
Of blind alleys and things that have worked: history's lessons on reducing maternal mortality

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*“It is only in recent years that the significance of the problem of
maternal
mortality has been clearly realised by the health experts, ...”*

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Summary

As a matter of fact, the patterns of maternal mortality were very different during the 1870-1937 period in industrialised countries such as USA, England and Wales or Sweden. This chapter analyses the conditions under which the industrialised world has reduced maternal mortality over the last hundred years. Preconditions appear to have been early awareness of the magnitude of the problem, recognition that most maternal deaths are avoidable, and mobilisation both of professionals and of the community. Still, there have been considerable differences in the timing and speed of reduction of maternal mortality in different countries. These were related to the way professionalisation of delivery care was determined, first, by the willingness of the decision makers to take up their responsibility; second, by the strategy adopted for making modern obstetrical care available to the population (and particularly by encouragement or dissuasion of midwifery care); and third, by the extent to which professionals were held accountable for addressing maternal health in an effective way. Where preconditions have been met and professionalisation of obstetric care has been adopted in developing countries, the same pattern of reduction of maternal mortality was observed, be the country still poor (Sri Lanka) or wealthier (Malaysia, Thailand).

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Introduction

Where nothing effective is done to avert maternal death, “natural” mortality is probably of the order of magnitude of 1,500/100,000. Part of the world now has maternal mortality levels of the order of 5, some 300 times less. Only rich industrialised countries have achieved such stable historical lows, but many middle-income and some poor countries are getting quite close, around or well below 50.

The majority of low-income countries, however, still has a long way to go. Poverty clearly contributes to this sorry state of affairs, but it does not explain everything.

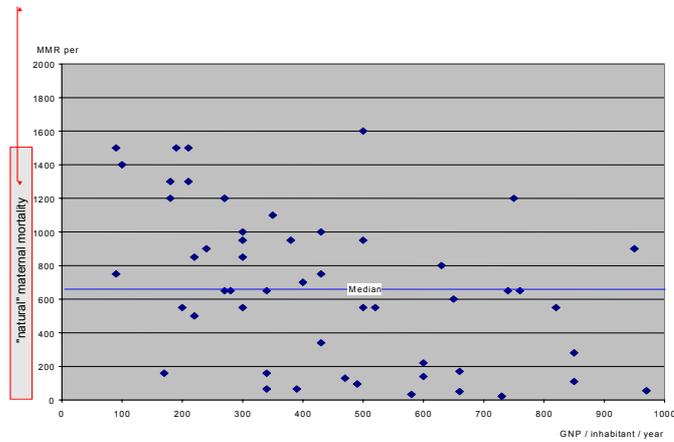
Figure 1 shows that the estimated maternal mortality ratio in countries with a GNP of less than 1,000US\$ ranges between 22 and 1,600. Even if one expresses GNP in purchasing power parity (PPP) terms, large inter-country differences remain: some still have maternal mortality ratios that are roughly equivalent to “natural” maternal mortality, others are way below. For example, in the early 1990s Vietnam, Lesotho, the Central African Republic and Nepal all had a GNP-PPP between US\$ 1,000 and 1,200. Their maternal mortality ratios estimates were 160, 600, 700 and 1,500. Certain countries definitely do better than others, even under severe poverty constraints.

These differences in track record get a different flavour if we compare present mortality levels in poor countries with those of industrialised countries at the beginning of the XXth century (Figure 2).

First, three out of four poor countries today have maternal mortality ratios that are higher than those of Sweden a century earlier, i.e. before caesarean section, blood transfusion or antibiotics, and at a time when nearly all deliveries took place at home. Lack of money for high-tech medicine is thus not the only explanation for the very high levels in some countries today.

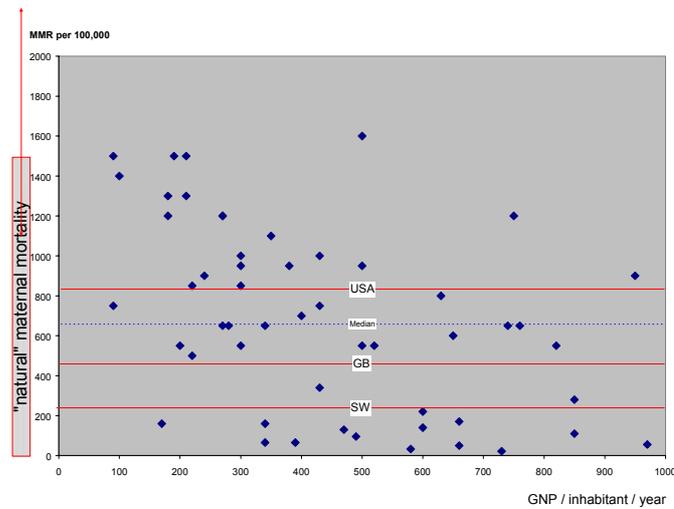
Second, a century ago, there were major inter-country differences in the West – not as large as the disparities in the developing world today, but pretty impressive all the same. In the USA of 1900, for example, there were about 700 maternal deaths for 100,000 births, i.e. three times more than in Sweden. Like in the developing world today, some of the industrialised countries have a better track record and managed to reduce maternal mortality much earlier than others.

