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Booked and unbooked mothers delivering at Harare Maternity Hospital Zimbabwe: a comparison of maternal characteristics and foetal outcome

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SUMMARY

This study was prompted by the poor maternal and foetal outcome at Harare Maternity Hospital, Zimbabwe, in unbooked mothers compared to women who had booked for antenatal care. Comparison was made of 195 recently delivered unbooked mothers with 196 booked mothers.

Unbooked mothers were significantly more likely to be younger, of lower parity, be single, have lower socio-economic status, live in or migrate from rural areas, be uneducated and have an unwanted pregnancy. Their infants were significantly more likely to be preterm and/or of low birth weight and had a higher perinatal mortality. The major reasons cited by the women for not booking were lack of money and delivery occurring before the intended time of booking. Discussion focuses on how to improve outcome in unbooked mothers.

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It is concluded that unbooked mothers constitute a high risk group which should be targeted for antenatal care and early booking. Concern is expressed that the universal introduction of user charges for maternity care under the Economic Structural Adjustment Programme (ESAP) will further deter this high risk group from the uptake of antenatal care.

INTRODUCTION

Monthly and yearly analysis of perinatal and maternal mortality in the Greater Harare Maternity Unit (Harare, Zimbabwe) show that both are markedly increased in women who do not book for antenatal care. The Greater Harare Maternity Unit comprises nine units in high density suburbs for low risk deliveries, and Harare Maternity Hospital for high risk deliveries. The catchment population is mainly a poor urban population many of whom migrate between urban and rural areas. The Greater Harare Maternity Unit delivers approximately 36 000 babies per year and about 45 pc of these are delivered in Harare Maternity Hospital.

A study in 1983 showed that 7,8 pc of women who delivered within the Greater Harare Maternity Unit did not book for antenatal care. However, unbooked mothers accounted for 33,5 pc of the total perinatal mortality and 52 pc of the total maternity mortality.^{1,2} The 1985 annual perinatal mortality statistics report for Harare Central Hospital showed that 8,1 pc of hospital deliveries were associated with an unbooked mother. The perinatal mortality for booked mothers at the hospital was 63,5 per 1 000, whereas for the unbooked mothers the perinatal mortality rate was 237,9 per 1 000.⁶

The unbooked pregnant woman, therefore, has a high risk of subsequent poor maternal and fetal outcome. To improve perinatal and maternal outcome associated with non-smoking, it is necessary to first ask three questions: (i) Who are the unbooked mothers; (ii) Why do they not book for antenatal care? (iii) Why should "non-booking" be associated with poor maternal and foetal outcome.

It is commonly believed but never proven, that the answer to the third question is that these women are deprived of supposedly beneficial antenatal care. However, other explanations need to be considered. Socio-economic factors or age and parity characteristics which predispose to obstetric complications with an averse perinatal outcome could be more common in unbooked women. Alternatively, in a community where many

women book late in pregnancy, the higher perinatal mortality associated with non-booking may be due to these women delivering preterm babies before their intended date of booking.

The present study attempted to answer these questions by: (a) Comparing social, economic, demographic and personal characteristics in a group of booked and unbooked women delivering at Harare Maternity Hospital; (b) Finding out by questionnaire the reasons for non-booking (unbooked group) and booking (booked group); (c) Recording birth weight, gestational age and delivery and foetal outcome in both groups of women.

MATERIALS AND METHODS

From January to March 1986, a case control study was performed in which 195 unbooked women delivering at Harare Maternity Hospital were compared with 196 booked women.

Eligibility for study: All women delivering at Harare Maternity Hospital.

Definitions: A **booked** mother was defined as one who attended antenatal care on two or more occasions. This criterion for booking was used because it is only on the second antenatal visit that routine investigations taken at the first visit (e.g. haemoglobin, VDRL) can be reviewed and acted upon, and any trend in the progress of pregnancy becomes apparent. If the mother had attended antenatal clinic elsewhere, outside the Greater Harare Unit and could produce proof of visits with her blood results, she was included as booked. An **unbooked** mother was defined as one who had attended antenatal care on less than two occasions.

Selection of subjects: During the time period of the study all unbooked women who had delivered in the preceding 24 hours were considered eligible.

