Antenatal care in Maputo, Mozambique

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SUMMARY Mozambique, within its plan for overall social and economic change, has given priority to primary health care with a principal focus on maternal and child health. In 1980 an antenatal control form was introduced into all Maputo's antenatal clinics to monitor pregnancies and to help direct specialist care to mothers at greatest risk—a strategy known by WHO as the “risk approach.” In this study three health centres were selected from contrasting areas of the city. Almost 1000 completed antenatal forms were analysed to determine incidence of risk and to evaluate the implementation of this strategy. It was found that: (1) a considerable number of women at risk were identified, referred, and successfully monitored through their pregnancy. (2) Of those women at risk who were identified by the health centres, fewer than half were actually referred for specialist care. (3) Those women at greatest risk were not the highest users of the services, and many of them underused the services compared with those at lower risk. (4) The level of risk and child mortality varied with a measure of urban quality of the areas in which the centres were located.

This study was undertaken in Maputo, the capital city of Mozambique. Maputo, a city of 700 000 inhabitants, is characterised by great diversity of urban environment. While about 10% of the population live in the fully serviced urban zone, 80% live in the periurban shanty town zone and the remaining 10% in the sparsely populated rural zones. Expansion and reorganisation of health care services has been given high priority with particular emphasis on primary health care. A wide range of preventive actions are promoted, especially those relating to maternal and child health.¹

The maternal mortality rate is nationally estimated at between three to four deaths per 1000 live births, and the infant mortality rate to vary between 75/1000 in parts of Maputo to more than double this figure in the rural areas.² Antenatal clinics have been established in Maputo to increase the access of pregnant women to the health services and to identify, through completion of an antenatal form, those at highest risk. This approach, in line with the World Health Organisation's “risk approach” strategy,³ requires identification of the risk factors associated with an increasing risk of morbidity and mortality, including those specific to individual national epidemiological profiles. WHO/UNICEF have recently investigated decision making in primary health care in seven countries implementing a primary health care programme, of which

Mozambique was one.⁴ This present study, which forms part of a larger investigation of primary health care in Maputo (D Jelley, unpublished observations) investigates how the risk approach has been implemented in three sample areas.

Method

In 1980 Maputo city health authorities introduced an antenatal form to be used in all its antenatal clinics to improve both monitoring and follow up of pregnant women. The form records both medical and obstetric history and an estimate of obstetric risk. Each woman's risk status is assessed at her first visit, and she is referred to the appropriate level of care according to the criteria enumerated in table 1. The form is in Portuguese, a language spoken adequately by the interviewing midwives who complete the forms when the pregnant woman presents for her first consultation, the interview itself often being conducted in the local language. Clinical details having been added to the form by the examining midwife, the form is retained by the woman to bring to her next consultation, the date of which is explained to the mother and written on the form. The two midwives assess the woman's risk status, and appointments with the health centre doctor or with the hospital obstetrician are made as appropriate.

Women ideally return to the health centre five

Table 1 *Risk factors: referral should take place if any of the risk factors are present*

Category 1	Referral for birth at Central Hospital: Previous birth using forceps or vacuum extractor Haemorrhage after three of more previous births Manual removal of the placenta during three or more previous births Primip less than 1.5 metres Primip under 16 years old
Category 2	Referral to an obstetrician: Age over 35 More than five previous births Most recent delivery a stillbirth Recent neonatal death Two or more previous miscarriages or stillbirths Recent birth of more than 4000 g Hypertension in previous pregnancies Convulsions in this pregnancy Hypertension in this pregnancy
Category 3	Referral to the health centre doctor: Previous convulsions outside pregnancy Excessive hunger, thirst, and increased frequency of urination Pain in urination Productive cough for over 3 weeks Active tuberculosis

more times during their pregnancy; referral to specialist care is made if subsequent visits indicate that the pregnancy is not progressing normally. The midwife who attends the delivery completes the antenatal form with details of the birth, and the mother is requested to return the form to the health centre where she attended for postnatal care.

The antenatal clinics in which this study took place, Alta-Mae, Malhangalene, and Machava II, were a stratified sample respectively situated in the urban, periurban, and rural zones of Maputo. Data were provided by the city authorities about population, habitation density, degree of urbanisation, type of housing, access to water, transport routes, and employment rates for each city district. Most of these factors were already graded on a five point scale—for example, piped water = 5, to open well = 1. The numerical values for each of the factors in each district were summed to provide a numerical index of urban ecology for each district. The three districts could thus be compared. D J worked in each health centre for one month. In this time all the antenatal forms returned to the health centres by the women during the three months preceding the start of the study were collected by D J and relevant data were transcribed for analysis. Nottingham University computer centre was used to analyse the data, both to determine patterns of all antenatal clinic users and to compare data from the three clinics.