Figure 1. Maternal mortality ratios in the poorest countries, 1990 estimates. Ratios are plotted against the countries GNP and compared to “natural maternal mortality”. “Natural maternal mortality” is assumed to range between 1,100 and 2,500



SOURCES: GNP/inhabitant in 1993: World Bank 1995 Estimation of maternal mortality ratios in the 1990s: Stanton *et al.* 1995

Figure 2. The same data as in figure 1, but compared to the 1900 maternal mortality ratios of the USA, England & Wales and Sweden



The history of these relative successes and failures is to a large extent a history of different approaches to the professionalisation of delivery

care, even before technology-assisted hospital delivery became the norm³. In order to make this case, we will look at differences in speed of reduction of maternal mortality in what is now the industrialised world, and attempt to identify the factors for success and failure. We will then look at obstacles faced by developing countries today, and draw some lessons with regard to strategic do's and don'ts in maternal health policy.

Patterns of reduction of Maternal Mortality in the West

Although the historical evidence is patchy, we do know that in countries like England maternal mortality levels were halved – compared to “natural maternal mortality” – towards the beginning of the XIXth century. Progress was in fact much more impressive for maternal than for overall mortality. Loudon explains this “*largely in terms of factors specific to childbirth rather than in terms of factors likely to have impinged on mortality of all causes*”: “*the decline in maternal mortality [between 1750 and 1850] was related both to an increasing proportion of midwife deliveries and to a higher standard of midwifery*” (Loudon 1992a). By 1850 maternal mortality was at a level of around 800/100,000 or even lower: levels not unlike the median poor country today.

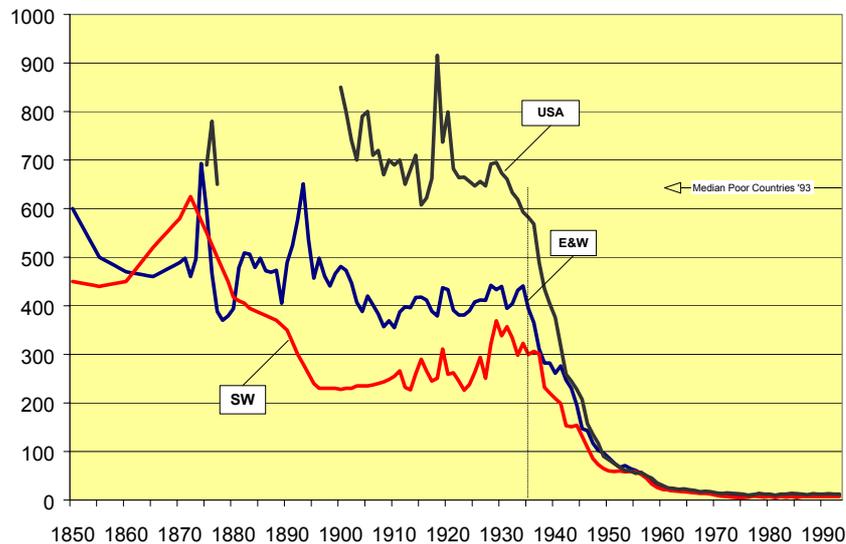
Between the mid-XIXth century and the late 1930s, the patterns of reduction diverge markedly (Figure). On the one hand there are Northern European countries – Sweden is the prototype, but Denmark, Norway or the Netherlands follow roughly the same pattern: a clear downward trend from as early as 1870, stabilising at 250-300 per 100,000 between 1900 and 1940. At the other extreme, maternal mortality ratios in the United States remained in a 600-800 bracket up to the mid-1930s. In-between the Swedish success story and the American failure one finds south-west Europe.

The North European success story is all the more impressive since it was achieved before modern hospital technology, transfusions, caesarean sections, or antibiotics became available, and, in the case of Sweden, in a poor rural country with a dispersed population. The circumstances and

³ Formal midwifery schooling in Europe had started in the XVIIth century (one of the first manuals was ‘*Des Maladies des Femmes grosses et accouchées*’, by François Mauriceau (1637-1709)). Towards the midst of the XVIIIth century London became the centre for publication of treatises on midwifery. Midwifery has been a profession for centuries, but only in the XIXth century professional bodies start to claim delivery care as their expert territory. “*There were two main stages in what has been termed the ‘medicalisation of pregnancy. The first stage consists of its incorporation into medical discourse in the seventeenth and eighteenth centuries as a ‘natural’ state; the second is its gradual redefinition as pathology – as a medical phenomenon akin to illness: this process has really only become marked in the period since 1950, although it has developed along with the clinical care movement itself.*” (Oakley 1984).

strategies that made this possible and conversely, that caused the USA to lag behind, may help to understand why many poor countries have failed to reduce maternal mortality at a time when the technology to avoid maternal deaths is well known.

Figure 3. Maternal mortality from 1870 to 1993 in Sweden, the USA and England & Wales



Sweden

Sweden is unusual in the amount of historical information available on its demography. Its General Register has systematically collected individual health data since 1749. Very much in line with the development of vital statistics and quantitative methods in the XVIIIth century (Fox 1993), the Swedish *Sundhetskommisionen* reported that at least 400 women out of 651 dying in childbirth could have been saved if only there had been enough midwives (Högberg *et al.* 1986). This *de facto* introduced the notion of 'avoidable maternal mortality'. The *Sundhetskommisionen* had enough authority to set a policy of training midwives in such numbers as to make sure that all deliveries – home deliveries, of course, were the norm – would be attended by qualified personnel.

Training large numbers of midwives was a slow and progressive process. Results were obtained only because authorities and professionals had a common purpose in tackling the problem of maternal mortality. One century after the report, in 1861, 40% of births were attended by certified professional midwives. The figure would double

over the next four decades, to 78% in 1900. In the meantime the number of home deliveries assisted by traditional birth attendants dropped from 60% in 1861 to 18% in 1900. Only a small fraction of births, between 2% and 5%, took place in hospital⁴.