The unbooked mothers chosen were a 50 pc random sample of recently delivered unbooked women. Randomisation was achieved by opening the next in a series of previously prepared opaque sealed envelopes inside of which a card stated whether or not the woman was to be recruited for the study. All those selected agreed to recruitment. For practical reasons, recruitment to the study was limited to week days.

The booked mothers were selected by identifying from the Delivery Register the next delivery of a booked mother following every unbooked delivery that had been recruited.

Data collection: Information concerning the women's age, parity, marital status, area of residence, socio-economic status, occupation, educational level and attitude to the pregnancy were obtained by personal interview on the day of delivery or the day after. The questionnaire also included questions about the woman's reasons for booking. One Research Midwife (JM) performed all the interviews throughout the study so there was consistency in the collecting of information. Other information taken from the woman's obstetric record related to birthweight, gestational age at delivery and foetal outcome. The mother was also weighed at the time of interview.

Data analysis: A biostatistician assisted in the data analysis. For all categorical data a Chi square test was used. For all data where an interval measure existed (e.g. age, parity, mother's weight and gestation) a non-parametric test (2 sample Kolmogorov-/Smirnov test) was used, since the data was not normally distributed.

RESULTS

During the three month study period there were 40 379 deliveries at Harare Maternity Hospital. A total of 195 unbooked and 196 booked mothers were recruited to the study. The non-response rate for questions was negligible except for the one which inquired about family income and data on maternal weight was not always available.

Who were the unbooked women? Significant differences were found between unbooked and booked mothers in relation to age, parity, marital status, rural residence, education, partner's employment, family income and attitude to the pregnancy (Table I). No differences were found between unbooked and booked mothers for maternal weight or maternal occupation.

Why do women book or not book for antenatal care?

Unbooked mothers: All unbooked mothers were asked their reasons for not booking. All answered this question and many gave more than one reason (Table II).

The two most common reasons given for not booking were lack of money to pay for care, travel expenses, etc. (39,5 pc) and lack of awareness of the importance of early booking, thinking that there was still time enough to book later as they did not have any complications (39 pc).

Table I: Demographic characteristics of booked and unbooked mothers

	Unbooked n = 195 (pc)	Booked n = 196 (pc)	p Values
Age (less than 24 yrs)	118 (60,5)	96 (50,0)	p<0,05
Parity (<2)	114 (58,5)	84 (42,9)	p<0,05
Marital Status (Single)#	45 (23,1)	16 (8,2)	p<0,001
Residence (Permanent or part time rural dweller)≠	66 (34,2)	37 (19,5)	p<0,005
Education (no education)	23 (11,9)	11 (5,6)	p<0,05
Partner's Occupation (Unemployed)*	47 (31,3)	7 (3,9)	p<0,001
Family Income (<Z\$150 per month)**	63 (77,3)	58 (39,5)	p<0,025
Attitude to Pregnancy (Unwanted)	30 (15,6)	7 (3,6)	p<0,001

- # "Single" refers to those women who had no stable partner, and includes unmarried, separated, divorced and widowed women.
- ≠ Women who resided permanently in a rural area or migrated between rural and urban dwellers.
- Married respondents only.
- ** Z\$150 per month was chosen as the income to study since it is the amount below which health care services, including antenatal care are provided free. Family income was not known by 24,6 pc of booked mothers and 40,5 pc of unbooked mothers. (The percentages shown in the table were derived from the number of respondents in each group.)

Table II: Unbooked women — reasons for not booking

Reasons for not booking	No. of mothers giving this reason for not booking (pc)
No money for care/transport, etc.	77 (39,5)
Thought too early to book (still intended to book later)	76 (39,0)
No time (work at home, in the fields, job, etc)	14 (7,2)
Too far from health facility	12 (6,1)
Not aware of value of ANC/only delivery important	7 (3,6)
Did not want people in community to know (schoolgirls)	5 (2,6)
Other	4 (2,0)

*The percentages refer to percentages of unbooked mothers (i.e. of total = 195) who gave this particular reason for not booking

The monthly family income for the 77 women for whom lack of money was the main reason for failure to attend antenatal clinics was reviewed separately. Of these, 29 (37,7 pc) women were entitled to free antenatal care since their family income was less than Z\$150 per month. Information about income could not be provided by 35 (45,4 pc) women.

