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TOO FAR TO WALK: MATERNAL MORTALITY IN CONTEXT

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Abstract—The Prevention of Maternal Mortality Program is a collaborative effort of Columbia University's Center for Population and Family Health and multidisciplinary teams of researchers from Ghana, Nigeria and Sierra Leone. Program goals include dissemination of information to those concerned with preventing maternal deaths. This review, which presents findings from a broad body of research, is part of that activity.

While there are numerous factors that contribute to maternal mortality, we focus on those that affect the interval between the onset of obstetric complication and its outcome. If prompt, adequate treatment is provided, the outcome will usually be satisfactory; therefore, the outcome is most adversely affected by delayed treatment. We examine research on the factors that: (1) delay the decision to seek care; (2) delay arrival at a health facility; and (3) delay the provision of adequate care.

The literature clearly indicates that while distance and cost are major obstacles in the decision to seek care, the relationships are not simple. There is evidence that people often consider the quality of care more important than cost. These three factors—distance, cost and quality—alone do not give a full understanding of decision-making process. Their salience as obstacles is ultimately defined by illness-related factors, such as severity. Differential use of health services is also shaped by such variables as gender and socioeconomic status.

Patients who make a timely decision to seek care can still experience delay, because the accessibility of health services is an acute problem in the developing world. In rural areas, a woman with an obstetric emergency may find the closest facility equipped only for basic treatments and education, and she may have no way to reach a regional center where resources exist.

Finally, arriving at the facility may not lead to the immediate commencement of treatment. Shortages of qualified staff, essential drugs and supplies, coupled with administrative delays and clinical mismanagement, become documentable contributors to maternal deaths.

Findings from the literature review are discussed in light of their implications for programs. Options for health programs are offered and examples of efforts to reduce maternal deaths are presented, with an emphasis on strategies to mobilize and adapt existing resources.

Key words—maternal mortality, obstetric complication, developing countries, health services utilization

INTRODUCTION

Every year about 500,000 women worldwide die due to complications associated with pregnancy and childbirth [1, p. 1]. Unfortunately, maternal aspects of Maternal Child Health have all too often been relegated to secondary priority within the child survival revolution [2]. However, emerging information and concern with this high rate of maternal mortality precipitated the foundation of the Safe Motherhood Initiative (SMI) and the Prevention of Maternal Mortality Program (PMM) in 1987.

The Safe Motherhood Initiative (SMI) was formally launched at a conference held in Nairobi, Kenya. It calls for concerted action at the local, national and international levels to reduce the high rates of maternal mortality and improve women's health in the developing world [3]. SMI differs from other health initiatives in that it focuses on the well-being of women as an end in itself. The prevention of death of pregnant women is considered to be the key objective, not because death adversely affects children and other family members, but because the women are intrinsically valuable.

Within SMI, there are proposals for a variety of interventions. These include programs aimed at improving the health status of women who become pregnant, at improving women's access to health services during pregnancy and at improving the quality of medical care available to women who experience complications during pregnancy and delivery.

There are several similarities between the problems experienced by health planners and promoters within SMI and those experienced by other health initiatives, including issues of distribution, utilization and quality of services. PMM thought it worthwhile to see what findings from research in related fields might be applicable to the challenges faced by SMI. The PMM Program is a collaborative effort of Columbia University's Center for Population and Family Health (CPFH) and multidisciplinary teams of African researchers in Nigeria, Ghana and Sierra Leone.

Sponsored by the Carnegie Corporation of New York and the John D. and Catherine T. MacArthur Foundation, this partnership seeks to strengthen the capabilities of African institutions in developing, implementing and evaluating preventive programs. Furthermore, an essential component of our program is to disseminate information useful to researchers, program planners and policy makers concerned with preventing maternal deaths. This review is part of that activity.

We conducted a multidisciplinary literature review to gather information that can guide programmatic effort in the prevention of maternal mortality.* In reviewing a broader body of literature than that dealing strictly with maternal mortality, we are viewing maternal mortality as an instance of a generic problem. Our aim in doing so is to derive insights from a broader body of research and experience, notably in the social sciences, that can be applied in SMI. The articles we selected cover the developing world, with an emphasis on Africa.

We are not claiming to consider all possible factors that may contribute to maternal deaths. For example, we are not dealing here with background factors such as nutrition.† The focus of our review is the interval between the onset of an obstetric complication and its outcome. The reason is that even among well-nourished, well-educated women who receive prenatal care, a sizable proportion develop serious complications during delivery. While there is still a lively debate within SMI about the relative importance of various kinds of interventions, there can be no doubt that the interval we have chosen to concentrate on is crucial to reducing maternal deaths [4].

This paper first presents a conceptual framework—the three phases of delay—which identifies obstacles to the provision and utilization of high quality, timely obstetric care. We then present the findings of our literature review as they relate to these three phases of delay. Potential applications of the findings and directions the PMM program has taken are then discussed. The review points to an approach which prioritizes practical, measurable interventions designed to improve the availability and accessibility of services, which should in turn mitigate factors which impede the decision to seek these services.

THE CONCEPTUAL FRAMEWORK: THE THREE PHASES OF DELAY

We know from the clinical literature that about 75% of maternal deaths result from direct obstetric causes, such as hemorrhage, obstructed labor, infection, toxemia and unsafe abortion [5]. We also know from this same literature that a majority of these deaths could have been prevented with timely medical treatment. Delay, therefore, emerges as the pertinent factor contributing to maternal deaths. Hospital-based investigators of maternal mortality have long bemoaned patients' delay in coming for care. However, to blame the patient for the delay would be simplistic. We view delay as having three phases:

Phase I delay

Delay in deciding to seek care on the part of the individual, the family, or both. Examples of factors that shape the decision to seek care include the actors involved in decision-making (individual, spouse, relative, family); the status of women; illness characteristics; distance from the health facility; financial and opportunity costs; previous experience with the health care system; and perceived quality of care.‡

Phase II delay

Delay in reaching an adequate health care facility. Examples include physical accessibility factors, such as distribution of facilities, travel time from home to facility, availability and cost of transportation and condition of roads.

Phase III delay

Delay in receiving adequate care at the facility. Relevant factors include adequacy of the referral system; shortages of supplies, equipment, and trained personnel; and competence of available personnel.

Although some proportion of maternal mortality is a result of all three phases of delay, any one phase can prove fatal. 'Phase' here connotes placement in a temporal order, from the onset of complications to treatment. While there does exist complex interplay between phases, one type of delay is not linked inextricably with another. Anticipating concerns that a universal model such as this loses sight of the specific pathways exhibited in different places, we will simply note that maternal death in areas where distances to health facilities are large and services poor are comparable to maternal deaths in New York City, where a woman may live next door to a high technology hospital but still die because of poverty and its attendant impact on the decision to seek care.

*We produced short abstracts of the studies reviewed, entering them in a computerized database. This database is available to anyone interested in using it, modifying it, or adding to it. Interested persons will need to have PROCITE, the bibliographic software used to enter, edit, and retrieve abstracts. For more information, contact Ana Pagan at the following address: Center for Population and Family Health, Columbia University School of Public Health, 60 Haven Avenue, New York, NY 10032, U.S.A.

†Readers interested in the literature on these background factors are referred to the excellent review by J. Leslie and G. Rao Gupta. *Utilization of Formal Services for Maternal Nutrition and Health Care in the Third World.* International Center for Research on Women, Washington, DC, 1989.

‡Except where otherwise noted, our discussion of the decision to seek care and the utilization of health care services focuses exclusively on modern medical care, since the major complications we are concerned with are not treatable at the traditional health care level. Therefore, when we talk about seeking care, we mean modern medical care.

The model as presented is universal insofar as both of these cases fit the framework.

FINDINGS

Our findings are presented chronologically: prospective patients begin their health-care-seeking process with the decision to seek care, then they try to reach a health facility where they can receive care. Figure 1 is a schematic representation of how the various factors discussed affect the interval between onset of illness (specifically, an obstetric complication) and its outcome.

Phase I Delay: Decision to Seek Care

The factors that affect the decision to seek care are often those discussed as 'barriers' or 'constraints' to the utilization of services in the literature on health care seeking behavior. Numerous researchers have observed that increasing the availability of services (for instance, by building more facilities or expanding health programs) does not always increase the use of services. This finding has stimulated research into factors that might account for the underutilization of services.