Midwives in Sweden were allowed to use forceps and hooks for craniotomy as early as 1829. They had a great deal of autonomy – in this thinly populated rural country that was a self-evident necessity – but were supervised by the local public health doctor. The latter could be called upon in case of major complication and was held accountable for official reports. The lines of authority were strong enough to generalise the introduction of aseptic techniques as early as 1881 – only a few years after it had been introduced in hospitals. The early adoption of this original combination of professional assistance to home deliveries and use of effective techniques enabled Sweden to achieve the lowest maternal mortality ratios in Europe (228 maternal deaths per 100,000 live births) by the beginning of the XXth century.

The Swedish success was partially a result of scientific and technical advances (Högberg *et al.* 1986) and partially a result of social changes empowered by public authorities. It is the combination of various ingredients that made this success possible (Figure 4). The potential of this recipe was further confirmed by later adopters of the same policy⁵ - i.e. the Netherlands, Denmark and Norway. An active policy of training midwives, selected for their social profile and capacity to introduce modernisation as ‘health missionaries’, with a close follow-up of compliance with hygiene and technical prescriptions (Marland 1997), reduced maternal mortality ratios to below 300 per 100,000 by 1920.

USA

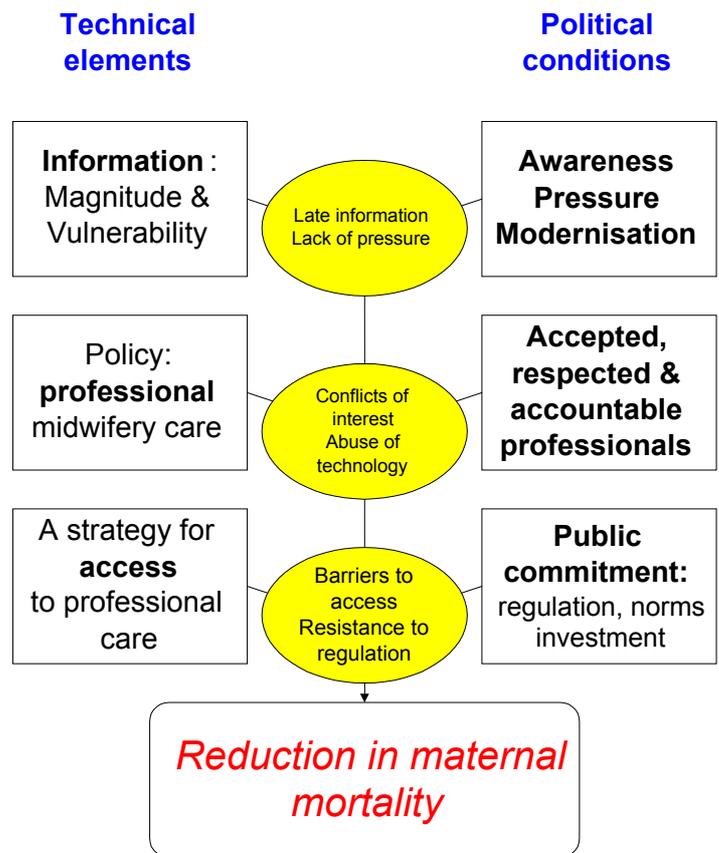
The situation in the USA was quite different. Information became available only from 1900 onwards (Pearl 1921), much later than in Sweden, and there was no public policy to deal with what was not generally recognised as an issue. The debate was dominated by the (successful) attempts by obstetricians to marginalise midwifery (Declercq & Lacroix 1985, Borst 1988, King 1991, Reagan 1995).

Figure 4. The combination of technical and policy environment factors that made early reduction of maternal mortality in certain countries possible, and

⁴ These figures are quite similar to those in, for example, England. In European history maternities appeared later than general hospitals. They had a (deserved) bad reputation: “the mortality of maternity hospitals is said to be so great that it is expedient, indeed absolutely necessary, to close them entirely” (Duncan 1870).

⁵ Japan had a pattern similar to Sweden, albeit delayed. In 1900 maternal mortality had dropped to 436. In 1920 it was 353, 272 in 1930 and 239 by 1940. This was concomitant with professionalisation of home deliveries (MCH Japan 1992).

the obstacles in other countries



Midwives there were a mixed lot, going from the many untrained ‘neighbourhood midwives’ to the few highly trained midwives who were mainly recent European immigrants, but left to fend on their own, without support or supervision, despised and professionally isolated. Midwifery was actively discouraged by the lobby of obstetricians. *“To the American obstetrician the midwife was ‘a relic of barbarism’ who must be abolished ... If European countries persisted in employing midwives on a large scale, it only showed how backward Europe was compared to America.”* (Loudon 1997).

In Sweden the notion of ‘avoidable maternal death’ had been used since the XVIIIth century and was at the basis of a public policy of midwifery coverage. In the USA this notion was essentially used by doctors for ‘scientific’ attacks on the market share of midwives (Fraser 1998). *“Fear of the midwife’s real power, her ability to do the work of obstetrics – translated into a public portrayal of such women as primarily responsible for long labours and puerperal deaths.*

Physicians, by contrast, associated themselves with painless labour and safe childbirth” (Fraser 1998).

There was evidence that midwifery was a real alternative: where midwives were trained and supervised, as in Newark, they achieved remarkable results: a maternal mortality rate of 150 for midwife deliveries as opposed to 690 for deliveries by physicians (Loudon 1997). Nevertheless, obstetricians were left to effectively block the development of professional midwifery: by the 1920s this had already led to a decreasing pool of midwives in urban areas. In Richmond, for example, the midwife examining board had reduced the number of practising midwives from 105 to 47 in a 3-year period (Fraser 1998) and maternal mortality remained high.