Reviewing the gestational age at delivery of the 76 who said that it was "too early" to book, it was found that 12 (15,8 pc) delivered before 28 completed weeks and 15 (19,5 pc) delivered between 28 and 31 completed weeks. Thus 27 (35 pc) of them delivered before 32 weeks. Thirty eight (50 pc) delivered at 36 weeks or later. Most pregnant women in this group planned to book after 28 weeks with some only planning to book around the expected time of delivery.

Booked mothers: All booked mothers were asked to give their reasons for booking. All women responded and many gave more than one reason for booking (Table III).

Table III: Booked patients — reasons for booking

Reasons for booking	Number of mothers giving this reason as booking (pc)*
Want healthy baby	187 (95,4)
Medical supervision for early detection and treatment of complication	105 (53,6)
Want safe delivery	21 (10,7)
Advised by friends/relatives	18 (9,2)
Advised by midwives (previous medical or obstetric problem)	18 (9,2)
Problem in current pregnancy	8 (4,1)

*Refer to percentage of total number booked.

The majority of the women booked either because they were concerned about the well being of their baby or because they were aware of the importance of early detection and management of complications, should these arise.

Only 68 (34,9 pc) of booked women did so before 28 completed weeks gestation. Seventy (35,9 pc) booked between 28 and 31 completed weeks gestation and 37 (18,9 pc) booked between 32 and 35 weeks. Twenty (10,3 pc) booked after 36 completed weeks. From this it can be seen that even if a women books for antenatal care, she tends to book late, usually after the 28th week.

Why should "non-booking" be associated with poor outcomes?

Three parameters of foetal outcome were studied: (i) Gestational age at delivery; (ii) Birth weight; (iii) Perinatal mortality.

Ten of the 195 unbooked mothers had a twin delivery compared with one of the 196 booked mothers. The incidence of preterm delivery and low birth weight is increased in multiple pregnancy and the perinatal mortality is also increased compared to singletons.⁸ Because of the possible bias introduced by this uneven distribution of twin pregnancies between the study groups, twins were excluded in the analysis of fetal outcome. Thus 195 booked mothers were compared with 185 unbooked women.

Infants of unbooked mothers were more likely to be preterm, of low birth weight and have an increased risk of perinatal death (Table IV). The perinatal mortality rate in this study (twins excluded) was 129,7 per 1 000 for unbooked women, compared with 35,9 per 1 000 for booked women.

Table IV: Foetal outcome in booked and unbooked mothers (twins excluded)

	Booked n = 195 (pc)	Unbooked n = 185 (pc)	p values
Preterm delivery (<37 weeks)*	18 (9,2)	76 (41,1)	p<0,001
Low birth weight (<2,5 kg)	25 (12,8)	81 (43,8)	p<0,001
Number perinatal deaths	7 (3,6)	24 (13,0)	p<0,001

*Gestational age was calculated from the date of the last menstrual period.

DISCUSSION

This study, prompted by the poor maternal and foetal outcome in the 'unbooked' mother, describes the demographic characteristics of such women, itemises the main reasons for non-booking and attempts to identify factors of importance in adverse pregnancy outcome. In interpreting the results, the study limitations need to be remembered. Firstly, the study was not community based but looked at a group of high risk women delivering at Harare Maternal Hospital. Secondly, women in the study groups were not allocated randomly to the

booked or unbooked groups. Indeed, it would be unethical to do this. The two groups are, therefore, self-selected and this is a possible source of bias. Discussion will now focus on the three questions raised in the introduction.

Who are the unbooked mothers? Unbooked women delivering at Harare Maternity Hospital when compared with booked women, are significantly more likely to be younger, of lower parity, of single status, having an unplanned or unwanted pregnancy, of lower socio-economic status and more likely to migrate between urban and rural areas or reside in a rural area permanently.