Our review indicates that the barriers most

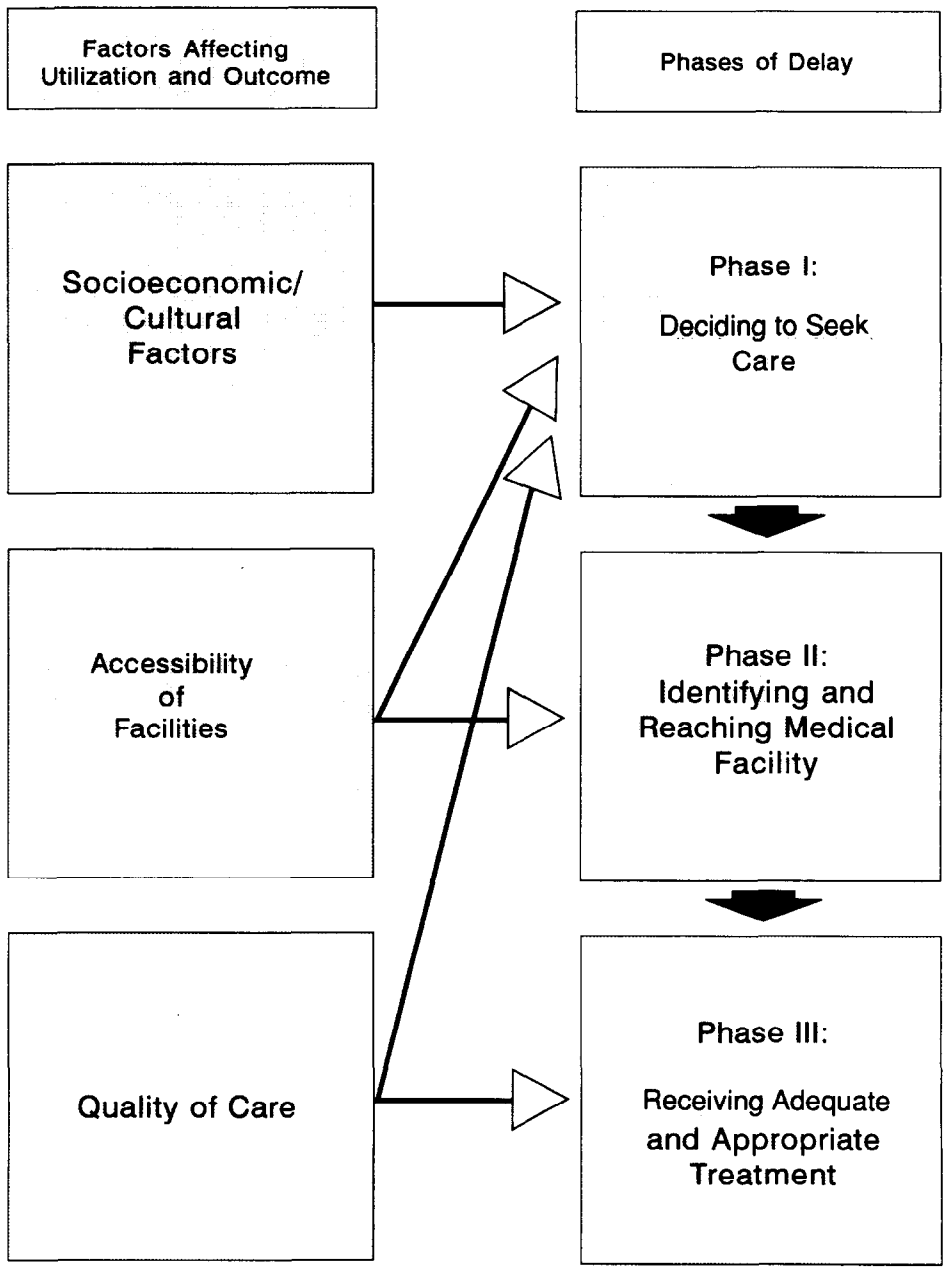

Fig. 1. The three delays model.

commonly studied and discussed are distance, cost, quality of care and sociocultural factors. In what follows, we present findings concerning the influence of each of these factors on the decision to seek care. We also present our assessment of the relationships among these factors and the hierarchy of their influence on the decision to seek care.

Distance

The distance separating potential patients from the nearest health facility has been shown to be an important barrier to seeking health care, particularly in rural areas [6–10]. Distance exerts a dual influence: long distances can be an actual obstacle to reaching a health facility, and they can be a disincentive to even trying to seek care. In addition, the effect of distance becomes stronger when combined with lack of transportation and poor roads. Potential patients who have to walk or ride a mule over rugged terrain will take longer to reach a facility. Distance will therefore be a greater obstacle for them, and act as a greater disincentive to efforts to seek care, than for those who can travel by motorized vehicles on relatively good roads.

Distance as a disincentive to seeking care plays an important role in Phase I delay. However, the two influences—disincentive and actual obstacle—are related and often difficult to disentangle. Thus, some of the findings presented below are conjectural.

The impact of distance as a consideration in the utilization of health services has been assessed in a variety of ways, including community-based interviews and analysis of facility records [11]. In one series of interviews in Oyo State, Nigeria, respondents explained that they had not sought care because the facility was too far or, alternatively, that their choice of facility was made as a function of distance [12].

In studies using records from health facilities, findings often indicate that the highest proportion of users are located close to the facility—e.g. within a radius of five miles or kilometers—and that the proportion of users declines as the radius increases [6, 13, 14].

A third way in which the role of distance has been assessed is by looking at the severity of the condition in which patients arrive at the facility and relating it to how far they had to travel. The hypothesis is that those patients who arrive at the facility in an advanced stage of illness probably had to travel further than those who reached the facility in a less advanced stage of illness. This scenario highlights the role of distance as actual obstacle. However, some researchers extrapolate further, and propose that those patients who had to travel further probably also waited until the illness became serious before deciding to seek care. Presumably they waited longer because distance was acting as a disincentive to seek care earlier, thus delaying their decision [14]. For example, a case-control study of bacterial meningitis among Navajo children in New Mexico revealed that the total distances travelled by cases and controls were similar. However, the mean distance travelled on unpaved roads was 10 miles for cases, compared to 1–4 miles for controls. The author suggests that the distance travelled on unpaved roads acted as a disincentive and delayed the caretakers' decisions to seek care until complications of the initial disease developed [15]. In a Nigerian study, the percentage of individuals seeking treatment within one week of illness onset declined as distance from the treatment facility increased [10].

Some studies indicated that contrary to investigators' expectations, physical proximity does not necessarily increase utilization [16]. As one study in Kenya's Meru District illustrates, road improvements significantly reduced travel distance and time to health centers in the district. However, admission rates and patterns at the two mission hospitals most affected by these changes did not show substantial improvement. According to the author, road improvements alone do not guarantee increased utilization, as institutional barriers, such as the financial cost of treatment at the fee-charging mission hospitals, may limit the advantages of shorter distances [17].

The magnitude of the impact of distance on the decision to seek care appears to be shaped by other factors as well, such as the severity of the condition and the reputation of the provider. Stock's data from Nigeria show an effect of distance on utilization, yet he stresses that there are differences in the size of the effect according to illness and the perceived effectiveness of the health care provider. Tuberculosis, for instance, is an illness for which respondents considered medical care essential. In such cases, the nature of the illness and quality of care appeared to be more important than distance, and people did travel far to obtain care [10].

These and other studies suggest that the impact of distance is shaped by other factors and that reasons for nonuse often lie in institutional accessibility factors, such as the cost and quality of care, to which we now turn.

Cost

Another variable that receives considerable attention in the literature is the financial cost of receiving care, which includes transportation costs, physician and facility fees (when they exist), the cost of medications and other supplies, and opportunity costs. Cost and distance often go hand in hand as considerations in the decision-making process, as longer distances entail higher transportation costs [18].

The effect of cost of services on utilization is commonly assessed through interviews and surveys of users and nonusers in which respondents are asked to give reasons for their choice of actions when they are ill. If a large proportion of respondents give financial constraints as a major reason for not seeking care, or for seeking one form of care rather than another, this

indicates that cost of services was an important factor affecting utilization. Much to our surprise, the literature indicates that compared to other factors, the financial cost of receiving care is often not a major determinant of the decision to seek care [12]. A survey conducted among a sample of 680 Ibo, Yoruba and Hausa people in Nigeria revealed five factors that influenced people's decision to seek traditional or western medical care: Respondents ranked cost and distance fourth and fifth, respectively [19]. Kloos *et al.* reported that in Ethiopia, cost of services was often a less important consideration in utilization than were the quality of services and perceived efficacy of the treatment [20].

We found only a few studies that assessed the effect of changes in the fee structure on utilization levels [21]. Recent data from Nigeria show a drastic decline in hospital births, apparently as a result of the country's deepening economic crisis. Researchers at the Ahmadu Bello University Teaching Hospital (ABUTH) in Zaria found that obstetric admissions declined sharply between 1983 and 1985, the year that the government instituted fees for prenatal care and delivery. Obstetric admissions to ABUTH decreased further in 1988, when patients were required to pay for some of the essential supplies. The researchers note, however, that admissions for complicated obstetric cases increased during the 1983–1988 period, suggesting that the increased price did not deter utilization by women with obstetric complications. Further examination of hospital records indicated that the incidence of maternal deaths in the hospital increased by 56% between 1985 and 1988, whereas it had remained stable between 1983 and 1985. Hospital staff believe that this rise in maternal deaths may be associated with increasing costs that act to delay the decision to use the hospital until the woman's condition is critical [22].

Unfortunately, we did not find any studies that compared actual fees charged by various providers and then related the fees to income levels and to utilization. In fact, a few studies suggest that government facilities may be underutilized precisely because they are free [23, 24].

More generally, the literature simply does not provide systematic evidence that cost of services is a major barrier to seeking care in the developing world. These findings seem to contradict anecdotal reports from developing countries such as those mentioned above. Perhaps other study designs are needed to fully explore the circumstances in which the cost of services poses a major and a definitive barrier to care.

In addition to fees for services, there is evidence in the literature that the cost of medications is often very high [24, 25]. The cost of medicines is most likely to affect compliance with prescribed treatment. However, to the extent that the cost of drugs figures in the decision to seek care, it can be expected to delay or discourage that decision. The financial cost of health services in the form of provider fees and the price of medication are only some of the cost considerations facing individuals in their decision to seek care.