The data were obtained from forms returned by the women to the health centres after the birth of their child or after a failed pregnancy. A national census carried out in 1980 gives population figures

for each health centre district from which the number of pregnant women in the district in any given period may be estimated. If the number of women attending for first antenatal visits to each health centre over the same period is also known, then the coverage of antenatal services in each district may be estimated. These calculations indicate that for the three health centres studied over 90% of pregnant women made at least one visit for antenatal care. Slightly more than 50% of the women attending the clinics returned their forms after delivery or other termination of pregnancy. The remaining 50% are a special group who considerably influence interpretation of the data. The women whose pregnancies terminate in abortion, stillbirth, or perinatal deaths—that is, those at highest risk—are precisely those women underrepresented in these data, since many of them after a failed pregnancy do not return their forms as contact with the health centre has ceased. This must be remembered when the data are interpreted.

Results

There were 940 antenatal forms in the study and table 2 shows the mean age, parity, and proportion of cases at risk from each centre. The average age of women attending for antenatal care is 24—the women at highest risk, under 18 and over 35 comprising 9% and 7% of the population respectively. Six per cent of the women were found to have one or more risk factors in category 1, as compared with 27% in category 2 and 22% in category 3. When risk incidence is analysed in relation to age it may be seen that in category 2 the number of risk factors per woman increases considerably as a function of age, nearly two thirds of the women over 35 having two or more risk factors (table 3).

Of the 195 women aged under 35 in risk category 2, only 25% were referred as were 46% of the 62 women over 35. Therefore over half of the women

Table 2 *Mean age, parity, and proportion of cases at risk from each centre*

Items	Machava	Centre Malhangalene	Alta-mae	All centres
No of records	402	312	226	940
Mean age of women	25.0	24.2	24.4	24.5
Mean parity	3.9	3.3	2.9	3.4
Mean No of antenatal visits	3.4	3.2	4.7	3.7
Population at risk:				
Category 1	27	14	21	62
Category 2	131	91	53	275
Category 3	47	9	184	240

Table 3 Age cohorts and risk categories

Age cohort	Total No in cohort	Risk category					
		Category 1		Category 2		Category 3	
		No	%	No	%	No	%
<18	80	24	30	2	2.5	6	7.5
18-20	204	4	2.0	17	8.3	45	22.0
21-25	322	11	3.4	62	19.2	80	25
26-30	176	7	3.9	52	29.5	44	25
31-35	96	8	8.3	62	65	19	20
36-40	41	3	7.3	41	100	10	24
>40	21	0	0	21	100	3	14
Totals	940	57	6	257	27	207	22

NB. Some women are included in more than one risk category.

over 35 did not receive an obstetric consultation, which has serious implications because two thirds of these women have two or more category 2 risk factors. There were 57 women in risk category 1, of whom 43% failed to deliver at the Central Hospital, but this proportion rises to over two-thirds in those aged under 18.

When the specific risk factors within risk category 2 are examined separately, the most frequently encountered factor is high parity (16%); hypertension in a previous pregnancy was reported by 7% of the women, although only 15% of these were referred to an obstetrician. Five per cent of the women had experienced a previous neonatal death, 30% of whom were appropriately referred; 4% of the women reported two or more previous abortions or stillbirths, of whom 44% were appropriately referred.

When the whole population of 940 is examined 261 (28%) had lost at least one child, and this percentage increased with age, reaching over 60% in those over 35. The number of deaths per woman also increased. Altogether 256 women (27%) first visited the clinic in the first trimester and 147 (15%) made their first visit in the third trimester. Only 230 (25%) of the women achieved the recommended five or more visits and a further 230 attended once or twice. Of the total population of women attending the clinics, 105 (11%) gave birth at home.

Data from the three health centres were then compared. The three centres are located in contrasting areas. If we consider degree of

urbanisation type of housing, water, and access to transport the urban zone has an urban ecology index of 20 compared with 13 in the periurban zone and eight in the rural zone. Clear differences emerge between the health centres in risk incidence and risk referral (table 4) patterns. In risk category 1 risk incidence of between 5% and 8% was found in the three centres, but risk referral differed considerably. Some 89% of all women attending the rural zone health centre referred for delivery at Central Hospital did not actually deliver there as opposed to only 33% of risk category 1 in the other two centres who failed to deliver at Central Hospital. When the incidence of risk factors in category 2 is examined, the proportion of women with at least one risk factor is significantly ($p < 0.01$) higher in the rural and shanty zones.