The problem of maternal mortality only came on the policy agenda as a result of the public outcry against differences with Europe, in the early 1930's. The first enquiries into maternal deaths, in New York in 1930-32 (Llewellyn-Jones 1974), led the New York Times to put the blame for avoidable maternal deaths on doctors (Porges 1985). Still, the medical lobby managed to ensure hegemony of hospital delivery. From the late XIXth century until today, the *de facto* policy was to promote institutional delivery by obstetricians. However, without mechanisms to guarantee access or quality standards, this failed to address the problem and actually contributed to mortality through iatrogenesis. The lack of norms and accessibility would only be offset by the Emergency Maternity Care Programme during the 2nd World-War (Schmidt & Valadian 1969).

England & Wales

In England and Wales women fared somewhat better than in the USA. Information had been available since the first half of the XIXth century. However, it was not until 1930 that the concept of ‘primary avoidable factor’ was identified and confidential investigations⁶ into maternal deaths were organised (Llewellyn-Jones 1974). Things then accelerated, and in 1932, the Ministry of Health sent a mission to Denmark, the Netherlands and Sweden to find out how these countries managed to achieve their low maternal mortality ratios (Oakley 1984).

The explanation had to do with the implementation of midwifery policies. Unlike Sweden, England & Wales had no active policy to generalise and professionalise midwifery before the XXth century, but the information had been available for quite some time and authorities were aware of the problem. Midwives were regulated with a ‘Midwives Act’ in 1902. In comparison with Sweden and other countries with the same level of technical knowledge, progress was slow. This was certainly due in part to the government's indecision and to the fact that the funding of the necessary measures was left to the local authorities “*who spent as little as possible on maternal and child health*” (Loudon 1992a). The rampant competition between GP's and midwives for access to the delivery-market compounded the insufficient funding (Mottram 1997). In a number of places – Manchester for example – the Medical Officers of Health implemented the Act correctly. Elsewhere, they did little or nothing. In districts where doctors were hostile to midwives, the act was often used “*to harass midwives rather than to encourage their improvement*” (Donnison 1988).

Accessible technology and reliable hospitals

Between 1937 to 1970 maternal mortality dropped steeply throughout the industrialised world. By 1954 the USA and Sweden both reached 60 per 100,000. Further reductions after the 1970s brought maternal mortality ratios to the current low levels of less than 10. This new phase in the reduction of mortality ratios was a consequence of the improvement of techniques (antibiotics, caesareans, transfusions) in a context in which they were made available to the great majority of women, whether confined in hospital or at home. “*Once the medical technology to treat obstetrical complications becomes widely accessible, it seems that the actual place of delivery is not of crucial importance.*” (Maine et al. 1991).

⁶ The confidential enquiries would eventually play a major role in reducing mortality in England and Wales, but elsewhere – in Australia, for example, where they were introduced in 1939 – as well: they identified potential for improvement and increased accountability.

The improvement of financial access to professional care was a key factor, but health care systems also developed a culture of quality of care sustained by a system of control and professional accountability. This, in turn, was fed with information derived from generalised monitoring of mortality ratios and enquiries into maternal deaths.

Success or failure: combining the right ingredients

In the period before hospitals could intervene effectively and safely, the relative successes and failures appear to have depended less on the development of science and technology than on a combination of information, policy and strategy.

The first element was information. Countries with an early reduction in maternal mortality were also the ones where information on the extent of the problem had been around for a long time, and where public authorities reacted on this information. In countries where such information was more recent maternal mortality was not on the agenda, and the development of a control policy was delayed.

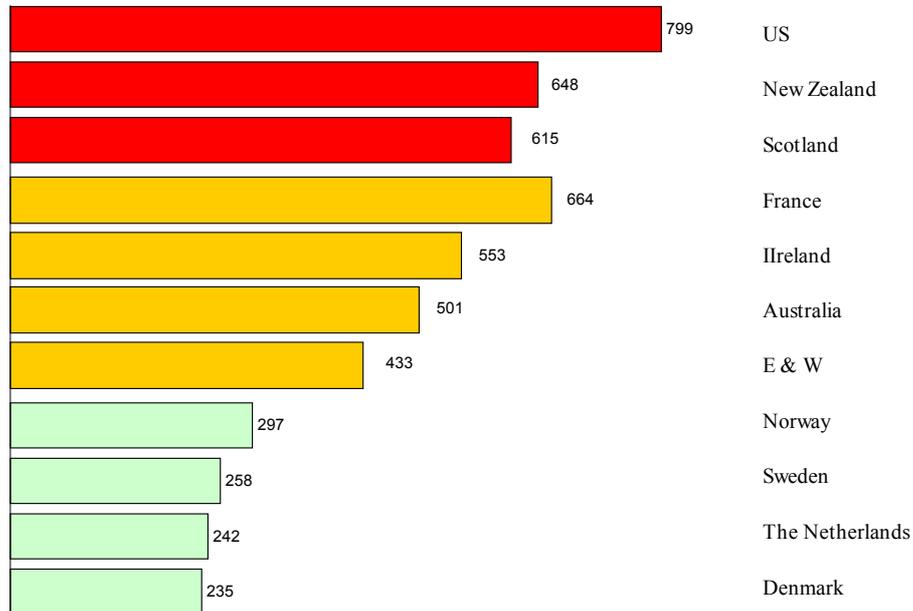
But the information was not enough. The nature of public administration, its commitment to public health and its capacity and willingness to react on information about avoidable deaths was just as important. What is sometimes less appreciated is that in the first half of the XXth century the debate on maternal mortality was not a matter for doctors and administrators alone. In various European countries, from the early XXth century to the late 1930s, committees concerned to improve maternal mortality were formed and associations with the same object, sometimes medical and sometimes lay, were founded. In the UK, for example, this eventually led to the 1938 Conference, attended by women from over 60 local associations, which gave rise to a comprehensive 'Mothers' Charter' (Oakley 1984). In Sweden the concern of the medical establishment with the levels of maternal mortality was sufficient to obtain a public commitment. In many other countries legislation was only introduced and funds made available after pressure mounted from the civil society.

