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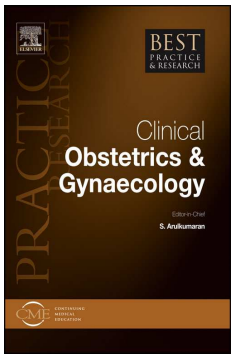

Planned Homebirth

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Abstract

With increasing medical advances and the ability to rescue the mother and her baby, there has been a growth in the number of women who deliver in hospital facilities. This allows the full care to be provided if required.[1] Maternal and perinatal mortality has fallen accordingly. This improvement in mother and baby outcomes has produced a conception of maternity safety in the developed world and a call for the return to homebirth. This has concerned the obstetricians and particularly the paediatricians who feel that this produces unacceptable risk to the mother and her baby. However, evidence, mostly from Europe but some from the US, suggest that homebirth can be relatively safe in the right circumstances. This needs a fully integrated comprehensive maternity care network that is supportive and responsive. The question should this be supported to help improve the safety of homebirth or resisted since homebirth in many situations is inherently unsafe.

Keywords

Homebirth, maternal mortality, perinatal mortality, maternity networks, ethical choice, midwifery, obstetrics.

Introduction

Throughout history, most people have been born at home or in the community and this remains true today. It is not that it was planned that way, it is just the way it was. It was not until the 1700 and 1800's did women begin to deliver in hospital but it was not for all [2-4]. The wealthy delivered at home with their accoucheur[5]. Hospital birth catered for the poor and destitute, to give them the supportive surroundings they did not have in the community[2-4]. Maternity hospitals were not without their problems[6] and institutional birth was not seen as beneficial or safe by all.

From the mid 1800s, there were developments and greater understanding of sepsis[6], bacterial infection and aseptic techniques[7]. In Edinburgh, the development of anaesthesia[8] allowed for the opportunity for interventionist techniques to be developed. Caesarean section became established and was potentially lifesaving in cases of obstructed labour[9](Table 1).

These changes were accompanied by a significant reduction in maternal mortality. In Sweden, there was a steady decline from 900/100,000 births in 1750 to 6/100000 births in 1980. Two-thirds of this decrease occurred before 1900 and the remainder since[10]. Similar reductions were found in the UK although at slightly different times (Figure 1)[11]. Throughout this time, most women still gave birth at home.

In the late 1940's, the medical developments of blood transfusion[12], antibiotics[13] and safe anaesthesia led to further reductions in maternal mortality(9) (Table 1) In 1950s, the National Health Service encouraged mothers to give birth in hospital. At that time, housing conditions and general health were still relatively poor and for many women the hospital was

safest environment in which to give birth. The move away from homebirths in the UK took place largely between 1963 and 1974 (Figure 2). In 1960, the percentage of women giving birth at home in the UK was 33% but this fell to a 0.9% between 1985 and 1988 with a slight rise since. Maternal mortality continued to fall dramatically from 400/100000 in 1939 to 14/100000 in 1970[14] and 10/100000 in 1980 (Figure 1) [11, 15]

In the Netherlands, there was a similar reduction in homebirth. In 1965, two-thirds of all births occurred at home. Over the next 25 years, this reduced so that two-thirds of births occurred in hospital and fewer than one-third at home(11). This is still a high rate of homebirth but the Dutch maternity care system depends on a high level of training for midwives[16].

Worldwide, institutional birth has been the cornerstone of actions aimed at reducing maternal mortality. However, there are various obstacles to this [17]. These affect the efforts to reduce maternal mortality and are associated with the three delays (1) delay the decision to seek care; (2) delay arrival at a health facility; and (3) delay the provision of adequate care[18] (Table 2).

Is homebirth safe? (Table 4)

This reduction in maternal mortality has made many people think that pregnancy is now safe and forget that it is our ability to save in the hospital that has changed. But this belief has led to a very vocal demand for a return to homebirth, largely as a women's right[19]. Women who choose homebirth are mostly married (91%), white (87%) with a college education (62%). The reasons they choose homebirth are shown in table 3[20]. The most common reason given was safety, the same reason people use to argue against it[21, 22]. These women

equate medical intervention with reduced safety and trusted their bodies' inherent ability to give birth without interference [19].