The other important component is the opportunity cost of the time used to seek health services. Time spent getting to, waiting for and receiving health services is time lost from other, more productive activities, such as farming, fetching water and wood for fuel, herding, trading, cooking and so on. As women carry out a large majority of these tasks, the value of their time and the competing demands made on it are important to consider.

In many parts of the developing world, prospective patients, especially women, do not travel alone to a health facility: They are accompanied by other adults and by children who cannot be left at home alone because caretakers are not available. All these additional people swell the cost of transport [27]. Often, family members accompanying patients must incur the costs of staying in a town where the health services are offered. Furthermore, the availability of others to help with household chores, to look after children or to accompany patients to the facility can be a factor in the decision to seek care [13].

It should be stressed that the cost/benefit ratio of using medical services may be viewed very differently in emergency cases [24]. However, we did not find information on factors influencing decision-making under emergency conditions.

Quality of care

Quality of care is an important consideration in the decision to seek care. Our review found that where potential patients have access to more than one facility, their perception of the quality of care offered at these facilities often takes precedence over concerns about distance [28]. Annis found that in the Guatemalan highlands, government health posts seemed to be conveniently located, yet that proximity did not guarantee utilization, probably because the facilities were understaffed and underequipped and thus unable to provide quality care. Detailed on-site inspection of 83% of the operating health posts showed that more than half were understaffed, underequipped, or both. Annis thus stressed that "the current low utilization of Ministry facilities reflects poor quality of services—and certainly not physical access nor mysterious 'cultural barriers' " [16, p. 522].

The role that quality of care plays in the decision to seek care is related to people's own assessment of service delivery, which largely depends on their own experiences with the health system and those of people they know.

The two mechanisms through which quality of care affects the decision to seek care are satisfaction or dissatisfaction with the outcome (e.g. effectiveness of the treatment and remedies prescribed), and satisfaction or dissatisfaction with the service received (e.g. staff attitudes, hospital procedures, availability of supplies, efficiency) [10, 19, 29]. When patients are dissatisfied with services, the reason more often than

not lies in institutional factors, such as the procedures performed, staff attitudes and long waiting times. These factors will act as inhibitors of future utilization, thus affecting the decision to seek care [30].

Furthermore, modern medical facilities have a culture of their own, which often clashes with the culture of potential users [30]. The lack of emotional support and privacy in the hospital setting, compared with the home, and disruption of household responsibilities as a result of hospital confinement are some of the complaints which contribute to women's dissatisfaction with maternity services [23, 31].

Although a focus on cultural barriers to seeking modern obstetrical care may inappropriately de-emphasize institutional inadequacies and economic considerations, several studies have shown that beliefs associated with traditional birth practices act as disincentives to seeking such care. For example, Sargent's ethnographic studies of the Bariba in Benin suggest that where infanticide is still practised, modern medical culture comes into conflict with beliefs, creating barriers. Traditional Bariba belief holds that witches may be identified at birth, and an entire cosmology provides a rationale for infanticide. Although the values and beliefs of that society are in flux, and witches are increasingly 'managed' through less drastic procedures, infanticide persists.

> In Pehunko (Benin), extrinsic factors such as distance, time, and lack of support services rendered cosmopolitan support services unavailable to most women. But even where cosmopolitan practitioners were available to attend home deliveries, this alternative was viewed with suspicion for fear that witch detection and management might be obstructed. Moreover, the rural ideal was solitary delivery in which a woman demonstrated her courage and stoicism, enhanced her prestige, and had the flexibility to keep or reject the child [32, p. 206].

While Sargent's most recent and far-reaching material acknowledges the saliency of time, distance, cost and government policy factors, and that "modifications in medical and religious beliefs and practices occur in conjunction with hospital use," [32, p. 23], she maintains that belief is central to the decision-making process [*ibid.*]. Our review suggests that beliefs, as they relate to the etiology of illness and maternal complications, also play some part in the decision whether to seek modern obstetrical care. However, these beliefs play less and less of a role as societies change through urbanization and increasing recognition of the efficacy of modern medical treatment.

In addition to the above examples of what may be seen as general hospital policy, there are those procedures specific to childbirth that women dislike or fear [33]. Women may feel uncomfortable having to expose their genitals in the hospital ward [23], or they may intensely, dislike the positions favored by hospitals for delivery [34]. Other specific hospital procedures that inhibit utilization because women may fear them include surgical operations such as cesarean sections [35] and episiotomies [36].

Finally, how the prospective patient expects to be treated by providers and staff at the health care facility is an important dimension of the patient's assessment of the quality of care. If the facility has a reputation for unfriendly staff, rude service providers and humiliating treatment, the prospective patient may delay the decision to seek care until the seriousness of her condition necessitates overcoming all barriers [24, 30, 31, 37, 38].

Leslie and Rao Gupta identify corruption as another important dimension of staff attitudes [39]. Where 'little presents' help to get medicines and supplies, corruption may indeed delay the decision to seek care by increasing patient dissatisfaction and, of course, by swelling the costs of seeking care [24].

We have sketched some of the interactions between distance, cost and quality of services as they appear from our review of the literature on utilization of services. A fuller understanding of the decision to seek care needs to take into account other factors related to the illness itself.

Illness factors

The literature clearly shows that health-care-seeking behavior is strongly influenced by the characteristics of the illness as perceived by individuals. To begin with, prospective health care users must *recognize* that an abnormal condition exists. The perceived *severity* and the perceived *etiology* of the disorder then shape the decision to seek care. The studies we reviewed describe one or more of these illness factors without necessarily drawing conclusions about their role in the health-care-seeking process.

Recognition. Before deciding to seek treatment, people need to recognize that they have a condition requiring specialized attention [40].

> A recent survey conducted in six of Senegal's 10 regions indicated that women in these regions lack basic information on signs and symptoms of obstetric complications. One-quarter of the women interviewed could not name a single complication. Only 13 percent recognized fever, and 10 percent prepartum hemorrhage, as important danger signals. Some women even said that fever, dizziness and pallor were signs of a normal pregnancy [41].
>
> Although pregnancy is considered a normal life event among respondents [to a qualitative survey in Jamaica], a childbirth was perceived as potentially dangerous to the majority of the women interviewed. However, most women were familiar with only the common symptomatic complaints of pregnancy, and less than 10% of women could identify any specific risks or danger of pregnancy or birth [31].

Recognition of illness is defined by the patient's view of reality, not by the health professional's medical criteria, with which it may or may not coincide [42, 43]. Moreover, individuals' assessment of a health condition can be influenced by the prevalence of the condition. In a classic study in medical sociology, Zola emphasized that in populations

where a particular condition is widespread, it is perceived as normal, natural, inevitable "and thus to be ignored as being of no consequence" [44, p. 615]. In addition, the perception of a condition as inevitable is often accompanied by the perception that it is not amenable to treatment, that nothing can be done to manage it [20].

Pregnancy and childbirth are ubiquitous events. Although acknowledged as potentially risky, pregnancy and delivery are commonly considered natural, normal work for women. In other words, they are often not seen as illnesses for which medical expenses are justified and a hospital room booked [23, 36, 45]. Furthermore, just as pregnancy is considered a normal event, death during labor and delivery may sometimes be considered 'normal ' or inevitable. Such fatalistic views can lead to the perception that the condition is not amenable to treatment, and can thus act as effective barriers to a timely decision to seek care. The recognition of a health condition can also be shaped by sociocultural prescriptions and interpretations. Among the Bariba of Benin, for example, labor that lasts up to a day is considered normal and thus is not recognized as dangerous [33, 46].

In parts of Africa, prolonged obstructed labor is taken to be a sign of the woman's infidelity [45, 47–49]. Obstructed labor is thus interpreted as punishment for adultery and not recognized as a medical problem. It is believed that the woman must 'confess her sins' so that the delivery will progress smoothly, thus precluding the decision to seek medical care for the complication.

Finally, mention should be made of situations in which a health problem is recognized, but care is not sought because of the fear of social or legal sanctions. Those suffering from a condition they view as shameful or stigmatizing may recognize its seriousness, yet the fear of punishment and ostracism can prevent them from seeking appropriate care. For example, venereal diseases are often denied, unreported and untreated [20]. Vesicovaginal fistulae and complications resulting from unsafe induced abortion often remain unreported, therefore untreated, because of ostracism and shame in the former and the fear of sociolegal sanctions in the latter [34 ,50–53]. Certainly in the case of an unwanted pregnancy, the condition and the need for care are both recognized. However, fear, shame and desperation can act as powerful barriers and lead to disastrous consequences as women seek illicit and unsafe abortion, attempt to self-abort and, in extreme cases, commit suicide [54–57].

Severity. In addition to recognition of a health condition, the perceived severity of an illness is a very important factor in the decision to seek care. Utilization of services appears to be influenced by the recognition of symptoms *and* the assessment that the symptoms are serious enough to justify medical care [18, 42, 58].

The perception of a condition as normal or minor interacts with cost and distance in the decision to seek care. Just as certain conditions (such as pregnancy) are perceived as 'natural' and therefore not requiring medical care, conditions that are perceived as minor also do not justify the expenses of money, time and travel effort often involved in medical care [10, 20]. Cosminsky and Scrimshaw report that residents on the Guatemalan plantation that they studied tended to use low-cost remedies to treat minor conditions and then move to more expensive resources if the illness progressed [59].