If information and public concern were elements that determined success or failure, another was the choice of policy. With hindsight we can say that before the technological hospital delivery of the second half of the XXth century came of age, the safer and more effective policy was to provide professional midwifery assistance at delivery, supervised, controlled, chosen on basis of a social profile that would promote modernisation (Marland 1997). Where this was the backbone of maternal health policies, mortality ratios dropped. Where it was not, they stagnated (Figure 5).

There is a whole body of evidence, and not only from north-west Europe, that shows that professional midwifery as such makes a difference, even in the absence of modern hospital technology. In the first half of the XXth century delivery was safer with a professional midwife than with a doctor. For example, Mary Beckenridge's Frontier Nursing Service in the USA brought maternal mortality down to 66 in 1935-37 among the population it served, whereas in the same years hospital physicians in Lexington, Kentucky remained with a mortality of 800-900 among their white clientele.

Those countries that managed to get doctors to co-operate with a midwifery-based policy fared relatively well. Where doctors won the battle for professional dominance – and for their share of the market – women died. *“It may be an extraordinary conclusion, but it is likely that [in the 1920s] at least 200,000 lives might have been saved by a maternity system based on trained midwives in the very country [the USA] in which the midwife was branded as a relic of the barbaric past”* (Loudon 1997).

Figure 5. Maternal mortality in 1919-20 in countries with deliveries predominantly assisted by midwives (bottom), by both midwives and doctors (mid) and predominantly by doctors (top)



No country in the Western world has escaped the midwife-doctor debate, “from the violent denunciations of the midwife in the United States, through the struggles for midwife registration in Britain, to the more measured but none the less significant discussions on the place of Dutch midwives in providing obstetric care” (Marland & Rafferty 1997). But the potential of midwives has been realised only where they were well trained, supervised, regulated, and held accountable for results. The relatively poor performance of doctors and hospitals – and their contribution to mortality through iatrogenesis – in the same period can best be explained by the greater difficulty in making them adhere to scientific standards and in holding them accountable for results.

It was not, however, merely a question of public authorities making the right policy choice; it was also a matter of being able to implement such a policy with enough authority to make professional delivery care accessible. North-west Europe adopted different versions of Sweden’s strategy of putting ‘a midwife in every parish’: a strategy based on proximity, geographical, but also cultural and financial, based on a long term effort in financing and training as well as regulating midwifery. When hospital- and obstetrician-based delivery care came of age in the second half of the XXth century, proximity and access also became the determining factors, as in many developing countries today.

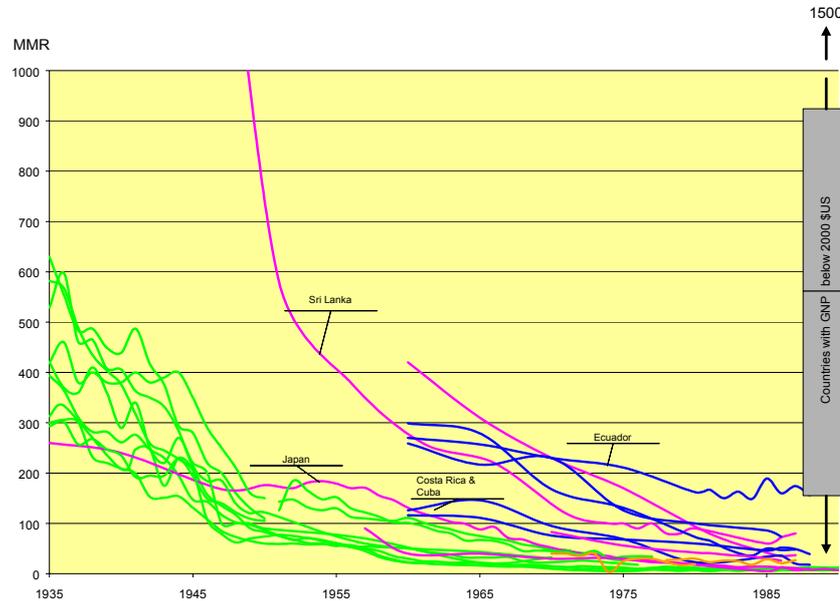
This combination of the technical and political factors (Figure 4) resulted in a significant reduction of the maternal mortality in Sweden, Japan, Denmark, Norway and The Netherlands, even without hospital technology. In countries like the USA, Belgium, Great-Britain, France or Italy ingredients were missing and mortality remained higher until modern hospital technologies became accessible; in those countries medicalisation of delivery would eventually be more pronounced. The commitment and sense of responsibility of health professionals and the State, clearer understanding of the causes of mortality – associated with the advent of effective technologies: caesarean section, antibiotics, blood transfusion – and extension of coverage to the population as a whole enabled the industrialised countries to attain extremely low maternal mortality ratios in some twenty years (between 1937 and 1960). By that time it did not make a difference whether the policy was to promote confinement in hospital (as in the United States) or at home (as in the Netherlands): that became a question of culture and efficiency, not of effectiveness in reducing mortality.