When the number of child deaths are compared, women in the urban zone have the lowest level of child loss—some 19% of these women have lost at least one child as opposed to 29% in the shanty zone and 33% in the rural zone. The mean number of deaths per woman varied between 2.3 in the rural zone and 1.3 in the urban zone. The age range of the women in the different areas was broadly similar. Use of services also varied (table 5); in the rural zone 12% of women had their first consultation in the first trimester of pregnancy compared with the shanty and urban zones where a third of the women present first in the first trimester. In the urban zone 10% of the women make a total of fewer than three visits to the clinic,

Table 4 Risk referral by health centre

Category	Machava		Malhangalene		Alta-mae		Totals	
	Total No	Referred No (%)	Total No	Referred No (%)	Total No	Referred No (%)	Total No	Referred No (%)
3	23	3 (13)	14	10 (71)	20	15 (75)	57	25 (43)
2	135	49 (36)	86	23 (27)	52	16 (31)	273	88 (32)
1	40	6 (15)	11	7 (64)	153	88 (57)	204	101 (49)

and 56% achieve the recommended five or more visits. In the rural and shanty zones under 20% of the women attend the clinic five or more times.

Table 5 Use of services by health centre population

Health centre	Total No of antenatal visits					
	1-2 No	%	3-4 No	%	Five or more No	%
Machava (rural)	99	25	233	58	70	17
Malhangalene (shanty)	110	35	158	51	44	14
Alta-Mae (urban)	23	10	76	34	127	56
Totals	232	25	467	50	241	25

Discussion

LEVEL OF RISK, CHILD MORTALITY, AND URBAN QUALITY

Research has shown that levels of health both within and between societies are critically determined by socioeconomic factors.⁵ The incidence of risk, prevalence of diseases, and resulting mortality principally reflect level of income, access to basic needs, and environmental quality. The variation in level of risk and child mortality among the women attending the three health centres clearly demonstrates this point. Women from Machava, the poorest and least well serviced area, have a significantly higher level of risk and child mortality than the women attending the centre in Alta-Mae, a fully developed area.

CHILD MORTALITY, LEVEL OF RISK, AND USE OF SERVICES

Although socioeconomic factors are the primary determinants of both disease incidence and level of risk, health service provision itself clearly has an important impact in combatting disease and delivering preventive care. Ideally, health status and level of risk should be the key factors in determining use of services so that those most in need receive

maximum benefit from available services, irrespective of the absolute level of service provision. This theoretical position underlies the risk approach to maternal and child health.³ Analysis of the data obtained, however, shows that in this case the reverse is in fact true. Table 6 illustrates this point. It shows the operation of the "inverse care law"—that is, that those most in need of health services in fact use them less than those who have less need. In table 6 it may be seen that a higher percentage of women with risk factors have fewer than three antenatal consultations than women with no risk factors. Conversely, more women with no risk factors achieve the recommended five or more visits than do women with risk factors. Table 5 clearly shows that women in the rural zone who have overall a higher incidence of risk and child mortality visit the antenatal clinic considerably less than women in the urban zone, who have a much lower incidence of risk factors. This phenomenon requires some explanation if the selective redeployment of resources advocated in the risk approach strategy is going to be effective. It has already been noted that highest levels of risk and child mortality are found among women living in the poorer areas of the city. Corroborative evidence from a parallel survey carried out at three health centres during the same period (D Jelley, unpublished observations) confirms this finding—high risk and child mortality being associated with a range of factors such as poor housing, no piped water, no formal education, etc, indicative of low socioeconomic status. It is important to understand why women of low socioeconomic status and concomitant high risk have a lower use of antenatal services.

Most women in this study were not in paid employment. None the less, the tasks for which they are responsible are many, and often include a considerable amount of manual activity. Women in most developing societies are the providers of basic needs for the family group.