Health practitioners who support homebirth do so for main three reasons: a woman's right to choose; it may be more cost effective; and if homebirth is not supported, some women might choose to have a free birth which is even more dangerous. Those who opposed homebirth argue that complications can occur during childbirth and timely transfer may not be possible[23].

In Europe, there is a long tradition of midwifery led care, based in the community, in countries such as the Netherlands, UK and Sweden. These services are integrated into the local maternity services. Various studies have tried to answer the safety question but many have built in biases and small numbers making the power of the studies inadequate to look at significant morbidity or mortality.

In the Netherlands, planned homebirths were found to be at least as safe as that of planned hospital births.[24]. But when intrapartum and early neonatal mortality rates are compared, the raw data suggested that it was lower in homebirth but, after case mix adjustment, the relative risk showed a nonsignificant increase in perinatal mortality (OR 1.05, 95% CI 0.91-1.21). The study concluded that in certain at-risk subgroups home birth has added risk (up to 20% increase)[25]. A small study of cord gas analysis in 85 homebirths and 85 hospital births, showed that the median values for pH in the umbilical artery (7.19) and base excess (-9.9 mmol/l) in home deliveries differed significantly from those of matched controls (7.25 and -7.7, respectively) delivered in the hospital. It appears that delivery in the hospital with continuous fetal monitoring favours the birth of less acidotic children[26]. These studies

suggest that, although for the majority homebirth is safe, it may be because things do not usually go wrong, but if they do, the risks are higher. Similarly, the rate of severe acute maternal morbidity in low risk women was low at 2.0 per 1000 births and there was no evidence that planned homebirth led to an increased risk[27]. However, it is to be remembered that this was in a maternity care system with well-trained midwives and a good referral and transportation system where most homes are within 5Km of a hospital[27].
One of the main arguments of those advocating homebirth is the psychological benefits. However, a study which looked at whether women who give birth at home are less prone to mood disturbances during the early puerperium than those who give birth in hospital found no difference in the incidence of blues and depression between women who gave birth at home and those who gave birth in hospital[28].

In the UK, a large prospective cohort study (Birthplace) provides some of the best data about the relative risk of place of birth and its results are widely quoted (and misquoted). It compared perinatal and maternal outcomes and interventions in labour by planned place of birth at the start of care in labour for women with low risk pregnancies. It involved women who gave birth at home, in freestanding midwifery units (FMU), in alongside midwifery units (AMU - midwife led units on a hospital site with an obstetric unit), and a stratified random sample of obstetric units. In all, there were 64,538 eligible women that took part in the study. There were 250 primary outcome events giving an incidence of 4.3 per 1000 births (95% CI 3.3 to 5.5) again emphasising the relative low incidence of complications. Overall, there were no significant differences in the adjusted odds of the primary outcome for any of the non-obstetric unit settings compared with obstetric units. But, in nulliparous women, the odds of primary outcome were higher for planned homebirths (adjusted OR 1.75, 95% CI 1.07 to 2.86) but not for either midwifery unit setting. For multiparous women, there were no

significant differences in the incidence of the primary outcome by planned place of birth but the incidence of primary outcome was lower. Transfers from non-obstetric unit settings were high for nulliparous women (36% to 45%) and lower for multiparous women (9% to 13%).

Therefore, homebirth is associated with less interventions but, for nulliparous women, there is a poorer perinatal outcome[29]. Secondary analysis of the data showed a reduction in instrumental delivery and an increase in 'straightforward vaginal birth' in community based care but no difference in intrapartum caesarean section rates[30].

