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■ Review Article

Centrality of Data to Reduction of Maternal Mortality

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ABSTRACT

Background: Industrialized countries of Europe and America reported similar figures of maternal mortality for developing countries today as far back two to three centuries ago. ***Objective:*** The objective of this review was to compare the strategies for reducing maternal mortality in developed countries and those adopted in developing countries and to proffer possible solutions. Sources of materials for this article are from learned journals and reports on the subject. **Conclusion:** Experience from developed countries suggests that data on the magnitude of maternal mortality is central to mobilizing political commitment, resource allocation and community participation. By contrast, efforts at reducing maternal mortality in developing countries have been devoid of the emphasis placed on data and magnitude of the problem.

Keywords: Maternal mortality, Developed Countries, Developing Countries

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Introduction

Countries vary enormously in terms of the situations and challenges they face and their capacity to address these. However, experience from around the world over the past decade has demonstrated that a number of features are common to successful efforts to address maternal mortality. Reducing maternal mortality requires coordinated long-term efforts. Actions are needed within families and communities, in the society as a whole, in health systems and at the level of national legislation and policy. Further interactions among the interventions in these areas are critical to reducing maternal mortality and to building and supporting momentum for change.

The high rates of maternal mortality in developing countries exist in spite of high levels of awareness among governments and international agencies that the vast majority of maternal deaths are preventable. This disparity exists despite the safe motherhood initiative launched in 1987. The reasons for a lack of progress are complex but not insurmountable. One postulate is that different stakeholders have simply not seen maternal

mortality as a sufficient priority. To be seen as a priority requires strong advocates being armed with sufficient data. The calls for fostering the political will to address the problems of maternal health in developing countries have become almost ritualistic.[1] This has often been done without a clear view of the concrete content of the political and social strategies that are the necessary complements of an adequate knowledge base.[2,3] This review shows the pivotal role of information and data as a tool for the reduction of maternal deaths in developed countries and the lack of a similar framework in programmes in developing countries.

Patterns of maternal mortality reduction in industrialized countries

As far back as 1870, maternal mortality ratios in most of what now is the industrialized world were above 600 per 100,000 live births. For some of the countries- such as Sweden, England and Wales, and the USA, detailed time series are available. Though current levels are well below 10 per 100,000 live biths, there are different patterns of reduction. The Swedish ratio started dropping as early as 1870,stabilizing at about 250 per 100,000 around theturn of the century, with figures for England and Wales as well as USA far exceeding these values4. A period of stagnation was followed by a fast reduction, between 1937 and the end of the sixties, leading to the current levels.

- ***Sweden***

  In the early 18th century, Sweden was a poor country with a dispersed population. Early recognition of the magnitude of the problem was made possible because as far back as 1749, Sweden had organized a general register for the systematic collection of individual health data. As early as 1751, the Swedish Health Commission directed attention towards avoidable maternal mortality' with the observation that at least 400 women of the 651 women dying in childbirth could have been saved if only there had been enough midwives.[5]

  Public health authorities consequently developed a policy of training enough midwives to make sure that qualified personnel would attend all home births. Training enough midwives was a slow process, however results were obtained because there was strong political will to tackle the problem. The local public health doctor, who could be called upon in case of serious complication and was accountable for official reports, supervised the midwives. As early as 1829, midwives were allowed to use forceps and hooks for craniotomy. By 1861, 40 percent of births were attended by midwives, rising to 78 percent in 40 years. There was a corresponding decline in the number of deliveries carried out by traditional birth attendant (60 percent in 1861 and 18 percent in 1900).[4]

  The major decline in maternal mortality occurred after the implementation of the systematic use of aseptic techniques. This had been introduced in hospitals in the late 1870s and by 1881 all certified midwives had been instructed to use them. The early adoption of trained assistance and simple aseptic delivery 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 20th century.[5]

  The Swedish example was partially a result of scientific and technical advances and partially of social changes empowered by a strong political will. Late adopters of a similar policy i.e. the Netherlands, Denmark and Norway also succeeded in achieving maternal mortality ratios under 300 per 100,000 live births by 1920.[6] The causal chain accounting for the reduction involved the following factors; data information on the magnitude, political commitment, availability of effective techniques and assistance to most deliveries provided by trained health professionals able to culturally integrate such a technology as well as ongoing quality and supervision.

- ***England and Wales***

  In England and Wales, maternal mortality

ratios were computed routinely from the end of the first half of the 19th century. However it was not until 1930 that the concept of 'primary avoidable factor' was identified and confidential investigations into maternal deaths were organized. This created the necessary political environment for further action. 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.[7]

The explanation had to do with the implementation of midwifery policies. Unlike Sweden, there were no policies comparable to professionalization of midwives. In comparison to Sweden and other countries with comparable technical knowledge, the progress was slow. This was due in part to government's indecision and to the fact that the funding of the necessary measures was left to local authorities 'who spent as little as possible on maternal and child health.[4] Professionalization of obstetric care in England and Wales was slow. Insufficient funding also led to rampant disagreements between midwives and general practitioners as to professional roles.