It is important to note that we did not find any studies showing that illness severity was not an important factor or that it played a lesser role than other variables as a consideration in the decision to seek care. This is in contrast with the findings of studies examining the role of distance, cost and beliefs about illness causation, all of which reveal much variation in the importance of these factors.

The aforementioned studies indicate that the perceived severity of the condition may well be an overriding factor in the decision to seek appropriate care. Furthermore, there is an interaction between severity of illness and other factors involved in the decision. Specifically, there is a reluctance to incur costs when the disorder is perceived as non-threatening or self-limiting. However, the perception of these expenses as a barrier seems to decrease dramatically when the disorder is perceived as serious, debilitating or life-threatening, and the perceived benefits of seeking care seem to outweigh the constraints. As perceived severity increases, utilization of services increases and the impact of distance and cost in decision-making decreases.

It should be noted that most of the studies we reviewed assume that the decision to seek care is a process that occurs in stages. While this may be the case for conditions with a slow onset, it is unclear what happens in medical emergencies (e.g. postpartum hemorrhage).

Etiology. Once the decision to seek care is justified by the perceived severity of the illness, a key factor in determining the type of care (self, traditional, modern or a combination of the three) that will be sought is the cause to which the illness is attributed by patients and their families.

Our review indicates that while beliefs about illness causation do sometimes play a role in the decision to seek medical care, this role is not as important as it might have been a few decades ago, when the efficacy of medical care was less well accepted in the developing world [27]. Furthermore, while traditional medicine is still relatively more available than modern medical care in rural areas, there is ample evidence from most parts of the developing world that the trend is toward utilization of both systems for treatment of most conditions.

Medical anthropologists and sociologists, such as Cosminsky and Scrimshaw [59], Foster [27], Lasker

[24] and Young [18] reject the view that beliefs about illness causation generally lead to decisions not to seek medical care. They argue that people are empirical and pragmatic, as opposed to 'unscientific,' or 'irrational,' that they base their health care decisions on an assessment of available and accessible resources.

The important lesson from anthropological studies of health beliefs is that a narrow focus on 'cultural barriers' obscures the role that institutional inadequacies and economic considerations play in the decision to seek care. Nonetheless, variation across cultural groups and across health conditions remains great, and beliefs about illness causation do sometimes affect the decision to seek medical care. As we noted earlier, the belief that obstructed labor is caused by a woman's infidelity is widely held—for example, in Sierra Leone, Liberia, Ghana and Zimbabwe. It should serve as an important reminder of the types of factors that need to be identified by research and addressed by programs. It also illustrates that at the heart of many factors that limit access to care is the status of the women in the society.

Women's status

Women's status is composed of the educational, cultural, economic, legal and political position of women in a given society. While women's status generally underlies and shapes women's access to health services, there are specific ways in which it directly affects and delays the decision to seek care. In this section, we focus on how women's access to health services is limited by constraints on their autonomy.

In countries as diverse as Nigeria, Ethiopia, Tunisia, India and Korea, studies show that women do not decide on their own to seek care: the decision belongs to a spouse or to senior members of the family [10, 20, 23, 41, 60–62]. Furthermore, women's mobility is limited in certain areas because they need permission to travel. Often this permission must be granted by the spouse or the mother-in-law [10]. Where women's mobility is severely restricted because of such cultural prescriptions, efforts to seek timely care may be thwarted. According to Harrison, in Zaria, Nigeria, "no matter how obvious the need for hospital management becomes for the girl who develops obstructed labor, permission to leave home for hospital can usually be given only by the husband; if he happens to be away from home, those present are often unwilling to accept such responsibility" [34, p. 385]. In Ethiopia, women tend to use those primary care facilities within walking distance from their homes, because of "cultural restrictions placed on [their] travel outside the community" [20, p. 1013].

For a woman with obstetric complications, access limited to the nearby primary care centers is not of much help. These facilities are usually not equipped to deal with obstetric complications, and further delay can occur through staff errors and misdiagnosis.

In addition to identifying the major factors generally shaping the decision to seek care, our review indicates that these constraints often apply unequally to women. Consider the example of distance. We have discussed how overcoming this barrier largely depends on mobility: Individuals with access to motorized vehicles are more mobile than those with access only to bicycles or donkeys, who are in turn more mobile than those who can rely only on their feet. Yet among the strict Muslim communities of northeastern Nigeria, women are not allowed to ride bicycles or donkeys. Although these means may be physically present in the community, they are effectively unavailable to women [10].

Women's status also interacts with the cost of treatment in the decision to seek care. The literature on the preference for male children provides evidence that the consideration of cost in the decision to seek care is applied unequally to males and females [26]. Witness for example the impact of son preference on access to health services, a phenomenon best documented for Asia, specifically India and Bangladesh, and to a lesser extent, for the Middle East [63] and Africa [38, 64].

In Bangladesh, as elsewhere, private physicians' fees are much higher than those of other providers. Parents consulted private physicians three times as often for their sons as for their daughters. Moreover, the purchase of drugs prescribed by physicians was about three times as frequent when the prescription was for a boy as when it was for a girl [65].

Especially where resources are scarce, parents' health care seeking behavior and expenditures often reveal a preferred investment in their sons' health. Even where health care services and transportation were both free of charge, such as in Matlab, Bangladesh, parents still used the services far more frequently for injured or ill boys than for girls [66]. It is evident that the low value placed on females adversely affects their utilization of health services. However, this link has been generally overlooked. As Royston and Armstrong have recently pointed out, "sex discrimination as a contributory factor to maternal mortality has been largely ignored, [and] has been hidden within the general issue of poverty and underdevelopment which is assumed to put everyone . . . at an equal disadvantage in health terms" [67, pp. 45–46]. Stemming from the low status of women, reluctance to allocate resources or assign importance to female health inhibits the decision to seek modern medical care when complications associated with pregnancy and childbirth arise.

In many parts of the developing world, women consider childbearing as their only means of gaining status. Thus, women often find themselves in a paradoxical situation: high fertility is their main channel to improving their status, but it increases their risk of maternal death. Even in some societies

where women are financially independent, they derive pride and prestige chiefly from their roles as mothers [68]. Sargent's study of the Bariba of Benin illustrates yet another way in which pregnancy and childbirth confer status on women.

> To the Bariba, birth represents a rare opportunity for a woman to demonstrate courage and bring honor to both her family and that of her husband by stoic demeanor during labor and delivery. The woman who manages to deliver without calling for assistance until the child is born is especially esteemed [33, p. 291].

In such situations, a woman's efforts to gain esteem and enhance her status have direct implications for the recognition of complications and delays in the decision to seek care if they do develop.

None of the studies reviewed examines utilization of services by women who are financially independent, who are autonomous in their decision-making and who derive status and prestige from roles other than motherhood alone. Furthermore, the role of women's informal power is rarely addressed. Research in such contexts is much needed. It might mitigate some of the gloominess described above.

The potential contribution of such research can be gleaned from preliminary results of focus-group research conducted in Enugu, Nigeria. Women participating in the focus groups argued that although their husbands are the overall decision-makers, the women are financially independent. Access to cash, they stated, was the most important factor in the decision to seek care. This means that in case of a medical problem, the women do not need to wait for their husbands, as they have ready access to cash and are able to pay for the expenses incurred [69].

Economic status

The literature describes statistical associations between economic status and the utilization of services. However, the mechanisms through which this association operates are not specified. Possibilities include: (1) income constraints; and (2) characteristics of the health care facilities serving the poor that may discourage use [20, 70, 71]. What is clear, however, is that morbidity and mortality rates are higher among groups of low economic status [20, 52, 56, 72–74].

Most of the studies reviewed indicate that economic status affects the use of health services. In general, these studies find that utilization increases as economic status increases [9, 12, 75]. In studies by Kwast *et al.* in Addis Ababa, Ethiopia, economic status was measured by income, house ownership and occupation. The lowest rates of prenatal clinic attendance and the highest rates of home delivery were found among women from the lowest economic status groups [56, 73]. Data from Iraq show that consultation rates for all health facilities rose from 67 per 100 illness episodes for low-income households to 103 for those in the high income bracket [13]. In Calabar, Nigeria, distance did not deter patients from using the family health clinic: Patients living further away were of higher economic status and more commonly owned cars or motorcycles than did those living closer to the clinic [7].

Educational status

Education is measured by the number of years of formal schooling. In developing countries, men generally have higher educational levels than women. Our review reveals two major findings with respect to the role of formal education in the decision to utilize health services: (1) that its role is not clear-cut; and (2) that the mechanisms through which education may play a role are not well understood.

Most of the studies reviewed show that utilization of medical services increases with increasing levels of education. The positive association repeatedly documented is that between mother's education and use of child health services and child survival technologies [76–78]. The presence of a positive association between educational level and use of adult health services is not as consistent [75]. However, survey results from Ethiopia, Jordan and the Philippines indicate a significant positive association between use of prenatal care services and level of womens' education [56, 58, 78].

The mechanisms through which education might affect the decision to use health services are not well understood. It has been hypothesized that education affects individuals by introducing them to a new 'modern' culture [77]; that increasing levels of education increase knowledge and awareness by shaping thought patterns—for example, by acting as "medication against fatalism" [76]; and that education increases access to information. A related hypothesis is that education increases self-confidence and imparts respect and influence [76].