Professionalisation of delivery care and maternal mortality in developing countries

Time series on the evolution of maternal mortality in developing countries are harder to come by than in the West (Figure 6). There is practically no long term trend information on African countries. There is some more information for Latin America in the second half of the XXth century. The earliest and most important reductions were obtained where health services are well organised and accessible, countries like Cuba or Costa Rica. For most other Latin American countries the time series are of questionable reliability. They show slower and later reductions, and now stagnate at levels between 100 and 200. These persistent high levels seem to be related to social inequalities in access to quality health care, compounded by legislation limiting access to safe abortion (Mora & Junes 1993, Paxman 1993, Rendon *et al.* 1993).

Historical data in the poorer countries in Asia, such as Laos or Cambodia, are scarce – a notable exception being Sri Lanka. In Sri Lanka registration of births and deaths has been compulsory since 1897 and it has among the best documented time series in developing countries.

Figure 6. Reduction of maternal mortality after the second World War



What little information there is confirms the importance of information and its utilisation; professional delivery care with accountable and responsive personnel; and a strategy to guarantee access to such professional services. There is negative and positive evidence.

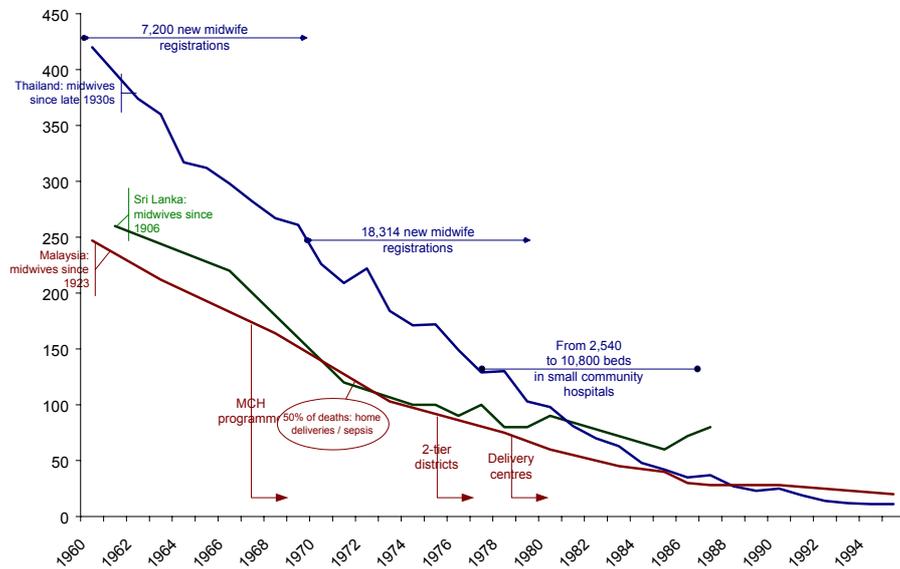
The economic transition in Mongolia, for example, led to the closure of maternities, cut-backs in emergency transport and dwindling hospital supplies. Maternal mortality ratios responded quickly to the breakdown of services, and rose from 120 in 1991 to 210 in 1994 (EA2RS 1996). Likewise, in Iraq the sanctions severely disrupted previously well functioning health care services, and maternal mortality ratios increased from 50 in 1989 to 117 in 1997, and even to 294 in Central and South Iraq (UNICEF 1998).

But there are also examples that confirm that combining a strategy of professionalisation of delivery care with a strong public commitment works (Figure 7). In Sri Lanka maternal mortality levels, compounded by malaria epidemics, had remained well above 1,500 the first half of the XXth century (twenty years of antenatal care notwithstanding). From around 1947 they started to drop, “closely [following] the development of facilities for health care in the country” (Seneviratne & Rajapaksa 2000).

The network of facilities was backed up, in 1960, by a special committee appointed to investigate maternal deaths, whilst professional organisations were involved in establishing training and service links. This brought maternal mortality down to between 80 and 100 as of 1975. Malaysia and Thailand are examples of how one can get further down than that.

In Malaysia maternal mortality was in the 120-200 bracket in the 1970s – the equivalent of the US or the UK in the post World-War II years (Leng 1990). In the 1980s ‘low risk delivery centres’ were created, backed up by good quality referral care, all with close and intensive quality assurance and on the initiative of the public sector authorities (Koblinsky *et al.* 1999). In 1991 Malaysia introduced confidential enquiries (Suleiman *et al.* 1999). All this brought maternal mortality down to 60-80 in 1990 and further to 20 around 1995.

Figure 7. Maternal mortality since the 1960s in Malaysia, Sri Lanka and Thailand



Up to the 1960s Thailand had maternal mortality levels above 400, the equivalent of the UK around 1900 or the USA in 1939. During the next fifteen years the first three health plans (1961-1976) gave priority to the training of paramedical personnel. During the 1960s 7,191 midwives were newly registered: double the number of the previous decade. Gradually TBAs were substituted by certified village midwives. Mortality halved, down to between 200 and 250 in 1970. During the 1970s the registration of midwives was stepped up: 18,314 new registrations. Midwives became a key figure in many villages: it was the heyday of Thai midwives, as respected figures in the villages, and with a high level of professional and social self-esteem. It also was effective: mortality dropped steadily and caught up with Sri Lanka by 1980, at 98 (Wibulpolprasert 2000). The fourth and fifth health plans then put the main thrust on strengthening and equipping district hospitals. In ten years time, from 1977 to 1987, the number of beds in small community hospitals quadrupled, from 2,540 to 10,800. The number of doctors in these districts rose from a few hundred to 1,339. By 1985 mortality had halved again, down to 42. By 1990 it was down to 25 and in 1995 to 11 per 100,000 – the downside being an impressive medicalisation with 28% of deliveries through caesarean section.