Awareness of the problem by the population played an important role in putting maternal mortality on the agenda in the 1930s: the 1938 Mothers Charter Conference in Great Britain, for example, was attended by women from over 60 local associations.[7] By 1935 maternal mortality ratios began to fall, mainly as a result of steady decline in puerperal infections.[8,9] The capacity to handle major emergencies in a hospital environment further decreased levels down to 85 per 100,000 live births in 1950.[10]

The confidential enquires into maternal deaths in 1949 drew attention to other causes of maternal deaths that could be prevented by effective methods of prophylaxis and treatment. With this and under pressure from the public, both obstetric specialist and primary care-givers became aware of their potential in reducing maternal mortality and managed to assess needs for improvement e.g. control of bleeding, safe anaesthesia, effective emergency obstetrics services.[11] These enquire played the part of a medical audit with the resulting awareness among caregivers contributing to the decline from 87 to 25 per 100,000 between 1950 and 1965.[12]

- ***United States of America***

Information on maternal mortality became available only from 1900 onwards much later than in Sweden or England. There also was no public outcry to deal with what was not generally recognized as an issue. Much of the debate on maternal care was dominated by the successful attempts by obstetricians to marginalize midwifery.[13]

In large cities however, maternal mortality at the beginning of the century compared unfavourably with ratios in European countries. In 1918, the maternal mortality ratios in the US was 885 per 100,000 live-births, as high as in Sweden a century before and twice the Swedish ratio for the mid 19th century.[4] There was evidence that midwifery was a real alternative: where midwives were trained and supervised as in Kentucky, Mary Breckinridge, had demonstrated that a network of trained and permanently available midwives could provide a service of high quality. In the rural area where she worked the level of maternal death was 68 per 100,000 in contrast to where a physician carried out deliveries in the town of Leamington, where it exceeded 800 per 100,000 live births.[9]

The problem of maternal mortality only came on the policy agenda following public outcry against differences in figures of maternal deaths with Europe, in the early 1930's. With the emphasis on public hospital delivery, it was only in the late 30's that a declining trend appeared: through reduction of puerperal infection, more effective ways of controlling obstetric emergencies and less iatro-genesis. The trend accelerated with the Emergency Maternity and Infant Care Program

during World War II. This helped define standards for staffing, infrastructure, services and charges in all areas that qualified for state subsidies. It had an immediate effect on the quality and accessibility of care provided to pregnant women and their childrens.[14]

The historical presentation of trends in maternal mortality suggests two main phases in the reduction in mortality ratios.[15] The first was characterized by the recognition of both the magnitude and manageability of the problem, and by the development and accessibility of effective midwifery techniques with ongoing supervision. Countries that achieved this on a large scale, obtained reductions of maternal mortality to the equivalent of the 25th centile of the poorest countries today.

The key to success was early recognition of the magnitude of maternal mortality both in absolute terms and in comparison with other countries, followed by identification of factors affecting its distribution and what could be done to alleviate it. Problem identification was an essential factor in raising decision-makers awareness and in balancing political and professional perspectives with community expectations. The speed of implementation was a function of the willingness of decision-makers to enforce such policies; of the strategy adopted for making practices of obstetric care available to the population and the extent to which professionals were held accountable for providing quality care.

Further reduction- the second phase, was made possible by the improvement of techniques, in a context in which they were mastered and were available to the great majority of women, whether confined in hospital or at home. There was a culture of quality of care sustained by a system of control, which in turn was fed with information derived from studies of maternal deaths. Technological developments and increased accessibility of hospital care allowed the countries that already had reduced their maternal mortality considerably to reach today's value. How then do these circumstances compare to the situation in developing countries today?

Maternal mortality in developing countries

In developing countries, technologies such as the use of antibiotics, blood transfusion and lower segment caesarean section are known by professionals. This has however had limited impact, if any, on maternal mortality. Many reasons can be adduced to this gap. In part, it may represent a failure to mobilize resources adequately, ill-informed choices of strategies and perhaps most importantly a lack of data and information on which to prioritize strategies and allocate resources.

Approaches to reduction of maternal mortality in developing countries

The year 1987 marked a significant dateline in the approaches to prevention of maternal mortality in developing countries. An alliance of co-sponsoring agencies, including the World Health Organization, United Nations Population Fund, United Nations Children Fund, International Federation of Gynaecology and Obstetrics, International Planned Parenthood Federation, Population Council, World Bank, Regional Prevention of Maternal Mortality Network (Africa), Safe Motherhood Network of Nepal with Family Care International was to halve maternal deaths by the year 2000. These global organizations acting as Safe Motherhood Inter-Agency Group, whose role is to raise international awareness about safe motherhood, set goals and programmatic priorities for the Global Safe Motherhood Initiative, support national Safe Motherhood programmes, stimulate research, mobilize resources, and provide technical assistance and share information to make childbirth and pregnancy safer.[16,17]

Training traditional birth attendants

In parallel with the promotion of antenatal clinics, efforts were made to improve obstetric services through training of traditional birth attendants. The assumption on which this practice was based

was that there were not enough professional health personnel to provide maternity care, not at present or in the immediately foreseeable future. It was also argued that there were not enough beds or staff at hospital level to absorb the workload that would be created if all women had access to hospitals for their confinement.[18] The traditional birth attendants on the other hand existed and performed deliveries (mostly in rural areas). They were accessible and culturally acceptable and they influenced the decision of mothers to go to health services. Admittedly, their technical competence was inadequate. The solution was to train them in modern methods of delivery.

