Safe Motherhood

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Light on maternal mortality in India

In order to investigate the degree and causes of maternal mortality in Anantapur District, Andhra Pradesh, India, detailed enquiries were made at the grass roots and the records of health facilities were examined. The number of maternal deaths proved to be much higher than would have been revealed by a perusal of official data alone. Many women in a serious condition died on the way to hospital or soon after arrival because the means of transport were too slow or otherwise unsuitable. Maternal mortality rates varied substantially from place to place, reflecting differing levels of economic development and the presence or absence of primary health centres and subcentres.

In India the hospital statistics on which many estimates of maternal mortality have been based are not representative of the total population, since an overwhelming majority of deliveries are conducted by traditional birth attendants. There is also a question mark over the extent of abortion-related maternal deaths. New approaches are clearly needed to discover the scale and causes of maternal mortality.

Described below is a low-cost study of maternal mortality in southern India. Its main objectives were to estimate the number of maternal deaths in a whole community during one year, and to discover the causes, not only in clinical terms but also in terms of avoidable factors in the health services and in the socioeconomic, sociocultural and behavioural fields.

The study was conducted in Anantapur District, an economically backward part of the state of Andhra Pradesh. More than four-fifths of the population is rural and the people are predominantly engaged in agriculture. Industrial development is only just beginning. In the urban areas, medical services are available through government hospitals located at district and taluk (subdistrict) headquarters. Medical and health care in the rural areas is the responsibility of primary health centres. Except for the district headquarters hospital, all health care institutions are controlled by the district medical and health officer. The district hospital, which has 450 beds, is directed by a civil surgeon.

In order to strengthen health and family planning services the national government...
has developed a plan for the creation of facilities and the provision of services, which is being implemented in many parts of the country with financial aid from various agencies. In Andhra Pradesh the World Bank is providing assistance to implement the plan in three districts, one of them being Anantapur.

The study, which covered both urban and rural areas during the period 1 July 1984 to 30 June 1985, was divided into three main parts:
- identification of cases of maternal death;
- investigation of causes of maternal death;
- case-control study to determine characteristics of cases of maternal mortality (i.e., how women who died differed from those who did not).

**Interviewing team**

After the cooperation of state, district, and local health officials had been assured, six male interviewers and a male supervisor were recruited. They were non-medical personnel with considerable experience of conducting health surveys. Before being sent into the field they received seven days’ training.

The team visited each of the 15 hospitals in the district, where information was collected about deaths of women of reproductive age (15–49 years) in all wards during the reference period. Initially the principal investigator accompanied the team. Medical records and case sheets were evaluated with the help of professional staff, so as to identify those women who had died of maternal causes. Information on deaths of women in the same age group, along with identifying characteristics, was also taken from death certificates obtained from the civil registration authorities; this led to the discovery of additional deaths of relevance to the study. All additional cases of death where the cause recorded could be clearly attributed to complications of pregnancy, childbirth and the puerperium were considered to be maternal in character.

Government health facilities in the rural areas are provided through a network of primary health centres, each covering a population of approximately 100,000 in 100–250 villages spread over an area of 390,520 km². In order to make the basic health services easily accessible, there is a subcentre for every 5000 people.

The team visited the 22 primary health centres in the district and asked the various categories of health personnel about deaths of women in the age group 15–49. A sample of 50% of the subcentres associated with each primary health centre was visited by the team. Their records were examined, all deaths of women in the reproductive age

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asked about deaths of women in the reproductive age group. Enquiries on the same subject were made of children in the village schools; this proved to be a very useful source of information. Details of the causes of death were obtained from responsible members of the households concerned.

Most deaths, particularly in rural areas, occurred at home or on the way to hospital.

Information on births was collected from the civil registration authorities and from health facilities. However, the data were grossly deficient. The results of a sample survey conducted in 1981 were therefore used in the calculation of rates.

An interview schedule for a detailed survey of maternal deaths and controls was pretested on 25 cases in villages outside the sample. Controls were randomly selected in each village from the women who gave birth during the reference period and survived. The data were evaluated and modifications were made. For urban areas, controls equal in number to the cases of maternal death were randomly selected from hospital records.