A major commitment of the ministries of public health to organise professional assistance to deliveries clearly works. This, however, is not what happens in many poor countries. Apparently the obstacles they face are not unlike those that delayed reduction of maternal mortality in many Western countries in the first half of the XXth century, including the sometimes appallingly bad quality care in hospitals (Prual et al. 2000).

Inadequate information

Clearly maternal mortality was not a matter of public concern up to the late 1970s, in spite of the fact that it was broadly at the level which had given rise to major political pressure in Sweden in the XIXth century and in Britain in the early XXth. Various factors may have contributed to this.

First, information was hard to come by. Vital statistics in developing countries were – and still are – very much incomplete. In 1977 only 66 countries out of 162 provided (incomplete) data on maternal mortality: in Africa 5 out of 52, in Asia 13 out of 43 and in Latin America 19 out of 31 (Rochat 1981). In those days the only data on maternal mortality in developing countries came from hospitals (Kwast 1988), without the denominator that could give a population perspective. Given the weakness of routine registration, there have been major efforts to provide estimates of maternal mortality through, a.o. the DHS surveys.

This kind of information is, however, much less effective for generating corrective action than, e.g., the confidential enquiries that

became routine in the UK at the end of 1950s (Godber 1994). It is even less effective than the data that were available in Sweden in the XIXth century. First, to estimate maternal mortality through surveys is demographers' work, often performed by foreign experts, with little ownership by authorities, national medical establishment or civil society. This greatly reduces their impact. Second, maternal mortality ratios only indicate the magnitude of the problem, not its vulnerability. They do not encompass the notion of avoidable deaths that their combination with clinical experience and enquiries in maternal deaths carried in, e.g., the UK. Third, survey estimates do not provide the degree of disaggregation necessary for planning and priority setting or for mobilising local authorities to respond to their particular situation. To know that 21 women died in a year in one particular district is information of a different kind than to know that MMR is estimated at 530 in the country. The sampling errors are such that even DHS survey estimates cannot be used for more than trend assessment over 10 year-intervals (Stanton *et al.* 2000).

Second, there is what Graham calls the 'measurement trap' (Graham & Campbell 1992) in translating the information into priority setting. Infants under one appear to run a much greater risk of dying than mothers when mortality quotients or rates are measured; for the maternal mortality rates relate to only one pregnancy at a time and not to the total number of pregnancies a mother may have in the course of her life.

As a matter of fact the problem was grossly underestimated. Around 1980 many in academic circles still thought maternal mortality in poor countries was of the order of magnitude of 300/100,000 (Rao 1981, Rosa 1981). Furthermore, donor agencies, planners and a substantial part of the scientific community considered that it was easier to have an impact on the mortality of children than on that of mothers; for child mortality seemed to respond rapidly and visibly responds to a range of vertical programmes (Walsh & Warren 1979). At that time, the 1980s, the international development world was arguing about the correct interpretation of the concept of 'primary health care' (Van Lerberghe 1993, Van Lerberghe & De Brouwere 2000). In the meantime things medical, and especially hospitals, were decidedly unfashionable (Van Lerberghe *et al.* 1997).

If the scientific world and the planners have been slow to appreciate that they were failing to address a huge problem, the same can be said of the health professionals. In developing countries there have been no pressure groups of health professionals comparable to those which were active in Britain and the United States in the early XXth century. Among specialists in the large hospitals in the capitals quality of care was not a

key feature of the medical culture, and it was rare for quality standards to be promoted or monitored. Practitioners in the district hospitals have many priorities, and the lack of resources rapidly leads to fatalism, certainly for problems that are not immediately visible. Health care providers in the hospitals of developing countries do not expect large numbers of maternal deaths. They are statistically rare (Rosenfield 1989) and doctors are not directly confronted with such occurrences: most of the women who die, do so at home, not in the hospital. The lack of visibility (Ebrahim 1989) is quite convenient in a context where women's lives are valued poorly, high fertility is culturally rewarded, and health professionals have little in common with their client populations.

The turning point came with the "*Where is the M in MCH?*" paper of Rosenfield and Maine (Rosenfield & Maine 1985, WHO 1986) and Mahler's appeal for the Safe Motherhood Initiative in 1987 (Mahler 1987). Ten years later it had become difficult to ignore that a major challenge had to be dealt with. But it was clear, too, that many of the past strategies in poor countries had failed.

Ill-informed and ineffective strategies

Alongside family planning, the first WHO expert committee formally put the focus on antenatal clinics and education of the mothers in the early 1950s (OMS 1952). The package of measures introduced to reduce maternal mortality had long remained substantially the same (in actual fact these measures had mainly been directed towards improving the survival prospects of infants).

Nevertheless, there had been evidence in the industrialised West, for as long as since 1932, that screening for maternal death was not very effective: a letter to the Lancet stated that "*80 percent of maternal deaths were due to conditions (sepsis, haemorrhage, shock) not detectable antenatally*" (Browne & Aberd 1932, Reynolds 1934). Nonetheless, antenatal risk scoring systems were extrapolated from Europe to developing countries in the 1960s. They soon became common wisdom (Lawson & Stewart 1967, King 1970, Van der Does & Haspeh 1972, Cranch 1974) and, during the 1970s and 1980s, mainstream doctrine with WHO's risk approach (WHO 1978, Backet *et al* 1984).