Studies by Hamilton in South Africa⁴ and McKinley and McKinley in Aberdeen⁹ also linked poor socio-economic status with non-booking. In Zimbabwe, it is more difficult to classify socio-economic status than in the UK for several reasons. Firstly, many women do not know the value of the family income. This was reflected in our results where 24,6 pc of booked women and 40,5 pc of unbooked women did not know the family income. This may introduce some bias into the analyses of this factor.

Secondly, many families have the male partner involved in waged employment in an urban area, with the wife involved in agricultural work on a subsistence farm or vegetable plot. Both may also join with other family members in informal sector activities such as trading and selling vegetables. Thus the total family income from different sources is difficult to quantify. Nevertheless, the crude measure used to illustrate socio-economic status in the study (family income and partner's occupation) do support the association with low socio-economic status and non-booking.

The South African and Aberdeen studies^{4,9} showed an association between single women and non-booking. However, their booked women tended to be older and of higher parity than in the present study. McKinley did note a disturbing increase in late attendance of young primigravidae, possibly related to premarital conception. It is difficult to explain these differences between communities. In our population cultural beliefs in the importance of the first childbirth after marriage occurring in the maternal home rather than in a health care institution or ignorance about the need for antenatal care are possible explanations. In addition, young primigravidae who are single and unsupported

with negative attitudes towards their pregnancy may be poorly motivated to attend for antenatal care.

Unbooked women were more likely to reside permanently in rural areas or to migrate between urban and rural areas. Failure to book may be a result of them moving between areas of residence and being unsure of where they will be when labour commences.

Why do women not book for antenatal care? The two most common reasons given were that the women did not have enough money to book and/or thought it was too early to book but had intended to do so.

The first reason obviously relates to socio-economic status. In 1986, the booking fee which included the costs of antenatal care and the cost of delivery, was Z\$20,00 at a municipal maternity clinic and Z\$40,00 at Harare Maternity Hospital. Further charges would be incurred for additional days stayed in the hospital. Ambulance fees were charged and the woman had to finance transport to and from the antenatal clinic. The costs were significant, especially for women in the lower income bracket.

What is disturbing, however, is that 37,7 pc of the unbooked women who said they could not afford antenatal care were actually eligible for free care because their total monthly income was less than Z\$150,00 per month. Either they did not know about free care, or the additional costs of transport and ambulance fees were a deterrent. In addition, there were often difficulties in proving eligibility for free care to the health services administration. It required a letter from the employer, or if unemployed, a recommendation from Social Services. Until proof was available, the women had to pay. There were therefore, obstacles to women in low-income families accessing free antenatal care.

Since this study was performed there have been further changes in the charges. In 1988, there was a doubling of the booking fee. In 1991 (last year) the implementation of the Economic Structural Adjustment Programme (ESAP) had led to a complete restructuring of the system of payment for maternity services. Maternity care is no longer free and there is no longer a single comprehensive booking fee which covers all aspects of maternity care from booking until postnatal visit. Instead, every investigation, procedure, medication and in patient admission is charged separately and the total cost to any one patient has increased exorbitantly. Empirical observation suggests that the catchment population for Harare Maternity

Hospital cannot afford these charges. The authors are concerned that this new development under ESAP may increase the percentage of unbooked women and adversely affect perinatal outcome.

The reason that **"it was too early to book"** reflects that tendency to late booking in our pregnant women. Many women giving this reason said that they had intended to book at eight months. Traditional birth attendants have previously concentrated on the delivery rather than the antenatal period, although this is now changing with government programmes to upgrade the skills of traditional birth attendants. Among women citing **"it was too early to book"**, 35,5 pc delivered at gestations less than 32 weeks, and it is plausible that they really did intend to book. For women who delivered after 32 weeks gestation, and for the 50 pc who delivered after 36 weeks, it is difficult to know whether they really did intend to book for antenatal care or just attend for delivery.

Previous research by Reid and MacIlwaine in 1970 and Scott-Samuel in 1980 has stressed the alienating features of antenatal care.^{10,11} Consumers of antenatal care complain about the long waiting time and poor continuity of the staff attending them. However, such reasons were not cited here as reasons for non-attendance, presumably, because such reasons can only be cited by people who have attended for antenatal care. In our study, the booked nulliparous women will not have had prior experience of antenatal care.