There is evidence in the literature that higher levels of education may not guarantee higher levels of health services utilization [11, 24, 42, 43]. Some studies suggest that with increasing education, individuals depend more on self-care and self-prescribed medication and postpone the visit to a facility until after these methods fail to produce a cure. However, it may also be that the better educated are generally healthier, thus requiring less care than the less educated.

Although there are not many studies that show a negative relationship between education and utilization of health services, they are important, because they illustrate that the explanation of differential utilization cannot be reduced to one variable. In addition to their education, literate and illiterate individuals alike rely on their past experience of health services as a source of information. Furthermore, focusing on education as a main factor in poor utilization levels in effect lets the health system 'off the hook.' It obscures the fact that there are often institutional factors that deter utilization and it ignores the potential effect of outreach activities.

The experience of declining infant mortality independent of education in countries such as Cuba,

China, Costa Rica and Sri Lanka illustrates what Cleland and van Ginneken call the "equalizing influence of health services" [78]. Declines in infant mortality were sharp among offspring born to illiterate mothers in China and to those with less than four years of schooling in Costa Rica. Over time, accessibility and availability of medical services in these countries reportedly decreased differentials in infant and child mortality that had been associated with levels of parental education.

By contrast, there are instances where neither strong national investments in education nor achievement of a high literacy rate appeared to have any effect on that country's high mortality rate. Bullough has pointed out that countries with high under-five mortality rates spend about three to five times as much on education as on health. He further notes that Paraguay and Tanzania are examples of countries that "manage to combine high literacy rates with high maternal mortality rates: adult female literacy 85 percent and 80 percent, maternal mortality rate 469 and 370/100 000 live births" [80, p. 1119].

In its purest form, the decision to seek medical care is a behavioral response to a perceived need created by an illness. The complexity of the real world, however, introduces variability and constraints into this process. It is therefore simplistic to relate people's underutilization of services to their ignorance, illiteracy, poverty, laziness or superstition. Rather, underutilization is often related to people's knowledge, based on previous experience, that facilities are far away and often difficult to reach, that they may be closed, that needed drugs may be out of stock, and that staff are often less than helpful and polite. In other words, the actual accessibility of services is often at the heart of the matter (Fig. 2).

Phase II Delay: Reaching a Medical Facility

The accessibility of services plays a dual role in the health-care-seeking process. On the one hand, it influences people's decision-making, as outlined under the rubric of Phase I Delays. On the other hand, it determines the time spent in reaching a facility after the decision to seek care has been made. This latter effect we term Phase II Delay.

Interviews with pregnant women in rural Kenya indicated that 47 percent of the women intended to deliver in a hospital, 40 percent intended to deliver at home and 13 percent had not yet decided at the time of the interview. Of those who had decided to deliver in a hospital, only 36 percent actually did so. The rest had not changed their minds—they were simply not able to reach the hospital [81].

The data further indicate that 84 percent of the women in the sample had received prenatal care; that the majority of the women and their relatives could recognize risk factors; and that women who experienced difficulties with previous deliveries were significantly more inclined to plan for a hospital delivery than were those who had a history of uncomplicated deliveries. Yet a sizable proportion of women could not act on their informed decision because they lived far from the hospital, which they could reach only by walking or by waiting for a passing lorry [81].

Here, distance and the unavailability of public transportation were not considerations that delayed the decision to seek care. They were actual obstacles that prevented women from reaching the hospital. Factors that create Phase II Delays include the location of health facilities, the travel distances that result from this distribution and the transportation means necessary to cover the distances. In other words, Phase II Delays result from the actual accessibility of health services.

Phase II delays are very common, particularly in rural areas, yet they are not systematically documented in the literature. Rather, researchers have typically focused on the individual and institutional characteristics that inhibit the timely use of services. The perspective that users and providers are the only actors in the health-care-seeking process prevails throughout the literature. By focusing exclusively on the two poles of the health-care-seeking process, this perspective fails to take into account all that happens on the way to the health care facility.

Phase II delays have important programmatic implications. For instance, it is of little use to identify high-risk pregnant women who should deliver in the hospital and to raise the community's awareness of risk factors if the women are unable to reach the hospital, as in the Kenyan example cited above. Gathering data on delays that face patients who are trying to reach a facility is thus an important research effort that can serve to guide programmatic interventions.

Distribution of facilities

There is a general shortage of medical care institutions in the developing world. In addition, existing facilities are more often than not concentrated in and around urban areas. Governments plan to have rural areas served by a network of regional and district hospitals in large towns, primary health centers, health posts and dispensaries. In many cases, however, this network does not function as planned. All studies reviewed indicate that inhabitants of urban areas have better access to health facilities than do rural inhabitants [20, 24]. In the Syrian Arab Republic, 30% of all government and 19% of all private hospital beds are concentrated in Damascus, the capital city. Also, 65% of the nation's health centers are located in urban capitals of governorates. Health care providers are also in short supply and unevenly distributed. Of the country's 221 obstetricians, 78 (35%) practice in the capital city. In contrast, only nine obstetricians practice in the rural areas, and four of them are located in Damascus governorate. This means that there are only five obstetricians in the country's remaining 13 governorates [82].

A concern for equitable distribution seems to have guided the allocation of health resources in a few countries. According to Cardoso, the Cuban Ministry of Health has paid particular attention to the rural areas in establishing a network of hospital

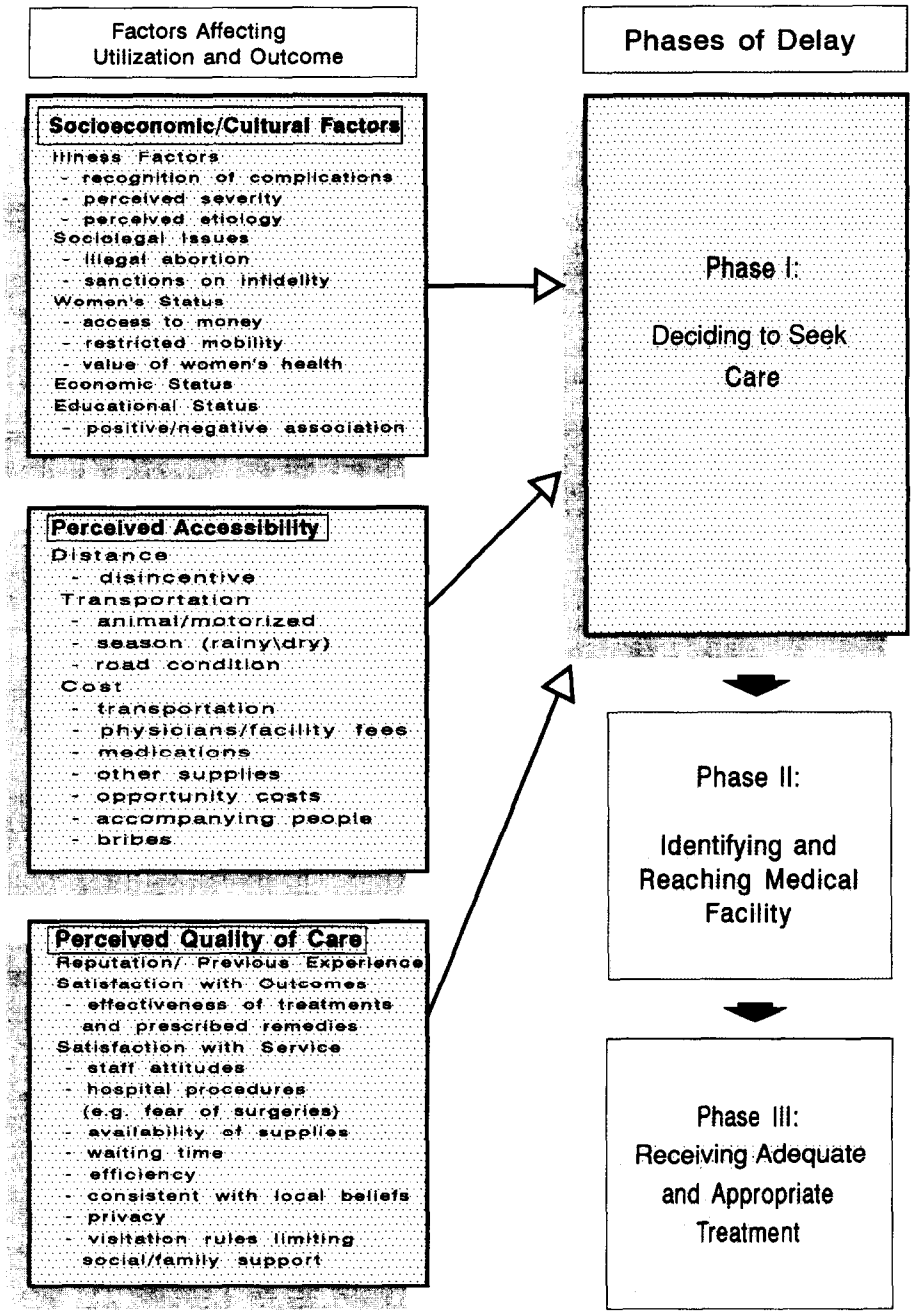

Fig. 2. Phase I delay, detail.

facilities that would be accessible to the entire population. Existing hospitals were enlarged and new hospitals were built in the rural areas [83].