In order to carry out detailed interviews, the team revisited the homes of the deceased women and spoke with household members, preferably the husbands. For controls, an effort was made to interview the women concerned; failing this, other responsible members of the households, preferably the husbands, were interviewed.

During the first phase of the study, the interviewers visited the hospitals as well as municipal officers in small and large towns with a total urban population of 569,500. In the rural areas they visited all the villages with primary health centres, 181 villages with subcentres and 1,192 other villages spread across the district, the population covered being 1,090,640, just under half the rural population of the district. During the second phase the interviewers visited all the towns in the urban areas, 10 villages with primary health centres, 65 villages with subcentres, and 135 other villages to carry out detailed interviews on maternal deaths as well as on controls.

The interview schedules were examined by an obstetrician/gynaecologist, who classified obstetric and clinical causes of death, assessed whether death had been preventable, and indicated, where appropriate, what steps should have been taken to prevent death.

Much preventable mortality

There were 7.98 maternal deaths per 1000 live births, a much higher rate than those reported previously in India. Most maternal deaths, particularly in rural areas, occurred at home or on the way to hospital. Thus, under Indian conditions, studies based only on hospital records are likely to underestimate maternal mortality. It should also be noted that social, economic, cultural and behavioural factors, and access to health services, may differ between women who die in hospital and those who die at home.

Maternal deaths accounted for 36% of female mortality in the reproductive age group. Slightly less than half the identified maternal deaths in the reproductive age group were noted in health facility records, and only about a third were entered in the records maintained by primary health centres and subcentres. This situation could be improved by the proper motivation,
training and supervision of primary health workers responsible for maintaining complete records of births and deaths.

The maternal mortality rate in the rural areas was 8.30/1000 as against 5.45/1000 in the urban areas. Maternal mortality was four times higher in poorly developed villages than in highly developed ones, and was significantly lower in villages with primary health centres or subcentres than in those without such facilities. Integrated rural development and improved village infrastructures clearly helped substantially to prevent or reduce maternal deaths.

Out of 284 maternal deaths for which detailed information was collected, 63% were associated with live births, 14% with stillbirths, 10% with abortions, and 13% with non-delivery. In approximately a fifth of cases there was prolonged labour. Less than half the deaths occurred in hospital, the majority taking place at home or on the way to hospital.

Antepartum, intrapartum and postpartum deaths accounted for 19, 12 and 69% respectively of the total maternal mortality.

Of 140 women taken to hospital in a serious condition, 96 were transported by public bus, 27 by bullock cart, 5 by manually operated rickshaw, and 12 by ambulance or other motor vehicle. Considerable delays occurred and consequently 24 women died on the way and 54 died immediately after reaching hospital. Clearly, it is vitally important to have suitable transport available for this purpose.

About two-thirds of the deaths were due to direct obstetric factors, the remainder being attributable to indirect causes. The major clinical causes of maternal mortality were sepsis (36%), haemorrhage (12%), eclampsia (9%), retention of placenta (7%), and infective hepatitis (10%). Nearly 80% of the deaths could have been prevented by early antenatal care, treatment of predisposing health conditions, and timely medical care or hospitalization.

The cases of maternal death and the controls were compared with regard to demographic, social, economic and behavioural factors. Significant differences were found in caste, family size, socioeconomic status, literacy, age, numbers of pregnancies, stillbirths, abortions and living male children, awareness and utilization of health facilities, predisposing health conditions and danger signals, registration for antenatal care, and number of antenatal visits.

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Diverse sources of information are essential to determine with a fair degree of accuracy the magnitude and causes of maternal mortality. The most important source is the community survey covering a large area, with the aim of achieving a meaningful analysis of the causes of maternal mortality not only in clinical terms but also with respect to demographic, social, economic, cultural and behavioural factors and the accessibility of health care. Such studies can generate a wealth of information useful to health planners and administrators responsible for reducing maternal mortality, and can be conducted at a cost affordable by most developing countries.

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