Most booked women mention the desire for a healthy baby and the value of antenatal care in early detection and treatment of complications, as being their motivation for booking. Such understanding may relate to the higher socio-economic status of these women and/or problems in a previous pregnancy influencing their decision to book in subsequent pregnancies. The booking gestation of booked women deserves comment: 34,9 pc booked at 28 weeks; the most common gestation for booking was between 28 and 31 weeks, and 28,9 pc booked after 32 weeks. This again reflects the tendency to late booking in our catchment area. It is believed by many women that it brings **"bad luck"** if the pregnancy is declared to anyone before it is visible to observers that the woman is pregnant.

Why should non-booking be associated with such poor maternal and foetal outcome? The data col-

lected was not really sufficient to answer this question, particularly with respect to maternal outcome, but some interesting comments can be made.

This study showed that unbooked women were more likely to have poor socio-economic status and also to be at risk for poor foetal outcome. The questions to be asked are (a) does poor socio-economic status lead to non-booking and then the lack of antenatal care result in poor maternal and foetal outcome, or (b) does poor socio-economic status lead to non-booking and independently is associated with the occurrence of obstetric complications resulting in poor maternal and foetal outcome?

Enkin and Chalmers in their book *Effectiveness and Satisfaction in Antenatal Care*³ attempt a critical appraisal of the benefits of antenatal care. While accepting that antenatal care may be very beneficial for certain high risk pregnancies, they question its value as presently organised for screening low risk pregnancies. They also state that many currently held managements and routines in antenatal care have not been evaluated and shown to be effective in preventing or treating obstetric complications.

It is clear that unbooked mothers in our study had a significantly greater proportion of low birth weight and preterm babies. This was also found by Hamilton in the second part of her study in South Africa.⁵ Low birth weight and intra-uterine growth retardation had been shown to be associated with poor socio-economic status.⁷ In developing countries, mediating factors may be marginal nutrition and excessive physical work. We did not ask women directly about their physical activity. However, in Zimbabwe, rural women and **"migrating"** women tend to be involved in much heavier energy expenditure activities from agricultural work such as ploughing, pounding maize and carrying water compared to urban women. They featured more strongly in the unbooked group. Cigarette smoking, which has been demonstrated as a risk factor for low birth weight⁷ is extremely rare amongst all women attending Harare Maternity Hospital.

Antenatal care fails to predict or prevent many cases of preterm labour. It may detect intra-uterine growth retardation but routine screening fails to detect this problem. This suggests that it is not solely non-booking which results in the higher perinatal mortality in the unbooked group, but that it is the underlying causes for

preterm labour or intra-uterine growth retardation which are responsible.

The finding in our study that there was a significant group of unbooked mothers who delivered a preterm low birthweight baby before they had intended to book shows that our antenatal care service which for most women start between 28 and 31 weeks, has no value in predicting or preventing such problems. The question remains as to whether we would have been able to predict or prevent the preterm labour had they booked at 12 weeks.

CONCLUSION

In conclusion, based on the study results the following recommendations are made: (i) Women who attend antenatal clinics usually tend to be a self-selected low-risk group. The more high-risk groups do not attend. Education as to the need for antenatal care needs to be targetted at them through media campaigns, relocating antenatal clinics and home visits of community health workers.

(ii) Antenatal care and delivery should be free since they are mainly preventive services. The cost of health care is a deterrent for women to book for antenatal care (particularly for women with high-risk pregnancies).

(iii) Health education should be provided at all levels but especially by community health workers, about the importance of early booking (preferably at about 12 weeks).

These three conclusions are based on the assumption that antenatal care is or could be effective (particularly if high-risk groups are persuaded to attend — an assumption which has not yet been proven conclusively). Even if improved and earlier utilisation of antenatal care services by the high-risk group of present "non-bookers" is achieved, it is doubtful whether this alone would reduce the greater risk of perinatal mortality. Specifically, more research is needed into the risk factors for and causes of preterm labour and intra-uterine growth retardation so that antenatal care services might develop strategies to predict, prevent and treat these problems.

In general, improvement in socio-economic status, elevation of women's status in society, access to education and better access to family planning services so women can plan pregnancies remain important requirements for reducing maternal and perinatal mortality.

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