Unfortunately, the Cuban model does not appear to be widespread. Of course, Cuba is a relatively small country, a factor which probably facilitates the implementation of such policies. Still, there are many small countries where distribution of resources is much less equitable.

Travel distances

The uneven distribution of facilities has implications for travel distances between women and even the closest facility, let alone a specialist referral hospital. The issue of access is therefore an acute problem for rural inhabitants in most developing countries. Examples of actual travel distances cited in the literature gives an idea of the magnitude of the

problem [11, 23, 52]: People from a rural farming community in Mexico had to travel 30 km to reach the nearest medical facility [84]; in Ethiopia, rural patients had to walk between 15 and 18 km to the nearest town where Land Rover service was available to transport them to the nearest medical facility [20].

Travel distance can be measured as a straight line between two points—e.g. the house and the hospital. But people often cannot follow a straight line to reach a facility. The nature of the terrain and the condition of the roads often dictate that distances will be longer [69, 85].

Transportation

In addition to travel distance, the scarcity of transportation in developing countries is also a harsh reality [24, 88]. In Tanzania, a woman with placenta previa "died only 20 miles from the Consultant Referral Hospital because the Land Rover assigned to her medical center was being used by an unauthorized person at the time, and she bled to death at the roadside waiting for a taxi" [89, p. 104].

As a result, inhabitants of rural areas commonly have to walk or improvize means of transportation to reach a health care facility [72, 90]. For example, "In a remote area of Bangladesh, seriously ill patients were often carried to the clinic on a chair because there were no vehicles available to transport them" [14].

The patient's condition can, of course, deteriorate with increasing delays in reaching a treatment facility, making the condition more difficult to treat once the facility is reached—that is, if the patient is still alive upon arrival.

Deaths on the way to the hospital

Not all individuals who decide to seek care at a medical facility arrive there in time to be treated; some die while trying to get there. Deaths on the way to seeking care may result from the joint effect of Phase I and Phase II delays: There might have been a delay in the decision to seek care, which was further aggravated by the long distances and/or the unavailability of transportation. But it is entirely possible that the decision to seek care was timely, yet the poor distribution of facilities and the resulting distances separating people from services accounted for the delay and therefore caused the death.

In addition, it must be specified that reaching a health facility does not necessarily mean the end of the health-care-seeking journey. If the nearest facility is a peripheral health center not equipped to treat the condition or even to administer essential first aid, seriously ill patients will have to go on to another, better equipped institution. By the time the patient reaches an adequate health facility, the delays will have further increased the risk of a death *en route*.

Data on such deaths are scarce. Hospital-based studies are not helpful, since they include only deaths that occur in the institution. Community-based research is more relevant, but deaths on the way to seeking care are sometimes counted as deaths at home. Of all studies reviewed, the literature on maternal mortality proved to be the richest source of data on deaths occurring on the way to seeking care [76, 91, 92] (Fig. 3).

A 1984 investigation of maternal mortality in 287 Chinese cities, districts and counties revealed that 15 percent of all recorded maternal deaths occurred on the way to the hospital. They were all in rural areas [93].

In Addis Ababa, 13 percent of maternal deaths recorded over a two-year period occurred on the way to the hospital [94].

Phase III Delay: Receiving Adequate Treatment

Today, Mary, the lady who helps us in the house, came late to work, I told her off for being late and asked why. She said that one of her townswomen . . . had died in the hospital while giving birth to a baby. This was her fifth delivery. She was not from a far off village but from Sokoto city itself. She had not gone too late to hospital but rather gone on time. . . . By the time they found a vehicle to go to hospital, by the time they struggled to get her an admission card, by the time she was admitted, by the time her file was made up, by the time the midwife was called, by the time the midwife finished eating, by the time the midwife came, by the time the husband went and bought some gloves, by the time the gloves were brought to the hospital, by the time the midwife was called, by the time the midwife came, by the time the midwife examined the woman, by the time the bleeding started, . . . by the time the doctor was called, by the time the doctor could be found, by the time the ambulance went to find the doctor, by the time the doctor came, by the time the husband went out to buy drugs, IV set, drip and bottle of ether, by the time the husband went round to look for blood bags all round town, by the time the husband found one and by the time the husband begged the pharmacist to reduce the prices since he had already spent all his money on the swabs, dressings, drugs and fluids, by the time the haematologist was called, by the time the haematologist came and took blood from the poor tired husband, . . . by the time the day and night nurses changed duty, by the time the day and night doctors changed duty, by the time the midwife came again, by the time the doctor was called, by the time the doctor could be found, by the time the doctor came, by the time the t's had been properly crossed and all the i's dotted and the husband signed the consent form, the woman died. Today the husband wanted to sell the drugs and other things they never used to be able to carry the body of his wife back to their village but he could never trace [the body] again in the hospital [95].

This excerpt from a letter sent to us by a colleague provides a vivid illustration of Phase III delays—those that occur at treatment facilities. Delays in the delivery of care are symptomatic of the inadequate care that results from shortages of staff, essential equipment, supplies, drugs and blood as well as inadequate management. Late or wrong diagnosis and incorrect action by the staff are other factors that contribute to delays in the timely provision of needed care. All these deficiencies in the quality of the care provided at health facilities are frequently mentioned in the literature.

In addition to identifying the diagnoses in cases of maternal death, some hospital-based studies determine whether or not the deaths were avoidable. They generally find that while a small number of maternal deaths are unavoidable, the large majority are either

entirely or probably preventable. For example, 98% of institutional deaths studied in Tanzania [87]; 94% of maternal deaths studied in Cali, Colombia [96]; 88% of those studied in Vietnam [97]; and 80% of those studied in Jamaica [98] and in Lusaka, Zambia [88], were judged preventable by the respective investigators.

Insufficient and unqualified staff, clinical mismanagement of patients, unavailability of blood, shortages of essential drugs and missing supplies and equipment limit individuals' access to lifesaving procedures. According to a technical working group formed by the World Health Organization in 1986, these deficiencies "represent a failure on the part of the health services to seize the last chance to save a woman" [99, p. 2]. This technical working group also identified seven obstetric functions that are essential at the first referral level to save the life of emergency obstetric patients. Accordingly, district and subdistrict hospitals should be able to perform cesarean sections, administer anesthetics and blood transfusions, perform vacuum extraction, carry out suction

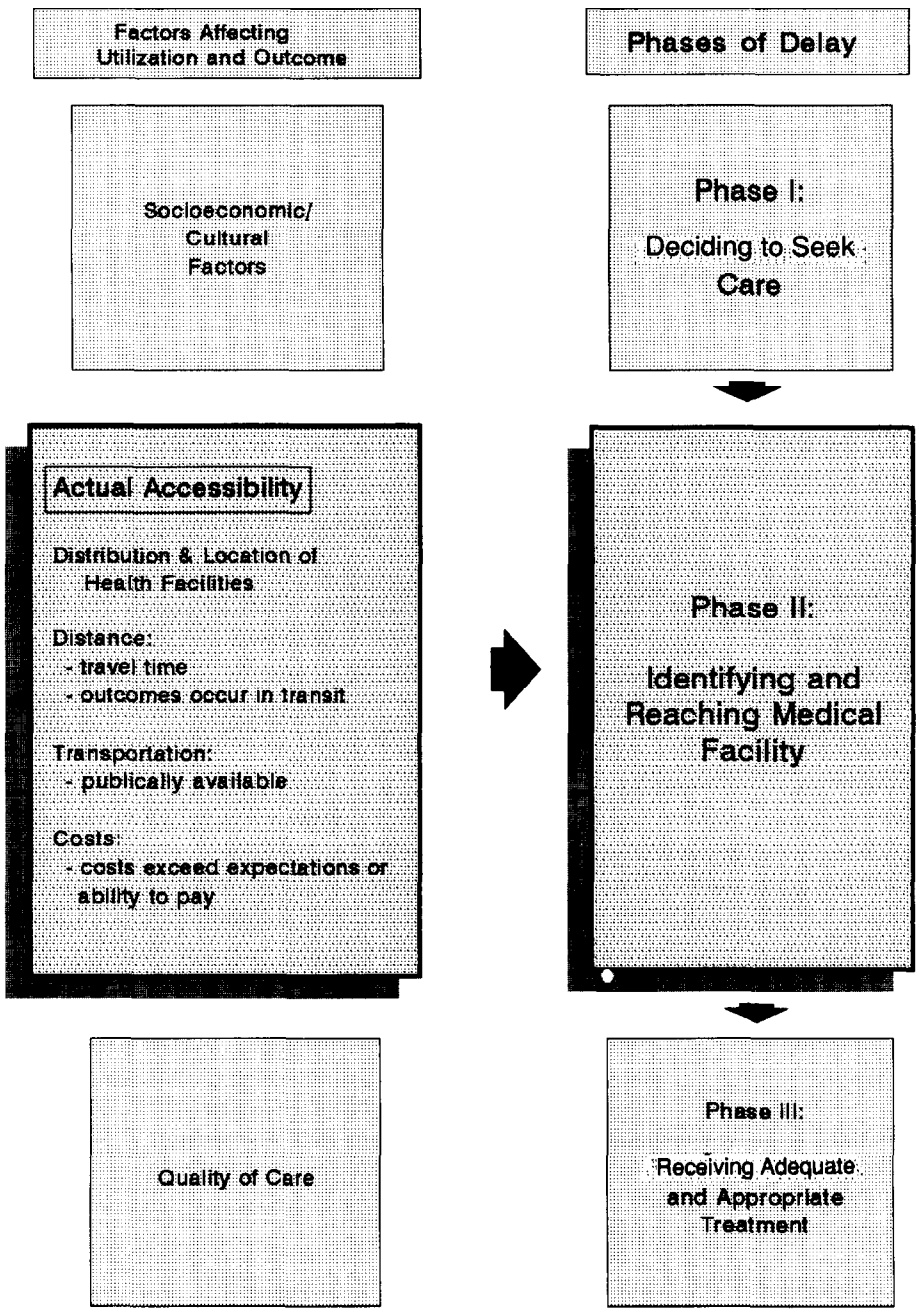

Fig. 3. Phase II delay, detail.

curettage for incomplete abortion, insert intrauterine devices and perform tubal ligation or vasectomy. The capacity to perform these essential obstetric functions provides a guideline against which to evaluate the quality of care described in the following findings.