In France in 2005-6, the out-of-hospital birth rate was 4.3 per 1000 births but the rates more than doubled in women living 30km or more from their nearest maternity unit. [31]. The highest risk of neonatal mortality and morbidity in those living under <5 km from a maternity unit, probably related to urban deprivation, but it increased again at >/=45 km compared with 5-45 km. They concluded that neonatal deaths associated with out-of-hospital birth were rare but more frequent at longer distances of transfer[32]. The Birthplace study demonstrated that median transfer time from decision to transfer to first hospital assessment was 49 minutes. If the transfer distance was within 20 km the time was 47 minutes, increasing to 55 minutes 20-40 km away and 61 minutes if more remote. In women who gave birth within 60 minutes after transfer, adverse neonatal outcomes occurred in 1-2%. Therefore, transfers from home commonly take up to 60 minutes from decision to transfer and first assessment in the hospital even for transfers for potentially urgent reasons[33]. In a German study of 360 transfer cases, the most frequent reasons for transfer were premature rupture of membranes and failure to progress in labour. There was an increase in operative deliveries (caesarean section, and instrumental vaginal delivery) and the babies were more likely to have low Apgar scores and be admitted to the neonatal unit, particularly in primigravida. Therefore, intrapartum-

transferred women, in particular when nulliparous, represent a special high-risk group who may require operative intervention[34]. These studies of distance and time taken to transfer need to be considered with the studies on the effect of the decision to delivery interval for emergency delivery[35].

In Sweden, between 1992 and 2004, the neonatal mortality rate was found to be 2.2 per thousand in the homebirth group compared with 0.7 in the hospital group but this did not reach significance (RR 3.6; 0.2-14.7)[36]. In New Zealand, which has an independent midwife-led model of care, a study of the 244,047 pregnancies showed that medical-led births were associated with lower odds of an Apgar score of less than seven at 5 min (OR 0.52; 0.43-0.64), intrauterine hypoxia (OR 0.79; 0.62-1.02), birth-related asphyxia (OR 0.45; 0.32-0.62), and neonatal encephalopathy (OR 0.61; 0.38-0.97) compared with midwife led care. There was a trend towards fewer infant deaths, but this did not reach significance for perinatal related mortality (OR 0.80; 0.54-1.19), for stillbirth (0.86; 0.55-1.34), and for neonatal mortality (0.62; 0.25-1.53). The main difference in New Zealand is that midwives practice autonomously without close links to obstetric services and these results may reflect this[37].

Over the last decade, planned homebirths in the United States (US) have increased. Neonatal mortality rates in hospital births attended by certified midwives were significantly lower (3.2/10000) than homebirths attended both by certified midwives (10.0/10000) (RR 0.33 95% CI 0.21-0.53) and uncertified midwives (13.7/10000) (RR 1.41 95% CI 0.83-2.38). This study confirms that, in the United States, neonatal mortality rates for homebirths are significantly higher than hospital birth[38]. Similarly, a New York study showed that neonates with HIE had a 44.0-fold (95%; CI 1.7-256.4) increased odds of having been

delivered out of hospital, whether unplanned or planned[39]. These results probably reflect the disconnect of homebirth from hospital-based obstetrics in the US. The evidence of lower cord gas results[26], HIE rates [39] and higher mortality[38] opens the debate on the role of the future child in the decision making process. The choice of place of birth may only be justified if it does not expose the future child to an unreasonable increased risk of avoidable disability. Couples should be informed of these risks and doctors should attempt to dissuade couples when they elect a place of birth that puts the health and well-being of the future child at risk.[40]

The UK studies suggest that homebirth can be carried out in relative safety but it requires teamwork, extensive expertise, neonatal and anaesthesia support, and ready access to equipment such as ultrasonography. Most women undergoing homebirth have full access to all that modern maternity care can provide, including an obstetrician for advice and support. None of these is generally available in US homebirths[41].

The problems with transfer

More than 10% of all planned homebirths in high-income countries are completed in the hospital and this rises to 45% in primigravida. This has a morbidity of its own. All women in Sweden who had a planned homebirth between 1998 and 2005 were invited to participate in a study of the emotional effect of transfer. Women who had been transferred during or immediately after the planned homebirth had a more negative birth experience (OR 13.5, CI 8.1-22.3) compared with women who completed the birth at home. The reasons for this related to organizational factors and the way the women were treated. This may be overcome

by establishing care pathways between the home setting and the hospital to enhance the positive birth experience irrespective of where the birth is completed.[42]

