggerated by some underascertainment of the relevant official denominator figure

for all births outside hospital and are subject to uncertainty because sampling methods had to be used to apportion the overall figure.

The number of home births in the Northern region is currently very low (0.9%). The rate is much the same as in Scotland but lower than in any other area of England and Wales. Numbers could well increase, however (as they already have in parts of southern England),⁸ once women start to exercise the "choice in childbirth" envisaged by the government's endorsement¹⁹ of the Cumberlege report.²⁰ More women could almost certainly be delivered outside hospital with equal safety (given that the obstetric "profile" of many women booking for hospital delivery was no different from that of those initially booking for delivery at home), but whether the community midwifery service could at the moment and within its current budget respond to any rapid rise in the number of women wanting a home birth is less certain. A study of 1005 United Kingdom mothers for the Department of Health in 1993 indicated that 22% would have liked the opportunity to consider home birth,²¹ and several studies suggest that 10% of women might request such an option were it available and considered safe (a proportion that does not seem to have varied appreciably over the past 20 years).²²⁻³⁰

Key messages

- Perinatal mortality in babies born outside hospital was four times higher than the average for all births in the Northern region between 1981 and 1994
- Only three of 134 deaths were associated with planned home birth
- Over three quarters of the perinatal deaths associated with planned home birth occurred in hospital
- The hazards associated with planned home birth are quantifiable only when death is classified according to the original planned site of delivery
- Perinatal mortality in the few (<1%) pregnancies in which home birth had been planned was less than half the average for all births, and few of these deaths were associated with substandard care

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Outcome of planned home and planned hospital births in low risk pregnancies: prospective study in midwifery practices in the Netherlands

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Abstract

Objective—To investigate the relation between the intended place of birth (home or hospital) and perinatal outcome in women with low risk pregnancies after controlling for parity and social, medical, and obstetric background.

Design—Analysis of prospective data from midwives and their clients.

Setting—54 midwifery practices in the province of Gelderland, Netherlands.

Subjects—97 midwives and 1836 women with low risk pregnancies who had planned to give birth at home or in hospital.

Main outcome measure—Perinatal outcome index based on "maximal result with minimal intervention" and incorporating 22 items on childbirth, 9 on the condition of the newborn, and 5 on the mother after the birth.

Results—There was no relation between the planned place of birth and perinatal outcome in primiparous women when controlling for a favourable or less favourable background. In multiparous women, perinatal outcome was significantly better for planned home births than for planned hospital births, with or without control for background variables.

Conclusions—The outcome of planned home births is at least as good as that of planned hospital births in women at low risk receiving midwifery care in the Netherlands.

Introduction

In the Dutch maternity care system midwives are qualified to provide independent care for women with uncomplicated pregnancies.^{1,2} They also identify and select the women who, because of existing or anticipated problems, require care from an obstetrician.^{1,3} Twenty five years ago, women receiving primary care all gave birth at home, but since the 1970s they have been able to choose between home birth and hospital birth under the care of a midwife or general practitioner. This has led to a substantial reduction in home births (from 69% of all births in 1965 to 31% in 1991)⁴ and an increase in the proportion of births attended by midwives (from 35% in 1965 to 46% in 1992). About half of births attended by midwives now occur in hospital, with women and their babies generally being discharged within a few hours after birth.

There is growing concern among primary care givers that these short-stay hospital births (termed "poliklinische bevallingen") enhance the risk of medicalisation and may ultimately eliminate the home birth option. Indeed, referral to an obstetrician occurs more frequently for women with a planned hospital birth than for those choosing home birth.⁵ The reasons for this difference are unclear. Self selection may be an important confounder, with the healthiest and most affluent women choosing home birth. Also the choice of home or hospital may influence referral to specialist care, as resources are more likely to be used if they are closer at hand.



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