Ill-staffed facilities

Insufficient numbers of medical and nursing personnel at a facility necessarily lead to delays in patients' receiving the care they need. This shortage is often not only a matter of staff numbers, it is also a matter of competence. In other words, there is a shortage of trained, qualified personnel [57, 87, 98, 100]. In a study of maternal mortality at the University Teaching Hospital (UTH) in Lusaka, Zambia, "the most worrying finding [was] that an avoidable hospital factor was present in 52 percent of cases" [88, p. 77]. Hospital factors identified included poor intrapartum assessment, failure to correct anemia, missed diagnosis of ruptured ectopic pregnancy and unavailability of the anesthetist. The investigators argue that all these factors could be "reduced or eliminated" [*ibid.*]. Numerous other studies report similar cases of clinical mismanagement from Colombia [96], Kenya [101], Malawi [102], Vietnam [97], and Zambia [88, p. 77].

Ill-equipped facilities

A lack of equipment and supplies plagues health facilities in most regions of the developing world. There is little question that this situation is due in part to the very real issue of limited resources. But it is often perpetuated by poor management and organization of the available resources. Difficulty obtaining blood for transfusion assumes paramount importance in the management of several major obstetric complications and is often identified as an avoidable factor delaying the provision of adequate care [56, 103, 104]. For example, blood shortages were implicated in 35% of hospital maternal deaths in rural Tanzania [89], 39% in Malawi [102], and 36% in Vietnam [97]. At Korle-Bu Teaching Hospital in Ghana, prepartum hemorrhage was an indication for 9% of the cesarean sections performed in 1971. The investigators argue, however, that patients who might be treated conservatively if blood were available are sectioned as the quickest way of stopping the bleeding. They maintain that the situation would improve considerably if the maternity unit had its own blood bank [105].

Inadequate supplies of essential drugs, such as antibiotics and ergometrine, are other avoidable factors that contribute to phase 3 delays. Such shortages occur at all levels of the health system [16, 26, 56, 87, 97]. In Ilorin University's Teaching Hospital in Nigeria, some patients were without any antibiotics until the third day after a cesarean section, because their relatives were not able to buy the drugs immediately and they were not in stock at the hospital pharmacy. Sepsis caused 82% of the deaths in this hospital study. Most of these would have been prevented with a course of antibiotics [106].

In brief, the vast body of literature documenting medical and nursing staff shortages, failures in the clinical management of complications and shortages in essential supplies indicates that the quality of care in many institutions is inadequate. These studies show that blaming the patient for seeking care late obscures the fact that the health care system often fails the patient (Fig. 4).

DISCUSSION

In the preceding sections of this paper, we have presented findings from a great variety of studies to help us elaborate some of the factors that may contribute to delay in preventing deaths among women with obstetric complications. We now piece together these various factors to examine the larger picture.

Obtaining medical care for women with obstetric complications begins with the recognition of danger signs. Access to such information and understanding of the gravity of symptoms, such as bleeding or prolonged labor, help a woman and her family to seek timely treatment. Even when women and their families recognize danger signals and understand the need for medical care, they are also aware that there is not much the medical facility can do for her when there is no trained doctor or nurse-midwife, when blood shortages are regular and when equipment is frequently broken. People do not bother to seek care when they know that they probably will not be cured, that they are even likely to die in the hospital. Unfortunately, and despite the efforts of many dedicated and hardworking health providers, this is the state of affairs in many facilities in the developing world. Under such circumstances, people's decisions not to use the health facilities available to them make sense.

The process of obtaining medical care unfolds within the confines of the health care system. In defining the components of this system, it is important to speak not only of the providers, but also of the users as part of that system. As with any system, changes introduced into one component can effect changes in other components. Thus, the objective obstacles encountered in Phases II and III feed back into the subjective decision-making of Phase I, linking the user of health services and the provider of these services into the same system.

To apply what has been learned in this literature review, one can begin with a brief discussion of program strategies. The factors identified as contributing to delay were the following: distance, cost, quality of care, illness characteristics, women's status, economic status and educational status. As Fig. 1 showed, these factors all influence a woman and her family in their home as they decide whether to seek medical care for her. Interventions designed to affect

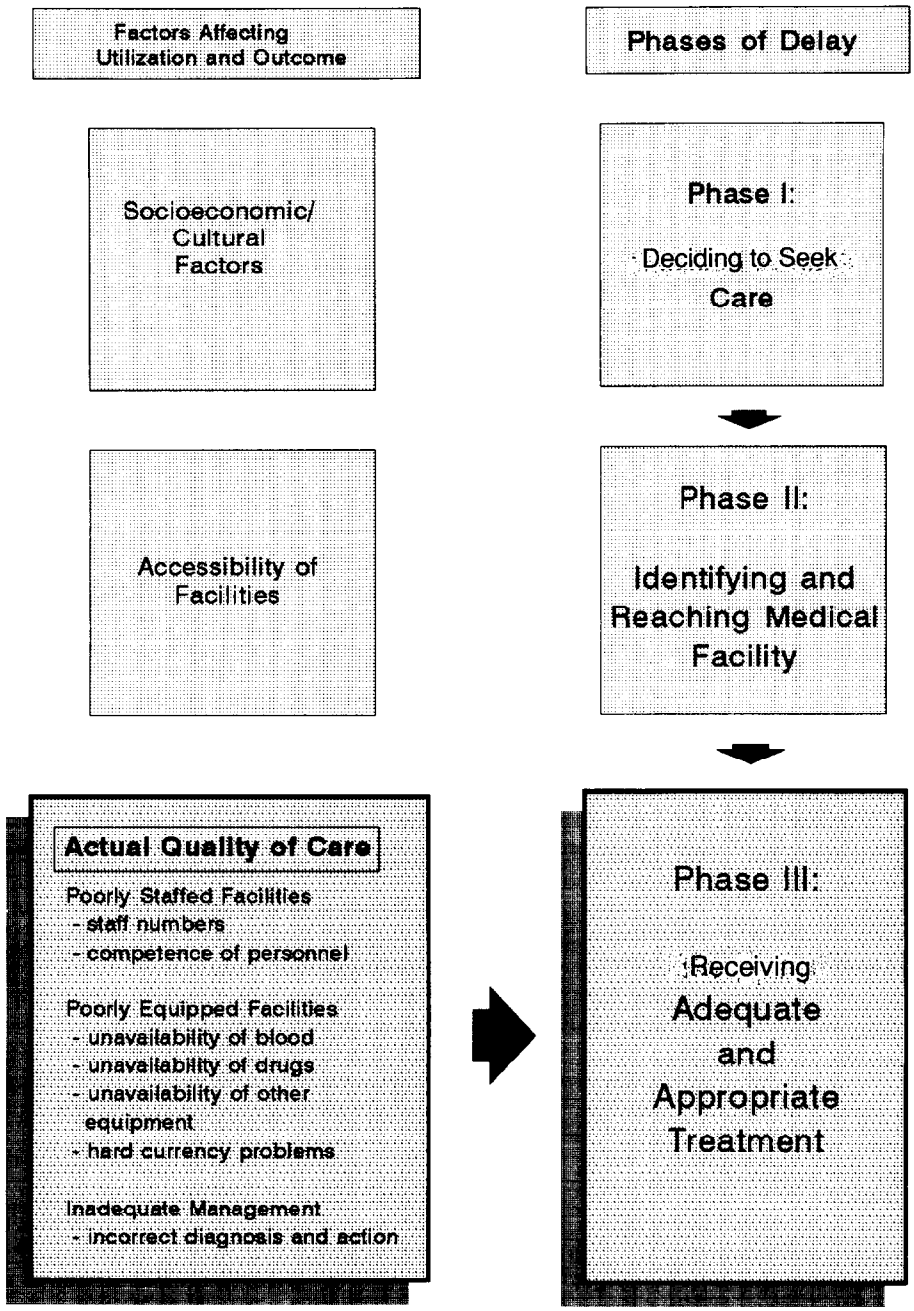

Fig. 4. Phase III delay, detail.

these factors, however, must operate at quite different levels.

Consider, for example, distance and cost. Both these factors affect people's decisions to seek care; there is, however, relatively little that individuals or families can do to influence these factors. Rather, in order to make systematic and widespread changes in these factors, the government must take steps to improve the distribution and financing of medical care. Even so, there are some actions that can be started on a smaller scale and may help reduce the toll of maternal deaths. Some of these are discussed below.