An Australian study compared the experiences of intrapartum transfer of the woman, her partner and her midwife. The midwives' experiences emphasised the need for support from their colleagues to acknowledge their ongoing role and knowledge of the woman[43]. The women found that the midwife helped them through the transfer experience and were appreciative of continuity of care. Although they were disappointed not to achieve the labour and birth they had anticipated, they appreciated the skills and expertise provided by the hospital. However, they felt that the focus of care moved from them to their baby, making them feel diminished. Maternity care providers should ensure that the woman remains the focus of care after transfer and understand the significance of effective communication to ensure women are included in all care discussions[44]. There is also significant emotional stress for their partners who found it difficult to witness the difficult labour journey[45]. There is a need to improve the support for women and their partners to help them make decisions about planned homebirth and provide ongoing support if they make that choice[46].

Alternatives

Advocates of planned homebirth have emphasized patient safety, patient satisfaction, cost effectiveness, and respect for women's rights. Many obstetricians in the US do not want to support homebirth but still wish to provide excellent and compassionate emergency obstetric care to women who require transfer in. They would prefer safe and compassionate hospital-based alternatives and advocate for these to be developed[47] This would provide compassionate and respectful treatment of pregnant women, which, they feel, cannot be achieved in planned homebirth[48]. They also believe that paediatricians should help create

hospital settings that resemble homebirth in birthing centres that are in or adjacent to hospitals.[49] It may be better to plan birth in an alongside maternity unit (AMU) for women with selected relatively common risk factors where transfer to an obstetric unit is easy and rapid[50].

These alternative institutional settings have been established for the care of pregnant women who prefer little or no medical intervention. They may also offer care throughout pregnancy and birth, or only during labour; and be part of hospitals or a freestanding unit. Specially designed labour rooms include bedroom-like rooms, ambient rooms, and Snoezelen rooms[51]. In a meta-analysis, these alternative settings increased the likelihood of no intrapartum analgesia/anaesthesia (RR 1.18, CI 1.05 to 1.33), spontaneous vaginal birth (RR 1.03, CI 1.01 to 1.05), breastfeeding at six to eight weeks (RR 1.04, CI 1.02 to 1.06) and very positive views of care (RR 1.96, CI 1.78 to 2.15) and decreased the likelihood of epidural analgesia (RR 0.80, CI 0.74 to 0.87), oxytocin augmentation of labour (RR 0.77, CI 0.67 to 0.88), instrumental vaginal birth (RR 0.89,CI 0.79 to 0.99) and episiotomy (RR 0.83, CI 0.77 to 0.90)[52]. These results mirror the UK experience with Birthplace where there were no increase risks but lower intervention rates in low risk women giving birth in Birthing Centres either alongside (AMU) or freestanding (FMU)[29].

By continuously striving to make hospital births more humane and support home-birth-like environments in the hospital, obstetricians can help to reduce the demand for homebirth and give women what they want without increasing the risk to her or her baby[21].

The ethical position

Obstetricians have an ethical and legal obligation to discuss any increased risks of perinatal and neonatal mortality and morbidity associated with any intervention or management[53]. If planned homebirth in the context of American healthcare is more dangerous, then this should be discussed and planned homebirth should not be recommended but it may still be the patient's choice. Many in the US feel that obstetricians should not participate in planned homebirth. At the same time, they continue to have an obligation to provide prenatal and emergency obstetric care[21]. In the UK, midwives were more enthusiastic about home birthing than any other professional and more supportive of the UK government's plan to increase homebirth rates. GPs and obstetricians/gynaecologists tended to hold neutral opinions about home birthing and regarding support for the government's plan.

Paediatricians/neonatologists were generally the most negative about home birthing and opposed to the government's plan[54]. The paediatricians obviously care for the baby which will influence their opinion, but in the UK, the fetus has no legal rights. It's the mother's choice.

Planned homebirth

There is an obvious "Atlantic Divide" over the role of homebirth in modern obstetrics. There is agreement that, for medically complicated pregnancies, outstanding care can only be provided in an obstetric unit but, for low risk pregnancies, US obstetricians are more against homebirth than their European counterparts. In the United States, there is an increased risk of neonatal mortality and morbidity of planned homebirth and many believe that homebirth should not be allowed and, ethically, doctors have a professional responsibility to discourage it.[55]. However, by doing that, it makes the separation of homebirth from hospital support wider and the outcomes potentially worse.