In the early-1980s the first evidence questioning the cost-effectiveness of antenatal screening in developing countries appeared (Kasongo Project Team 1984), and common wisdom began to be challenged (Smith & Janowitz 1984): "*The ineffectiveness of ANC as an overall screening programme not only renders it less than what it claimed to be; it does not even then say what it is.*" (Oakley 1984). Six years later Maine became explicit: "*No amount of screening will separate those women who will from those who will not need emergency medical*

care” (Maine *et al.* 1991). The Rooney report of 1992 formally changed the balance to scepticism⁷ (Rooney 1992). It is hard nowadays to defend antenatal care merely on basis of its potential for screening out preventable maternal death – but many are the administrators or funding organisations that continue thinking that as long as antenatal consultations are being conducted, one has done one’s duty. In the meantime a WHO seminar in Malaysia in 1970 had launched the training and promotion of traditional birth attendants as another strategic axis (Mangay-Manglacas 1990). This strategy was further promoted in the influential recommendations of a 1972 inter-country-study. A decade later the initial enthusiasm still persisted (Williams *et al.* 1985, Tafforeau 1989, Sai & Meesham 1992), but it gradually gave way to scepticism (Chen 1981, Mathews 1983, Belsey 1990, Maine 1991, Bryant 1990, Smith *et al.* 2000). Little effect was seen apart from tetanus prevention. The resistance (or inability) to change of TBAs, their lack of credibility in the eyes of the health professionals, the *de facto* impossibility to organise effective and affordable supervision, all have discredited training of TBAs. Whatever its other merits, it is now considered an ineffective strategy to reduce maternal mortality.

⁷ In the industrialised world antenatal care also increasingly meets with scepticism (Jahn *et al.* 1998, Jahn 1999): “*Much of what passes for prenatal care in [the USA] is unduly expensive, unnecessarily high-tech, and serves no beneficial purpose, consisting of infrequently avert the conditions we want our babies to avoid*” (Strong 2000).

Making professional care accessible

It has taken the international community up to the 1990s to realise that the important thing is that deliveries are far safer with professional assistance, and that when a serious problem appears a pregnant woman should have access to an appropriately equipped health service.

Antenatal care or delivery attendance by TBAs without professional obstetric care cannot achieve the same. If the necessity of referral level obstetric care has now become obvious, the need for professional assistance to all deliveries – essential obstetric care – still meets only with limited support, and the medical assistance model clearly is favoured over midwifery. The end result is that some countries have invested all in institutionalisation and medicalisation of childbirth. Others, still put their hopes in antenatal screening and TBAs. Only a minority is investing in the now – at last – WHO-recommended essential obstetric care. EOC is much more credible for and readily accepted by the medical community than the ANC-TBA strategies of the 1970s. Where resources are available EOC expands rapidly and maternal mortality drops. The downside is that it also easily gets translated into institutionalisation and ‘technologisation’ of delivery. In Thailand, for example, the midwifery association has ceased to exist in the early 1990s, and as a rule deliveries now take place in hospitals: 28% through caesarean section.

In countries with severe resource constraints, however, there remain major problems in implementing these strategies. First, because huge investments in time and money are necessary to train the required numbers of professionals: midwives are scarce, 1 per 300,000 inhabitants in a 1990 estimate (Kwast 1991), especially outside the capital cities. Huge investments in time and money are necessary also to provide the necessary referral facilities able to complement a still to be created network of professional assistance to normal deliveries. Resources are not enough, though. Accessibility also has financial, cultural and psychosocial aspects (Jaffré & Prual 1994). Perhaps the most intractable and important issue is that of the accountability of professionals: for the quality of what is done in the hospital, and for what is not done outside (Nasah 1992, Derveeuw *et al.* 1999).

Winning the hospital battle

Historically the concept of avoidable deaths has made it possible for decision makers to realise that the problem is vulnerable. Measuring maternal mortality ratios is not enough. Maternal mortality ratios measurements need to be complemented by information that involves the entire community of maternal care providers, with immediate implications for local action. Various such methods are presently promoted: assessment of Unmet Obstetrical Need (De Brouwere & Van Lerberghe 1998), identification of avoidable deaths through confidential enquiries (Hibbard *et al.* 1996, Bouvier-Colle *et al.* 1995, Cook 1989), audits (Filippi *et al.* 1996), systematic verbal autopsies (Ronsmans 1998, Wessel *et al.* 1999, Langer 1999). These can contribute to generating information in a format that can be used for pressure through professional organisations and public: pressure for resources and pressure for accountability.

Professionalisation of delivery care is the key. In the Swedish model promotion of delivery care has preceded the impact of hospital technology. One could imagine to try to reproduce a similar sequence: first develop ambulatory midwifery, and later add hospital care. Such an approach would however (i) withhold the benefit to be obtained from the mutual potential of both elements; (ii) lack political credibility, and produce results too slowly; (iii) put the medical establishment in a position of conflict such as in the USA or England & Wales of the first half of the century. Winning the hospital battle (access to quality referral delivery care by accountable professionals) first is crucial from a strategic point of view, and a condition in order to get the doctor's collaboration in the promotion of professional midwifery (access to quality primary delivery care).

Thinking back on Morocco's blind spot for maternal health in the 1980s and the reluctance to face the evidence of the dramatic proportions of the problem, one key policy maker observed: *"The problem is really too big, you cannot tackle it with a programme, you need to tackle the whole system. That requires such an amount of resources, and above all of efforts."*: investments in training, in health care networks, in transformation of the system to ensure financial accessibility and accountability of the providers. This is unlikely to happen without public initiatives and pressure from the civil society. But the same Moroccan experience shows that progress is possible. It will take time, as it has done in Sweden and in China, in Sri Lanka and in Cuba. If the various elements are put into place, significant and largely irreversible reductions should be possible, even with limited resources. Extrapolating from historical and recent experience, reductions of over 50% in well less than

ten years are perfectly realistic. With still nearly 600,000 maternal deaths per year at this moment, it seems worth trying.

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