Water, food, fuel, and shelter must be procured, young children must be cared for, and basic health care given to any members of the family who require it. Virtually all small scale agriculture is carried out by women. Socioeconomic status is a principal determinant of access to all basic needs. Level of

Table 6 Use of services by risk category

No of attendances at antenatal clinic	Category 1		Category 2		Category 3		0 factors	
	No	%	No	%	No	%	No	%
1-2	20	53	124	48	37	18	192	30
3-4	14	25	77	30	75	36	256	40
>5	13	22	56	22	95	46	256	40
All	57	100	257	100	207	100	642	100

NB. One or more risk factors may coexist in any mother.

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income will usually influence the type of house, its distance from the nearest water supply, the quantity and quality of food that may be bought and cultivated, and the amount that can be spent on fuel and clothing. It thus becomes clear that those women of low socioeconomic status who have least access to these necessities have to spend proportionally more time in procuring them to maintain subsistence levels. Therefore their use of prenatal services is likely to be low to the extent that it reduces the time available to carry out their basic tasks, and thus threaten the family's day to day survival. A distinction is clear between preventive services—in this case antenatal care—whose value lies in averting a possible crisis—and curative services, which must be used when necessary since illness has an immediate impact on the woman's capacity to provide for her family. It is thus not surprising that we find a low uptake of preventive services among women of lowest socioeconomic status, although these same women will attend the health centre for curative care.

EFFECTIVENESS OF RISK REFERRAL PROCEDURES

The risk approach can be considered effective only if it not only encourages attendance and gives adequate support to those at risk but also if those identified to be at risk are referred to the appropriate level of care.

It may be seen in table 4 that referral rates in all categories of risk are low. A partial explanation of these low referral rates lies in the location of the health centre, and the level of staffing available. In risk category 1 only 10% of women from the rural zone deliver in the Central Hospital whereas 70% of women from the shanty and urban zones do. Machava, the rural zone, has many districts with poor transport services and even from its central industrial area transport into central Maputo is often difficult to arrange—only five of the city's existing 28 ambulances were in service at the time this study was carried out. Women in risk category 2 should receive an obstetric consultation—only one third actually do so. These consultations are provided, usually on a monthly rota, at the nearest general hospital to the health centre, and delay in obtaining an appointment may be considerable due to lack of specialist doctors.

In category 1 referral rates are higher but this is largely due to the high level of referral at the urban centre, where laboratory facilities are available for immediate analysis of blood and urine samples and the health centre doctor is able to offer regular obstetric consultation. At the other centres, where facilities are less adequate, referral rates are considerably lower.

Failure to refer women with risk factors may also

partly relate to the woman herself. Older women, for whom antenatal care has been introduced at a late stage in their reproductive life, may be less convinced of the need for preventive monitoring and also have proportionally greater demands made on their time in servicing the needs of their usually large families. (In this study 70% of the women over 35 had had six or more children.) Of the women who failed to deliver at Central Hospital, lack of transport was cited as the usual cause. Since inadequate transport is predictable, however, and many women living far from the hospital could possibly arrange to stay closer to the hospital at the time of the birth, it is also likely that the midwives do not explain sufficiently clearly to the mothers why they must try to get themselves to hospital for delivery. Again, adequate communication between health worker and mother is essential if appropriate advice is to be given to those women at risk.

Conclusions

We have shown in this study that the level of risk and child deaths in the women attending the three Maputo health centres investigated varies considerably with the degree of urban quality of the areas in which the health centres are situated. The implementation of the risk approach has been shown to be effective to the extent that considerable numbers of women of risk are being identified and referred and monitored through their pregnancies in an organised and systematic way.

Nevertheless, those women at highest risk do not make the highest use of available services and underuse antenatal care when compared with their lower risk counterparts. Of those women at risk who are identified by the health centre, not all are given the degree of support and understanding that their risk status would indicate and fewer than half are actually referred to the appropriate level of specialist care. It is therefore necessary to ask a series of questions that have an important bearing on the planning of health service provision. How can the uptake of antenatal services be increased by those women at greatest risk and with highest rates of previous child loss? More important still, how may antenatal services be extended to reach those women in the community who at present have no contact with the health centre services? How can referral procedures for all categories of risk be improved, so that those who require specialist care actually receive it? All these questions need to be answered if the risk strategy is effectively to identify and service those in greatest need.

Notwithstanding these shortcomings, the advances in maternal and child care in Mozambique should not

be underestimated. The inception of a national health service that explicitly aims to provide health care to the whole population is a major step forward in a country such as Mozambique, which still suffers from extreme poverty. Clearly, only initial steps are being traced in this report, and much progress remains to be made, especially in extending provision of care to all rural areas, but the primary health care programme that has been started has the potential to improve substantially both maternal and child health.

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