The system is different in the UK and the Netherlands and there are lessons that can learned from these systems[1]. Most women with straightforward pregnancies may be better off birthing outside the hospital in the United Kingdom and the Netherlands as long as there is a good integrated transfer process. Such women still have full access to obstetric services if required. In the UK, most community midwives are part of an integrated maternity system based around an obstetric unit with a robust system of escalation, transfer and reception which helps to prevent increased maternal and neonatal morbidity and mortality. The system is slightly different in the Netherlands but homebirth midwives are also well integrated into the overall healthcare system[27].

Therefore, if a woman is going to be able to have a planned homebirth, the homebirth needs to be planned. It is not just a decision the mother makes. It should also include the planning of arrangements for homebirth and the network infrastructure around it. The development of these systems should be based around the 3-delay model[18]. This is used to assess the factors that contribute to maternal death but it can also be used to understand why newborn babies die[56].

Managing Risks of Planned Home Birth

By using the 3-delay model as a template, the risks of homebirth can be minimised allowing planned homebirth to be offered to women who request it. Generally, the risks of events occurring are no greater at home, it is how they are responded to that increases the risk. The contributors to increased risk are (1) a delayed decision to seek care; (2) delayed arrival at a healthcare facility; and (3) delayed provision of hospital-based obstetric care.

Delayed decision to seek care

The true risk assessment of the woman herself.

The evidence suggests that the risk to the mother and her baby is linked to the incidence of risk and the need to transfer. Women, who have had a spontaneous vaginal birth before, are at the lowest risk of any complication in labour and need for transfer. This constitutes around 25-30% of the pregnancy population where homebirth would be relative safe.

Women with accepted increased risk, such as previous caesarean section and breech birth are at higher risk of complication and transfer as are all primigravidas. Delivery in an alongside midwifery unit would be a safer option for them where transfer which would be required in around 50% of cases and it would be easier and less stressful to achieve.

In any homebirth, the risk assessment needs to be constantly reassessed to allow the diagnosis of deterioration of the clinical situation to be made at the appropriate time when rescue is still possible.

Willingness to escalate

Both the mother and the midwife need to be ready and willing to transfer if the need arises and accept of the value of the hospital and see it as part of the facilities for their benefit. There needs to be an open dialogue between the midwife and the hospital to allow this. The more independent the midwife, the more risk there is to the mother and her baby[37].

Fully trained midwives

The midwives in the UK and the Netherlands are integrated into the maternity services and are required to maintain training and professional standards. This includes training in obstetric emergencies to allow them to stabilise any clinical situation before help arrives.

Planned network structure or governance

The strength of the UK and Dutch systems is the network structure and integration. This helps the identification of the degree of urgency and the communication between the various members of the healthcare team[57]. Without a robust maternity network, homebirth cannot be provided with guarantee of safety.

1) Delayed arrival at a health facility

Communication from home to hospital

The midwife needs to have a good relationship with the hospital she is transferring to, have had previous discussions with them and warned them of the problems that were arising. In the UK, the hospital labour ward is informed of women labouring at home within their area.

The need immediate transport

Facilities for transport in emergency situations needs to be planned. In the UK, if a midwife calls for emergency support an ambulance aims to arrive within 8 minutes, usually along with paramedics for resuscitative support if required.

Distance from home to facility

The aim in Holland is for the women to live within 5km of the hospital. What is of more importance is the length of time transfer takes. For “routine transfer” a time of up to an hour is common in the UK but even in emergency transfer, 45 minutes is around average. This increases the need for trained skilled midwives who can stabilise the situation and for rapid response on arrival at the hospital emphasising the importance of communication and support.

Planned network system for escalation

All these factors can be overcome by the forming of a network system for escalation, including training, awareness, communication, transport and rapid response.

2) Delayed provision of hospital-based obstetric care

The need for the Facility to be receptive

The facility needs to be receptive to the transfer, this requires communication, trust and empathy.

A planned network response

The response is dependent on a robust maternity network supportive of each other.