Distance

The physical distance between people and medical care in developing countries is a problem that will take a substantial amount of time, money and political will to solve. However, there are several comparatively inexpensive measures that could reduce maternal deaths by reducing travel distance to health services. Simply expressed, either pregnant women

have to move closer to the services, or the services have to move closer to the women.

The first option has been implemented in the form of maternity waiting homes, which provide modest accommodation close to the hospital for pregnant women who live far away. These women can live in the home during the last few weeks of their pregnancy, then be transferred at the onset of labor or any complication to the nearby local hospital for delivery. A number of countries—such as Cuba [107], Colombia, Uganda and Zaire—are experimenting with maternity waiting homes. Unfortunately, there are no studies to date that evaluate the impact of maternity waiting homes on deaths among women from complications. Such programmatic research is much needed.

While maternity waiting homes will be practical and useful in some situations, they are not the solution to the uneven distribution of obstetric care in developing countries. To deal with this problem, a number of programs are being planned in which community members will be helped to prepare for the eventuality of obstetric emergencies either by setting aside funds to pay for public transport or by arranging with owners to make their vehicles available in emergencies.*

The second option—that of moving the services—was endorsed by a WHO Working Group on the Organization of Maternal Health Care, which stressed that "programmes should be guided by the axiom that all services should be provided at the most peripheral level of the health system at which this can be done effectively" [99, p. 9].

It is not reasonable to propose that definitive treatment of obstetric complications (such as cesarean section) be made available at all health facilities. Even so, many women's lives would probably be saved if health centers in rural areas were at least able to provide first aid to women with complications. In three isolated Gambian villages, the single most important factor contributing to mortality declines "has apparently been the on-the-spot, 24-hr availability of a physician or qualified midwife" at the clinic [108 p. 912]. In addition, free transportation to and from the clinic was provided, and the clinic physician or midwife assisted at home deliveries. According to the authors, transfer to a hospital in cases of major difficulties could be achieved within 3 hr. No pregnancy-related deaths have been recorded in the project area since 1975. This is in contrast to statistics from a nearby non-project village where, in 1981–83, there were 24.2 maternal deaths per 1000 women of childbearing age.

One of the common suggestions for extending the coverage of maternity care services is to train traditional birth attendants (TBAs), since there are many societies where they still conduct a large proportion of the deliveries. While there may be other benefits to such training (e.g. reducing the incidence of tetanus among newborn infants), it does not address the problem of major obstetric complications, many of which cannot be predicted. For most major complications, there is little that a TBA can do in the way of treatment, although existing training programs would do well to include more on first aid measures.

Quality of care

Some of the program options for improving quality of care have already been mentioned, for instance, upgrading peripheral facilities to provide obstetric first aid and even treatment. But there are also actions that can be taken to improve the services in large hospitals. For example, in a major teaching hospital in Nigeria, the obstetric operating theatre has been closed for more than a year because the anesthesia equipment needs repair. Consequently, women who need emergency obstetric surgery have to wait until they can be operated on in the hospital's all-purpose theatre. Reducing Phase III Delay in this case does not require equipping a whole operating room, it just requires repairing the available equipment.

As noted in our review, lack of essential supplies is a common problem in developing countries. Usually, this is part of much wider economic problems, involving devalued currencies, reduced purchasing power, poor balance of trade and stringent structural adjustment policies. Such issues are, for the most part, beyond the scope of health programs. Even within these difficult conditions, however, there is often something that can be done to reduce their impact. In an African country, PMM staff have observed a 'people's store' set up in the courtyard of a large clinic. This store operates on a revolving fund started with clinic money. It sells items that are out of stock in the clinic pharmacy (which depends on the government's central store for supplies). The people's store buys its supplies from merchants in the town at wholesale prices. Thus, the people's store saves patients and their families both time and money.

There are many other options for improving quality of care in health facilities, including training programs and expanding roles for nurses and midwives. The few mentioned above are intended only to illustrate that relatively simple innovations are possible even under very difficult economic conditions.

Cost

This is one of the most difficult factors for which to propose program options at any level. In the past decade, household incomes and purchasing power have been declining in many countries along with government spending in general and for health care in particular. In addition, importing drugs and supplies requires hard currency, which many countries must allocate instead to servicing their debts with foreign banks.

*These programs have been planned in the context of the PMM collaboration with teams of African researchers. Implementation began in 1991.

At the same time, grass roots development continues in the face of these constraints. Farmer-run cooperatives already allow individuals to pool limited resources and negotiate a better deal in the marketplace. Similarly, a community group, such as a women's organization, could use the profits of an income-generating activity toward the bulk purchase of generic drugs to stock a local clinic. Such a group could cooperate with an area hospital toward the same end, making the drugs available to patients at cost. The need for creative experimentation and the involvement of interested nongovernmental organizations is great and may be the most fruitful direction at present.

Economic educational and women's status

Here again, extensive changes will require policy changes at a very high level. Policies and measures to improve women's status, for instance, are being adopted at the global, national, and local level [109].

The United Nations Convention on the Elimination of All Forms of Discrimination Against Women is, in effect, an international bill of rights for women. The convention was adopted by the United Nations General Assembly in 1979 and by early 1988, it had been ratified by 94 nations [110].

Lasting change lies in the structure of a society and change must occur at the top as well as at the grass roots. Thus, people in health programs must put government proclamations into action, and even anticipate them, if necessary, to ensure that women's status becomes more than a topic at cabinet meetings.

'Your wife's health is important; look after her' was the theme for a community education program in northern Nigeria. Men in the communities targeted were reminded of the importance of women's health and the need for maternal care through posters and radio broadcasts. In addition, separate discussion groups were held with men and women (most of whom are in purdah). Participants were told about activities to promote the role of women in development locally, nationally and globally. Women's health needs were also discussed and experiences and perceptions of home and hospital delivery were exchanged [111].

Illness characteristics

The literature reviewed indicated that people's recognition of illness and their perception of its severity are important influences on the decision to seek care. From a program point of view, this is an encouraging finding, because the recognition of danger signs during pregnancy, labor and delivery can be addressed through community-level programs. A Senegalese survey revealed that women lacked information about obstetric complications. In response, the government of Senegal plans to provide community education on pregnancy care and obstetric complications through women's groups [41]. In other countries, lack of information may not be a problem. Women and their families could have enough knowledge to seek care in a timely fashion. They may face other obstacles, such as distance, the cost of services and their inadequate quality.

The PMM experience

Many of the practical applications of our conclusions from the literature review become apparent in the above discussion. Indeed, several aspects of the PMM program take their cues from the conclusions we suggest here. As mentioned earlier, the PMM program works through a network of teams of researchers and practitioners in Ghana, Nigeria and Sierra Leone. In each country, solutions to problems associated with maternal mortality are different. As a part of their operations research projects, teams first conducted situational analyses of health facilities and focus group research to determine barriers to utilization of services and areas where the quality of these services may be improved. The PMM Network's activities to date have focused attention on hospitals (improving the availability of drugs and supplies, improving hospital management and quality of care), on secondary health facilities (expanding and decentralizing provision of emergency obstetric care, improving staffing and skills), and finally on communities (improving emergency transportation, improving the availability of blood, providing first aid, and encouraging the early treatment of complications). The PMM project has adopted a strategy of meeting the community halfway, feeling that it is counter-intuitive to educate and motivate the community about seeking emergency obstetric care until services and accessibility are adequate.

Although women experience delays beginning with the decision to seek care, the PMM approach starts at the other end—with receiving care at the emergency obstetric care facility. The schematic diagram in Fig. 1 is helpful in pointing out our rationale; all the factors affecting utilization and outcome of Phase II and III Delays—distance, transport, roads, cost and quality of care—are crucial variables in the Phase I decision-making process.

Programs must recognize that even 'low risk' women develop obstetric complications, and that provision of prenatal care, food and vitamin supplementation programs, and training of traditional birth attendants in safe, hygienic birthing practices may be of limited efficacy. Additional locally relevant research should be conducted when designing more community-based interventions, such as involving traditional birth attendants in the reduction of maternal mortality. Prenatal screening programs, whether these involve traditional birth attendants or not, may not bring the benefits they intend to bring, since their epidemiologic sensitivity has traditionally been disappointingly low. Also, it is widely assumed that traditional birth attendants are influential in encouraging or discouraging patients and their families from seeking necessary obstetric care; clearly, more research is needed in this regard. Certainly research and education efforts should be directed at decision-makers as they are identified—e.g. mothers-in-law, husbands, religious leaders, etc. The PMM

Network works with community leaders to encourage their participation as educators, advisors and mobilizers.

CONCLUSIONS

In conclusion, we believe that given large gaps in the literature regarding factors affecting the utilization of health services, high priority should be given to field-based research that can elaborate the factors leading to delay in different settings by focusing simultaneously on circumstances facing women in the community and in the health facility. We believe that programs to reduce maternal deaths are more likely to succeed if they are based on gathering data on these various components and then devising interventions that will address them.

The next step is thus for people involved in the Safe Motherhood Initiative to assess the situation in their respective regions and implement program options based on their findings. We also urge people to evaluate their interventions: only if programs are systematically evaluated will we be able to say whether they were effective in reducing delay.

We hope that this article encourages a fresh perspective on the prevention of deaths among women with obstetric complications.

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