The strategy was not an entirely new concept, but rather a practice that was promoted from the early part of the 20th century in many developing countries.[19,20] In 1970, an inter-regional seminar in Malaysia organized by the WHO recommended a wide ranging international study of the characteristics of personnel concerned with maternal health, including TBA's in order to improve the quality of the data available for planning maternal health programs.[21] In the late 70's, mobilization of the community was at the core of the primary health care strategy and the training of TBA's seemed entirely in accordance with empowerment of the community.[22] Tens of thousands of TBA's were trained, principally in Asia and Latin America, but also in Africa.[23] With the advent of the 'at risk' approach, it was even hoped that these TBA's could conduct antenatal clinics and might even be incorporated into the health care system as health personnel.[24,25]

Doubts started to emerge as to the effectiveness of these strategies in the late 80's. Namboze while still recommending that they should be trained, expressed his skepticism that 'such women are unlikely to change their ways even if they are trained; by training them you are creating a substandard cadre which will never pass an examination, and you are likely to increase the time of delay in the village before antenatal care is sought, particularly in the case of high risk mothers.[26] It gradually emerged that the training of TBA's had little impact on maternal mortality and that the most effective measures were those that made it possible to reach a well equipped hospital.[27-29]

Antenatal clinics and the risk approach

Again the postulate was that it was possible to anticipate complications of pregnancy and to identify at-risk deliveries by means of good antenatal clinics. It was thought possible to identify these problems with a satisfactory degree of sensitivity and specificity.

The at-risk approach was developed and challenged only sporadically. However in 1980, a study at Aberdeen showed that the productivity of the routine antenatal clinic in relation to the prediction and identification of obstetric problem was extremely low. The conceptual error here is inherent in the approach, which considers only two elements: the proportion of problems in the population considered to be at risk and the relative risk which is the ratio of the incidence of problems among women identified as not being at risk. The Kasongo study, which was one of the first to gather information on the prevalence of risks in a group of women and data in terms of sensitivity and specificity, showed that women at risk were only a small proportion (29%) of all women with obstructed labour.[30]

The current consensus is that even in developing countries where the prevalence of risk is high, antenatal screening has low predictive value because of its low sensitivity (30%) and its relatively low specificity (around 90%).[4]

Imperatives for reduction of maternal mortality in developing countries

Vital statistics in developing countries are often incomplete or absent. In 1977, only 66 out of 162 countries provided data, though incomplete, on maternal mortality. In Africa, five of 52, in Asia 13 of 43 and in Latin America, 19 of 31 countries did.[31] The only information on maternal mortality in developing countries comes from hospital studies or statistics.[32] These tend to give a very bleak picture. However without a denominator to put the figures in a population perspective, its value is

limited. In the early 50's, the few statistics available in developing countries (mainly in Asia and Latin America) showed mortality ratios of the order of 300-400 per 100,000 live births, 3-4 times higher than the levels of industrialized countries at the time. In the late 1960s. the rates in industrialized countries were of the order of 30 per 100,000 live births and in those developing countries where figures were available, of the order of 300 per 100,000, 10 times higher.[33] It was only in 1985 although these figures were available in the late 1970s- that the scientific world became aware of the fact that maternal mortality in developing countries was 20-100 times higher and the cumulative risk of dying was 55-400 times higher there than in the industrialized world.[34-35]

Maternal mortality, it would appear was not a public health concern, in spite of the fact that it was broadly at the level which had given rise to major political pressure in Sweden in the 19th century and in Britain in the early 20th century. Two elements that proved essential in industrialized countries are absent in developing countries; recognition of the magnitude of unmet needs and the adoption of the right strategies.

Awareness of maternal mortality rates and the causes of maternal deaths have been determining factors in the active development of strategies for combating maternal mortality in the western world. In developing countries, this tool, the systematic recording of the number and causes of maternal deaths is not routinely carried out. The use of mortality ratios through surveys remains inadequate, since they are not routinely provided and do not allow planners to take decisions: they do not localize the problem and do not identify the actions to which it would be vulnerable. Such vital registration or confidential enquiry could serve as a basis for active advocacy from the population, pressure on decision makers to provide resources, pressure on health professional to professionalize obstetric care, to set and enforce standards and pressure on health care providers to account for the quality of care provided.

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