Managing the transfer as high risk on arrival

With the appropriate discussions and warnings, the facility can be ready to provide immediate high quality care on arrival which may mean an immediate emergency caesarean section.

An obstetrician linked to care

For this all to work well, there needs to be an obstetrician linked to care either from the beginning of pregnancy or at least when the complications first develop. This may be as

problem in systems where there is a unit cost to care but without it, there can be delays in providing rescue services.

The ownership of case as booked for homebirth

When a women transfers, her midwife needs to be allowed to come with her for support but the midwife needs to accept that she is no longer the lead carer but work in collaboration with the hospital team. The hospital team needs to take full control but allow her midwife to give input and support. A woman after transfer is at high risk and is vulnerable due to the change of circumstances where she feels that she has lost control of her environment. This is not a time for conflict or recrimination but a time for maximum collaboration to rescue the situation to the benefit of the mother and baby.

Can it be done in the US?

In San Diego, in the BirthPlace program, obstetricians and midwives work closely together to provide a comprehensive perinatal service in an integrated collaborative practice serving a largely a low-income population. These women are delivered by midwives in a freestanding birth centre (FSB) which is part of a larger integrated health network. Results suggest similar morbidity and mortality in the two groups and a lower intervention rate. The results suggest that a collaborative practice using a freestanding birth centre as an adjunct to an integrated perinatal health care system is possible in the US environment[57].

Conclusions

There is no straight forward answer to the question of “is planned homebirth safe?” It depends. It can be safe but it must be part of a fully integrated service to allow transfer and rescue. It produces a classic Catch-22 problem:

Do I support a planned homebirth service which I don't believe in and help to produce a safe integrated service or do I reject it and make planned homebirth even more dangerous?

Table 1: Factors contributing to the reduction in maternal mortality

1888 - 1940
Aseptic techniques
Anaesthesia
Caesarean section
Suturing of the uterus
Influence of World War II
Safer anaesthesia
Antimicrobials (penicillin)
Blood Transfusion
Surgical skills and techniques
Institutional birth

Table 2: The 3-delay model

(1) Delay the decision to seek care
Lack of careful risk assessment and early referral
Unwillingness to escalate
Lack of fully trained midwives
No planned network structure or governance
(2) Delay arrival at a health facility
Poor communication between home carer and hospital
Lack of immediate transport arrangements
Excessive distance from facility
No planned network system for support and escalation
(3) Delay the provision of adequate care
Facility not receptive
No planned network response
Not treated as high risk on arrival
No obstetrician linked to care
No ownership of case as booked for homebirth

Table 3 Reasons for choosing homebirth in the US[20]

	Reasons for choosing homebirth in the US	Total 169
1	safety	38
2	avoidance of unnecessary medical interventions common in hospital births	38
3	previous negative hospital experience	37
4	more personal control	35
5	comfortable, familiar environment	30
6	women's trust in the birth process	25

Table 4: Summary of Homebirth risks and benefits which vary depending on country and available networks

Homebirth benefits, risks and myths	
Benefits	
	Reduced medical interventions
	Better than previous hospital experience
	More personal control
	Comfortable, familiar environment
Risks	
	Increased risk of neonatal morbidity in primigravida
	Need for hospital transfer in up to 45% of cases in primigravida
	Less choice of analgesia
	Less skilled midwifery support
	Women's over trusting of the birth process
Myths	
	Homebirth is not safer although interventions may be less
	Epidurals are not less necessary, they are just not available without transfer
	The caesarean section rate is not reduced
	Women are not happier after homebirth

Conflict of interest statement:

I declare I have no conflict of interest in this chapter.

Practice Points:

The mother is free to choose the place of birth.

Homebirth needs to be part of an integrated maternity network.

Obstetricians need to be involved if homebirth is going to be safe.

Alternative places of birth should be developed to provide a better birthing experience.

A safe homebirth service is achievable if the healthcare providers are supportive.

Research Agenda:

Assess the risks and complications of homebirth using the 3-delay model.

Investigate the blocks and barriers to the development of a safe maternity network.

Investigate methods of reducing the transfer time between home and hospital.

Figures Legend

Figure 1 – Annual maternal mortality rates in England and Wales, 1880–1980. [11]

Figure 2 – Homebirth rate in UK from 1960-2013

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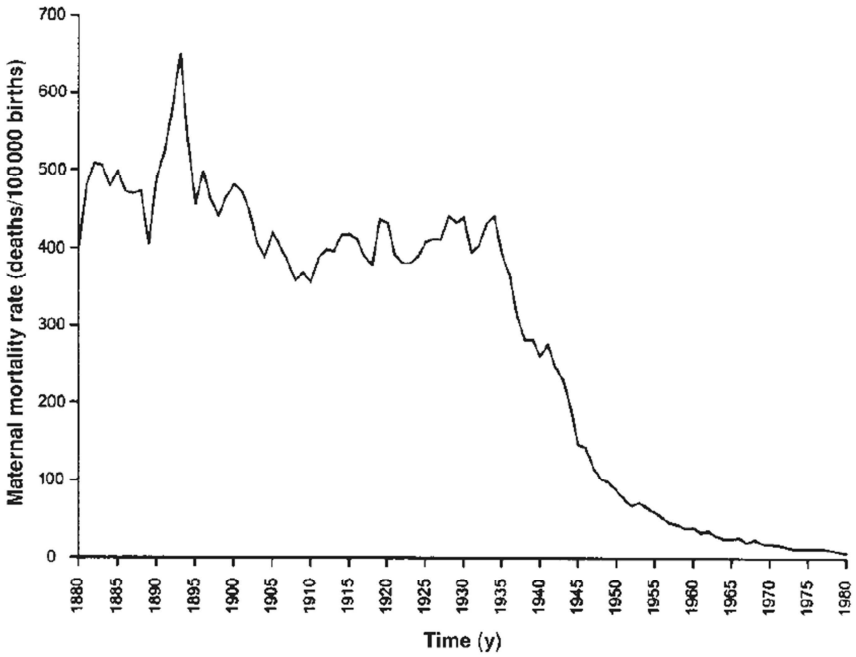

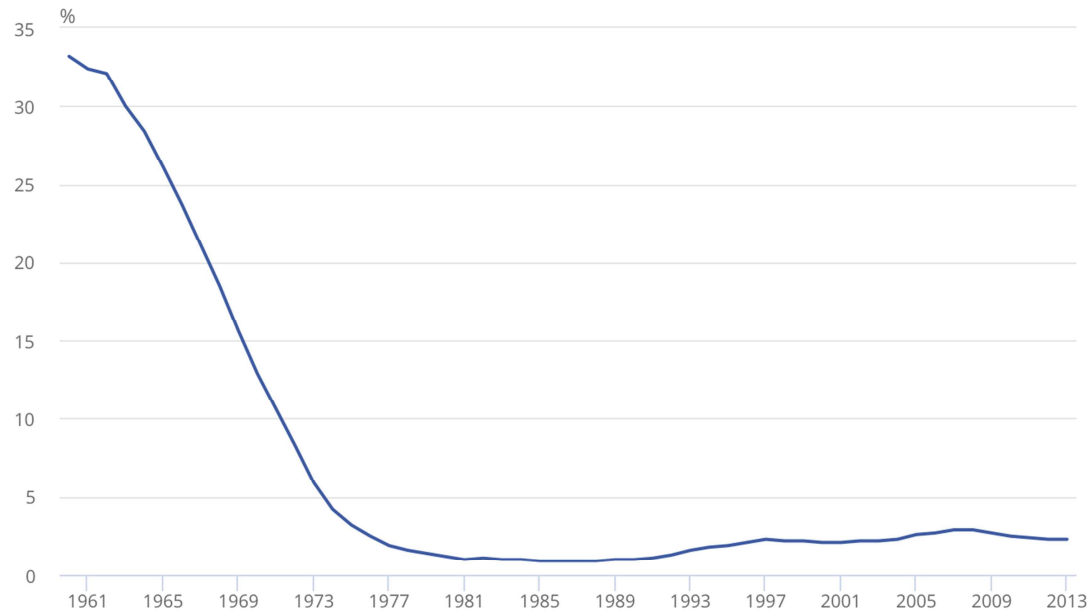

Source: Office for National Statistics